Traditional Food Plants in Sri Lanka

Out of a large number of edible plants explored since the beginning of civilization, only about 150 species have so far been considerably exploited. According to the FAO, only nine crops - wheat, rice, maize, barely, sorghum/millet, potato, sweet potato/yam, sugar cane and soyabean - are being exploited to provide human dietary energy - almost three quarters of human energy provided by the plant kingdom. The wealth of crop varieties built over thousands of years is being lost at an alarming rate.

In the current scenario of ever increasing population pressure and fast depletion of natural resources, continued dependence on a few selected crops has become risky because failure of one or another crop can end with a disaster when no replacement crops are available.

In this context, a large number of traditional food plants can be successfully used to ensure food security and better nutrition in rural mass in the developing countries since they are locally available, tasty and nutritious but rather cheap compared to socially accepted food varieties.

This monograph fulfills a long - felt need for a resource book on traditional food plants. It compiles useful information on 152 traditional food plants useful for academics, researchers, agriculturists, policy makers, teachers, students and the general public who are interested in the subject or involved in the promotion and utilization of traditional food plants.

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Traditional Food Plants in Sri Lanka Udaya Ra

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Udaya Rajapaksha

HECTOR KOBBEKADUWA AGRARIAN RESEARCH & TRAINING INSTITUTE

Traditional Food Plants in Sri Lanka

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M.Sc. Agric., Ph.D. (Moscow)

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To plan for a year, sow rice;
to plan for ten years, plant trees;
to plan for hundred years, educate people "

- A Proverb

FOREWORD

In the current scenario of ever increasing population pressure and fast depletion of natural resources, continued dependence on a few selected major crops under modern agriculture have become risky. Real food security relies on the diversity of food plants since the failure of one or another major crop can end in a disaster when the food base is narrow and no replacement crops are available.

But, our ancestors knew about the ecosystem in which they lived and practiced ways of ensuring the sustainable utilization of the natural resources. Not only did they use a large amount of plant species, but also developed a large number of varieties with qualitative and quantitative traits and adaptive to the different climatic conditions and resistant to pest and diseases. They knew how to prepare meals deliciously and nutritionally and store safely the rest of the food for future consumption. They had the knowledge to destroy the toxic compounds of some foods during the preparation. They also identified some food varieties that are not eaten together since they may be harmful to the humans. They knew food varieties which were good for various ages of the life and physical conditions.

This knowledge and skills related to traditional food plants, agriculture, food preparation post-harvest technology and nutrition are rapidly disappearing. Therefore traditional food plants and indigenous knowledge should be taken care of by adopting sustainable agricultural systems in order to ensure food security and improve the nutritional status of the population.

It is also important that traditional food plants and indigenous knowledge to be protected as they are valuable resources which will decide the fate of future agriculture. Therefore it is absolutely necessary to see that our right to these genetic resources, traditional food plants is protected in international trade agreements.

Therefore it is important to explore the potential of the traditional food plants and document all invaluable information for the future generation. In the context of increasing attention paid to the traditional food plants, Dr. Udaya Rajapaksha a Senior Researcher attached to the HARTI on whom the task of researching and compiling a monograph was entrusted has taken pains to compile this resource book I believe the monograph is valuable and informative and carries timely and forward looking significance.

S.G. Samarasinghe, Ph.D
Director - HARTI.

PREFACE

Considering the importance of low input agriculture and biological diversity for sustainable development, traditional food plants earn global attention in agricultural and food production programmes. Attempts are being made to identify, evaluate, conserve and use the traditional food plant species in a meaningful way all over the world.

In this context, there is a longlasting necessity of a resource book on traditional food plants with their various characteristics and the Hector Kobbekaduwa Agrarian Research and Training Institute has undertaken the task of compiling a book on the above subject. I believe that I have been privileged to coordinate and carry out this task in a useful way. I wish to record my sincere thanks to following personalities who directly and inderctly helped to accomplish this task.

Words can't express my deep sense of gratitude to Mr D.G.P. Seneviratne, former Director of Agrarian Research and Training Institute (Now Hector Kobbekaduwa Agrarian Research and Training Institute) for his untiring help, deep interest in the subject and meticulous guidance right through the course of the project. I recall with special thanks how he first sowed the interest of this research in me.

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Finally I thank Mrs. Kaman Karunaratne and Mrs. Pushpika Ranaweera for speedy type setting.

Udaya Rajapaksha

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INTRODUCTION

1. Background

Food plants are "traditional" in that they are accepted by rural communities through their customs, habits and tradition as appropriate and desirable foods: people are used to them and they know how to cultivate and prepare them for consumption. These preparations are agreeable to their taste. They have opinions as to their nutritive and therapeutic values. Further, these plants are grown in a particular ecosystem operating in a particular locality, or are gathered as wild or semi wild products. The wealth of traditional food plants available to a particular community is related to its particular food and farming system. The geographical location of the community and its proximity to the original sources of food varieties is obviously a positive factor, where the plant diversity of a particular locality is considered . Located in the humid tropics, Sri Lanka is a country with a rich plant diversity. About 3368 plant species belonging to 1294 genera and 132 families have been identified in Sri Lanka. About 800 of these are endemic to Sri Lanka, while the rest species have been brought to Sri Lanka from the various regions at different times.

The other reason for the rich diversity is the early native civilization. It is acknowledged that Sri Lanka has been the home of one of the earliest civilizations in the world. Archaeological evidence indicates that about the 10th century B.C there were people who knew how to make a fire and make pottery (Daraniyagala, 1992). Before the consolidation of agriculture, these hunter-gatherers used a wide range of plant species for food and medicine. In this process, they enhanced their knowledge in edible plants and learned about those which were toxic (Querol, 1992). This knowledge was transmitted from generation to generation.

The development of agriculture in Sri Lanka, as in any other country, has been gradual starting first with the planting of a few seeds of the most useful plants in the area surrounding the gatherer's camp and later around the settlements of settled populations. Although it is difficult to state with certainty when agricultural practices began in Sri Lanka, there is no doubt that the history of agriculture is as long as the history of the Sri Lankan people. The people developed cultural practices and farming systems according to the requirements of the plants with the improvement of knowledge on the environmental responses of each plant cultivated. According to historical evidence, three major types of farming systems have been adopted by the Sri Lankans from the earliest times (Siriweera, 1993).

The most widely practised farming system in Sri Lanka is paddy cultivation. Being the staple food, paddy has been cultivated from ancient times in the valleys of the Mahaweli Ganga and the Malvathu Oya. More areas were brought under cultivation

with the construction of tanks and canal systems for irrigation. Short and long duration varieties of paddy were selected for cultivation in both *Yala* and *Maha* seasons, respectively. According to the *Mahavamsa*, not only was Sri Lanka self-sufficient in rice during the reign of King Parakramabahu the Great (1159-1186 A.D), rice was also exported to other countries.

The second farming system was shifting cultivation or slash and burn cultivation, more popularly referred to as "chena cultivation". In the chenas, coarse grains and vegetables were cultivated under rainfed conditions. Among the coarse grains were *Kurakkan* (finger millet), which was considered as the second staple, *Meneri* (millet), *Thanahal* (Italian millet), *Amu* (Kodo millet), mustard, gingelly (sesame), green gram and black gram. Vegetables such as luffa (ridge gourd), ladies fingers (okra), snake gourd, bitter gourd, ash pumpkin, yellow pumpkin, melons and brinjal (egg plant) were also cultivated as mixed crops in chenas.

The third farming system maintained by the Sri Lankans from early times was the home-garden. Traditional root and tuber crops, jak, coconut, arecanut, winepalm (kithul), banana, sugar cane, ginger and turmeric, citrus species and other important food and medicinal plants were commonly cultivated in home-gardens (Siriweera, 1993).

In addition, it is very well known that the forest played a vital role in the food system of our people. It provided a wide range of food varieties. Wild yams such *Katuala* (*Dioscorea pentaphylla*), *Hiritala* (*D. oppositifolia*), *Gonala* (*D.spicata*) were a good source of carbohydrate during lean seasons. Seeds of *Hal* (*Vateria copallifera*), Beraliya (*Shorea megistophylla*) and *Madu* (*Cycus circinalis*) and the plant heart of *Kitul*, (*Caryota urens*), *Indi* (*Phonenix zeylanica*) and *Thala* (*Corypha umbraculifera*) were ground as flour and used for various preparations. Wild bread fruit and banana have been used from the prehistoric era (Daraniyagala, 1992). A large number of forest plants such as woodapple (*Feronia limona*), *Indi* (*Phoenix zeylanica*), *Weera* (*Antidesma bunius*), *Palu* (*Manilkara hexandra*), *Mora* (*Ephoria longan*), velvet tamarind (*Dialium ovoideum*), tamarind (*Tamarindus indica*), *Timbiri* (*Diospyros malabarica*) and *Ulkenda* (*Polyalthia korinti*) has been used as fruits.

A large number of green leafy vegetables grown in the forest were used for human consumption, Palms such as *Kitul* (*Caryota urens*) and *Thala* (*Corypha umbraculifera*) provided starch, particularly *Kitul* was a very important tree which provided palm sugar. Trees such as mi (*Madhuca longifolia*) provided both oil and sugar.

Sri Lankan farmers used not only a large number of plant species to fulfil their dietary requirements but also utilized and developed many varieties and land races of food crops. By trial and error they selected varieties best suited to specific environmental conditions. Robert Knox (1983) provides in his "*An historical relation of the Island Ceylon*" evidence to show that the people of Sri Lanka cultivated a large

number of rice varieties. "They had several sorts, and called by several names according to different times of their ripening, however, in taste little disagreeing from one another. Some will require several months before they come to maturity, called *Mauvi*; some six *Hauteal*; while others will ripen in five *Honorowal*; others in four, *Hinat*; and others in three, *Aulfancol*". According to the *Poojavaliya*, written in the 10th century A.D., more than 200 rice varieties were cultivated in Sri Lanka at the time.

In 1902 the Nugawela Disava exhibited a collection of more than 300 rice varieties at the Kandy Agri-horticultural and Industrial Exhibition (Senadira et al, 1985). At present more than 3194 rice varieties have been collected and preserved by the Plant Genetic Resources Centre at Gannoruwa (Wijesinghe et al. 1993). According to the Administrative Report 1996 of the Department of Agriculture 9783 crop samples were collected at the Plant Genetic Resource Centre and out of which 3769 are rice samples. A large number of these are traditional varieties. It is clear that our people have, over many generations, utilized nature's gifts and developed varieties with desirable traits which were appropriate to the particular climatic conditions. Even today we come across traditional varieties, some of which can give a stable yeild even under unfavourable soil and climatic conditions.

2. Food Plant Diversity is Jeopardized

Out of 80000 edible plants explored by man since the beginning of civilization only about 150 species have so far been exploited considerably. Today less than 30 plant species meet about 90 percent of the world food requirement (Mal, 1994). Wheat, rice, maize, barely, sorghum/millet, potato, sweet potato/yam, sugar cane and soyabean provide three quarters of the plant kingdom's contribution towards human dietary energy requirements (FAO, 1993). The wealth of crop varieties built over thousands of years is being lost at an alarming rate.

It is known that both natural and human factors influence the erosion of plant diversity. Plants become extinct or are transformed into new species in the process of evolution, but the rate of extinction is much higher due to human factors. Political, economic and social factors directly influence genetic erosion, particularly the erosion of food plants. Some of these factors are described below.

Our traditional subsistence agriculture, farming systems, food systems and food culture were challenged for the first time during the British Era in the 19th century. The emphasis then was on plantation agriculture, which included the cultivation of tea, rubber and coconut on a large scale. Three botanical gardens were established in different ecological zones of the country, Peradeniya, Gampaha (Henerathgoda) and Haggala. Trials were to be conducted to check on the adaptability to the soil, climatic conditions and yeild potentials of the economically important plants before taking up their cultivation on a large scale. The British brought in South Indian

Tamils to Sri Lanka to work as estate labourers and to fulfil their dietary requirements rice was also imported. Thus, as a result of the promotion of plantation agriculture, traditional agriculture suffered.

The unsuccessful Uva Wellasa uprising in 1918, just three years after the British captured power in Sri Lanka, also influenced traditional agriculture adversely. The British rulers who managed to suppress the uprising nevertheless realised that the strength of the "rebels" lay in the prosperity of Uva Wellassa ("Wellassa" means one lakh of paddy fields). In order to prevent a further uprising, peasant families were annihilated, paddy fields and grain silos were burnt and tanks and other irrigation systems destroyed. In a short time the whole of the Magama and Uva Wellassa regions were ruined. The British did not encourage traditional farming for a considerable length of time, hoping to break the backbone of the traditional farmers. This seriously affected traditional food varieties and farming systems.

European food habits also had serious implications on our traditional food and farming systems. The aliens introduced food plants familiar to them in Europe in order to satisfy their food requirements. Consequently, vegetables such as cabbage, potatoe, carrot, beans, beet root and leeks were grown in the hill country areas where the agro-ecological conditions were favourable for such crops. The Sri Lankan elite imitated the British, and with time these varieties of vegetables became popular among the common people too. These vegetables are popularly known as "upcountry vegetables" even today, as they are cultivated in the highlands of Sri Lanka. Although the Portuguese and the Dutch, who ruled before the British introduced certain crops of the New World such as chillies, sweet potato, tobacco and potato, they did not hamper or uproot our own food systems; instead they were incorporated into our food systems. Even now European vegetables are more popular and considered prestigeous. Although one can argue that the introduction of these crops enriched the crop diversity in Sri Lanka, the damage done to the traditional food plant diversity is greater due to the cultivation of few crops on a large scale in order to meet the high demand for exotic varieties created by high social acceptance.

Some policies and strategies adopted by successive governments before and since independence have also been responsible for the decline in useful traditional food plants. For instance, the Green Revolution launched in the 1960's had as its motto the increase in productivity using high yielding varieties and high inputs. Existing traditional varieties were deemed unsuitable for the new situation and only a few new varieties were bred and cultivated. Monocropping is the accepted farming system in modern agriculture. As a result of the cultivation of selected varieties of a few cash or market oriented crops, thousands of food crops grown in farmers fields have been seriously threatened At the same time, the government policy of achieving self-sufficiency in rice and of converting the uplands, where the coarse grains were cultivated, to paddy fields under various irrigation schemes in the country has had a negative impact on other cereals such as finger millet and other millets. This led to

a serious erosion of traditional food plant varieties.

Traditional tubers and yams and also jak and breadfruit are becoming less important in the Sri Lankan diet due to certain social factors. Only a limited number of green leaves are consumed by the people, and hundreds of leafy vegetables are being neglected, while others are being discarded as weeds due to lack of knowledge of their nutritive and therapeutic value. Fruits of the temperate zone such as orange, mandarin, apple, grapes and pomegranate began to appear in urban markets. Urban groups go for instant foods and many fast food outlets have been opened in the cities, popularizing pastries, burgers and pizzas.

Deforestation has also a serous impact on plant genetic erosion and food security of the local people. Some 200,000 square kilometers are disappearing every year. In Sri Lanka, the land area under forest cover has decreased from about 70% at there turn of the century to about 22% today.

Considering the importance of conservation of natural habitats, the Sri Lankan government has declared some forests as protected areas. Although protection of forests is extremely important from environmental point of view, it has limited the access to the people who live around the forests and rely on them for survival.

3. Why Traditional Food Plants are Important?

In the current scenario of ever increasing population pressure and fast depletion of natural resources, continued dependence on a few selected major crops has become risky. In Sri Lanka, the diversity of edible plant spices, varieties, and landraces is under serious threat. For example, grains such as kodo millet, millet and Italian millet which contributed significantly to carbohydrate intake early this century, are hardly cultivated anywhere. This situation has become more crucial due to cash cropping. The comparative advantage in commercial agriculture has resulted in replacing a large number of crop varieties grown in farmers' fields for their dietary needs by a few crops which have a commercial significance. In modern agriculture, a large number of food varieties is being destroyed as "weeds".

Let us consider the reasons why a wide range of the traditional food plants are important for the survival of humans.

3.1 Food Security

Real food security relies on the diversity of food crops. Therefore the failure of one or another major crop can end in a disaster when the food base is narrow and no replacement crops are available. Further, it is now widely accepted that the increase of food plant varieties may result in short and long term benefits to the community.

It has, therefore, become extremely necessary to look for new alternative or non-conventional plant resources for diversification of present day agriculture. In this context, underutilized traditional food plants assume special significance. Various International Organizations, GOs, and NGOs are now involving themselves in collection and evaluation of plant varieties and collecting and dissemination of knowledge on underexploited food varieties. For instance, the International Board for Plant Genetic Resources (IBPGR) has selected more than fifty crops to be concerned with. In this, the IBPGR considers the following facts: the level of risk to the crops and their wild relatives; the economic and social importance of crops; the materials that need collecting; the needs of plant breeders, and the quality of the present collection (Fowler et al., 1990).

In the case of Sri Lanka, collection of plant genetic resources is in progress. For instance, the Plant Genetic Resources Centre (PGRC) has collected a large number of both local and imported varieties and land races of rice, coarse grains, and vegetables. Collection of root and tuber crops and horticultural crops is handled by the Central Agricultural Research Institute (CARI) of the Department of Agriculture (DOA). A valuable collection of spices and economically important crops is maintained by the Department of Export Agriculture (Wijesinghe et, al., 1993).

Further, the Ministry of Agriculture and Lands has identified 21 vegetable varieties and 12 fruit varieties for intensive cultivation in order to ensure the availability of food throughout the year. The list of vegetables and fruits is given below:

(Vegetables)
Ash plantain, Ash melon, Bitter gourd, Carrot, Tomatoes, Winged beans, traditional seeds and yams, Cucumber, Ladies fingers, Brinjals, Sweet potatoes, Mushrooms, Beet, Beans, Sweet chillies, Drumstick, Raddish, Leeks, Pumpkins, Fence gourd,

(Fruits)
Pineapple, Mango, Banana, Rambutan, Pomogranate, Woodapple, Orange, Lime, papaw, Guava, Passion fruit.

Most of the fruits and vegetables listed above are considered "traditional" by the Sri Lankans. This reflects the growing necessity for promotion of crops, particularly traditional, which are now underexploited, in order to satisfy the food requirements of the increasing Sri Lankan population.

To safeguard the real food security, the increase of the number of food plant species alone is not adequate, but also the genetic diversity within the species or varietal diversity should be conserved and improved. Genetic uniformity is a part of modern agriculture. Agricultural crops are plant populations that are typically uniform, because uniformity is essential in modern crop husbandry. Uniformity has a great advantage for modern agriculture, for instance, crops are of the same height, they

mature at the same stage and therefore it is easy to harvest and have desirable qualitative and quantitative characteristics. There is a further advantage when all the crops in one region are identical, because the harvest can be stored and transported in bulk (Robinson, 1996).

Despite the said advantages there is a main disadvantage of the modern varieties in that they are not resistant to pests and diseases mainly due to the use of one gene for resistance. Unlike modern varieties, resistance of land races provided by set by genes and that is much more suitable for survival in the evolutionary process carried out by nature.

Agricultural crops have faced a disastrous situation due to lack of resistance in the recent past. Potato blight in Ireland in 1840s and coffee rust in Ceylon in 1870s have destroyed whole cultivations and provided unique examples for negative impacts of genetic uniformity (Flower et al. 1990). Both Ireland and Ceylon are rather secondary centres for those crops respectively and they were introduced to these countries with a narrow genetic base. Corn leaf blight in Florida, USA in 1970 and the failure of Besostaja wheat variety in Ukraine are recent examples. Wild relatives of potatoes that occurred in Mexico helped to come out from potato blight in Europe. Therefore, for sustainable use of agricultural crops a large number of crop varieties and their wild relatives should be maintained and conserved.

3.2 Traditional Food Plants and Nutrition

In terms of quality of life indicators, the development of Sri Lanka was no less spectacular to that of the economic growth of East Asian economies in the recent past. The crude death rate declined from 38 per thousand in 1900 to only 6 in 1987, a level no country in Asia, Africa, Europe and North America could achieve in their history of development, excepting Korea and Taiwan. Infant mortality declined to 21 from about 70 within the short span of the last 25 years. Similar high standards have been achieved in life expectancy, literacy, child mortality and maternal mortality (outcome indicators) as well as immunization against childhood diseases.

Despite improvements in many public health indicators, problems of malnutrition persist in Sri Lanka, particularly among women and pre-school children. Inadequate dietary intake and suffering from illness are two major causes of malnutrition. These problems include poor growth of children, high rates of Low Birth Weights (LBW), poor maternal nutrition status and deficiencies of micronutrients. In the long term, poor nutrition has an adverse impact on the productivity of the country because it leads to lethargy and reduced work capacity among the population.

Now it is realized that malnutrition is an outcome of a number of factors. Food insecurity at household level is one of the major factors which contribute to

malnutrition. Ensuring food security at global, regional or country level does not necessarily reflect the household food security, since accessibility to food plays a vital role, particularly among poor people. Therefore, introduction of alternatives to rural poor with low purchasing capacity has a vital significance in this regard.

Introduction of low cost food varieties affordable to the family budget and increasing the household food production are two effective strategies to ensure the household food security.

The seasonal availability of food makes changes in food prices. Families have to make food choices within their budgets in planning an appropriate family diet. The knowledge and practice of preparing diets with a variety of foods and the use of local seasonal foods are important for improving the nutrition status of the family (MPP&I et al.1994).

Traditional food varieties can be effectively used as low cost food sources for low income groups of underdeveloped countries such as Sri Lanka. In this context, traditional food plant varieties have some distinct advantages due to the simple reason that they are common, popular and still contribute significantly to the dietary needs of the rural poor. They adopt well to unfavourable environmental conditions and some of them can even be grown in marginal lands which have good resistance to pests and diseases. Therefore they require low attention and little or no inputs. They are nourishing and have a value similar to socially accepted food varieties and can perform the function of either staple or supplementary foods. Since most of them are gathered fresh from the surrounding or are with application of lesser amounts of agro-chemicals compared with commercially grown crops, they can be considered fresh and healthy foods. The use of a large number of food plants varieties in the diet ensures availability of all the nutrients required by the human body. They also provide food during the lean seasons and provide additional incomes to the farming community. Most of the plants are also used as medicine, timber, firewood and can be useful as to domestic utensils.

3.3 Indigenous Knowledge for Sustainable Agriculture

Some traditional food plants may be directly promoted in the future as main crop varieties by including them in agricultural development programmes. Since they have useful traits in terms of nutritional and therapeutic value, resistance to unfavourable soil conditions, drought tolerance and resistance to pests and diseases, they can be used as plant genetic material to be used in future crop improvement programmes.

There is an invaluable body of indigenous knowledge associated with cultivation, preparation, nutrition and storage of traditional food plants which can be incorporated in future agricultural programmes with or without modification. The traditional food plants have now been improved due to the years of hardwork and

practice on wild species by our ancestors. Traditional farmers had a vast and unique knowledge on plants and their agricultural practices and utilization.

Our ancestors knew about the ecosystem in which they lived, and practised ways of ensuring the sustainable utilization of the natural resources. Not only did they use a large range of plant species, but also developed a large number of varieties adaptive to the different climatic conditions. They knew how to prepare meals deliciously and nutritionally and store safely the rest of the food for future consumption. Culinary is one of sixty four noble arts of ancient Sri Lanka. People ate a large number of food varieties. Rice was the staple food and that was prepared in many ways (Sannasgala, 1989). The supplementary food was prepared according to seven methods (*Hathmaluwa*) to be served with rice. They had the knowledge to destroy the toxic compounds of some foods during the preparation. They also identified some food varieties that are not eaten together since they may be harmful to the humans (Wickramarachchi, 1988). They knew food varieties which were good for various ages and conditions. This vast knowledge on cultivation, preparation, post-harvest technology and nutrition accumulated particularly with women. This knowledge was transmitted from generation, to generation from mother to daughter. Most of this knowledge is fast disappearing, but thanks to the aurvedic system of traditional medicine, knowledge on nutritional and therapeutic values are still remaining. This knowledge was transmitted from one generation, to another orally and by practice. Unfortunately this knowledge and skills related to traditional farming are rapidly disappearing, along with the people themselves. Therefore traditional food plants and indigenous knowledge should be taken care of by adopting sustainable agricultural systems.

3.4 **Intellectual Property Rights and Future of Agriculture**

Traditional food plants should be protected as they are a valuable genetic resource, which will decide the fate of future agriculture. Therefore it is absolutely necessary to see that our right to these genetic resources, traditional and indigenous food plants is protected in international trade agreements. The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) concluded with a big question mark on the sovereignty of future third world agriculture. The unpopular Dunkels Draft suggested that new varieties are to be patented under Trade Related Intellectual Property (TRIPS), which permit the developed countries to monopolize the genetic material and agriculture in the world and control third world agriculture (Shiva, 1995). Article 27:3 (A) of the Final Act signed at the Ministerial Meeting of the Trade Negotiational Committee on 15th April 1994 in Marakesh, Morocco, provides patent rights over plant varieties and animal breeds. The World Trade Organization (WTO), established after dissolution of GATT oversees the programme.

Big corporations from the North, particularly TNCs are involved in a worldwide scramble to appropriate and patent the genetic resources of the South. The rush to

patent these genetic resources may be viewed as part of the drive by global capital to acquire monopolies, for the essence of a patent is that it confers a monopoly of the product on its guarantee. However, it is clear that a number of recent developments on the world scene have also given a big impetus to this drive to patent. The emergence of the biotech industry in the North as potentiality, the most lucrative of industries is clearly one of these factors. Related to this is the push by the North through the WTO, to bring down the barriers which stand in the way of such patenting. By successfully engineering the inclusion of intellectual property rights within the framework of GATT, the North has ensured the adoption of a uniform set of intellectual property laws which will facilitate such patenting.

It is very well known that food crops originated in specific places in the world as a result of a unique piece of work done by our ancestors. They are called centres of plant origin and diversity. At the early stages these crops had spread only slowly outside of the centres. Failure of the first agricultural systems may have led to their spread. People moved to more prosperous areas with the seeds which were used by them for agriculture. For the spread of agricultural crops there might have been various reasons, but it had spread at a much higher level due to traders and travellers. It increased from 16th to 19th centuries when Europeans dominated the plant explorations. Economically important crops were introduced to their territories and colonies. These crops have been removed over the years to Northern countries and their colonies without making any payment or compensation for intellectual property of the farmers of the country of origin and diversity. A large number of plant genetic resources has been already collected and being maintained by seed laboratories and cell libraries of developed countries. Moreover, by claiming the exclusive proprietary right to a product which was hitherto the patrimony of a whole community and civilization, and which was freely available to all, the TNCs are challenging the very foundations of traditional societies in the South and their social and ethical norms.

There is a growing worldwide opposition to the granting of patents on biological materials. Farmers and indigenous peoples are outraged that plants that they developed are being "hijacked" by companies. Groups as diverse as religious leaders, parliamentarians and NGOs are intensifying their campaign against corporate patenting of living things, (Khor, 1995).

Unfortunately Sri Lankan people are more or less silent regarding plant patenting. Therefore, creating an awareness among various groups of people is essential. Also, developing countries like Sri Lanka should have a very firm policy to conserve our genetic resources, particularly food and medicinal plants and their wild relatives and to eradicate biopiracy.

4. Conservation of Agricultural Biodiversity

Scientists all over the world now widely accept that there is an urgent need to adopt remedial measures to slow down the extrication of biological diversity, particularly diversity of food plants. All the efforts of biological conservation so far have been centered mainly on *ex-situ* (off-site) conservation of germplasm collections and maintenance of research stations and plant genetic resource centers. Integrated and consolidated efforts should be made in order not only to preserve, maintain and handle genetic resources, but also to utilize this valuable diversity for the betterment of mankind. Now it is accepted that diversity of food plants cannot be saved only through one strategy. Flower et al. (1990) suggest five laws of genetic conservation the first of which describes that agricultural diversity can be saved only through the use of diverse strategies. Therefore, along with *ex-situ* (off-site) conservation through gene banks and active community participation in collecting, maintaining and utilizing traditional food plants should be promoted. Concerned authorities should adopt conservation strategies to strengthen their sustainability. Traditional food plants are not conserved unless they are used. Therefore, it is important to make traditional food plants useful to ordinary people and profitable to cultivate. While promoting cultivation, agro-based industries have to be introduced. Modern and traditional technologies to improve the storage and processing of traditional foods should also be introduced. New market avenues for the traditional products also have to be identified.

4.1 Community Participation in Plant Genetic Conservation

In the conservation and sustainable use of traditional food plants, it is very necessary to identify the correct persons to be consulted since the diversity saved depends on who will be consulted (Flower et al., 1990). Also, how much of diversity is saved depends on how many people are involved. Farmers, rural people, traditional doctors, and particularly women should be involved in this conservation process to ensure that the total needs of the community are met. The more involvement, the will be greater the potential to conserve.

Women's participation is essential in conservation of traditional food plants, since our elderly generation has the unique knowledge of traditional yams, vegetables and green leaves which are grown in their surroundings. They can identify the plants as they know how to cultivate and prepare them nutritionally and agreeable to the table. They have been educated by their parents not only to consume but also to store the additional food for off-seasons. The vast knowledge of traditional methods of food preparations, as well as preservation, has been passed down from generation to generation and mostly accumulated with the housewives.

Therefore, womens participation is extremely essential in collecting important information on food plants and their cultivation, utilization and storage. It is also

accepted that women must be involved in conservation and promotion processes. Therefore, first of all information should be collected and documented for future agricultural programs. Considering the importance of women's involvement in traditional food plant promotion, various agencies, particularly NGOs should launch programs for conservation and introduction of agro-based industries related with food and medicinal plant varieties with women's participation.

4.2 Awareness as an Important Factor

Awareness programs are particularly important in community participation in agricultural diversity and conservation. The new generation (so called educated) is unaware of the importance of what their parents ate, how they prepared their meals from locally available valuable foods, the nutritional values of food varieties and how they used natural resources in a sustainable manner. Therefore proper education, which includes Knowledge-Attitude-Practice, is a prerequisite in promoting traditional food plants. Traditional and modern recipes and modern food technologies have to be introduced to increase the consumption of traditional food plants. In Sri Lanka, various organizations, particularly NGOs, are attempting to educate the general public on the importance of biological and agricultural diversity, conservation and sustainable use of indegious knowledge, introduction of traditional nutritious diets to low income families. This attempt should be acknowledged and further enhanced. The respective institutions should get together to create an awareness among the people about traditional food plants and the conservation of biological diversity.

Therefore, both formal and informal education systems should be adopted to cover the areas such as conservation and importance of natural habitats and biological diversity, role of traditional food plants in food security, nutrition, medicine etc. and preparation of traditional meals must be introduced to school and university curriculum. Model school gardens and field genebanks have to be established in schools and higher academic establishments for both educational and research purposes.

In-service training for officers in GOs, NGOs and the private sector should be organised. Public lectures, symposia and workshops have to be organised to reach a wider audience. Both printed and electronic media can be successfully used in the education of the general public. Publications such as books, monographs, brochures, leaflets should be prepared targeting various groups of people. Electronic media have to be adequately used to address the population. Documentary films, video films, slides have to be produced to educate the people in the conservation of biological diversity, particularly diversity of food and medicinal plants.

5. Objectives, Area and Methodology of this Study

As discussed before, conservation and sustainable use of traditional food plants have become a responsibility of the human beings. This task should started be with a good assessment of the situation and a data base on traditional food plants. Various publications, articles and research papers have been published on traditional food plants of Sri Lanka . Yet there is a long-felt need for a resource book, which covers all the aspects of traditional food plants. The objective of the present study is to fulfil that need and provide the information of important traditional food plants in Sri Lanka. This monograph will be useful for academics, researchers, agriculturists, nutritionists, policy makers, teachers, students and the general public who are really keen and involved in the promotion and utilization of traditional food plants.

Some 152 plant species traditionally used as food are included to this monograph. Classification of "Traditional" has been done according to the belief and acceptance of the common people, since other criteria such as plant origin, age of the plant's introduction to Sri Lanka or the level of the exploitation of particular plant have no relationship with the "tradition". For instance, cereals such as finger millet, millet, Italian millet, which played a vital role in our traditional food system originated not in the territory of Sri Lanka but were introduced in the early periods. Most of the gourds such as pumpkin, ash melon which originated in Tropical America have been cultivated and enjoyed by our people over the past centuries. Our people consider them as traditional food varieties.

Let us consider the age of introduction. According to our people's belief, different values and perception are attached to the plants which were introduced in the same period. As an example, the Dutch introduced potatoes, sweet potatoes, manioc, chillies, tomatoes, and tobacco in the 17th century. They originated in Tropical America, but our people consider sweet potato, manioc, chillies and tomato as our traditional plant varieties; yet potato is not. The main reason for this confused perception is that potato was promoted by the British for their food needs which was very much prestigeous at the early stage compared to our traditional food system. It entered our food system later in a different form. Our people prepared potato curry or stake instead of mashed potatoes or french fries.

The plants discussed in this monograph are not evenly exploited or tapped by our people. Some of the traditional plants are well exploited while most of them are under- exploited and are vanishing from the farmers' fields and forests. Therefore, plants for the sample were selected in consultation with the rural people representing different agro-ecological zones, according to their importance as food plants.

Plants mentioned in this monograph grown in various soil and climatic areas in Sri Lanka were selected according to the opinion of rural people. Further, these were discussed with intellectuals, researchers, ayurvedic physicians, farmers, and rural villagers in order to clarify certain facts.

Information was collected mainly from the following three sources:-
(i). Available data, (ii). Field visits, and (iii). Informal discussions.

The following information was collected for each plant species.
(i). Family, (ii). Botanical name including common synonyms , (iii). Vernacular names, (iv). Description, (v). Centre of origin and distribution, (vi). Edible parts, (vii). Food use, (viii). Nutrition and Therapeutic values, (ix). Other uses, (x). Environmental response, (xi). Cultivation, and (xii). Storage

The plants discussed in this monograph are arranged according to alpherbatical order of the family, the *genera* of the plants of the family. In the *genera,* plants are finally listed in alphabetical order of the *species*.

ANTHOLOGY OF PLANTS

FAMILY:- ACANTHACEAE

BOTANICAL NAME:- ***Asteracantha longifolia***

Syn :- Barleria longifolia, Hygrophila longifolia

VERNACULAR NAMES:-

SINHALA : *Katu-ikiriya, Neera mulliya.*
TAMIL : *Neremulli, Nirmalli.*

DESCRIPTION:-

A perennial herb with an ascending rhizome, stems numerous, 60-120 cm tall, erect, nearly unbranched, somewhat compressed, thickened at nodes and hispid with long hair between nodes.

LEAVES:- Simple, sessile, whorled to a whorl, two opposite large ones 9-12 cm long, 1.3-2 cm broad, the four each having a slightly arched, sharp, yellow spine.

FLOWERS:- Large, irregular, bisexual, purplish-blue in a cluster of eight round each node in four pairs. Flowers in September, October and January.

FRUIT:- A loculicidal linear capsule with a few seeds (Jayaweera, 1981).

DISTRIBUTION:-

Grows throughout India and Sri Lanka. In Sri Lanka, it is common in the dry zone and in the low-country in ditches and marshy places (Jayaweera, 1981).

EDIBLE PARTS:-

Whole plant

FOOD USE:-

Tender leaves are eaten as a vegetable. Infusion of dried *Neera Mulliya* is used as a beverage.

Asteracantha longifolia

(A) Branch with whorled leaves, flowers and spines of the nods. (B) Lateral view of a flower. (C) Longitudinal Section of a flower. (D) Corolla spread out showing the didynamous stamens.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The plant contains alkaloids lupoeol in the roots and hentriacontane in the leaves.The root also contains a trace of a volatile oil, a yellowish-green wax, a sticky gum, maltose, hygrosterol and a crystalline substance. The seeds contains a semi-drying oil.

The burnt ashes of the plant with cow urine is given for oedema and dropsy. A decoction of the root is a diuretic and administered for stones in the kidney, hepatic derangements and as an antidysenteric. The seeds are given for gonorrhoea, jaundice, anasarca and to serve as an aphrodisiac. In the Muslim system of Ayurveda, the plant is used externally as a poultice or embrocation for rheumatism. (Jayaweera, 1981).

STORAGE :-

Stem and leaves are sun-dried.

FAMILY:- AIZOACEAE

BOTANICAL NAME:- ***Trianthema decandra***

Syn:- Zaleya decomdra

VERNACULAR NAMES:-

SINHALA : *Maha sarana*
TAMIL : *Vellaisharunnai, Charanai.*

DESCRIPTION:-

A prostrate, succulent, glabrous herb with slightly branched, long, angular stems and internodes 2.5- 9.5 cm long.

LEAVES:- Simple, exstipulate, opposite, somewhat unequal, 2-3.7 cm long, 0.8-2.2 cm broad, oblong- oval, rounded and apiculate at the apex.

FLOWERS:- Regular, bisexual, 4 mm diameter apetalous, short-pediculate in dense sub-umbellate, axillary clusters.

FRUIT:- A membranous, 4-seeded capsule, 4.5 mm long with a hard thick truncate cap which is detached by a transverse dehiscence carrying away two of the seeds with it.
Seeds orbicular reniform, 1.5 mm diameter, black and somewhat flat on the side (Jayaweera, 1981).

DISTRIBUTION:-

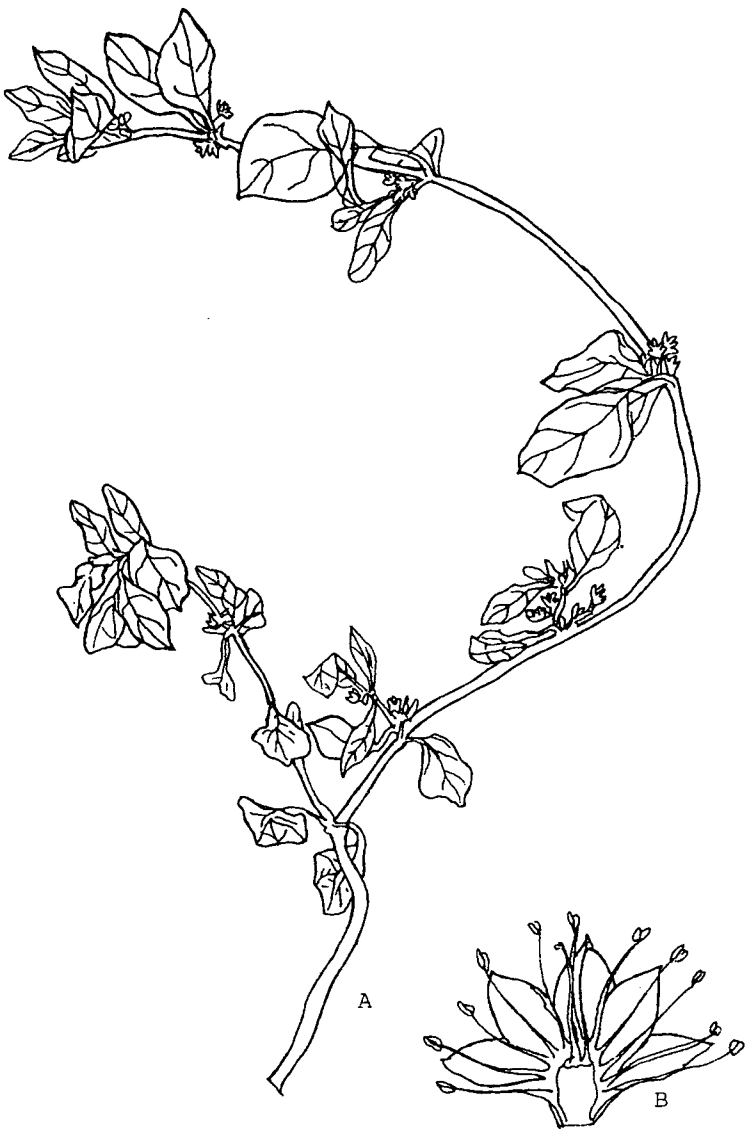
Grows in India, Sri Lanka, Burma, Timor and Java. In Sri Lanka it is grown well in the wet zone. It is cultivated in the dry zone under irrigation (Jayaweera, 1981).

EDIBLE PARTS:-

Whole plant.

FOOD USE:-

Eaten as a vegetable.



Trianthema decandra

(A) Branch (B) Flower

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 91.3 g, Energy - 24 kcal, Protein - 2.0 g, Fats - 0.4 g, Carbohydrates - 3.28 g, Calcium - 100 mg, Phosphorus - 30 mg, Iron - 38.5 mg, Vitamin C - 70 mg.

The root of the plant is an aperient and is useful in hepatitis and asthma. Given with milk, it is supposed to be specific for orchitis. The juice of the leaf is dropped into the nostrils to relieve migraine (Jayaweera, 1981).

CULTIVATION:-

Areas for cultivation- can be grown in all regions of the country. Loamy and sand soils with a high humus content are preferred.

Planting season- Throughout year. However, for good crop establishment, plant during the rainy season.

Land preparation - The land has to be worked to a depth of about 20 cm in order to attain a fine condition which can be done by mammoty.

Planting material- Seeds and cuttings

Irrigation - Adequate soil moisture must be made available for establishment and good growth of the crop.

Fertilizer- Add organic matter at the rate of 1.5 kg/sqm at planting and every 6 months there after.

STORAGE:-

In room temperature, it lasts only a few days and can not be kept beyond this length of time.

FAMILY:- AIZOACEAE

BOTANICAL NAME:- ***Trianthema portulacastrum***

VERNACULAR NAMES:-

SINHALA	: *Hin sarana*
TAMIL	: *Sharunnai, Shavalai*
ENGLISH	: Horse purslane

DESCRIPTION:-

A prostrate, much branched, succulent herb with rather angular stems.

LEAVES:- Simple, obliquely opposite very unequal, succulent, glabrous,the upper ones larger.

FLOWERS:- Small, light pink, regular, 4 mm diameter, bisexual, apetalous, sessile, axillary, almost inside the pouch of the petioles of the smaller leaves.

FRUITS:- Capsule 7 mm long, 5 mm broad, obconical, truncate, somewhat like the cusp of a molar tooth at apex with 1 -4 seeds in the upper portion at dehiscence. Seeds - Reniform, black, muriculate, 1.5-1.7 mm diameter (Jayaweera, 1981).

DISTRIBUTION:-

Grows throughout India, Sri Lanka, and most tropical countries. In Sri Lanka, it grows in the low country especially on the coast and in the Dry Zone near tanks (Jayaweera, 1981).

EDIBLE PARTS:-

Whole plant.

FOOD USE:-

Eaten as a pot herb.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 93.4 g, Energy - 21.0 Kcal , Protein -2.1 g, Fat -0.3 g, Carbohydrate - 2.3 g, Calcium - 50 mg, Phosphorus-28 mg, Iron Fe-2.4 mg, Vitamin - A-495 mg, Thiamine -930 mg, Riboflavin 130 mg, C-10 mg ((Weerakoon, 1993).

Trianthema portulacastrum

(A) Branch

The root contains a glucoside similar to saponin. The plant is a good source of calcium, iron and phosphorus. The powdered bitter and nauseous root is given in combination with ginger as cathartic. A decoction of the root is an abortifacient and emmenagogue. According to Nadkarni, an infusion of the roots is given for constipation,jaundice, strangury, dropsy, turbid liver and asthma. In Ghana the plant is applied as a dressing or poultice (Jayaweera, 1981).

CULTIVATION:-

See *Maha Sarana* (*Trianthera decandra*).

STORAGE:-

It lasts only two days under normal conditions.

FAMILY:- AMARANTHACEAE

BOTANICAL NAME:- ***Aerva lanata***

Syn :- Aerva bans, Aerva floribunda, Aerva brachiasa

VERNACULAR NAMES:-

SINHALA : *Polpala, Polkudupala.*
TAMIL : *Sirupulai.*

DESCRIPTION:-

Annual herb, 60-75 cm tall, often woody at base. Stem green erect or prostrate, with numerous, slender, cylindrical,more or less cottony, hairy branches.

LEAVES:- Simple, alternate, 1.2-3.5 cm long, 0.9-2.5 cm broad, oval or spatulate-oval, tapering to base rounded or subacute at apex.

FLOWERS:- Greenish white, very small, regular, bisexual, sessile in dense, axillary heads or spikes, bracts shorter than sepals. (period- throughout the year)

FRUIT:- In dehiscent, somewhat flattish, 0.8 mm long, 0.6 mm broad. Seeds only one to a fruit and black in colour (Jayaweera, 1981).

DISTRIBUTION:-

Widespread in the drier parts of the tropics and subtropics of the old World (Dassanayake and Fosberg, 1980). Grows throughout India, Sri Lanka, Malaya, Java, Sumatra, and in Tropical Africa (Jayaweera, 1981). In Sri Lanka,it is a common weed in the mid and low-country especially in the Dry Zone both in waste and cultivated ground.

EDIBLE PARTS:-

Whole plant.

FOOD USE:-

Tender leaves are used for vegetable and infusion of whole plant (wet and dried) is drunk as a beverage.

Aerva lanata

(A) Branch with leaves, flowers spikes, (B) Root. (C) Front view of flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

A decoction of the plant is a reputed diuretic and considered of great value in lithiasis. The plant is also used for coughs and as a vermifuge for children. The roots are used in the treatment of headaches. (Jayaweera, 1981).

STORAGE :-

It is normally sun-dried and kept in dry containers for longer periods.

FAMILY:- AMARANTHACEAE

BOTANICAL NAME: ***Alternanthera sessilis***

VERNACULAR NAMES:-

SINHALA : *Mucunuwenna.*
TAMIL : *Pounanganni, Ponnankani.*

DESCRIPTION:-

A prostrate herb with numerous, sub-quadrangular, glabrous stem, 15-60 cm long, often rooting at nodes; internodes 1.5-7 cm long, younger ones with two opposite lines of hairs, often purplish red.

LEAVES:- Simple, opposite, 1.5-5 cm long 0.7-1.7 cm broad.

FLOWERS:- White, regular, bisexual in densely crowded, small, axillary heads, sometimes slightly spicate, bracts membranous, 0.7 mm long, 0.4 mm broad, ovate, acute. (period- all the year round).

FRUITS:- Flat, kidney-shaped 2 mm long and as broad enclosed in the persistent perianth segments. Seeds, 1.2 mm diameter, glabrous and shining (Jayaweera, 1981).

DISTRIBUTION:-

Grows in humid places, throughout the warmer parts of India, Sri Lanka and other tropical countries Dassanayake and Fosberg, 1980). In Sri Lanka this plant is very common growing in wet places especially around tanks and ponds (Jayaweera, 1981).

EDIBLE PARTS :-

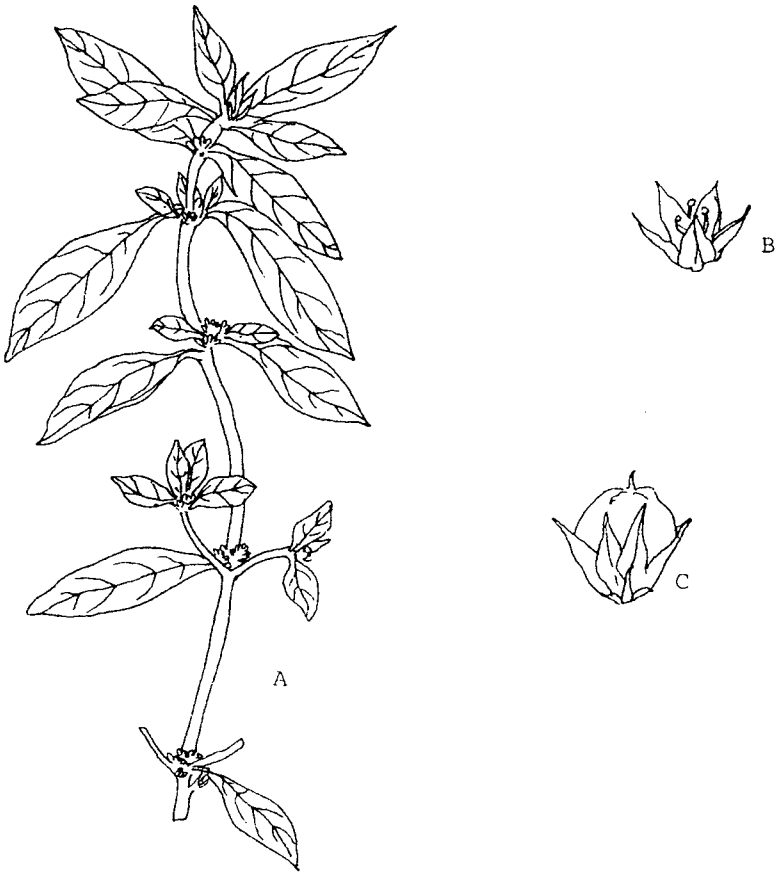
Whole plant.

FOOD USE:-

This plant is a popular pot herb. Frequently eaten as a vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 77.4 g, Energy - 72 kcal, Protein -5.0 g, Fat -0.7 g, Carbohydrate - 11.6 g, Calcium - 510 mg, Phosphorus - 60 mg, Iron-16.7 mg, Vitamin - A-965 mg, Riboflavin-140 mg, Thiamin -1.2 mg, Vitamin C-17.0 mg. (Perera et. al, 1979).



Alternanthera sessilis

(A) Branch with leaves and flower heads. (B) Lateral view of a flower. (C) Fruit.

The vegetative and reproductive parts of this plant are said to contain traces of hydrocyanic acid. It is a cholagogue laxative and is useful for chronic congestion of the liver, biliousness and dyspepsia associated with sluggish liver. Owing to its diuretic and diluent properties, it may be used with advantage in acute and chronic pyelitis, cystitis, gonorrhoea and strangury. It is also said to increase the flow of milk in nursing mothers. The expressed juice of the plant is given with cow ghee for the treatment of snake bite. In West Tropical Africa it is used as a poultice for boils, abortifacient and remedy for indigestion, while in Madagascar it is often used as a galactagogue (Jayaweera, 1981).

CULTIVATION:-

Areas for cultivation - Wet zone

Planting season - Throughout the year. However, for good crop establishment, plant during the rainy season.

Land preparation - The land has to be worked by mammoty in order to make a seed bed with fine condition.

Planting material - Steam by cuttings.

Planting and space - 15 cm long stem cuttings are planted in beds. Space between two plants is 30 cm and it can be grown as a pot herb.

Irrigation - Normally stem cuttings are planted in rainy season, therefore special irrigation is not necessary. In dry periods watering increases the productivity.

Fertilizer - Normally it is grown without fertilizer, but application of organic matter will increase the yield.

Pests /Diseases - Insects damage the leaves.

Time of harvesting - Harvesting begins about 2 months after planting.

Harvesting - Plants are cut to above two leaves from the bottom

STORAGE:-

In wet places the harvest can be stored for 2-4 days.

FAMILY :- AMARANTHACEAE

BOTANICAL NAME:- ***Amaranthus paniculatus***

Syn : A. speciousus, A. caudatus

VERNACULAR NAMES:-

SINHALA : *Rana- tampala.*
TAMIL : *Nut Keerai*
ENGLISH : Inca Wheat, Quinoa, Grain Amaranth

DESCRIPTION:-

A tall annual, 1.2-1.8 m high with stout, grooved and striate, glabrous, or slightly pubescent stems.

LEAVES:- Simple, alternate, 5-15 cm long, 2.5-7.5 cm broad, elliptic lancelot, acute or acuminate, base cuneate, nerves slender, numerous, prominent beneath.

FLOWERS:- Small, unisexual, monoecious or polygamous, numerous in dense, thyroid, gold coloured or red spikes, the central spikes the longest.

FRUIT:- Capsule 3 mm long ovoid, narrowed at the tip, seeds 1.2- 1.5 mm long, 1 mm broad subglobose, white, red or black (Jayaweera, 1981).

DISTRIBUTION:-

Centre of origin is the Indian region of South America. It was the staple of Incas and cultivation was prohibited by Spaniards in the 16th century. Grows as an escape or cultivated in Peru, India, Sri Lanka, Malaysia, Tropical Asia, Africa and Philippine Islands (Tindall, 1993). In the dry zone of Sri Lanka it is cultivated as a chena crop.

EDIBLE PARTS:-

Seeds and tender leaves.

FOOD USE:-

The seed and tender leaves are eaten in Iran and Iraq. Certain hill tribes in India and Africa use the grain as a staple food. Seeds are ground into flour and Roti is prepared from it. Pop seeds are mixed with honey and given to children. Tender leaves are eaten as a green vegetable and may be added to soup.

Amaranthus paniculatus

(A) Terminal branch of a plant. (B) Male flower. (C) Female flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 78.6 g, Energy - 67 kcal, Protein - 5.9 g, Fat 1.0 g, Carbohydrates 8.6 g, Calcium -530 mg, Phosphorus - 60 mg, Iron - 18.4 mg, Carotin - 14.90 mcg, Thiamine - 0.01 mg, Riboflavin - 0.24 mcg, Niacin - 1.1 mcg, Vitamin C -81 mg. (Perera et al., 1979).

The seed contains carbohydrate and protein. The plant is used as a diuretic for strangury. It is given for scrofula and applied topically to scrofulous sores. It is also said to be useful for piles and purifies blood. The extract of the leaves relieves pains and congestion in the chest (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:

Soil with a high organic content, with adequate mineral reserves is required for optimum yield. Optimum pH range is 5.5-7.5 but some cultivars will tolerate more alkaline conditions. Although it is tolerant to high temperatures, optimum is 23-30^{0}C, lowland areas up to 800 m altitude are more suitable for cultivation.

CULTIVATION:-

Rana tampala can be grown in home gardens or on small plots using labour-intensive practices. It may be sown direct or transplanted. It requires finely prepared soil so that small seeds can be firmly packed with good soil contact for optimum water absorption.

Spacing /Seed rate - The very small seeds are mixed with dry sand to ensure uniform distribution. They are sown broadcast on to prepared beds at a rate of 1.5-2 kg/ha.

Irrigation - Increases yield but uneconomic. It is normally grown as a rainfed crop.

Fertilizer - It responds well to fertilizers with a high Potassium content.

Time to harvest - First harvest may be taken at 2 weeks, but true harvesting starts 30-50 days from sowing, when plants are 15-20 cm high.

Harvesting- Either whole plant is uprooted when it is about 20 cm high, in 3-4 weeks after transplanting, or established plants are cut above the bottom two leaves, which encourages growth of side shoots

Yield - (Green harvest) Entire plant harvested- 20-25 t/ha; shoots only (successional harvesting)- 30-60 t/ha.

STORAGE:-

In wet places the green harvest can be stored for 2-4 days. Seeds can be kept well. Moisture content of seeds should be 8-11% for longer storage.

FAMILY:- AMARANTHACEAE

BOTANICAL NAME:- ***Amaranthus polygonoides***

VERNACULAR NAMES:-

SINHALA : *Walu tampala*
TAMIL : *Araikkirai, Punniyaku*

DESCRIPTION:-

A prostrate, glabrous herb with many spreading branches.

LEAVES:- Small, 0.7-1.5 cm long, 0.5-1 cm broad.

FLOWERS:- Regular, small, unisexual, monoecious 2 mm long, numerous in axillary clusters, bracts subulate, sharply acuminate. Flowers all the year round.

FRUIT:- A membranous, urceolate, indehiscent capsule, 1.5 mm long, 1.2 mm broad. Seed lenticular, 1 mm diameter, dark brown with raised border (Jayaweera, 1981).

DISTRIBUTION:-

Widespread in the warmer temperate regions and tropics. Grows throughout India and Sri Lanka and in all tropical countries. In Sri Lanka, it is a common weed growing in dry waste places and roadsides in the dry zone. (Dassanayake and Fosberg, 1980).

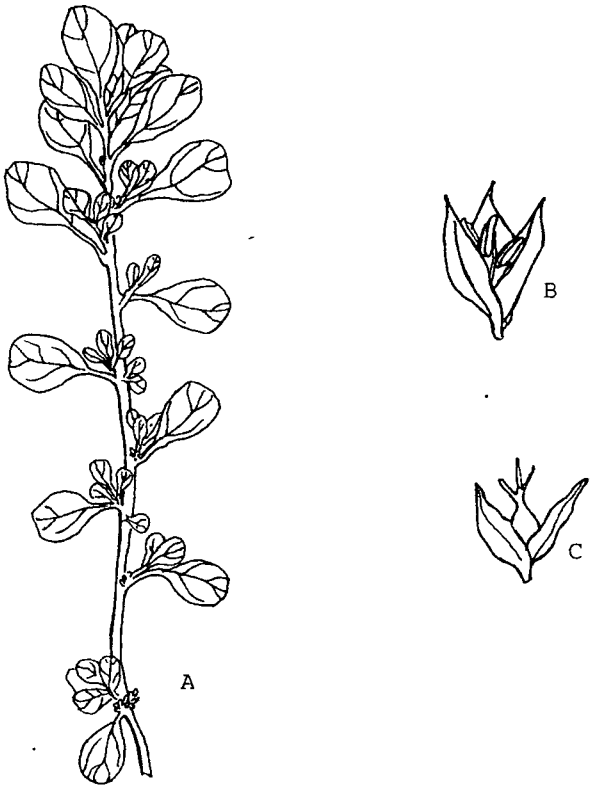
EDIBLE PARTS AND FOOD USE:-

Tender leaves are eaten as green vegetables.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 90.0 g, Energy - 33 kcal, Protein - 2.8 g, Fat 0.3 g, Carbohydrates 4.8 g, Calcium -251 mg, Phosphorus - 40 mg, Iron - 27.3 mg.

The seed contains carbohydrate and protein. The plant is used as a diuretic for strangury. It is given for scrofula and applied topically to scrofulous sores. It is also said to be useful for piles and purifies blood. The extract of the leaves relieves pains and congestion in the chest.



Amaranthus polygonoides

(A) Branch. (B) Male flower. (C) Female flower.

ENVIRONMENTAL RESPONSE:

Soil with a high organic content, with adequate mineral reserves and required for optimum yield. Optimum pH range is 5.5-7.5 but some cultivars will tolerate more alkaline conditions. Although it is tolerant to high temperatures, optimum is 23-30^{0}C, lowland areas up to 800m altitude are more suitable for cultivation.

CULTIVATION:-

Walu tampala can be grown in home gardens or on small plots using labour-intensive practices. It may be sown direct or transplanted. It requires finely prepared soil so that small seeds can be firmly packed with good soil contact for optimum water absorption.

Spacing /Seed rate - The very small seeds are mixed with dry sand to ensure uniform distribution. They are sown broadcast on to prepared beds at a rate of 1.5-2 kg/ha.

Irrigation - Increases yield but uneconomic. It is normally grown as a rainfed crop.

Fertilizer - It responds well to fertilizers with a high Potassium content.

Time to harvest - First harvest may be taken at 2 weeks, but true harvesting starts 30-50 days from sowing, when plants are 15-20 cm high.

Harvesting- Either whole plant is uprooted when it is are about 20 cm high, in 3-4 weeks after transplanting, or established plants are cut above the bottom two leaves, which encourages growth of side shoots.

Yield - Entire plant harvested- 20-25 t/ha; shoots only (successional harvesting)- 30-60 t/ha.

STORAGE:-

In wet places the green harvest can be stored for 2-4 days.

FAMILY :- AMARANTHACEAE.

BOTANICAL NAME:- *Amaranthus spinosus*

NAMES IN OTHER LANGUAGES:-

SINHALA	: *Katu tampala*
TAMIL	: *Mullukkirai*
ENGLISH	: Prickly Amaranth

DESCRIPTION:-

An annual herb, stem 0.3-1.02 m tall, green, stout glabrous and shining, much branched, cylindrical with a pair of very sharp divaricate spines in leaf axils at the base of the bud or branch.

LEAVES:- Simple, alternate, 3-8 cm long, 1.3-4.3 cm broad.

FLOWERS:- Regular, pale green, unisexual, monoecious, very small, numerous, sessile, in dense clusters both axillary and terminal interrupted spikes, male flowers fewer then female. Flowers and fruits from September to December.

FRUIT:- 1.2-1.5 mm long, very thin, circumscissile with persistent perianth segments. Seeds or bicular 1mm diameter, black and polished (Jayaweera, 1981).

DISTRIBUTION:-

Grows as a weed in waste ground throughout India, Sri Lanka and other tropical countries. In Sri Lanka it is very common on waste ground (Jayaweera, 1981).

EDIBLE PARTS:-

Young leaves.

FOOD USE:-

The young leaves are often eaten as a pot herb.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 85.0 g, Energy - 43 Kcal, Protein - 3.0 g, Fat - 0.3 g, Carbohydrate -7.0 g, Calcium - 800 mg, Phosphorus -50 mg, Iron - 22.9 mg, Carotene - 3564 mcg, Vitamin C - 33.

Amaranthus spinosus

(A) Branch with leaves, spines and flower spikes. (B) Front view of male flower.

Both vegetative and reproductive parts of the plant contain traces of hydrocyanic acid. The fresh tender leaves contain vitamin C and mucilage. The plant is used as a sudorific and febrifuge and is recommended for eruptive fevers. The leaves are considered a good emollient, lactagogue and a specific for colic. Externally, the bruised leaves are applied locally on eczema. The root is considered for gonorrhoea as it is a mild diuretic and demulcent to the urinary tract. In Ghana, an enema prepared from the plant is given for piles (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Soil with a high organic content, with adequate mineral reserves are required for optimum yield. Optimum pH range is 5.5-7.5 but some cultivars will tolerate more alkaline conditions. Although it is tolerant to high temperatures, optimum is 23-30^{0}C, lowland areas up to 800m altitude are more suitable for cultivation.

CULTIVATION;-

Katu tampala can be grown in home gardens or on small plots using labour-intensive practices. It may be sown direct or transplanted. It requires finely prepared soil so that small seeds can be firmly packed with good soil contact for optimum water absorption.

Spacing /Seed rate - The very small seeds are mixed with dry sand to ensure uniform distribution. They are sown broadcast on to prepared beds at a rate of 1.5-2 kg/ha.

Irrigation - Increases yield but uneconomic. It is normally grown as a rainfed crop.

Fertilizer - It responds well to fertilizers with a high Potassium content.

Time to harvest - First harvest may be taken at 2 weeks, but true harvesting starts 30-50 days from sowing, when plants are 15-20 cm high.

Harvesting- Either whole plant is uprooted when it is about 20 cm high, in 3-4 weeks after transplanting, or established plants are cut above the bottom two leaves, which encourages growth of side shoots.

Yield - Entire plant harvested- 20-25 t/ha; shoots only (successional harvesting)- 30-60 t/ha.

STORAGE:-

In wet places the green harvest can be stored for 2-4 days.

FAMILY:- AMARANTHACEAE

BOTANICAL NAME:- ***Amaranthus viridis.***

VERNACULAR NAMES:-

SINHALA : *Kura-tampala*
TAMIL : *Araikkirai.*

DESCRIPTION:-

A much branched erect annual stem 30-56 cm tall, cylindrical, glabrous and shining, purplish.

LEAVES:- Simple, alternate 3-6.3 cm long, 1.6-4.7 cm broad.

FLOWERS:- Small, unisexual monoecious, sessile in clusters on slender, tapering, interrupted, terminal and axillary paniculate spikes. (period-Oct-Dec).

FRUIT:- 1.5 mm long, compressed, rugose, glabrous, indehiscent with a membranous pericarp enclosed in persistent perianth leaves. Seed blackish, lenticular, 1 mm across, glabrous and shining (Jayaweera, 1981).

DISTRIBUTION:-

Grows in all tropical countries including India and Sri Lanka. It is a very common gregarious weed in Sri Lanka along roadsides and waste ground (Dassanayake and Fosberg, 1980).

EDIBLE PARTS:-

Tender leaves.

FOOD USE:-

The tender leaves are eaten as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 81.8 g, Energy - 38 kcal, Proteins - 2.2 g, Fats - 0.3, Carbohydrates - 3.8 g, Calcium - 330 mg, Phosphorus - 52 mg, Iron - 18.7 mg.

Amaranthus viridis

(A) Branch with leaves and flowering spikes. (B) Male flower. (C) Female flower.

It contains an alkaloid and is rich in calcium and iron. It is a good source of vitamins B and C. The powdered leaves yield a tannin, some reducing sugar and resin. This plant is a cholagogue, mild diuretic and demulcent to the urinary tract and is used with good results in chronic congestion of the liver, in irritable conditions of the bladder and in gonorrhoea when there is burning sensation in passing water. It is largely used as a hemostatic in hematuria, menorrhagia and bleeding from hemorrhoids. It is also used as an antidote for snake-bite, stings of wasps and bites of centipedes. The leaves are applied as a poultice to inflammations, boils and abscesses with beneficial effects. In Brazil, an infusion of the plant is used as a diuretic and galactagogue (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Soil with a high organic content, with adequate mineral reserves is required for optimum yield. Optimum pH range is 5.5-7.5 but some cultivars will tolerate more alkaline conditions. Although it is tolerate for high temperatures, optimum is 23-30^{0}C, lowland areas up to 800 m altitude are more suitable for cultivation.

CULTIVATION:-

Kura tampala can be grown in home gardens or on small plots using labour-intensive practices. It may be sown direct or transplanted. It requires finely prepared soil so that small seeds can be firmly packed with good soil contact for optimum water absorption.

Spacing /Seed rate - The very small seeds are mixed with dry sand to ensure uniform distribution. They are sown broadcast on to prepared beds at a rate of 1.5-2 kg/ha.

Irrigation - Increases yield but uneconomic. It is normally grown as a rainfed crop.

Fertilizer - It responds well to fertilizers with a high Potassium content.
Time to harvest - First harvest may be taken at 2 weeks, but true harvesting starts 30-50 days from sowing, when plants are 15-20 cm high.

Harvesting- Either whole plant is uprooted when it is about 20cm high, in 3-4 weeks after transplanting, or established plants are cut above the bottom two leaves, which encourages growth of side shoots

Yield - Entire plant harvested- 20-25 t/ha; shoots only (successional harvesting)- 30-60 t/ha.

STORAGE:-

In wet places the green harvest can be stored for 2-4 days.

FAMILY:- ANACARDIACEAE

BOTANICAL NAME:- ***Anacardium occidentale.***

VERNACULAR NAMES:-

SINHALA : *Kaju*
TAMIL : *Andima, Kallarma, Kottaimundiri, Saram, Palamundiri*
ENGLISH : Cashew Nut

DESCRIPTION:-

A medium sized tree with crooked trunk and terete, glabrous branches.

LEAVES:- Simple, alternate, ceraceous, 8.5-24 cm long, 5.8-14.5 cm broad, oblong, obovate or elliptic, rounded or somewhat retuseat apex, glabrous, firmly reticulately veined, base cuneate, margin wavy, lateral veins 10-15 pairs, prominent beneath; petioles 1-2.5 cm long.

FLOWERS:- Small, regular, polygamous in terminal, (bracteate) panicles longer than leaves.(period-November and Jan to March)

FRUIT:- Nut-reniform 2.5 cm long on a swollen, fleshy, yellow or red pedicel, pericarp cellular,full of acrid oil,seed reniform, ascending, exalbuminous, testa membranous, cotyledons semilunar with a milky taste (Jayaweera, 1981).

DISTRIBUTION:-

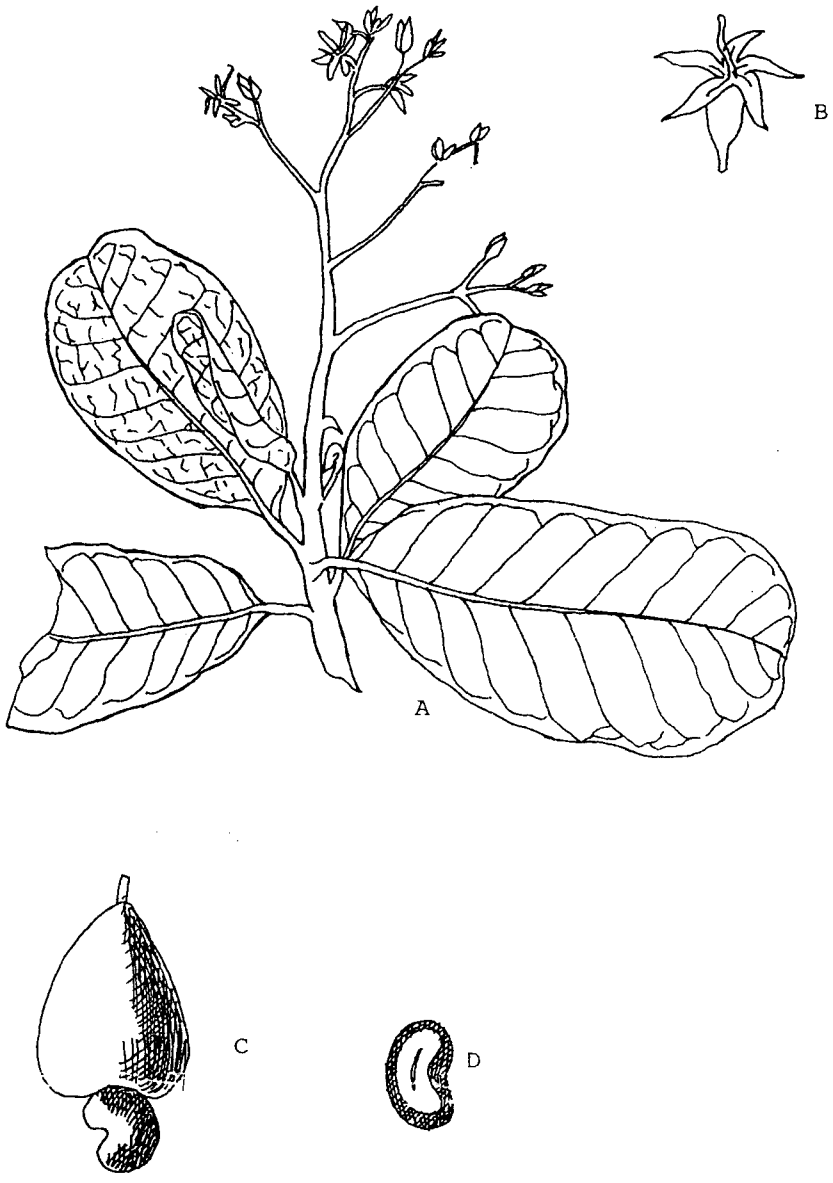
The Cashew nut is a native of Tropical America from Mexico to Peru, Brazil and West Indies. It was introduced to India from Brazil by Portuguese in the 16th century (Dassanayake and Fosberg, 1983). In Sri Lanka it is commonly found in village gardens and waste lands along the sandy western coast of the Island and in the dry zone (Purseglove, 1968; Jayaweera, 1981).

EDIBLE PARTS:-

Kernel of the seed and fruit apple.

FOOD USE:-

Cashew is one of the best nuts in the world. Matured seed kernels are eaten fresh, fried or roasted. It is also added into ice creams and fruit salads and used in the confectionery industry. Immatured kernels are prepared as a curry. Cashew apple is eaten fresh as a fruit and can be used in preparing pickles and salads. The



Anacardium occidentale

(A) Branch with leaves and flowers. (B) External view of a flower. (C) Nut borne on a swollen pedicel. (D) Longitudinal section of Nut.

extracted juice from cashew apple can be canned as a drink and used in vinegar preparations.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Cashew Nut)

Moisture - 40 g, Energy - 568 Kcal, Protein - 18.4 g, Fats - 46.3 g, Carbohydrates - 28.7 g, Calcium 28 mg, Phosphorus - 462 mg, Iron - 3.6 mg, Carotene - 5 mcg, Thiamin - 250 mcg, Riboflavin - 340 mg, Niacin - 2.4 mg, Vitamin C - 1 mg.

(Cashew Apple)

Moisture - 88 g, Protein - 0.2 g, Fat-0.1 g, Carbohydrate - 11.6 g, Vitamin C-234-371 mg (Perera et al, 1979).

The pericarp of the nut of this tree contains a toxic principle, cardol, anacardol, cardanol and anacardic acid. The kernels yield a fixed oil which contains linoleic, palmitic, stearic and lignoceric acids and sitosterin. The exudation from the bask is a mixture of gum-arabic and bassorin. A decoction of the bark of this tree is used as a remedy for diarrhoea, syphitiric swellings of joints and for diabetes. The juice of the ripe receptacle is recommended for scurvy, uterine troubles and dropsy. The oil of the pericarp is useful as an anaesthetic in leprosy and psoriasis. It is a powerful vesicant, vermicide and insecticide. The kernel of the fruit is used extensively in the confectionery trade. The oil extracted is a mechanical and chemical antidote for irritant poisons. In the Congo, the bark is used as an arrow poison and the oral administration of the tincture of the bark is supposed to lower blood sugar level (Jayaweera, 1981).

OTHER USES:-

The shell or pericarps yield cashew shell oil which is a vesicant and is used as a waterproofing agent and as a preservative.

ENVIRONMENTAL RESPONSE:-

A drought tolerant plant. Adopted to a large range of soils. Requires a rainfall of 1000-2000 mm. Grown well at the altitudes below 1000 m.

CULTIVATION:-

Cashew is normally propagated from seeds sown directly in the field at the beginning of the rainy season, it does not transplant well. High density seeds are selected from those which sink in a solution of 150 g salt per litre of water. These seeds are placed

in each hole about 23 cm apart and 5-7.5 cm deep. Under good conditions germination occurs in 2-4 weeks. Subsequently seedlings are thinned to have one per hole. Various methods of vegetative propagation are now available, including air/ground layering, grafting and inarching.

Spacing - Depending on soil type, spacing is of 9 x 9 m to 15 x 15 m.

Time to harvest - Fruit production begins 3-5 years after planting, depending on conditions and variety. The period from flowering to nut fall is 50-77 days. The apple takes 2-3 months to ripen fully.

Harvesting - The cashew apple should be picked before it drops, but the nuts can be left on the ground without damage if conditions are dry.

STORAGE:-

Cashew apple may be preserved as Jam or Canned. Matured dried nut can be preserved in dry places.

FAMILY:- ANACRDIACEAE

BOTANICAL NAME:- *Mangifera indica*

VERNACULAR NAMES:-

SINHALA	: *Amba*
TAMIL	: *Adishelarayam, Ambiram, Amiram, Mampalam*
ENGLISH	: Mango

DESCRIPTION:-

A large spreading tree, about 15-20 m in height with a rough grooved bark and glabrous stems and branches.

LEAVES:- Simple, alternate, crowded at the ends of branches, 12-40 cm long, 4.5-13 cm broad.

FLOWERS:- Small, yellowish green, polygamous, monoecious with a pungent odour arranged in large, many flowered, pubescent panicles longer than leaves, pedicles short, thick and jointed.

FRUIT:- A large fleshy resinous drupe, 7.5-20 cm long with a compressed,fibrous stone inside. Seeds large,exalbuminous, ovoid-oblong, compressed, testa papery with plano-convex, often unequal and lobed cotyledons (Jayaweera, 1981).

DISTRIBUTION:-

It probably originated in the India-Burma region and grows wild in the forests of India. Mango has been cultivated in India over 4 thousand years and is probably one of the oldest cultivated fruits (Purseglove, 1980; Raketin and Durmanov, 1989; Bose and Mitra, 1990). According to Buddhist literature, Mango juice was offered to Lord Buddha 2500 years ago. Grows in the Himalayas, Sikkim, Khasia, along Western Ghats and Sri Lanka. In Sri Lanka it has a long history as it is grown as a cultivated plant in almost every village garden. According to Mahawamsa, mango occurred in Sri Lanka when Mahinda Thero came (In 307B.C) to Sri Lanka. In the history it is found that King Kassapa grew mango orchards in Sri Lanka (Siriweera, 1993). A large number of varieties are cultivated in Sri Lanka.

EDIBLE PARTS:-

The fruit.

Mangifera Indica

(A) Branch with flower panicle. (B) Fruit. (C) Seed.

FOOD USE:-

Riped fruit is one of the best fruits in the world. The less fibre, turpentine flavour free, rosy-yellow skinned varieties are considered the best in the world market. Mango is eaten fresh, used for preparation of jams, cordials, juice and fruit salads. Mango layers are prepared from juice of riped fruits. Unriped fruits are used in pickles, chutney and culinary preparations. They are also sliced, sun-dried and used in off seasons.

OTHER USES:-

The timber is used in many ways.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(100 gr of edible portion)
Moisture - 81.0 g, Energy - 74 Kcal, Protein - 0.6 g, Fat -0.4 g, Carbohydrates - 16.9 g, Calcium - 14 mg, Phosphorus - 16 mg, Iron - 1.3 mg, Carotene - 2743 mcg, Thiamine-80 mcg, Riboflavin - 90 mcg, Niacin - 0.9 mg, Vitamin C-16 mg. (Perera et al., 1979).

The leaves of this tree contain euxanthin acid, euxanthon, hippuric and benzoic acids, mangiferin and margin while the bark contains tannin and the exudation from it yields resin and gum. The fruits which are consumed contain saccharose,levulose, dextrose and citric, tartaric and malic acids in addition to vitamins A,B,C, ascorbic acid and carotene. The seeds possess a fixed oil with oleostearin, starch, gallic acid and tannin. The juice of the leaves of this tree is given for bleeding dysentery. While an infusion of the young leaves is prescribed for chronic diseases of the lungs, coughs, and asthma. An infusion or expressed juice of the bark is used in menorrhagia, leucorrhoea, bleeding piles and hemorrhages of the lungs and intestines. A cold infusion of the barks of *Mangifera indica, Syzygium cumini* and *Terminalia arjuna* with bees' honey is given for bleeding from internal organs. A decoction of the dry flowers is used with beneficial effects on diarrhoea, chronic dysentery and gleet (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

It is well adopted to many types of soils. However deep well drained, sandy loams with a pH of 5.5-7.5 would be ideal for mangoes. Optimum temperature is 24-30^{0}C while the required rainfall is 500-2500 mm.

CULTIVATION:-

Mangoes are usually propagated by seed, but this is not recommended. It is preferable to produce planting stock by vegetative propagation of selected varieties. Germination takes about 20 days and is hastened by the removal of the fibrous seed husk.Seeds are planted at a depth of about 2 cm and seedlings reach a height of about 15 cm by 6-8 weeks. They are transplanted in the nursery, or in pots, when the first reddish leaves turn dark green and the cotyledons are still attached to the root collar. Selected mango cultivars are usually propagated by grafting, using various techniques of inarching, veneer and spile grafting, or budding into a seedling rootstock.

Planting - Planting holes 0.75 -1 m deep and wide should be prepared 6 months before planting with farmyard manure, wood ash and binomial mixed into the soil. Planting should take place with the onset of the rains. Young trees should be mulched, shaded and a weed-free circle maintained around each.

Spacing - Varies according to variety, vigor of trees and climate. Seedlings 10-12 m, grafted mangoes closer, 7 x 7 m.

Irrigation - Usually supplied during the first 4-5 years, but not always necessary where rainfall is greater than 700 mm/year and well distributed.

Fertilizer - Manuring is important during establishment. Nitrogen fertilizer applied to leave-bearing trees stimulates vegetative growth necessary for the next year's crop.

Time to harvest - seedling tress start to bear 4 -5 years after planting, with economic returns by the 8th year. Grafted trees start bearing in 3-4 years. From flower fertilization to fruit maturity takes 2-5 months, depending on cultivar and temperature. Harvested fruits are usually allowed to fall to the ground if too high to reach, but for marketing it must be carefully picked to avoid bruising. They are ready for harvesting when the ground colour of the area around the fruit stalk begins to change from green to yellow. They should be cut with scissors or a sharp knife, leaving a small stalk on the fruit.

STORAGE:-

Riped fruits should be washed properly before storing. Fruits are plucked in mature stage for prolonged keeping. Riped fruits are used in the manufacture of jams, jellies, juices and sundries, mango layers etc. Mango slices and juices are canned. Salted sun-dried mango slices can be stored for a number of months in dry and dark places.

FAMILY:- ANACARDIACEAE

BOTANICAL NAME:- *Mangifera zeylanica*

VERNACULAR NAMES:-

SINHALA : *Atamba*
TAMIL : *Katuma*

DESCRIPTION:-

Large tree, bark rather rough, slightly cracked-fissured, brownish-grey, with dispersed corky lenticulas.

LEAVES:- Stalks-2 cm long, leaf blades ceraceous, 7-13 cm (in saplings up to 20) long, lancelot or ovate oblong.

FLOWERS:- Panicles glabrous. Petals twice as long as the sepals, obtuse, clawed reflex Flowering-February, March and September (Jayaweera, 1981).

DISTRIBUTION:-

Mangifera zeylanica is a plant endemic to Sri Lanka. It is a tree of the lowlands in the moist and dry regions up to 1000 m altitude.

EDIBLE PARTS:-

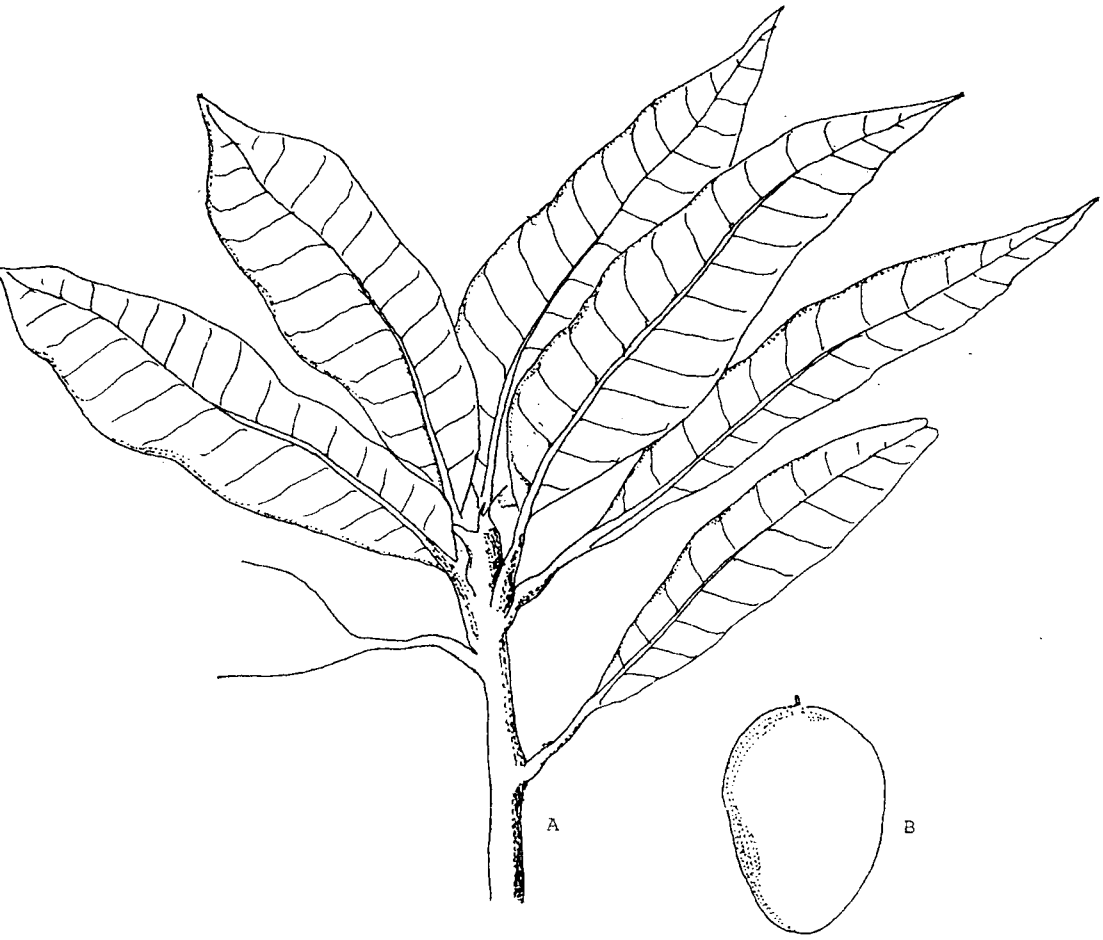
The fruit.

FOOD USE:-

Riped fruits are eaten fresh.

OTHER USES:

It is a good stock for mango budding. Timber is used in many ways.



Mangifera zeylanica

(A) Branch. (B). Fruit.

FAMILY:- ANACARDIACEAE

BOTANICAL NAME:- ***Spondias pinnata***

NAMES IN OTHER LANGUAGES:-

SINHALA	:	*Emberella.*
TAMIL	:	*Ambalam, Egin, Kattuma, Malai, Sudam*
ENGLISH	:	Bile Tree,Indian Hog Plum, Traveller's Delight, Wild Mango.

DESCRIPTION:-

A small or moderate-sized,deciduous tree, with a straight trunk, pale bark and glabrous young parts.

LEAVES:- Large,imparipinnate compound, 30-45 cm long, rachis thickened at base, cylindrical, striate, glabrous;

FLOWERS:- Regular, pale pinkish green, polygamous, 4-6 mm across, sessile in small clusters. (period -In January).

FRUITS:- An ovoid edible drupe, about 5 cm long smooth, yellow with a firm flesh and milky juice,stone woody and fibrous (Jayaweera, 1981).

DISTRIBUTION:-

A native of Polynesia. It was introduced to Sri Lanka by the Portuguese in the second half of the 18th century. Grows throughout India, Sri Lanka, Burma and the Andaman Islands. It is common in Sri Lanka, often planted in the moist low-country (Jayaweera, 1981).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Matured fruits are eaten fresh. Jams, chutney, pickles and *dosi* (candied) are prepared from the fruit. Delicious curry is prepared using fruits.

Spondias pinnata

(A) Leaf. ((B) Inflorescence. (C) Young fruits. (D) Flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 86.9 g, Energy - 46 Kcal, Protein -0.2 g, Fat -0.1 g, Carbohydrates - 12.8, Calcium - 56 mg, Phosphorus - 67 mg, Fe-0.3 mg, Carotene -205 mcg, Thiamin -50 mcg, Riboflavin - 20 mcg, Niacin - 1.4 mcg, C - 36 mg (Perera, et at., 1979).

The bark of this tree is used for treating dysentery. Among certain Indian tribes, the bark ground into a paste with water is rubbed for both articular and muscular rheumatism. The juice of the leave is used for earache. The fruit is an antiscorbutic and the acidic and astringent pulp is used for bilious dyspepsia (Jayaweera, 1981).

CULTIVATION:-

S. pinneta is propagated by seeds. It is budded with mango in order to get better *Amberella* plants. Plants start bearing of fruits at the age of 4-5 years. It is not cultivated in Sri Lanka commercially, but in home gardens.

STORAGE:-

Ripen fruits can be kept for a few days. It can be used for preparing pickles and chutney, which can be kept for several months.

FAMILY:- ANNONACEAE

BOTANICAL NAME:- ***Annona muricata***

VERNACULAR NAMES:-

SINHALA	: *Katu-attha, Katu-anoda, Rata-attha*
TAMIL	: *Sitha-Seetha palam*
ENGLISH	: Soursop

DESCRIPTION:-

A small tree about 4-10 m tall. Branches pubescent with appressed fulvous hairs when young, soon glabrate. Axillary buds narrowly conical, very acute.

LEAVES:- Leaf blade 8-11 cm long, 3-7 cm wide, obovate or narrowly obovate, rounded but short-decurrent at base, glabrous above, sparsely pubescent beneath.

FLOWERS:- Greenish-yellow, terminal or leaf-opposed.

FRUITS:- It is about 10-25 cm long, up to 15 cm in diameter. Ovoid or irregularly ovoid, dark green, covered with soft spines about 6 mm long and usually curved pulp white.
Seed-Blackish-brown (Jayaweera, 1981).

DISTRIBUTION:-

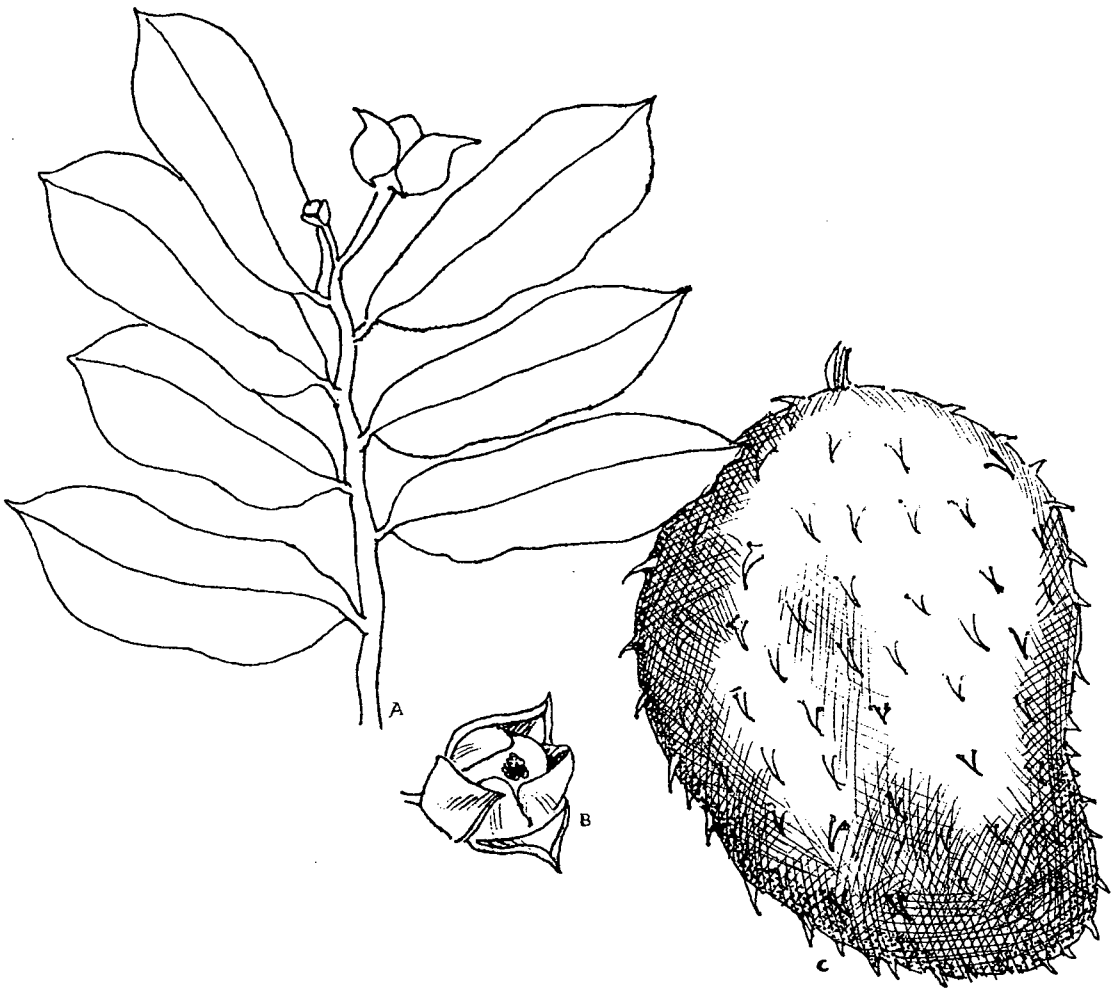
Probably it is a native of the West Indies (Querol, 1992). It could have been introduced to Sri Lanka by the Portuguese. They are now widely distributed throughout the humid tropics.

EDIBLE PARTS:-

The fruit

FOOD USE:-

Riped fruits are eaten fresh, sap of the fruit is used to prepare drinks and ice creams. Matured fruits are cooked as breadfruit.



Annona muricata

(A) Branch with leaves. (B) Flower. (C) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 81.7 g, Energy - 65 kcal, Proteins - 1.08 g, Fats - 0.39 g, Carbohydrates - 16.3 g Calcium - 14 mg, phosphorus - 27 mg, Iron - 0.68, Vitamin, Carotene - 1 mcg, Thiamine - 70 mcg, Niacin - 60 mcg, Vitamin C-20 mg (Perera et al., 1979).

Leaf infusion used as sudorific; antipasmodic; emetic flowers are antispasmodic. The ripe fruit is antiscorbutic; unripe fruit for dysentery. Seeds and green fruit astringent (De Pauda et al., 1997).

ENVIRONMENTAL RESPONSE:-

The soursop can be grown in a wide variety of soils, although well drained soils are more suitable. It require an annual rainfall of 100 cm or more. Adopted only to lowland areas, the soursop is widely planted in the tropics below an altitude of 100m.

CULTIVATION:-

It grows in low land of wet zone up to 670 m . It is propergated by seeds. Spacing - should be planted 5 m apart. It starts to bear fruits at the age of three years. In good years it bears 25-30 fruit in a season.

STORAGE:-

Riped fruits can be stored 3-5 days. Fruits are picked while immature for prolonged keeping. Cordials are made in commercial scale.

FAMILY:- ANNONACEAE

BOTANICAL NAME:- ***Annona reticulata***

VERNACULAR NAMES:-

SINHALA	:	*Attha, Weli-attha*
TAMIL	:	*Ramsitha*
ENGLISH	:	Bullock's heart.

DESCRIPTION:-

A small tree 5-10 m tall. Branches grayish sericeous when young, glabrate with age. Axillary buds ovoid, obtuse.

LEAVES:- Leaf blade about 10-20 cm long, 2-5 cm wide, lancelot, acute or obtuse and shortly decurrent at base, gradually long acuminate at apex, pubescent on both sides when young, glabrate on upper side at maturity.

FLOWERS:- Green, several from internodal cymes, rarely leaf-opposed.

FRUIT:- It is up to 10 cm in diameter. Spherical or ovid, turning yellow or reddish, smooth. Pulp-yellowish. Seed-black brown (Macmillan, 1956).

DISTRIBUTION:-

It originated in the West Indies and is grown as a fruit in Sri Lanka.

EDIBLE PARTS:-

The fruit

FOOD USE:-

Riped fruit is eaten fresh. Juice is also used as a drink.

NUTRITIONAL AND THERAPEUTIC VALUE

Moisture - 76.8 g, Energy - 70 Kcal, Proteins - 1.4 g, Fats - 0.2 g, Carbohydrates - 15.7 g, Calcium - 10 mg, Phosphorus - 10 mg, Iron - 0.6 mg.

Annona reticulata

(A) Branch with leaves. (B) Fruit.

Fresh leaves used as topicals applied to the stomach of children suffering from indigestion. Fresh leaves and fruits are anthelmintic. Green fruits and bark astringent in dysentery and diarrhea (De Pauda et al., 1987).

CULTIVATION:-

Occurs in wet zone home gardens of Sri Lanka. Propagated by seeds. In a season a tree bears 100-150 fruits and the weight of each fruit is about 400-700 g.

FAMILY:- ANNONACEAE

BOTANICAL NAME:- ***Annona squamosa.***

VERNACULAR NAMES:-

SINHALA	: *Anona, Sini-atta*
TAMIL	: *Sittapan, Sitapalam*
ENGLISH	: Sugar Apple, SweetSop, Custard apple

DESCRIPTION:-

A small tree, about 3-8 m high, leafy branches, pubescent or glabrate, hairs grayish-white, appressed or erefo-patent

LEAVES:- Simple, alternate, stipulate, 3.7-7.5 cm long, 1.8-3.7 cm broad, oblong-lancelot or elliptic, obtuse or subacute, entire, pellucido-punctate. glabrous above.

FLOWERS:- Solitary, bisexual, leaf- opposed, or 2-4 on short extra-axillary branchlets (period-May to July).

FRUITS:- Globular,cordate-ovoid or conical,6-9 cm in diameter, yellowish green, glucose, comprised of loosely cohering rounded pistils that fall apart quite easily, the pulp white, sweet, soft and juicy, having a very mild agreeable flavour. Seeds brownish-black and smooth (Jayaweera, 1981).

DISTRIBUTION:-

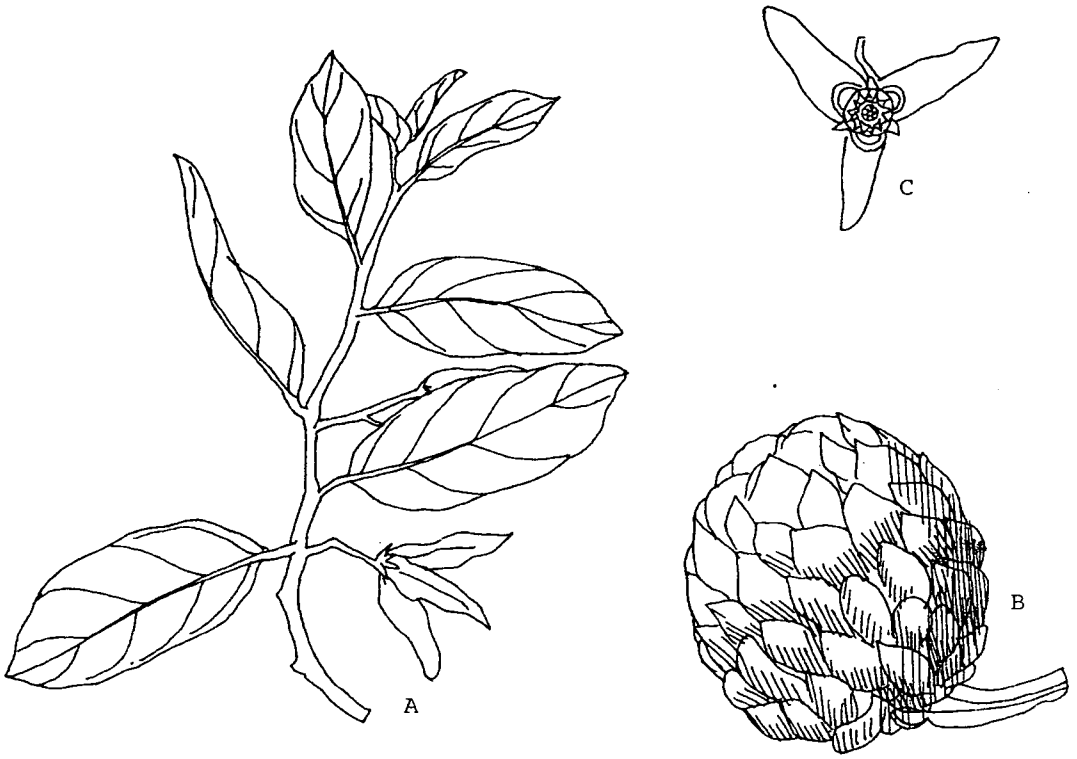
Originated in tropical America and West Indies (Querol, 1992) and is frequently cultivated in India, Sri Lanka and other tropical Asiatic countries (Bose and Mitra, 1985).

EDIBLE PART:-

The fruit.

FOOD USE:-

The riped fruit is frequently eaten.



Annona squamosa

(A) Branch with leaves and flowers. (B) Fruit. (C) Flower viewed from above.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture -70.5 g, Energy -104 Kcal, Protein -1.6 g, Fat -0.4 g, Calcium - 17 mg, Phosphorus - 47 mg, Iron - 1.5 mg, Thiamine - 10 mcg, Riboflavin -170 mcg, Niacin -1.3 mcg, Vitamin C-37 mcg. (Perera et al., 1979).

The leaves and seeds of this tree contain an alkaloid. The seeds in addition contain a neutral resin and a fixed oil with an irritant poison. The bark contains the alkaloid anonaine. Hydrocyanic acid has also been found in the leaves, bark and roots. The seeds, crushed into a paste with water, are applied to the scalp to destroy lice or used as an abortifacient if applied to the uterus in pregnant women. The bruised leaves of the riped fruit, applied with salt, induce or hasten suppuration of malignant tumors. The unriped fruit is given for diarrhoea, dysentery and atonic dyspepsia. (Jayaweera, 1981).

CULTIVATION:-

Areas of cultivation - occurs in home gardens in low and mid-country wet zone.

Planting material - seeds.

Spacing - 5 m apart.

Fertilizer - Compound NPK and Mg at rates up to 1 kg/tree every 3 months.

Harvesting - Best picked immature and ripened by storage in a dark, warm place.

STORAGE:-

Fruits once riped can be kept only for a few days.

FAMILY:- APOCYNACEAE

BOTANICAL NAME:- ***Carissa carandas***

VERNACULAR NAMES:-

SINHALA	: *Mahakaramba*
TAMIL	: *Kala, Kalakkay, Perungala*
ENGLISH	: Sri Lankan Damson, Malaysian Karanda

DESCRIPTION:-

A small tree or a large shrub, with numerous, divaricate branches and very sharp horizontal spines, often branched.

LEAVES:- Simple, opposite, oblong-oval or oblong-lancelot, 2.5-6.2 cm long, subacute at base, obtuse at apex, glabrous, thin.

FLOWERS:- Regular, bisexual in threes, shortly stalked in clusters at the ends of short, axillary and terminal peduncles (period-during March)

FRUITS:- A smooth, ovoid, bluntly pointed, raddish-purple berry, 1.8-2.5cm long with 4 seeds (Jayaweera, 1981).

DISTRIBUTION:-

Grows in the drier sandy and rocky soils throughout India, Sri Lanka, Burma and Malaysia. It is rare in Sri Lanka and can be found in Jaffna, Kurunegala and other dry districts.

EDIBLE PARTS:-

Fruits

FOOD USE:-

Riped purple colour fruits are eaten fresh. They are used for making excellent tarts and puddings. pickled in vinegor when green, they are used for making jelly.

Carrissa carandas

(A) Branch with leaves. (B) Branch showing fruit. (C) Branch showing cluster of flowers.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The bark contains an alkaloid. The roots contain traces of a volatile oil, salicylic acid and an alkaloid. In India, the leaves are used for diarrhoea, earache, soreness of the mouth and throat and syphilitic pains. A decoction of the leaves is often used at the commencement of remittent fevers. The root has a reputation of being a bitter stomachic and used as a remedy for itch along with other ingredients. The riped fruit possesses antiscorbutic properties (Jayaweera, 1981).

OTHER USES:-

It is planted as an exotic plant in Sri Lankan home gardens.

FAMILY:- APOCYNACEAE

BOTANICAL NAME:- ***Carissa spinarum***

VERNACULAR NAMES:-

SINHALA : *Heen karamba, Karamba*
TAMIL : *Chiru-kila, Kilatti*

DESCRIPTION:-

An intricately branched, erect or occasionally slightly scandent tree. Spines simple or forked, 1.2-6 cm long.

LEAVES:- Short-petioled, the blade 1.5-5 cm long and 1.2-4 cm wide, broadly ovate or rhomboid, widest in or below the middle, as long as wide to twice as long as wide, acute or rounded at the base, acute and apiculate at the apex ceraceous.

FLOWERS:- Scentless.(Flowers throughout all the year)

FRUITS:- It is about 0.7-1.2 cm long, shining, dark radish black. (Jayaweera, 1981).

DISTRIBUTION:-

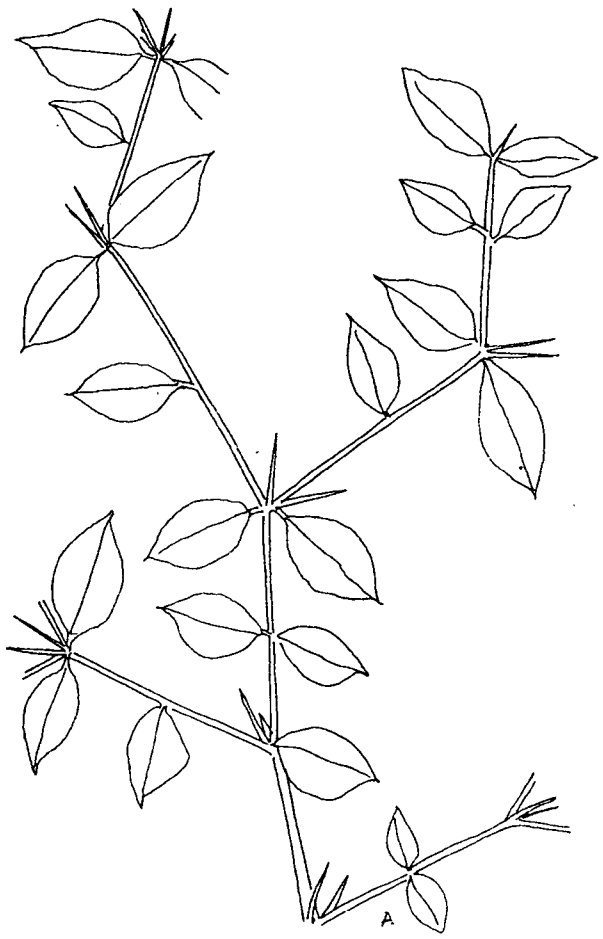
It grows in India, Burma and Sri Lanka (Jayaweera, 1981). In Sri Lanka it is common in the dry zone, especially over-grazed and otherwise disturbed vegetation along roads and at the edge of forests.

EDIBLE PARTS:-

Fruits

FOOD USE:-

Riped dark radish black fruits are eaten fresh



Carissa spinarum

(A) Branch.

FAMILY:- ARACEAE

BOTANICAL NAME:- ***Alocasia indica.***

VERNACULAR NAMES:-

SINHALA : *Desa-ala, Rata-ala*
ENGLISH : Alocesia

DESCRIPTION:-

A robust herb with bright green,large,triangular-sagittate, slightly repand leaves with strongly marked, whitish mid rib and 6-8, strong, pale, secondary nerves, petioles as long as or longer than the leaves, round and tapering upwards.

FLOWERS:- Female inflorescence yellow, narrowly ovoid, about 2.5 cm long, fertile male inflorescence white, 3.8-5 cm long.

FRUITS:- Berry red, 7.5-10 mm diameter (Jayaweera, 1981).

DISTRIBUTION:-

Centre of origin is South East Asia. It is a much cultivated species in the tropics including India and Sri Lanka.

EDIBLE PART:-

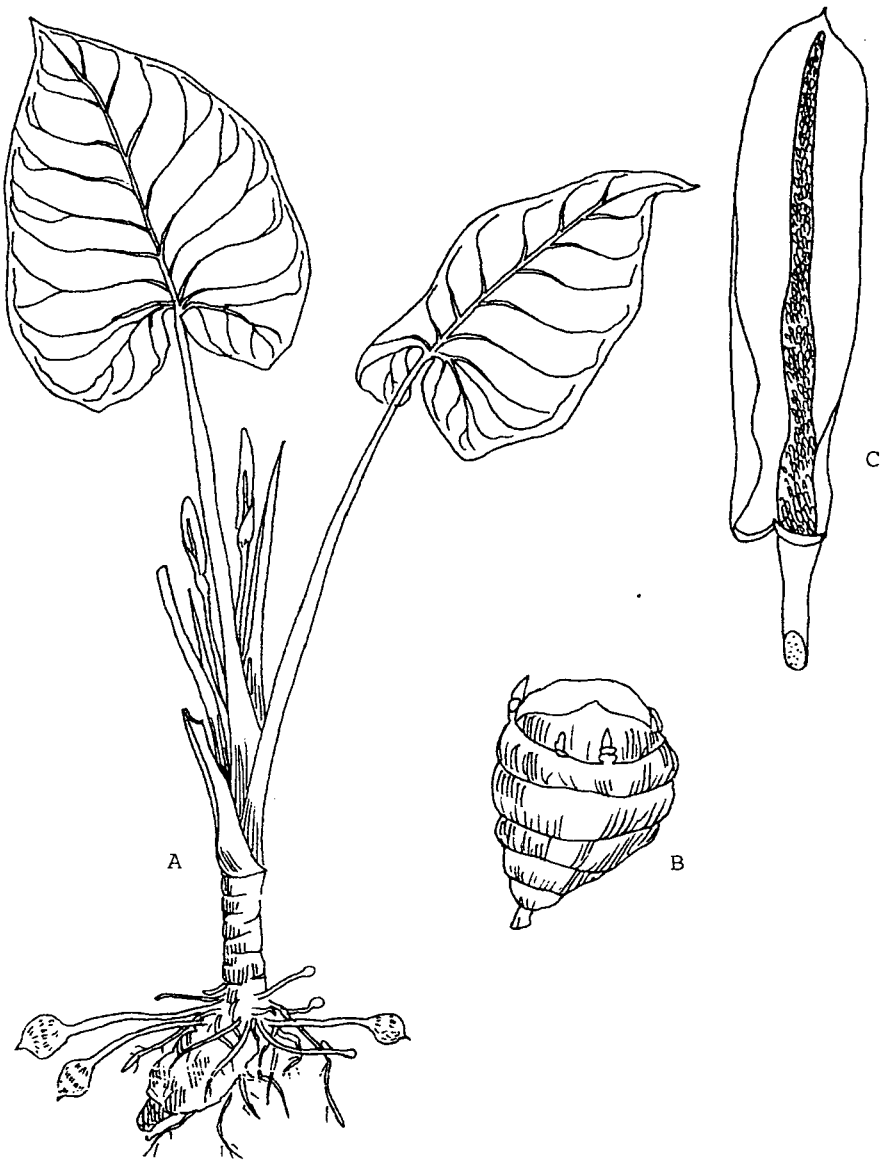
The tubers

FOOD USE:-

As a food the tubers are prepared in various ways. It can be boiled and eaten as staple prepared curries.

NUTRITIONAL AND THERAPEUTIC VALUE:

Moisture - 70 g, Energy - 111 kcal, Protein - 0.5 g, Carbohydrate - 27 g, Calcium - 150 mg, Iron - 1.0 g, Thiamin 0.03 mg, Riboflavin - 0.1 mg, Niacin 1.0 mg. (Perera et al, 1979).



Alocasia indica

(A) Plant. (B) Inflorescence. (C) Tuber.

Medicinally, the plant is regarded as useful in treating anasarca. The boiled tubers frequently act as a mild laxative and diuretic and are beneficial for piles and chronic constipation. The ash of the rootstock mixed with honey is used for cases of aphthae (Jayaweera, 1981).

OTHER USES:-

Leaves are used as wrapping materials.

ENVIRONMENTAL RESPONSES:-

Fertile lands with good water readoption are preferable; requires a well distributed rainfall of 2000 mm per year. Elevations below 1000 m are generally suitable.

CULTIVATION:-

Area for planting - This is quite suited to high rainfall areas, and can be expected to do well in the low-country and mid-country wet zone. Some of the relatively short-aged varieties can also be grown successfully in the dry zone, without irrigation.

Planting season - It can be planted almost throughout the year except during the very dry months.

Planting material - They consist of either crowns, or tubers. Crowns have to be planted almost immediately after harvest. Small sized tubers could be planted fully. Large ones should be cut into two or three pieces, each containing two or three eyes. It is usual to smear the cut surface with wood ash to prevent rotting.

Land preparation - The land should be worked to a depth of about 20-25 cm. The application of well rotted compost or cattle manure at this time gives beneficial results. Planting is usually done in individual planting holes. The tubers are buried 7.5-10 cm deep.

Spacing - 1.-1.5 m x 1-1.5 m.

Fertilizer - This responds well to manuring. Heavy application of well rotted cattle manure or compost, at planting, can double the yield of tubers. Preliminary weeding may be necessary till the plants grow up and shade the soil.

Time to harvest - Depending on variety, the crop may be lifted from three months onwards.

Harvest - The tubers are lifted carefully by digging the whole plant out, without injuring the tubers.

STORAGE:-

Uninjured tubers store relatively well.

FAMILY:- ARACEAE

BOTANICAL NAME:- ***Alocasia macrorrhiza.***

VERNACULAR NAMES:-

SINHALA	: *Habarala, Kiri habarala, kiri ala*
TAMIL	: *Parum sembu*
ENGLISH	: Giant Taro

DESCRIPTION:-

A large herb; rootstock tuberous, creeping and ascending, 60-90 cm high, annually scarred;

LEAVES:- Simple, large, very stoutly and long petioled, 60-120 cm long, 15-45 cm broad, peltate, broadly sagittately ovate, margins sub-undulate, basal lobes rounded and incurred. Petioles; 60-120 cm long.

FLOWERS:- Male and female parts of the inflorescence distant, separated by neuters. (Period- During February).

FRUITS:- Berries 2 cm diameter, red when ripe (Jayaweera, 1981; Tindall, 1993).

DISTRIBUTION:-

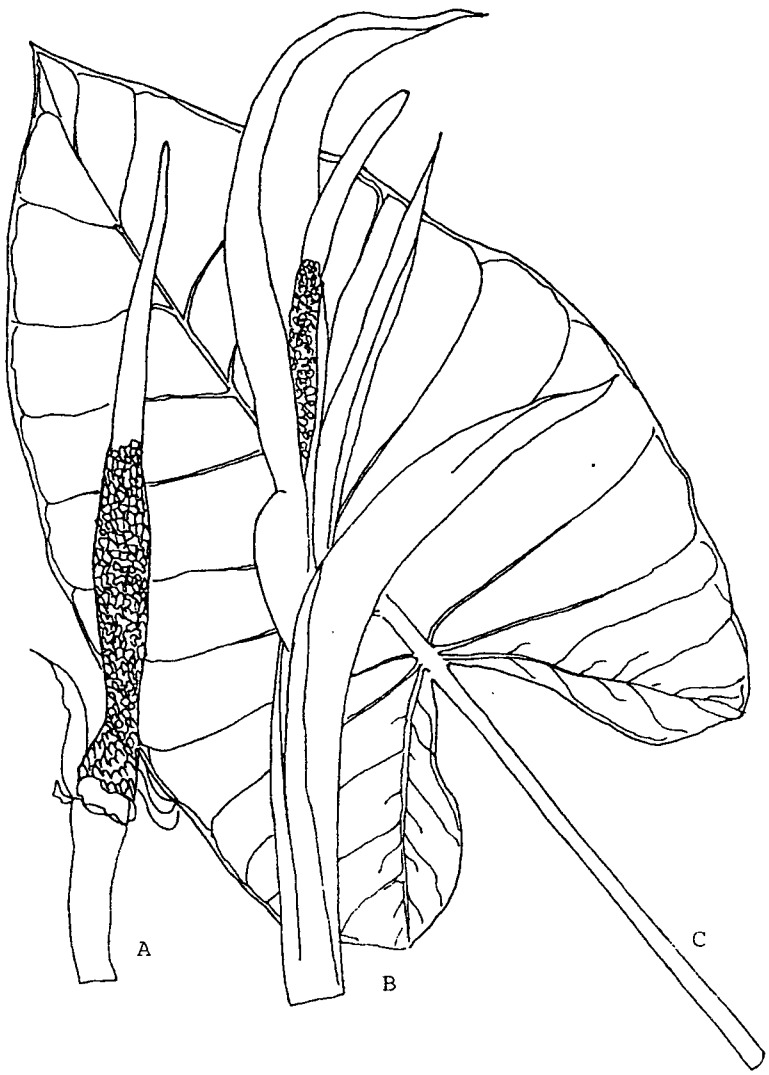
Indigenous to India, Sri Lanka and Malaysia (Tindall, 1993). Grows in all tropical countries including India, Sri Lanka, Malaysia and Philippine Islands. In Sri Lanka, it is a common herb in all village gardens.

EDIBLE PARTS:-

Tender leaves and tubers.

FOOD USE:-

The stem is peeled and used as a cooked vegetable and added to soups and stews. A very easily digested starch can be prepared from the stem. Leaves are eaten as a green vegetable.



Alocasia macrorrhiza

(A) Inflorescence. (B) Inflorescence with spathes and spadix. (C) Leaf.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 84 g, Energy - 61 kcal, Protein - 0.6 g, Fat - 0.3 g, Carbohydrate - 15 g, Calcium -30 mg, phosphorus - 50 mg, Iron - 1.0 mg, Thiamine - 0.05 mcg, Vitamin C - 5 mg. (FAO, 1968).

The stems, leaves and petioles contain stinging crystals of calcium oxalate which are destroyed by boiling or roasting. Hence the starch in the stem can be used as a source of food. The acid juice of the leaves of this plant gives instant relief to stings of the giant nettle. The chopped up leaves and roots are used as an application on painful joints. The cut surface of the stem is smeared with lime and water applied for dog bites. The dried stems along with other ingredients are given for piles and chronic fevers (Jayaweera, 1981).

ENVIRONMENTAL RESPONSES:-

Fertile land with good water retention are preferable. A well distributed rainfall of 2000 mm per year is required elevations below 1000 m are generally suitable.

CULTIVATION:-

Area for planting - This is quite suited to high rainfall areas, and can be expected to do well in the low-country and mid-country wet zone. Some of the relatively short aged varieties can also be grown successfully in the dry zone, without irrigation.

Planting season - It can be planted almost throughout the year except during the very dry months.

Planting material - They consist of either crowns, or tubers. Crowns have to be planted almost immediately after harvest. Small sized tubers could be planted fully. Large one should be cut into two or three pieces, each containing two or three eyes. It is usual to smear the cut surface with wood ash to prevent rotting.

Land preparation - The land should be worked to a depth of about 20-25 cm. The application of well rotted compost or cattle manure at this time gives beneficial results. Planting is usually done in individual planting holes. The tubers are buried 7.5 - 10 cm deep.

Spacing - 1.-1.5 m x 1-1.5 m.

Fertilizer - This responds well to manuring. Heavy application of well rotted cattle manure or compost, at planting, can double the yield of tubers. Preliminary weeding may be necessary till the plants grow up and shade the soil.

Time to harvest - Depending on the variety, the crop may be lifted from three months onwards.

Harvest - The tubers are lifted carefully by digging the whole plant out, without injuring the tubers.

STORAGE:-

Uninjured tubers store relatively well.

FAMILY:- ARACEAE

BOTANICAL NAME:- ***Amorphophallus campanulatus***

VERNACULAR NAMES:-

SINHALA : *Kidaran, Wal-kidaran, Raja ala*
TAMIL : *Karunaikkalangu*
ENGLISH : Elephant yam.

DESCRIPTION:-

A herb up to 1.25 m in height. Tubers of corms large, yellow or brown, 20-25 cm in diameter with central depression. Cormes are also formed underground, 5-10 being produced from the main corm or tuber.

LEAVES:- Single leaves large, tripartite, each part subdivided into numerous lobes, 30-80 cm long, with red markings.

FLOWERS:- Spathes 20-25 cm in length, with strong unpleasant odour, borne on a terminal inflorescence produced by the tuber (Jayaweera, 1981).

DISTRIBUTION:-

A native to tropical Asia (Tindall, 1993). It is cultivated in Indonesia, Sri Lanka, Philippines and Pacific Islands.

EDIBLE PARTS:-

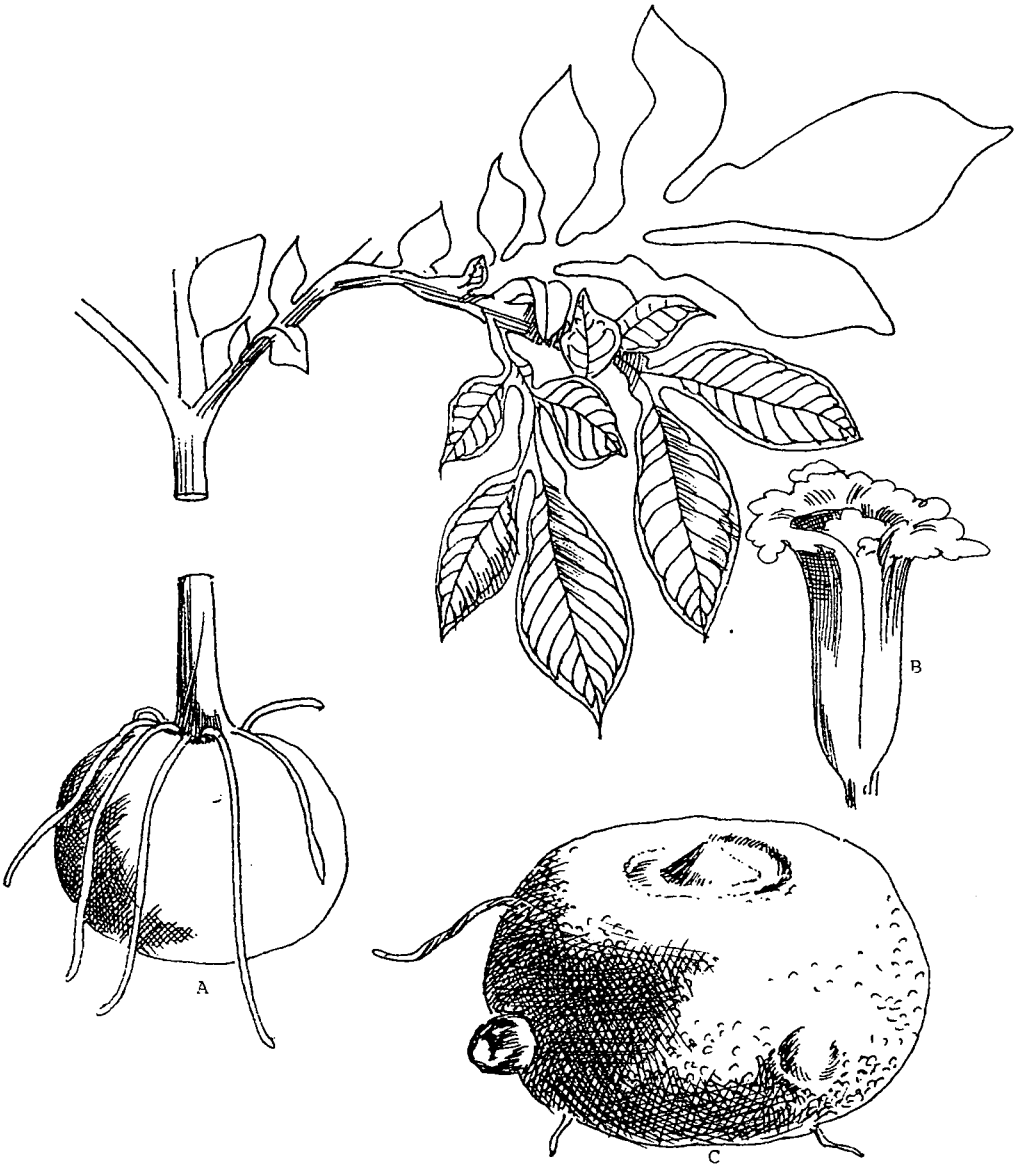
The tubers, young leaves.

FOOD USE:-

The boiled or roasted corms are eaten as a staple. Occasionally curries are also prepared from corms and leaves. The corm is useful in periods of food scarcity.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 78.9 g, Energy - 79 kcal, Protein - 1.2 g, Fats - 0.1 g, Carbohydrate -18.4 g, Calcium - 50 mg, Phosphorus -34 mg, Iron - 0.6 mg, Carotene - 260 mcg, Thiamine -60 mcg, Riboflavin - 70 mcg, Niacin - 0.7 mg (Gopalan et al., 1971).



Amorphophallus campanulatus

(A) Plant. (B) Inflorescence. (C) Corm.

The corm is used externally to relieve pain in acute rheumatism. The corm and roots are good for hemorrhoids (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Fertile, deep alluvial soils are preferable. Temperature between 25-35^{0}C and rainfall of 1000-1500 mm are considered suitable for elephant yams. Mostly productive at elevations below 1000 m.

CULTIVATION :-

Areas for cultivation - In Jaffna as well as in other locations of the low country wet zone.

Planting season-Planting is generally done with the rains either in the Maha or Yala.

Land preparation-It involves making planting beds or ridges.

Planting and space-Small corms or portions of 3-year old corms are planted on flat beds or ridges at a depth of 10-15 cm at a spacing of 30-100 cm x 30 60 cm, depending on the age and size of the corms. Mulching or shading may be required in the early stages of growth. The corms usually are dug and replanted over a 3-year cycle.

Time to harvest-The crop matures in 220-350 days after planting and the corms are excavated when the leaves become sencecent. After 3 years of growth, the corms weigh 7-9 kg each and are considered marketable.

Harvesting- Tubers are lifted carefully without injuring the tubers.

STORAGE:-

The corms are carefully cleaned and stored in heaps, preferably in well-ventilated sheds. They may lose up 25% of their weight during the first month of storage, but may be successfully stored for 7 months at 10^{0}C

FAMILY:- ARACEAE

BOTANICAL NAME:- ***Colocasia esculenta.***

Syn. C. antiquorum.

VERNACULAR NAMES:-

SINHALA	: *Gahala, Kandala, Tadala, Dehiala*
TAMIL	: *Shamakkilangu, Shemakkalengu*
ENGLISH	: Taro, cocoyam.

DESCRIPTION:-

A large herb with no stem above ground, but the base slightly swollen, arising from a tuberous rhizome, giving off sheathed, bulbiferous suckers.

LEAVES:- Simple, large, 15-48 cm long, ovate-cordate or heisted, dark ashy-green, bifid halfway from the base to the insertion of petiole, it is 90-120 cm long.

FLOWERS:- Male flowers densely packed,anthers cubical with immersed cells opening by terminal slits, female flowers crowded, globose, style very short (Jayaweera, 1981).

FRUITS:- Berries oblong.

DISTRIBUTION:-

A native of South East Asia. From India, it was taken to Egypt 2000 years ago, from where it was introduced to Europe (Tindall, 1993; Querol, 1992). Spaniards introduced it to the new world. Cultivated throughout the tropics including India and Sri Lanka. In Sri Lanka it is grown in most village gardens for it is tuberous suckers which are eaten.

EDIBLE PARTS:-

Tender leaves and tubers.

FOOD USE:-

Tubers are boiled and eaten and it is used to prepare curries. Leaves are eaten as a green vegetable.

Colocasia esculenta

(A) Plant. (B) Portion of the stem showing the tubers. (C) Inflorescence with the spadix inside.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Tuber)
Moisture -73 g, Energy - 102 kcal, Protein - 1.8 g, Fat 0.1 g, Carbohydrate 23 g, Calcium - 51 mg, Phosphorus - 88 mg, Iron - 1.2 mg. thiamin - 0.1 mg, Riboflavin - 0.03 mg, Niacin - 0.8 mg, Vitamin C - 8 mg (FAO, 1968).

(Leaves)
Moisture - 93 g, Energy - 24 kcal, Proteins - 0.5 g, Fats - 0.2 g, Carbohydrates - 6 g, Calcium - 49 mg, Phosphorous - 25 mg, Iron - 0.9 mg, Carotene - 180 mcg, Thiamine - 0.02 mg, Riboflavin - 0.04 mg, Niacin 0.4 mg, Vitamin C - 13 mg (FAO, 1972).

The corms have a high content of starch and protein. The colocasia starch contains amylase and the mucilage contains D-galactose, L-arabinose and uranic acid. The whole plant is a source of vitamin B. Besides being a starchy food, the tubers of this plant are laxative, diuretic, lactagogue and styptic. The pressed juice of petioles is used to arrest arterial hemorrhage. It is also used for earache and otorrhoea and also as an external stimulant and rubefacient, antidote for stings of wasps and insect. The ash of tuber mixed with honey is applied for aphthae in the mouth (Jayaweera, 1981)

OTHER USES:-

Leaves are used as wrapping materials.

ENVIRONMENTAL RESPONSE:-

A fertile soil with water retention capacity is ideal. Good drainage is required. A temperature of 21-27^{0}C and well distributed rainfall of 1000-1500 mm is good for taro. Mostly production occurs at altitudes below 1000 m.

CULTIVATION:-

Areas for cultivation - Low-country and mid country wet zone

Planting season - Almost throughout the year except during the very dry months.

Land preparation - The land should be worked to a depth of 20-25 cm.

Planting material - It consists of either the crowns, or tubers

Planting and space- Planting is usually done in individual planting holes. The tubers are buried 7.5 - 10 cm deep.

Fertilizer - Respond well to manuring. Heavy application of cattle manure for compost, at planting, can double the yield of tubers.

Time to harvest- Depending on the variety, the crop may be lifted from 3 months onwards.

Harvest- The tubers are lifted by carefully digging the whole plant out without injuring the tubers. Yields - 15-20 t/ha

STORAGE :-

The storage behaviour of different forms of Taro is very viable. Tubers must be cleaned properly before storage; corms can be stored up to four months in shaded pits.

FAMILY:- ARACEAE

BOTANICAL NAME:- ***Lasia spinosa***

VERNACULAR NAMES:-

SINHALA : *Kohila, Kohowila*
TAMIL : *Kohila*

DESCRIPTION:-

A shutout, spiny, marshy plant with a creeping spiny rootstock 2-3 cm diameter;

LEAVES:- Simple, long petioled, 15-45 cm long, 5-32 cm broad;

FLOWERS:- Spadix 3 cm long, 0.9 cm diameter, cylindrical, blunt at apex, Orange red in colour, densely clothed in bisexual, sessile.

FRUITS:- Not seen. (Jayaweera, 1981).

DISTRIBUTION:-

Grows in marshy places in tropical India, Burma, Sri Lanka, Malay, Peninsula and China (Jayaweera, 1981). In Sri Lanka, it is cultivated in the moist low- country for it is young leaves and rhizomes which are eaten.

EDIBLE PARTS:-

Young leaves and rhizome

FOOD USE:-

Both young leaves and rhizomes are eaten as a vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Tubers)
Moisture - 85.9 g, Energy - 53 Kcal, Protein - 1.7 g, Fat - 0.1 g , Carbohydrates - 11.3 g, Minerals - Calcium - 21.0 mg, Phosphorus - 74.0 mg, Iron - 0.4 mg, Thiamin 100 mcg, Vitamin C - 22 mg.

Lasia spinosa

(A) Aerial portion of a plant. (B) Part of the older spathe.

(Leaves)
Moisture - 89.8 g, Energy - 34.0 Kcal, Protein - 4.0 g, Fat - 0.6 g, Carbohydrate - 3.2 g, Calcium - 155 mg, Phosporus - 26.0 mg, Iron - 16.3 mg, Vitamin A - 1311.0 mg, Thiamine - 30 mg. (Weerakoon, 1993).

The leaves, stems, roots are used as a common remedy for piles (Jayaweera, 1981)

ENVIRONMENTAL RESPONSE :-

A temperature of 25-35^{0}C is required. It is grows well in marshy places in the Tropics. Fertile, alluvial soils are required for an optimum development.

CULTIVATION:-

Areas for planting - In the low country wet zone.
Planting season - Planting is generally done with the rains either in the *Maha* or *Yala*.

Planting material -The tuberous outgrowths of the fully developed corms are planted. Planting holes are prepared in the same way as for dioscorea yams.

Time to harvest - The corms can be dug out for use about 12 months after planting.

STORAGE:-

The corms can be stored for long periods if stored dry in a well ventilated room. Leaves can be stored in moist place for three days.

FAMILY:- ASCLEPIADACEAE

BOTANICAL NAME:- ***Dregea volubilis***

VERNACULAR NAMES:-

SINHALA : *Kiri-anguna, Titta-anguna*
TAMIL : *Kamal, Kodippalai, Kurinja*

DESCRIPTION:-

A very large, twining shrub with long, glabrous branches

LEAVES:- Simple, opposite, 7.5-11.2 cm long, 3.5-6.5 cm broad. Petioles 1.5-3.5 cm long .

FLOWERS:- Numerous, regular, bisexual, green or yellowish green, sweet scented. (period during March and April).

FRUITS:- Follicles 7.5-10 cm long, slightly tapering to a blunt point, cylindrical, shallowly grooved, glabrous and dull yellow (Jayaweera, 1981).

DISTRIBUTION:-

Grows in Bengal, Assam, Deccan, Madras and from Concan southwards in India, Sri Lanka, Java and Philippine Islands. It is rather common in Sri Lanka up to about 1000 m altitude (Jayaweera, 1981).

EDIBLE PARTS:-

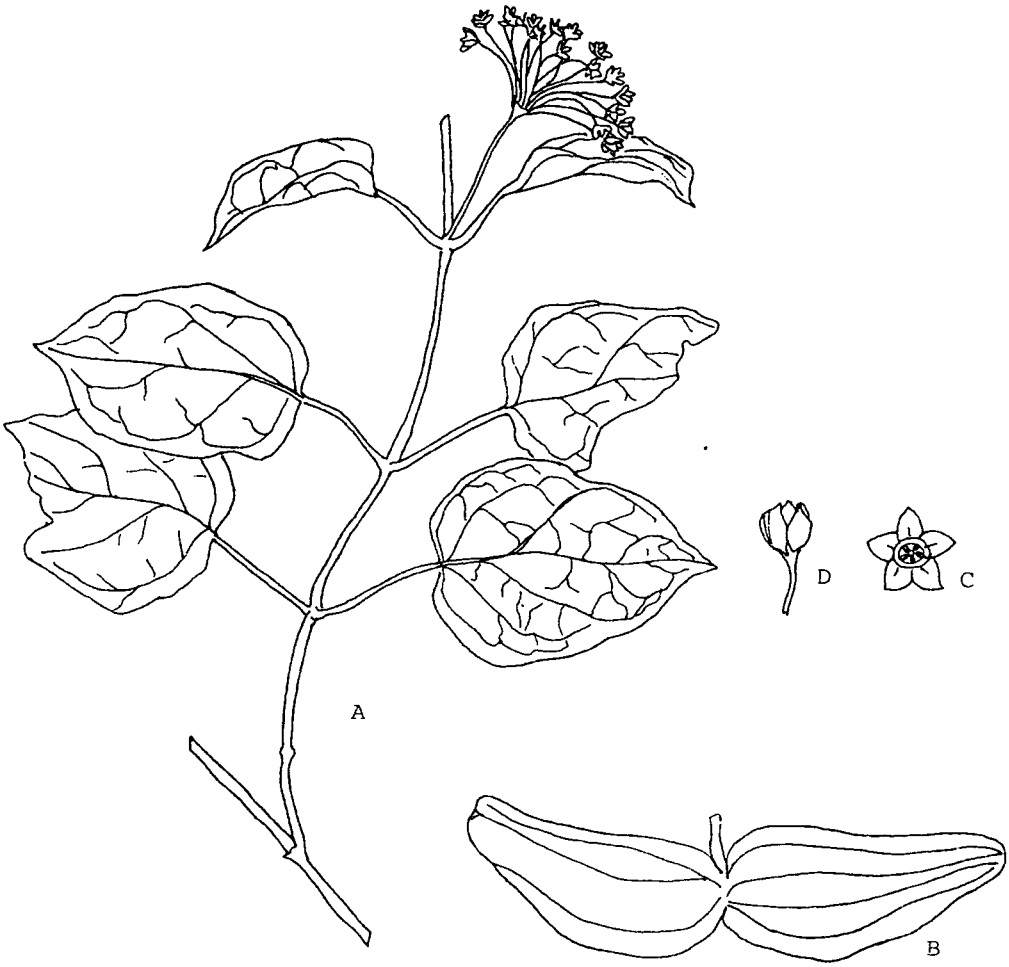
Tender leaves

FOOD USE:-

Tender leaves are eaten as a vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture -85.7 g, Energy - 45.0 Kcal, Protein - 4.0 g, Fat -0.5 g , Carbohydrates - 6.1 g, Calcium - 397.0 mg, Phosphorus - 83.0 mg, Iron - 25.0 mg, Vitamin A - 2760.0 mcg, Thiamine 30.0 mcg, Riboflavin 300.0 mcg, Niacin - 1.2 mg, Vitamin C - 99.0 mg (Weerakoon, 1993).



Dregea volubilis

(A) Branch with leaves and inflorescence. (B) Fruit follicles. (C) Dorsal view of flower. (D) Lateral view of flower.

The plant and seeds contain an active principle. The roots and young stalks of this plant are considered to have emetic and expectorant properties. The leaves are used, ground in to a paste, as an application on boils and abscesses (Jayaweera, 1981).

FAMILY:- ASCLEPIADACEAE

BOTANICAL NAME:- ***Hemidesmus indicus***

VERNACULAR NAMES:-

SINHALA	: *Iramusu*
TAMIL	: *Arakkam,Aritinviyachi*
ENGLISH	: Sarsaparilla

DESCRIPTION:-

Perennial, semi-shrubby twiner with a woody rootstock and numerous, very long, prostrate or ascending, whip-like stems, slightly twining cylindrical, thickened at nodes.

LEAVES:- Simple, opposite, exstipulate, very variable from oblong-oval to linear, 3.7-6.5 cm long, 3.5-8 mm broad.

FLOWERS:- Regular, bisexual on very short pedicels crowded in axillary cymes.

FRUITS:- 2, distinct, divaricated follicles, linear, falcate, terete, smooth, 10-12.5 cm long, dehiscing along the ventral suture; Seeds, oblong with long coma (Jayaweera, 1981).

CENTRE OF ORIGIN AND DISTRIBUTION:-

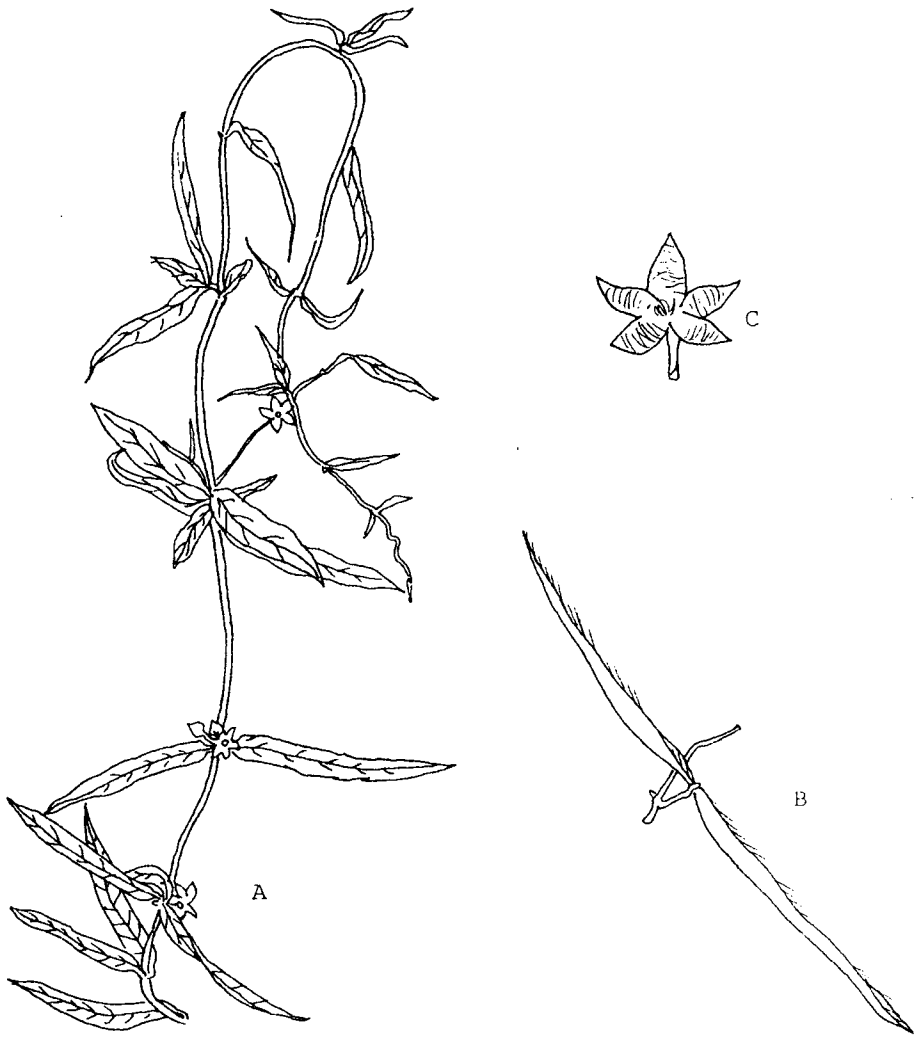
Grows in the northern parts of India extending eastwards as far as Bengal and Sikkim and south- wards to Travancore and Sri Lanka. In Sri Lanka it is very common in the low-country up to 800 m feet or higher,in grassy places (Jayaweera, 1981).

EDIBLE PARTS:-

The leaves.

FOOD USE:-

The infusion of tender leaves is drunk as a beverage, and leaves extracted are added for preparing porridge. It is used to prepare tonics and sherbets.



Hemidesmus indicus

(A) Branch with leaves and flowers. (B) Front view of flower. (C) Fruit of two divaricated carpels.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 92.1 g, Energy - 26 Kcal, Proteins -2 g, Fats -0.7 g, Carbohydrates -2.9 g, Calcium - 73 mg, Phosphorus - 21 mg, Fe - 10.9 mg, Carotene - 5.586 mcg, Thiamine - 30 mcg, Riboflavin - 260 mcg, Niacin - 0.5 mg, Vitamin C -28 mg (Perera et at., 1979).

The root of this plant contains a volatile oil and hemidesmine. The root is a substitute for sarsaparilla. It is used in treating loss of appetite, fever skin diseases, leucorrhoea and inflammation of urinary passages. The plant is used in the preparation of snake-bite cures.

FAMILY :- BASELLACEAE

BOTANICAL :- *Basella alba*

VERNACULAR NAMES:-

SINHALA	: *Niviti, Rat-nivithi*
TAMIL	: *Pasalai, Shivappluvaslakkira*,
ENGLISH	: Indian Spinach, Ceylon Spinach, Vine Spinach, Malbor Nightshade

DESCRIPTION:-

Perennial, straggling, succulent climber with very long, slender, glabrous, much branched succulent stems.

LEAVES:- Simple, alternate, 10-18 cm long 6.5-17 cm board, broadly ovate, sub-cordate or obtuse at base.

FLOWERS:- Regular, bisexual, few, sessile, about 4 mm long in short, lax pedunculate spikes. (Flowers September to December).

FRUITS:- A membranous, somewhat globose, about 5 mm long, embryo coiled in a flat spiral (Jayaweera, 1981).

DISTRIBUTION:-

Centre of origin is Tropical Asia (Tindall, 1993). Grows in India, Sri Lanka, Malaysia, Tropical Asia and Africa.

EDIBLE PARTS:-

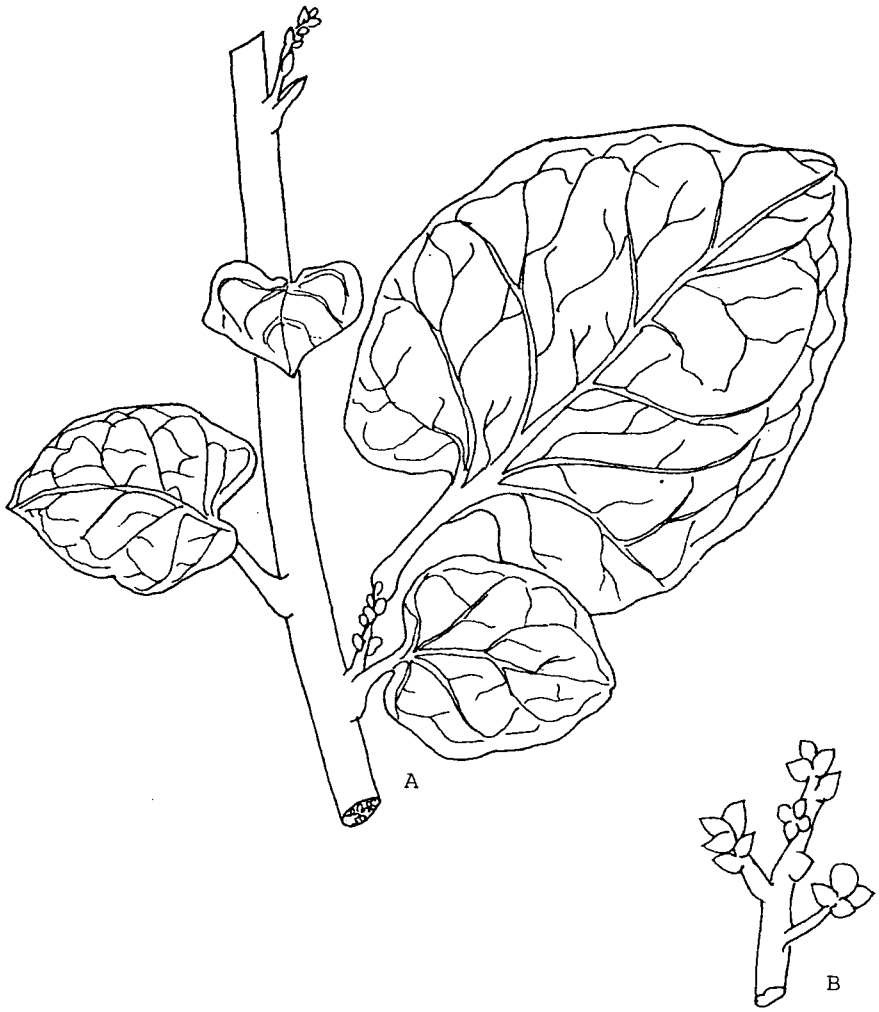
The whole plant

FOOD USE:-

The green leaves and unmatured stems are prepared as a vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 92.1 g, Energy - 26 kcal, Proteins - 2 g, Fats - 0.7 g, Carbohydrates -3.2 g, Minerals - Calcium - 73 mg, Phosphrus - 21 mg, Iron - 10.9 mg), Carotene - 5.58 mcg, Thiamine 30 mcg, Riboflavin - 260 mcg, Niacin - 0.5 mg, C-28 mg (Perera et al., 1979).



Basella alba

(A) Branch with leaves and spikes. (B) Young fruits.

The entire plant is an excellent source of calcium, iron and vitamins A1, A3, B, B3 and C. The leaves contain saponin. Medicinally, the roots are used as a poultice to reduce swellings. A decoction of the leaves is a good laxative for pregnant women and for children (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Most cultivars are tolerant to wide range of soil conditions and grows well in fertile soils with high contents of organic matters. Well adopted to high temparetures and high humidity. Grows well at altitutes below 500 m. Normally *Basella* is a short day plant. Flowering does not occur in daylength longer than 13 hours. Basella has a C_4 - cycle photosynthetic pathway.

CULTIVATION :-

Propagation is by seed, root or long tip cuttings. In Asia cuttings are favoured for growing, whereas seed is more commonly used in Africa. Plants grown from seed are more productive than those grown from cuttings. Seed rate/spacing - short-term crop 300 seeds/m x m in rows 10 cm apart, thinned to 100/m x m at 15 day cotyloid on stage.

Long-term crop 3-4 seeds/hole, shown directly into beds, in double lines either side of supports 1.2-1.5 m high, with 60 cm between plants in the row.

Irrigation - Watering should be liberal until seeds and cuttings are well established. There after only during dry periods.

Fertilizer - Grows without fertilizer, but production is greater when well supplied with organic manure.

Time to harvest - Short-term crop harvesting begins about 3 weeks after sowing. The tips are pinched out weekly for a period of about two months. Long-term crop-first leaf harvest in 5-6 weeks from seed, less for cutting. For transplanted seedlings, 55-70 days after transplanting, counting at regular intervals for upto 6 months.

Field - Commercially grown cultivers yeild 50 T/ha and more.

STORAGE:-

Leaves do not keep well. At 20-30^{0}c they will last for 1 day.

FAMILY :- BOMBACACEAE

BOTANICAL NAME :- *Durio zebethinus*

VERNACULAR NAMES:-

SINHALA : *Durian*
ENGLISH : Durian, Civit Fruit

DESCRIPTION:-

Durian is a tree reaching 40 cm high. The bark is grey, long itudinally furrowed and rough.

FLOWERS: They are golden yellow and arranged incymes. It flowers from June to September and bears ripe fruits from October to February.

FRUITS:- They are large 25-30 cm, spherical, ellipsoid or ovoid, densely convered with long or short and pointed or blunt spines. The ails which cover seeds are white, bright yellow or yellowish white. It tastes sweet of somewhat bitter sweet and is strongly odourous (Jensen, 1985).

DISTRIBUTION:-

It is native to Malaysia, now a days it is widely cultivated throughout Indonesia, Sri Lanka, India, Burama, Malaysia and Philippines (FAO, 1982).

EDIBLE PARTS:-

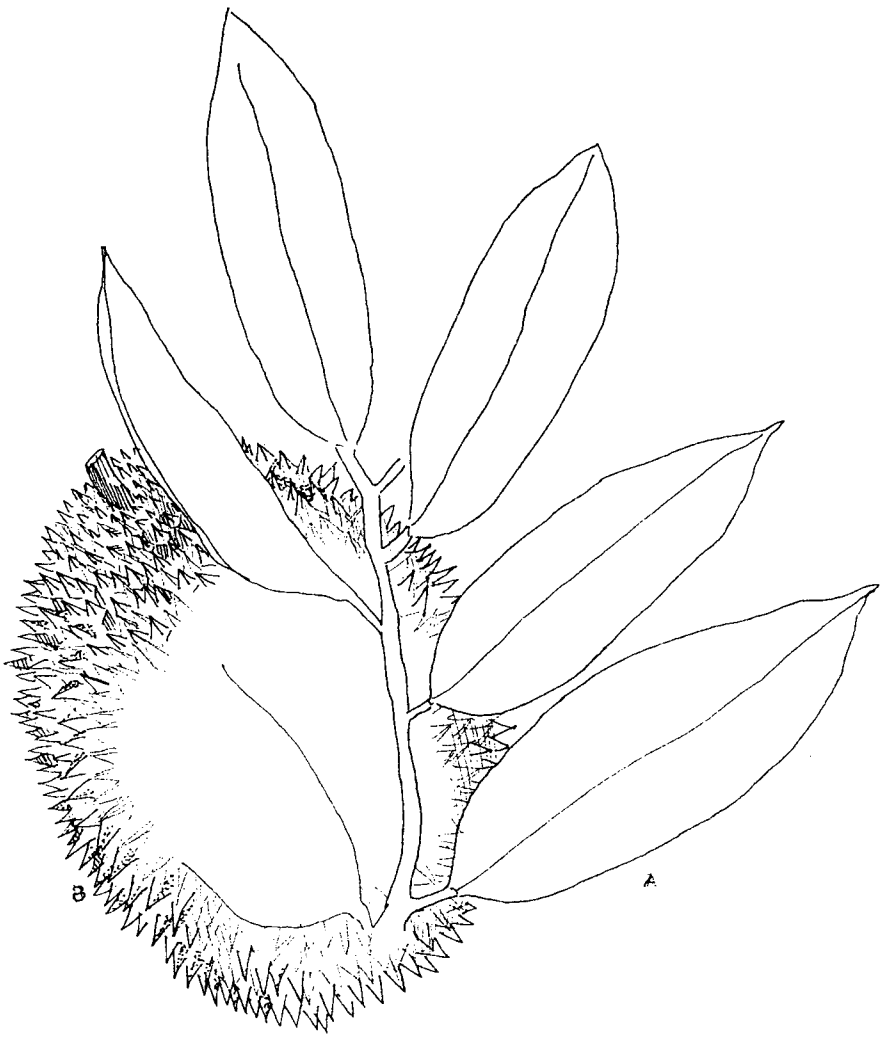
The fruit, seeds.

FOOD USE:-

The ails are usually eaten fresh. They are also sometimes made into a kind of dish prepared by first keeping them in brine, adding spices and then fermenting them. The fruits are also commonly used for flavoring ice-cream, candy and pastry. Nearly riped fruits may also be eaten as a vegetable. The seeds can be eaten after been boiled, or thinly sliced and fried.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 58.0 g, Energy - 183 kcal, Protein - 2.8 g, Fat - 3.9 g, Carbohydrates - 34.18 g, Calcium - 20 mg, Phosphrus - 50 mg, Iron - 1.0 mg, Carotene - 12 mcg. (Perera et. al., 1979).



Durio zebethinus

(A) Branch. (B) Fruit.

Leaves are utilized in medicinal baths for jaundice. Leaves and roots are used in a compound for fevers. The fruit has depurative and vermifuge properties, and is also considered tonic. Fruit walls are used externally for skin complaints (De Pauda et al., 1987).

ENVIRONMENTAL RESPONSE:-

Deep silt or clay loam soil with high organic matter is suitable for durian. Soil should also have a high content of sulpher. Temparatures below 8^0C are harmful for durian.

CULTIVATION:-

Grows well mid-country and upcountry areas. Generally propagated by seeds. Plants raised from seeds will produce fruits with different taste from those of the parent plants. Propargation of desirable plants can be better effected by bud-grafting. Properly cultivated plants will fruit after 7-8 years.

FAMILY :- BROMELIACEAE

BOTANICAL NAME :- *Ananas comosus*

Syn : A.Sativa, Bromalia comosus

VERNACULAR NAMES:-

SINHALA	: *Annasi*
TAMIL	: *Annasi*
ENGLISH	: Pineapple

DESCRIPTION:-

A terrestrial herb with rosettes of long and strong, spiny-serrate, linear-lanceolate.

LEAVES :- 1-1.5 m long, 5-7 cm broad, acuminate, green and shining on the upper surface, paler, beneath, stem erect, central, bearing at it is apex a simple, dense, cone-like spike.

FLOWERS:- Sessile, bisexual, (sterile in cultivated forms)

FRUITS:- A syncarplium formed by the coalescence of thickened rachis, spiny-toothed bracts, abortive ovaries and adhering parts into one large globose or elongated fleshy fruit called the "pineapple" (Purseglove, 1972).

DISTRIBUTION:-

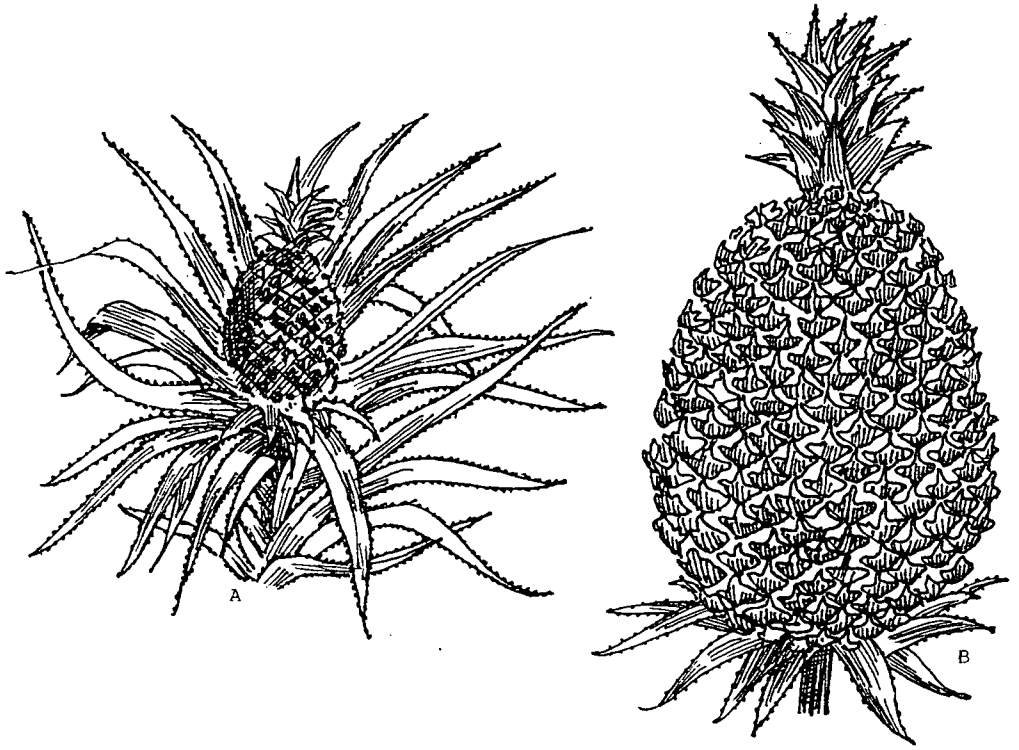
A native of Tropical America (Purseglove, 1972; Bose and Mitra, 1985; Querol, 1992). It was introdcued to Asia in the 16th century and now cultivated for it is fruit in all tropical countries. It is one of widely cultivited fruits in Sri Lanka (Department of Agriculture, 1993).

EDIBLE PARTS:-

The fruit

FOOD USE:-

Tender portion of the riped fruits is eaten in fresh and can be used for preparing salads, jams, pickles and beverages. Unriped fruits are eaten as a vegetable.



Ananas Comosus

(A) Plant. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 87.8 g, Energy - 46 kcal, Proteins - 0.4 g, Fats - 0.1 g, Carbohydrates - 10.8 g, Calcium - 20 mg, Phosphrus - 9 mg, Iron - 1.2 mg, Carotene - 18 mcg, Thiamine - 200 mcg, Riboflavin - 120 mcg, Niacin - 0.1 mg, Vitamin C - 39 mg (Perera et. al., 1979).

The flesh of the pineapple contains the sugars sccharose, glucose, fructose and mannite, citric acid traces of vanillin and the enzyme, bromelin, which has the same properties as trypsin. The fruit is also a good source of vitamins A.B, C and Calcium and Iron. The fruit as well as the juice of the leaves are a powerful anthelmintic and vermicide. The immature pineapple contains a poisonous substance which brings about violent purging and hence the juice is given as a vermifuge to children and as an abortifacient to woman (Department of Agriculture, 1993). Leaf juice is regarded as anthelmintic, purgative, and anti-inflammatory. The unripe fruit is considered to be diuretic, anthelmintic, expectorant and abortifacient, and is also credited with emmenagogue properties. bruised plant is applied to burns, itches and boils (De Pauda et al., 1987).

OTHER USES:-

Fresh pineapple flesh and juice contain a protein-digesting protein. *Annasi* leaves are used for ola leaf seasoning. A variegated form with green yellow and pink stripes, is grown as an exotic plant. In Southern Asia the young immature fruits are used as an abortifacient.

ENVIRONMENTAL RESPONSE:-

Sandy loams or laterite soils are more suitable for pineapple. Best pH range would be 5.5-6.0. Temparature of 24-32^{0}C is suitable. Rainfall of 1500 - 3000 mm is required. Grows in elevations up to 1500 m.

CULTIVATION :-

Areas for cultivation - Colombo and Kurunegala Districts and parts of the Puttalam and Badulla Districts around Hali-Ela, and Deegala.

Land preparation - Land has to be ploughed and harrowed, trenches are dug across the countour 2.0 cm wide and 2.0 cm deep. The dug out earth is placed on the lower side of each trench to form a small bund.

Planting material - Ratoons, suckers, slips, crowns.

Planting space - Suckers, crowns or shoots are placed in these trenches 35-40 inches apart with the tops leaning towards the bund. A little soil is scooped from the upper side of the tree and used to cover the suckers to a depth of 7.5 cm. The rest of the trench is allowed to fill in naturally with soil which is usually washed in during the rains.

Fertilizer - it must be heavily fertilized, starting at two months after planting and every four months thereafter.

Time to harvest - It depends on the planting material used. For prolonged storage it is advisable to harvest at the stage when 25-50% area of skin becomes yellowist. The natural fruiting season for pineapple in the low-country wet zone is from May to July and again in November to January.

STORAGE :-

Ripe fruits deteriorate soon and must be eaten 4-5 days. If harvested before full ripening, it is sucessfully stored for two weeks.

FAMILY:- CARICACEAE

BOTANICAL NAME:- ***Carica papaya***

VERNACULAR NAMES:-

SINHALA	:	*Gas-labu, Pepol*
TAMIL	:	*Pappali*
ENGLISH	:	Papeta, Papaya, Papaw.

DESCRIPTION:-

An erect tree, 6.9 m tall, with an unbranched, hollow, soft trunk, 10-60 cm diameter, marked with the scars of fallen leaves.

LEAVES:- Alternate, spreading together forming a terminal crown, petiolate, subpeltately palmate, lamina 30-44 cm long, deeply cut into 5-7 segments more or less lobed, petiole 58-83 cm long, hollow, shorter in the younger leaves, trunk and leaves contain a milky juice.

FLOWERS:- Regular, dioecious or polygamous, white, yellow or greenish, unisexual or a few in the inflorescence bisexual, male and polygamous inflorescences pendulous with long peduncles, female very short, male flowers 2-3.5 cm long.

FRUITS:- Large shortly stalked, ovoid, roundish, pear-shaped or ellipsoidal, 20-35 cm long, 10-15 cm diameter, pendulous (Jayaweera, 1980).

DISTRIBUTION:-

Indigenous to Tropical America and West Indies but cultivated throughout the Tropics (Purseglove, 1968; Querol, 1992). It was introduced to Sri Lanka in the second half of the 19th century. It is a common fruit tree planted in almost all village gardens in the midland low-country in Sri Lanka.

EDIBLE PARTS:-

The fruits.

FOOD USE:-

The riped fresh fruits are eaten throughout the Tropics. They are used to produce soft drinks, jams, icecreams and fruit salads. Flavoured and crystallized fruits are caned in a syrup. Unriped fruits are cooked and eaten and also used in making pickles and in meat tendering preparation.

Carica papaya

(A) Plant. (B) Leave. (C) Fruit. (D) Seed. (E) Female flower. (F) Male flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Ripe)
Moisture - 90.8g, Energy - 32 Kcal, Proteins - 0.6 g, Fats - 0.1 g, Carbohydrates - 7.2 g, Calcium - 17 mg, Phosphorus - 13 mg, Iron - 0.5 mg, Carotene - 666 mcg, Thiamine - 40 mcg, Riboflavin - 250 mcg, Niacin - 0.2 mg, Vitamin C - 57 mg.

(Unriped)
Moisture - 90.8 g, Energy - 32 kcal, Protein - 0.6 g, Fats - 0.1 g, Carbohydrate - 7.2 g, Calcium - 17 mg, Phosphorus - 13 mg, Iron - 0.5 mg), Carotene - 666 mcg, Thiamine - 40 mcg, Riboflavin - 250 mcg, Niacin - 0.2 mg, Vitamin C 51. (Perera, et al., 1979).

Matured fruits contain a digestive enzyme papain. It is styptic, vermifuge, anthelmintic and sometimes used to cause abortion. The Caribbeans used the riped fruit as a cosmetic. There remarkable complexion of those people is attributed to the use of the pulp of the riped fruit as a skin soap. It also removes freckles. The seed is used as condiment,carminative, emmenagogue, counter-irritant and as an abortifacient. In the Philippines, the bruised papaya leaves are used for rheumatism and roots are used for yaws and piles. A decoction of the leaves is given for asthma. In East Africa, the root is used as an anthelmintic and as a remedy for syphilis and gonorrhoea. In Java, leaves, roots and barks are given for beriberi, kidney and venereal diseases respectively (Jayaweera, 1980).

OTHER USES :-

Both leaves and immature fruits are used in seasoning of ola leaves. Immature fruits are tapped for latex which is used in preparing papain.

ENVIRONMENTAL RESPONSE:-

Grown well in neutral, sandy or loam soils. Atmospheric temperature of 25-30^0 C is suitalbe for papaya. A well distributed rainfall of 1000-1500 mm is required. Grows at altitues below 2000 m.

CULTIVATION:-

Generally propagated by seed from fully riped fruits. Seeds may be sown directly at final site, as 6-10 seeds are sown at each plant position and later thinned. Usually seedlings are prepared in the nursery and then transplanted. After one week, the germinated seedlings are transferred into polythene bags. Three to four weeks later, when the seedlings are 15-20 cm high, they can be moved to the field. The planting holes should be 0.5 x 0.5 m and enriched with well-rotted manure. Three seedlings should be planted per hole, 25 cm apart. Male plants, which normally produce

flowers within 3 months, can then be removed to leave a high proportion of female plants.

Spacing- 2.5-3.5 m apart. In direct planting, a seed rate of about 10,000/ha is required.

Irrigation- Necessary in the dry season in most areas.

Fertilizer- Inorganic and organic.

Time to harvest- Flowering occurs in 6 months, and fruits begin to ripe after 9 months.

Harvest season-Fruits are produced throughout the year.

Harvesting- Fruits are picked when they are half ripe. Once picked, fruits ripe rapidly within 1-3 days and should be transported to the market before they become soft.

STORAGE:-

Fruits once picked, can be kept for 6-10 days under normal conditions. Unriped fruits may be pickled.

FAMILY:- CLUSIACEAE

BOTANICAL NAME:- ***Garcinia cambogia***

Syn :- Mangostana cambodia

VERNACULAR NAMES:-

SINHALA	:	*Rata goraka, Goraka, Kana Goraka*
TAMIL	:	*Goraka*
ENGLISH	:	Goraka

DESCRIPTION:-

Tree up to 15 m high, usually much smaller with a dense, pyramidal crown. Branches patent (upper once erect-patent), the ends sometimes dropping. Wood yellowish brown, rather hard, moderately heavy.

LEAVES:- All parts glabrous. Bark blackish or dark grey, peeling off in small pieces. Live bark white with white sticky, thick lates, turning yellowish after exposure,leaves coriaceous, linear-oblong to - lanceolate (rarely ovate) 4x12 - 10x35 cm apex somewhat rounded and tip sharply apiculatel, base rounded to acute midrib hardly prominent above, prominent on lower surface, laterals conspicuous both sides, 15-20 pairs, irregular, erect-patent slightly curved towards margin, in between somewhat shorter laterals, reticulation lax, obscure. pedicels 1.5-2.5 cm long with a large of ovale with high margins.

FLOWERS:- Flowers axillary, polygamously dioecious. Male flowers with 5 (rarely 4) greenish white, suborbiculas concave sepals, margin fimbriate, the two outer ones 4-6 mm, inner ones thinner up to 7 mm long. Petals 5, orbiculares, shortly clawed, thin, white. Somewhat climate, veined, upto 9 mm long. Female flower larger than male, 1-3 from axils of terminal pair of leaves, sepals and petals as in the male; stamens 10-20 in rayed.

FRUITS:- Sub-globose, pointed (obligue), dark yellow up to 9 cm diam. The point 2-3 mm, bearing the stigma with long branches, pericarp with plenty of dark yellow, sticky, thick later, endocarp forming a sweet to sweet-acid, pleasant juicy arilloce; seeds oblong brown testa veined (Jayaweera, 1980).

DISTRIBUTION:-

Occurs in the Western India (Jayaweera, 1980). It is common in Sri Lanka in the moist low country upto 500 m altitude.

Garcinia cambogia

(A) Branch with leaves and flowers. (B) Fruit.

EDIBLE PARTS:-

The fruits.

FOOD USE:-

Dried rind of fruit is used for preservation purposes. It is also used to flavour curries instead of tamarind in Sri Lanka. Further it is used in vinegar preparation. Inner portion is sweet and acidic which can be eaten as Mangosteen.

NUTRITIONAL AND THERAPEUTIC VALUE:-

A decoction of the dried fruit is used as a medicine for bilious conditions. The gum of the bark is an inferior kind of gamboge. (Jayaweera, 1980).

OTHER USES:-

Seedling of one year are good for grafting in Mangosteen.

STORAGE:-

Sun-dried rinds can be stored for a long time in dry and cool places.

FAMILY:- CLUSIACEAE

BOTANICAL NAME:- ***Garcinia mangostana***

VERNACULAR NAMES:-

SINHALA	:	*Mangus, Mangosteen*
TAMIL	:	*Sulambali, Mangus-kai*
ENGLISH	:	Mangosteen

DESCRIPTION:-

A slow-growing compact tree, 6-9 m tall with a smooth bark but a yellow latex;

LEAVES:- Simple,opposite, 15-25 cm long, 6.3 -10.5 cm broad, elliptic-oblong, acute, base cuneate, thickly corioaceous, deep, shining green with numerous nerves curving and fusing with a double, extra marginal nerve; Petioles 20-25 mm long ;

FLOWERS:- Axillary or terminal, solitary, paired or fascicled; Staminate flowers not seen and probably male flower is extinct; Female flowers solitary or paired, 5 cm diameter, terminal on stout pedicels 1.3 cm long, yellowish;

FRUITS:- Globular, 7.5 cm across, reddish purple, the large leathery sepals persistent,rind thick and tough enclosing 5-7 white segments, seeds 6-8 formed apomictically enclosed in a white juicy ail.

DISTRIBUTION:-

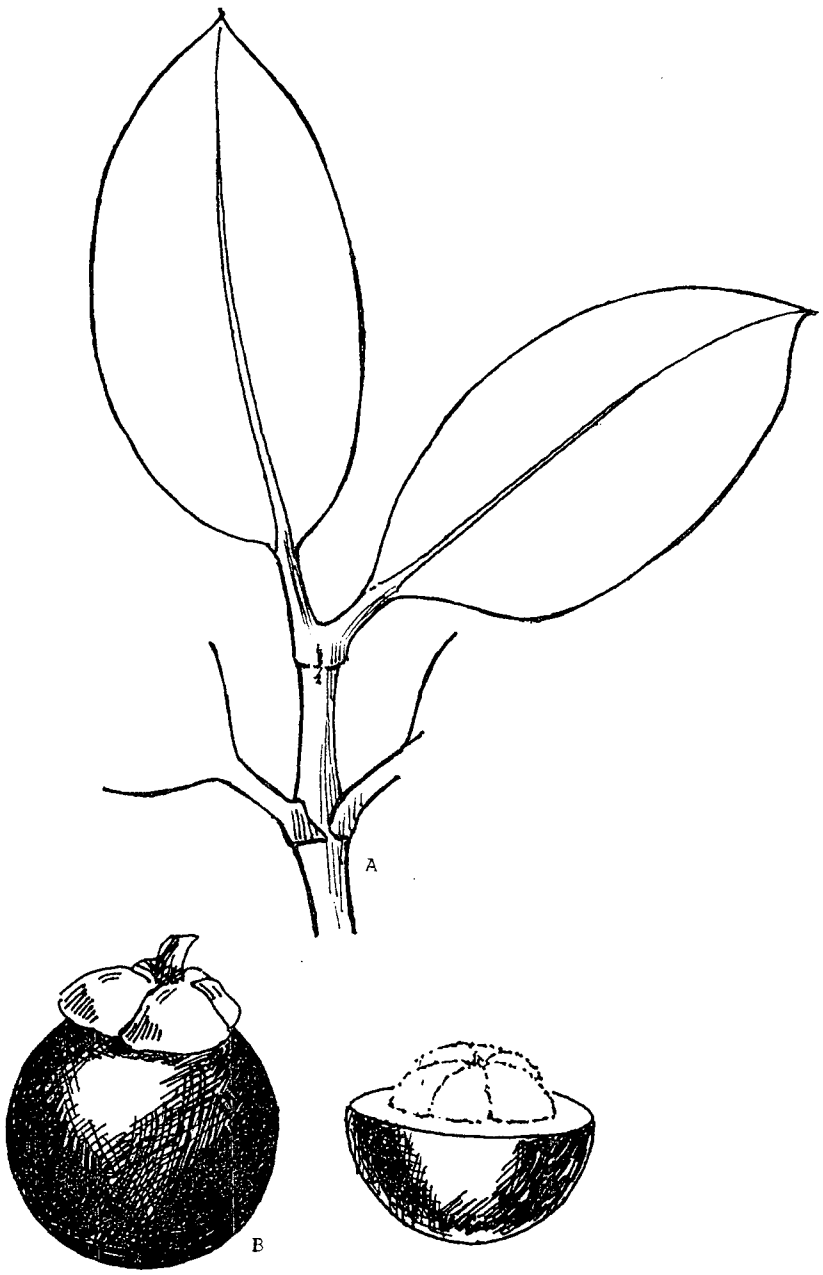
Indigenous to Malaysia (Purseglove, 1968; Bose and Mitra, 1990; Querol, 1992 and cultivated in the west coast of the India and Sri Lanka. It is a common fruit tree in most of the village gardens in Sri Lanka, both in mid and wet low-country (Department of Agriculture, 1993). Introduced to Sri Lanka in 19th century (Dassanayake and Fosberg, 1980).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

The tender portion is eaten and considered as a one of most delicious fruits.



Garcinia mangostana

(A) Branch (B) Fruit

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 84.9 g, Energy - 60 Kcal, Proteins - 0.5 g, Fats - 0.1 g, Carbohydrates - 14.3 g, Minerals - Calcium - 10 mg, Phosphorus - 20 mg, Iron - 0,2 mg (Perera et al., 1979).

The rind of the fruit contains tannin, a resin and a bitter principle called mangostin (Department of Agriculture, 1993). The edible oil contains saccharose, dextrose, and kerrelose. The rind of the fruit which contains resin is used in diarrhoea and dysentery. The bark and young leaves are also used for the same purpose and for ailments of the genitourinary tracts and as a wash for aphthae of the mouth. A decoction of the roots is drunk for dysmenorrhoea. In Cambodia the bark and the rind of the fruit are used for diarrhoea and dysentery as astringents. (Jayaweera, 1980).

ENVIRONMENTAL RESPONSES:-

Well drained 1-15 m deep soils are ideal. Well distributed rainfall of 1500-2000 mm is required for mangosteen. Optimal range of tempartature in 27 - 32^{0}C. High relative humidity of 75-80% is important for normal growth.

CULTIVATION:-

Areas for cultivation:- Wet zone lowlands of Sri Lanka, specially Kalutara, Colombo, Galle, Gampaha, Ratnapura and some areas of Kandy districts.

Mangosteen is propagated by seeds. Since seeds have short and low viability they must be planted within few days after removal from the fruit . In a nursery: At the age of 4-6 months plants are transfered to a secondary nursary. Plants are transplanted in the field at the age of two years about six metres apart. Plants bear fruits when they are 10-15 years old. The average yeild is around 200-500 fruits per tree but in some occasions it may go up to 1000-1500 fruits per plant.

STORAGE:-

It is possible to store up to two weeks in thin layers in room temperature.

FAMILY:- CLUSIACEAE

BOTANICAL NAME:- ***Garcinia terpnophylla***

VERNACULAR NAMES:-

SINHALA - *Koketiya, Gokatu*
ENGLISH - Indian Gamboge

DESCRIPTION:-

A moderately tall handsome tree with drooping branches. Bark pale, grayish or yellowish-gray, rather thing, smooth, affording a turgid, yellowish-green resin in small quantity.

LEAVES :- Very variable in size and shape, opposite, about 3-8 inches long, oval or narrowly oval, or lanceolate, much tapered at base abruptly, or gradually acute at open, or acuminate. Stiff, dark above, much paler below, a entire. Petiole, thick, short, 1/2 inch or less. Midrib distinct, prominent. Lateral veins parallel. An inter-marginal veins run between the arching ends of the lateral veins and the leaf margin is conspicuous. When very young, the leaves are tinged with pink.

FLOWERS:- Scented, pale yellow in axillary clusters make flowers have sepals and petals, the latter much longer than the former, stamens in spreading bundles. Female flowers larger than male flowers. Stigma irregularly lobed.

FRUITS:- About 1 inch, ovoid, smooth, pointed.

WOOD:- The outer sap-wood very pale-yellowish or grayish white, soft. Hent-wood yellowish brown. Becoming a rich mahogany brown with age; smooth, close-grained and intensively hard. With water - seasoning, the wood is much improved in general, but owing to its extreme hardness it is not a favourite in general, but owing to its extreme hardness it is not a favourite with sawyers (Dassanayake and Fosberg, 1980).

DISTRIBUTION:-

This endemic tree is irregularly distributed in Sri Lanka (Bandaranaike and Sultanbawa, 1991). It is mainly confined to the wet forests from 300 to 1200 m altitude, but is nowhere very abundant, it is occasionally sub-gregarious (Dassanayake and Fosberg, 1980).

Garcinia terpnophylla

(A) Branch (B) Fruit.

EDIBLE PARTS:-

Inner segments and seeds.

FOOD USE:-

Inner segments are eaten as mangosteen. Oil extracted from seeds called "Kokum butter" is edible.

NUTRITIONAL ANMD THERAPEUTIC VALUE:-

Oil is used for preparation of remedy for piles. Oil is also applied to burns, itchas and boils (Dassanayake and Fosberg, 1980).

OTHER USES:-

Since the use of timber is very popular in Sri Lanka, it is widely used in many occasions.

FAMILY:- CONVOLVULACEAE

BOTANICAL NAME:- ***Ipomoea aquatica***

Syn :- I. reptans, I. repens

VERNACULAR NAMES:-

SINHALA	:	*Kankun*
TAMIL	:	*Koilangu, Sarkareivalli, Kankun*
ENGLISH	:	Kang kong, Swamp cabbage, Water convolvulas, Water Spinach.

DESCRIPTION:-

Annual or biennial herb with long prostrate stems rooting at nodes, thick, hollow, glabrous, internodes 7-14 cm long.

LEAVES:- Simple, alternate without stipules, 5-12 cm long, 4.5-7 cm broad, ovate-oblong, the base usually dilated and hastate with rounded or acute lobes, glabrous, petioles as long as or longer than leaves.

FLOWERS:- Regular,bisexual, rather large, dull purple on long glabrous pedicels, usually solitary, often 2, peduncle much shorter than the petiole. (period-August to November) (Jayaweera, 1980).

DISTRIBUTION:-

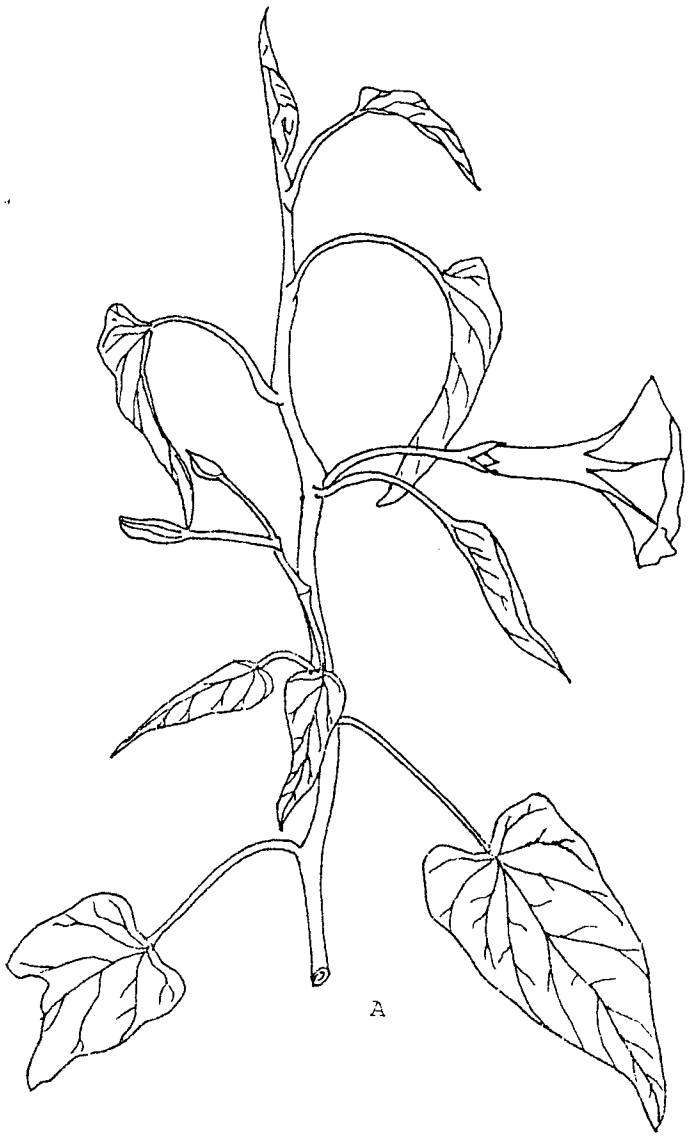
Grows in damp places throughout India, Sri Lanka, Burma and Philippines. Often cultivated as a pot herb. It also grows in Africa and Australia. In Sri Lanka it is common in shallow water and moist places in dry regions. There are two forms in cultivation - 1, semi aquatic form, *I.aquatic* a var, *aquatica*, ii. land form. *i. aquatica* var.*raptans* (Rice et al., 1993; Tindall, 1993).

EDIBLE PARTS:-

The leaves and part of the prostrate stem.

FOOD USE:-

The leaves and the parts of the prostrate stems are used as a cooked vegetable.



Ipomoea aquatica

(A) A branch with a flower and leaves.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 90.3 g, Energy -28 kcal, Proteins -2.9 g, Fats -0.4 g, Carbohydrates -3.1 g, Minerals - Calcium - 110 mg, Phosphorus - 46 mg, Iron - 3.9 mg - Carotene 1.98 mcg, Thiamine 50 mcg, Riboflavin 130 mcg, Niacin - 0.6 mg, Vitamin C-137 mg (Perera et. al., 1979).

It is an excellent source of Iron, Calcium, Vitamins B and C. The plant is mildly laxative and owing to the presence of insulin-like principle, it is used against diabetes mellitus. The bud is applied on ringworm (Jayaweera, 1985; Pauda et al., 1987).

OTHER USES:-

The wine is used as fodder for cattle and pigs.

ENVIRONMENTAL RESPONSE:-

Adopted to a wide range of soil conditions but clay soils with high temparatures are more suitable. Requires high moisture content of the soil. Normally grows in lowlands and short day lengths.

CULTIVATION:-

Areas for cultivation - Wet zone and moist places closer to irrigated tanks in the dry zone; the semi-aquatic form is after grown in places which are subjected to flooding.

Planting season - Almost throughout the year.

Land preparation - Land has to be worked to a fine condition and make seed beds.

Planting material - Stem cuttings.

Planting and space - Stem cuttings are planted in rows. Distance between two plants is around 40-45 cm.

Irrigation - Proper irrigation during day periods increases the yield of land form.

Fertilizer - Organic manure will increase the harvest

Time to harvest - The first harvest is 50 days after planting. Then harvesting can be done through the year if irrigation is available.

Harvest - Cut back to the two leaves above the bottom.

Yield - 4-6 ha given by semi-aquatic forms, the land form gives approximately 50% less.

STORAGE:-

Harvest is kept for 1-2 days under normal conditions.

FAMILY:- CONVOLVULACEAE

BOTANICAL NAME:- ***Ipomoea batatas***

Syn :- Batatas edulis

VERNACULAR NAMES:-

SINHALA	:	*Bathala*
TAMIL	:	*Wattalakklangu*
ENGLISH	:	Sweet potato

DESCRIPTION:-

Perennial plant grown as an annual under cultivation. The vines are either green or red or purple in colour and about 4-16 feet long. The vines may be hairy, especially at the nodes. The roots vary according to the colour of the outter skin, as well as the colour of the inner flesh, depending on the varieties.

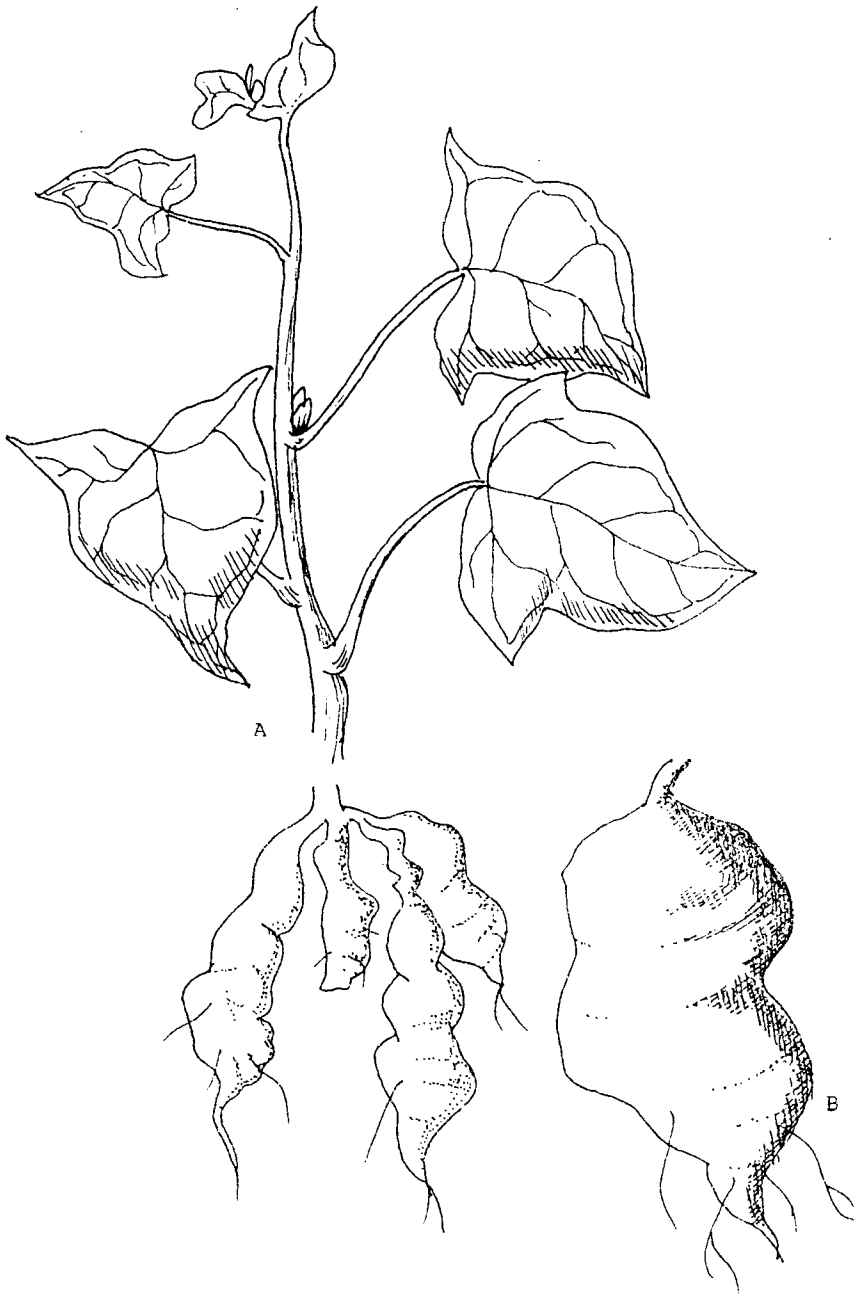
LEAVES:- They are heart shaped, with the margins either toothed or entirly or deeply lobed. In some varieties the leaves may be tinged with a slight purple.

FLOWERS:- They are funnel shaped, and either bluish or purple (Dassanayake and Fosberg, 1980).

DISTRIBUTION:-

Sweet potato is endemic to Central America (Querol, 1992; Tindall 1993) from where the Dutch brought it to Sri Lanka in the 17th century. Sweet potatoes can be grown from sea level up to an elevation of about 1,000 m. It is well adoptable to high rainfall areas.

When we talk about the origin or this plant, there is a famous folktale a Sinhala. Once upon a time, a mother visited her son's residence where he lives with his wife. When the mother visited her son, her daughter-in-law did not feed her and the mother was ill-treated by her daughter-in-law. Having felt himilated, mother went back to her home. As soon as mother-in-law disappeared from daughter-in-law's vicinity, she went to the kitchen to eat her lunch. To her dismay and surprise, she found blood in the container in which she had cooked rice. It is widely believed that the rice became blood due to her mother-in-low's carse. The daughter-in-law then threw the rice because of the blood outside. After some time, she was wonder-stricken to see a plant growth in the place where she threw the rice. The plant has swallowed roots which was found to be an edible food. Since then it was widely believed that the origin of this plant is rice and blood, it was named as "Bathala" in



Ipomoea batatas

(A) Plant (B) Tuber.

Sinhala where "Batha" and "Lay" stand for rice and blood respectively. *Bathalay* then customarily came to be pronounced as *Bathala* in recent times.

EDIBLE PARTS:-

The roots and tender leaves.

FOOD USE:-

Roots are boiled or baked or roasted and eaten. They can be used in preparing curries and pastries. Dried chips of sweet potato are fried and eaten as a snack. Tofees are also made from roots. Tender leaves and stem are eaten as green vegetables.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Roots)
Moisture - 68.5 g, Energy -120 Kcal, Proteins -1.2 g, Fats -0.3 g, Carbohydrates -28.2 g, - Calcium - 46 mg, Phosphorus - 50 mg, Iron - 0.8 mg, Carotene - 6 mcg, Thiamine -80 mcg, Riboflavin -40 mcg, Niacin -1.2 mg, Vitamin C -1 mg.

(Greens)
Moisture 80.79, Energy- 63 kcl, Protein - 4.2, Fat - 0.8, Carbohydrates - 9.7, - Calcium - 360 mg, Phosphorus - 60 mg, Iron - 10 mg, Carotene - 750 mcg, Thiamine - 70, Riboflavin - 240 mcg, Niacin - 1.7 mg, Vitamin C - 27 mg (Perera et al., 1979).

Sweet potato tops, particularly the purplish ones, are used for diabetes. Leaves are applied for boils, carbuncles and pimples. Boiled sweet potato is good for diarrhea (De Pauda and Pancho, 1989).

Medicinally, paste of roots or leaves is applied to scorpion-bite with benefit.

OTHER USES:-

Tubers are used as a source of starch, glucose, and alcohol. Leaves are fed to livestock.

ENVIRONMENTAL RESPONSE:-

Well drained soil is required. Optimal temperature is 24-25^{0}C and the rainfall should be in the range of 750-1250 mm. Daylength does not affect the yeild.

CULTIVATION:-

Areas for cultivation - Sweet potatoes can be cultivated successfully in the low-country and mid country wet zone in Sri lanka.

Planting season - Can be grown during the *Maha* and the *Yala* seasons. Planting is usually commenced with the early rains.

Land preparation - It involves ploughing and dishing the soil to break down the clods and remove all trash and stubble. The land is then ridged with a ridger.

Planting material - It consists of stem cuttings, about 15 - 25 inches long. Cuttings maybe taken when the vines begin to run from a newly established field or at harvest time.

Spacing - The cuttings are planted in such away as to bury about 2-3 nodes. The planting is done about 45 cm apart on the ridge.

Irrigation - Irrigation is required during drought seasons.

Fertilizer - Application of fertilizer will increase the yield of tubers. Application of NPK is generally recommended

Time to harvest - depending on the variety, the crop can be harvested between 3 5-5 months from planting.

Harvesting - It involves lifting of the tubers, which is usually done manually with the mamoty.

Yeild - One plant may produce 40-50 tubers, weighing from 100 g to 1.0 kg. A yeild of 08 - 10 t/ha to normally obtained.

STORAGE:-

The harvested tubers should be stored in a cool and dry place with good ventilation.

FAMILY:- CONVOLVULACEAE

BOTANICAL NAME:- ***Ipomoea obscura***

VERNACULAR NAMES:-

SINHALA : *Tel kola*
TAMIL : *Chirudali, Kuruguttali*

DESCRIPTION:-

Vines, the stem slender, twining or less commonly glabrescent, perennial.

LEAVES:- Ovate to cordate, 2.7-9 cm long, cordate baselly, acute, acuminate or apiculate apically, pubescent or glabrescent on both surfaces.

FLOWERS:- Inflorescence 1 or less commonly several flowers, the peduncles 3.5 -4 cm long. Corolla yellow, orange, green or white, usually with a white limb and yellowish.

FRUITS:- Capsular, globose, glabrous 8-12 mm long. Seed ovoid 1 black appressed pubescent or velvety, 5-5.5 mm long (Jayaweera, 1980).

DISTRIBUTION:-

Found in Tropical Africa, throughout Tropical Asia including Queensland and Fiji, China, Taiwan and Polynesia (Dassanayake and Fosberg, 1980).

EDIBLE PARTS:-

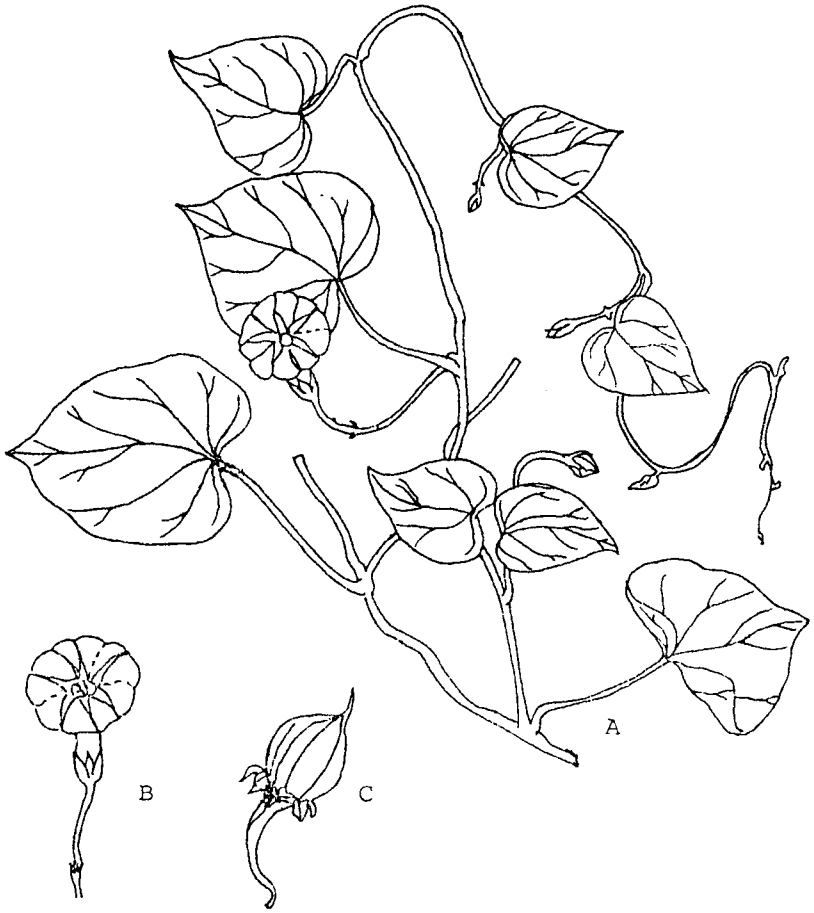
Leaves

FOOD USE:-

Leaves are eaten as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The leaves are used as an application on aphthous affections. The latex is used for treatment of gangrenous sores and for the preparation of medicinal oils used for some purposes. Internally, they act as a cardiac, stomachic, expectorant and diuretic and are useful for chronic dyspepsia, bronchitis and revel and hepatic dropsy (Jayaweera, 1980; Department of Aurveda, 1985).



Ipomoea obscura

(A) Branch with leaves and flower. (B) Side view of flower. (C) Fruit capsule.

FAMILY:- CRUCIFERAE

BOTANICAL NAME:- ***Brassica alba***

NAMES IN OTHER LANGUAGES:-

SINHALA	:	*Ela-aba*
TAMIL	:	*Kagudu, Venkaduku*
ENGLISH	:	White Mustard.

DESCRIPTION:-

An erect, annual herb, about 60 cm high with a few ascending branches, stiff, bright green, bristly with reflexed hairs throughout.

LEAVES:- Simple, alternate, petioled, pinnatifid, rough with hairs.

FLOWERS:- Regular, bisexual, yellow in corymbose racemes, pedicels longer then the calyx, ebracteate. Seeds- Sub-lobular, 2.5 mm diameter, pale yellow, testa smooth (Jayaweera, 1980).

DISTRIBUTION:-

Grows in east Syria and throughout southern Europe. It is a frequent weed in cultivated ground in England, Minor Asia, Algeria and China (Jayaweera, 1980).

EDIBLE PARTS:-

Seeds, young leaves.

FOOD USE:-

Used as an ingredient for many varieties of curries and pickles. Seed oil is edible and used for verious preperations. Young leaves are eaten as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The seeds on grinding, yield a fixed oil and myrosin. They also contain a crystalline principle called sinalbin. Mustard is a powerful stimulant and a valuable rubefacient. It is used as an emetic in narcotic poisoning and diuretic for dropsy. As a poultice, it is applied on the chest for bronchitis pleurisy and for alleviation of neuralgic pains. The powdered seeds are added to warm water and used to bathe the feet in cases of high fever (Jayaweera, 1980).

Brassica alba

(A) Plant (B) Fruit (C) Longitudinal section of fruit.

ENVIRONMENTAL RESPONSE:-

Mustard is adopted to widely different climatic conditions. Requires low or moderate rainfall. Grown in all classes of soils except very heavy clays.

CULTIVATION:-

Areas of cultivation - Dry zone of Sri Lanka.

Planting season - *Maha* season.

Planting material - Seeds

Planting and spacing - normally cultiated in chenas as mixed crop with finger millet. When grown as a pure crop, seeds may be drilled in row, 20 cm apart.

Harvesting - Harvest can be obtained after 90-100 days.

Yeilds - Pure crop will give about 200-250 kg to 400-500 kg/ha.

STORAGE :-

Seeds can be stored for a long time in dry containers.

FAMILY:- CRUCIFERAE

BOTANICAL NAME:- ***Brassica integrifolia***

VERNACULAR NAMES:-

SINHALA	:	*Aba*
TAMIL	:	*Kadugu*
ENGLISH	:	Indian Mustard

DESCRIPTION:-

Erect annual herb with a stem 0.4-1.0 m high, glabrous or with a few bristles at the base, much branched, often purplish up to the pedicels.

LEAVES:- Large, pinnatifid without basal lobes,terminal lobe much the largest basal leaves long, persistent, 5-10 cm long, broadly obovate.

FLOWERS:- Regular, bisexual, yellow, 6-8 mm long, in long rasemes. Seeds-beak narrowly conical, seedless nearly 1.2 cm long, 1-1.3 mm diameter (Jayaweera, 1980)

DISTRIBUTION:-

It grows from Egypt to China and is often cultivated in India. In Sri Lanka, it grows as a weed in vegetable plantations (Jayaweera, 1980).

EDIBLE PARTS:-

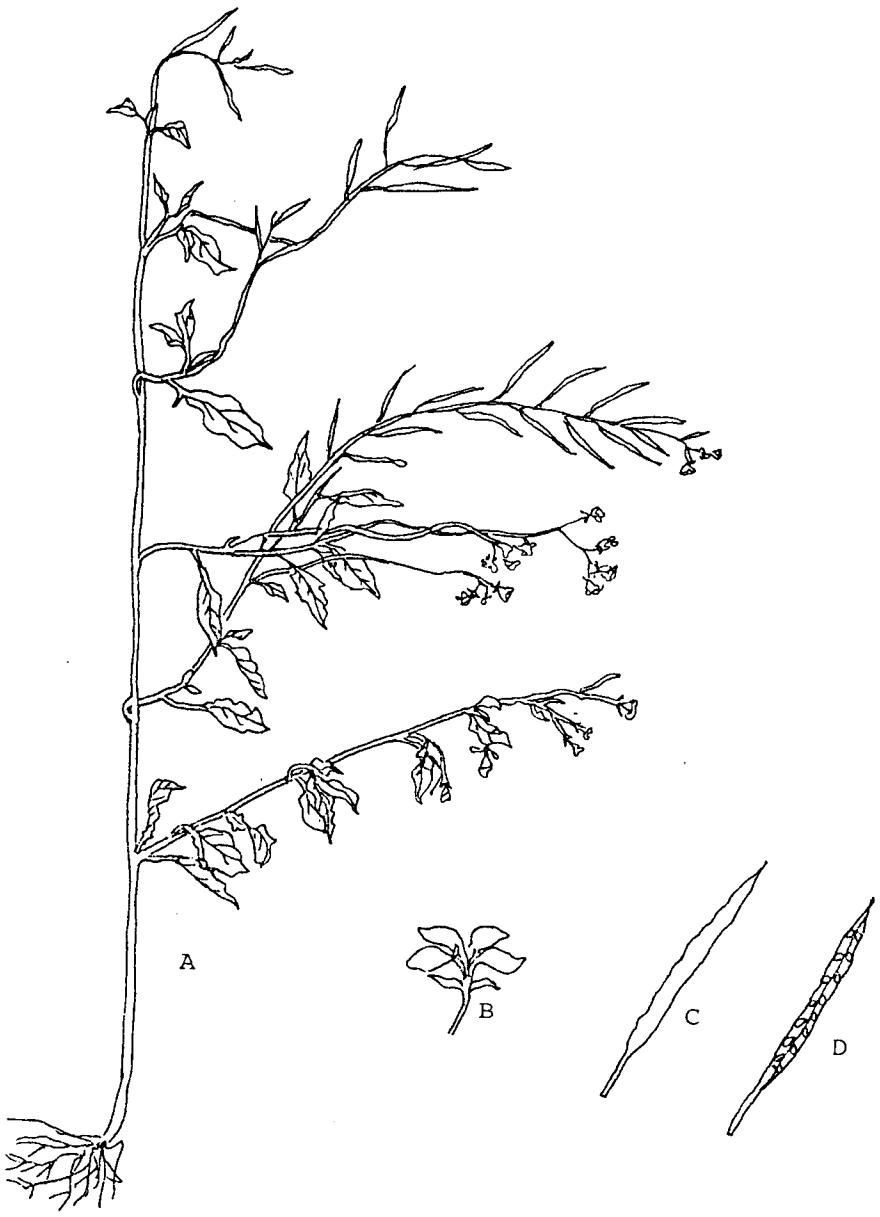
Seeds, young leaves.

FOOD USE:-

They are used as an ingredient for pickles and seed oil is used in food preparation. Mustard sauce is made from seeds. Seed oil is used as a cooking oil. Leaves are eaten as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 8.5 g, Energy - 541 kcal, Proteins - 20 g, Fats - 39.7 g, Carbohydrates - 23.8 g, Calcium - 490 mcg, Phosphorus - 700 mg, Iron - 17.9 mg, Carotene - 162 mg, Thiamine - 650 mcg, Riboflavin - 260 mcg, Niacin-4.0 mg, Vitamin C-0 g (Perera et al., 1979).



Brassica integrifolia

(A) Plant (B) Flower (C) Fruit (D) Lngitudinal section of fruit.

The pale yellow oil extracted from the seed contains sinigrin. The leaves contain Calcium, Phosphorus, Iron and Vitamin B. A plaster of ground mustard seed applied externally relieves pain due to pleurodynia, pleuritis, hepatitis, gastralgia, lumbago and is used as a counter-irritant in inflammatory conditions of the viscera. Applied to the nape of the neck, it prevents cerebral congestion. To check convulsions in children, the patient is immersed in a mustard bath (Jayaweera, 1980).

ENVIRONMENTAL RESPONSE:-

Mustard is adopted to widely different climatic conditions. Requires low or moderate rainfall. Grows in all classes of soils except very heavy clays.

CULTIVATION:-

Areas of cultivation - Dry zone of Sri Lanka.

Planting season - *Maha* season.

Planting material - Seeds

Planting and spacing - normally cultiated in chenas as a mixed crop with finger millet. When grown as a pure crop, seeds may be drilled in rows, 20 cm apart.

Harvesting - Harvest can be obtained after 90-100 days.

Yeilds - Pure crop will give about 200 - 250 kg to 400 - 500 kg/ha.

STORAGE :-

Seeds can be stored for a long time in dry containers.

FAMILY:- CRUCIFERAE

BOTANICAL NAME:- ***Brassica nigra***.

VERNACULAR NAMES:-

SINHALA	:	*Gan-aba, Kalu aba*
TAMIL	:	*Kadugu*
ENGLISH	:	Black mustard.

DESCRIPTION:-

A large, branching, annual herb, 0.5-1.5 m tall, hispid, internodes 4-5 cm long.

LEAVES:- Irregularly lobed or pinnate with a large terminal lobe and 1-3 pairs of progressively smaller ones below, 11.6-17.3 cm long, terminal lobe 8.7-12.5 cm long, 5-10 cm broad, margin serrate, glabrous above and hispid along veins beneath.

FLOWERS:- Regular,bisexual in a terminal panicle of branched racemes, ebracteate, bracteoles foliar, lanceolate, 1.4-5.5 cm long, 0.3-1.9 cm broad.

FRUITS:- A fusiform, glabrous siliqua, 1-2.5 cm long; seed round and brown, 1.5-2 mm in diameter and minutely pitted (Jayaweera, 1980).

DISTRIBUTION:-

Centre of origin is Euroasia. It is a weed in waste and cultivated ground in England, Asia Minor, North-western India, South Siberia, North Africa and the Mediterranean regions. It is frequently cultivated in India,Tibet and other tropical countries (Jayaweera, 1980).

EDIBLE PARTS:-

The seeds and young leaves.

FOOD USE:-

They are used as an ingredient of pickles and seed oil is used in food preparation. Mustard saurce is made from seeds. Edible seed oil is used in various preparations. Young leaves can be eaten as a fresh vegetable.

Brassica nigra

(A) Plant (B) Flower (C) Fruit (D) Dehiscing fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 8.5 g, Energy - 541 kcl, Proteins - 20 g, Fats - 39.7 g, Carbohydrates - 23.8 g, Ca -490 mcg, Phosphorus - 700 mg, Iron - 17,9 mg, Carotene - 162 mg, Thiamine - 650 mcg, Riboflavin - 260 mcg, Niacin - 4.0 mg, Vitamin. C-0 g (Perera et al., 1979).

Besides the alkaloid sinapine, the seeds contain myrosin, sinigrin, inosite, albumins, gums, colouring matter and fixed and volatile oils of mustard. A poultice of the ground seed is very useful for cases of febrile and inflammatory diseases, internal congestions spasmodic, neuralgic and rheumatic affections. A paste of the seed along with other ingredients is applied on pimples and urticaria. The oil extracted from the seed is a stimulant and a mild counter-irritant when applied externally. Hence it is useful against sore throat, internal congestion and chronic muscular rheumatism. Ground mustard is eaten with roast meats as it promotes digestion (Jayaweera, 1980).

ENVIRONMENTAL RESPONSE:-

Mustard is adopted to widely different climatic conditions. Requires low or moderate rainfall. Grows in all classes of soils except very heavy clays.

CULTIVATION:-

Areas of cultivation - Dry zone of Sri Lanka.

Planting season - *Maha* season.

Planting material - Seeds

Planting and spacing - normally cultivated in chenas as a mixed crop with finger millet. When grown as a pure crop, seeds may be drilled in rows, 20 cm apart.

Harvesting - Harvest can be obtained after 90-100 days.

Yeilds - Pure crop will give about 200 - 250 kg 400 - 500 kg/ha.

STORAGE :-

Seeds can be stored for a long time in dry containers.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Benincasa hispida***

VERNACULAR NAMES:-

SINHALA	:	*Alupuhul, Puhul*
TAMIL	:	*Kalyanappushinikkay, Pusanikkai, Wattakkai, Sambal Pusanikkai*
ENGLISH	:	Ash Pumpkin, Wax gourd, White gourd, Ash gourd

DESCRIPTION:-

A large trailing or climbing plant with stout angular, hispid stems, tendrils 2-fid.

LEAVES:- 10-25 cm diameter, reniform-orbicular, cordate, more or less deeply 5-lobed, hispid, beneath petioles 7.5-10 cm long without glands.

FLOWERS:- Large yellow monecious, all solitary without bracts.

FRUITS:- 30-45 cm long broadly cylindric, not ribbed, hairy, ultimately covered with a waxy bloom; seeds many,oblong, compressed and margined (Jayaweera, 1980)

DISTRIBUTION:-

Benincasa hispida grows wild in Java and cultivated throughout India, Sri Lanka and other tropical countries (Tindall, 1993). In Sri Lanka it is mostly cultivated in the dry zone during the rainy season and elsewhere throughout the year.

EDIBLE PART:-

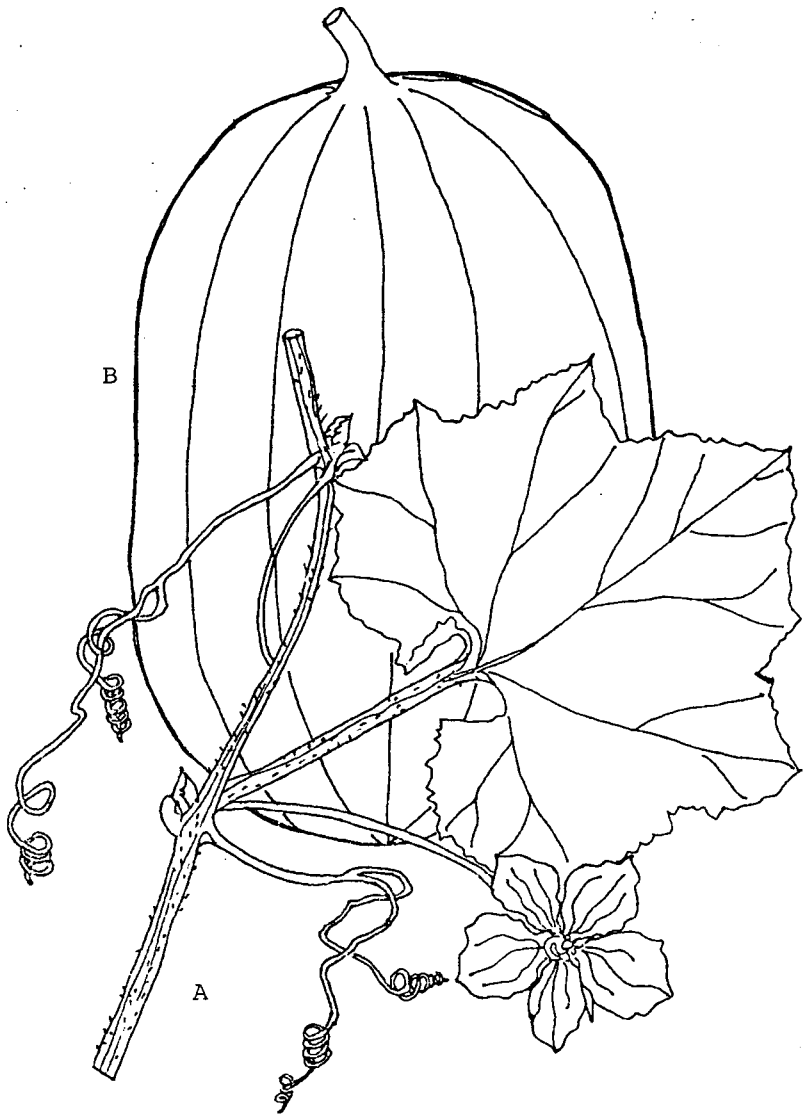
The fruit, seeds, young leaves and flower buds.

FOOD USE:-

The young and matured fruits are eaten as a vegetable. Grated inner portion is boiled with sugar to prepare sweets. Seeds are roasted and eaten. Young leaves and flower buds are eaten as green vegetables.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 96.5 g, Energy -10 kcal, Proteins -0.4 g, Fat -0.1 g, Carbohydrates - 1.9 g - Calcium - 30 mg, Phosphorus - 20 mg, Iron - 0.8 mg, Carotene - 0, Thiamine - 60 mcg, Riboflavin - 10 mcg, Niacin 0.4 mg, C - 1 mg (Perera et al., 1979).



Benincasa hispida

(A) Stem (B) Fruit.

The fruit contains a fixed oil, starch,cucurbitine, resin, proteins, myosin and vitellin, sugar and Vitamin B and C. The fresh juice is a specific antidote for mercuric, alcoholic and snake bite poisoning. It is used for insanity, epilepsy and other nervous diseases. The cortical portion of the fruit is given for diabetes. A decoctions of the leaves with rock salt is given for cholera. Decoction of the stem and fresh juice of the fruit are also antidotes for many vegetable poisons. In Indo-China, the leaves and seeds are given as a purgative (Jayaweera, 1980).

ENVIRONMENTAL RESPONSE:-

Elevation below 500 m, with relatively high temperature and moderate rainfall is good for ash melon. The demand for water is very high during the early period of vegetation. Relatively low temperature and short daylength stimulate the development of female flowers.

CULTIVATION:-

Propagation is by seeds. Five seeds are normally planted together, 2-4 cm deep on ridges, mounds or in prepared beds or holes. Alternatively, container-sown seedling may be transplanted when they are 10-15 cm high. The ideal time for sowing is at the beginning of the rains. Seed rate is 5-7 kg/ha. Spacing rows 20 cm apart with 60-100 cm between plants, ridges or mounds 75-90 cm apart each way.

Irrigation- is required at regular intervals particularly during dry periods.

Fertilizer-NPK before sowing or planting.

Time of harvest-Leaves are ready to be picked in 35- 60 days, fruits 80-140 days from sowing or planting.

Harvesting-As soon as the plant vines are about 60 cm length, fruits before the seeds begin to ripen, and when the skin begins to harden.

Yeild - About 20 T/ha.

STORAGE:-

Undamaged fruits are hung and kept around 6 months and more.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Colocynthis citrullus***

Syn: *Citrullus lanatus Citrulls valgaris.*

VERNACULAR NAMES:-

SINHALA	:	*Komadu, Peni-Komadu*
TAMIL	:	*Pitcha*
ENGLISH	:	Water Melon

DESCRIPTION:-

An extensively climbing annual with thick, angular, branching stems; young shoots villous;

LEAVES:- Simple, alternate, 7.5-20 cm long, ovate to ovate-oblong in outline, cordate at base, deeply or moderately 3-7 lobed; Petioles a little shorter than the limb, villous;

FLOWERS:- About 2-3.5 cm diameter, monoecious, yellow, solitary and axillary, consist of male and female flowers.

FRUITS:- About 25 cm diameter, sub-globose or ellipsoid, smooth greenish with a glaucous waxy coating, flesh juicy red or yellowish white: seeds black margined (Jayaweera, 1980).

DISTRIBUTION:-

Indigenous to tropical and sub-tropical Africa (FAO, 1980; Querol, 1993), but cultivated in most of the eastern countries. It is of ancient cultivation in Mediterranean region and reached India in pre-historic time. In Sri Lanka it is cultivated mostly in the dry zone during the rainy season.

EDIBLE PART:-

The fruit and seeds.

FOOD USE:-

Riped fruits are eaten fresh and are a good substitute for drinking water in desert areas. It is used in preparations of salads, juices and ice cream. Roasted seeds are used as a snack.

Colocynthis citrullus

(A) Fruit (B) Leaf (C) Apical portion of a branch.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 95.8 g, Energy - 16 Kcal, Proteins -0.2 g, Fat -0.2 g, Carbohydrates -3.3 g, Calcium - 11 mg, Phosphorus - 12 mg, Iron - 7.9 mg, Thiamine - 20 mcg, Riboflavin - 40 mcg, Niacin 0.1 mg, Vitamin C - 1 mg (Perera et al., 1979).

Contains ascorbic acid oxidase, while the flesh of the fruit contains saccharose, dextrose, citrulline, carotin etc. The peel contains a fixed oil. The seed yields an oil,proteins, cucurbitol and an active principle of cucurbocitrin. The juice of the root is used to arrest hemorrhage after abortion.

ENVIRONMENTAL RESPONSE:-

Soils well drained, high in organic content, with a good water holding capacity are good for water melon. Growth and fruit production in most areas are rapid during dry and sunny periods. Elevations up to 1000 m provide suitable conditions for growth.

CULTIVATION:-

Generally watermelons are cultivated or grown semi-wild. They are often inter-cropped with maize, sorghum and millet. Seed is planted at the beginning of the rains, where rainfall is limited or at the end of the rainy season on good moisture-containing soils. Seeds, in groups of 1-3, are sown 2-4 cm deep in trenches, on mounds, or in widely spaced planting holes. Alternatively seedlings may be raised in containers and transplanted when 10-14 cm high.

Spacing-2 m x 70 cm up to 3.5 x 3.5 m, depending on the cultivar.

Seed rate - 2.5 -3 kg/ha.

Irrigation - Rainy season crops may not require watering, but dry season crops may need a good soaking once a week to keep the soil moist.

Fertilizer - NPK is applied before sowing or transplanting.

Time to harvest - 80 -100 days from sowing, continuing for 40-50 days.

Harvesting - Maturity is indicated by withering of tendrils and increasing fruit density. Fruits give a dull hallow sound when tapped.

STORAGE:-

Fruits should not be left too long in the field after ripening. When picked carefully at the proper stage of maturity, and stored in a cool, dry place water melons can be kept for 2-4 weeks.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Cucumis melo var conomon***

VERNACULAR NAMES:-

SINHALA	:	*Hen-Kekiri*
TAMIL	:	*Vellarikkai*
ENGLISH	:	Chinese White Cucumber, Oriental Pickling melon.

DESCRIPTION:-

An annual, tendril climber with long, bluntly angular stems, rough with hooked prickly hairs on ridges, tendrils simple.

LEAVES:- Simple, alternate, 7.5-11.2 cm long, broadly cordate ovate with the basal lobes rounded, usually shallowly cut into 3 or 5 acute lobes, slightly dentate, very roughly hairy on both sides;petioles stout, often as long as the leaves, deeply sulcate above, often much twisted.

FLOWERS:- Regular, yellow, unisexual, monoecious, small; male flowers in small clusters, female flowers solitary, 1.8 cm wide.

FRUITS:- Ovoid - globose, slightly trigonous in section, small, glabrous, obscurely striped with dark and light green, solid, fleshy; seeds numerous, horizontal, narrowly ovoid, compressed and smooth (Jayaweera, 1980; Tindall, 1993).

DISTRIBUTION:-

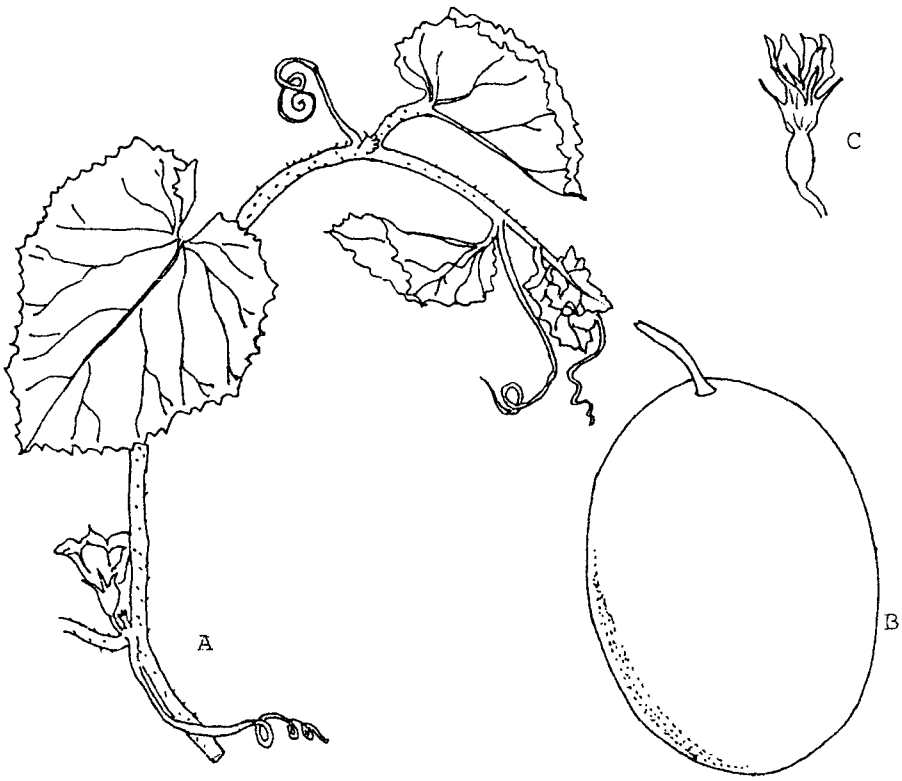
Grows in South-east Asia (Tindall, 1993). It is common in waste ground in the low country in Sri Lanka.

EDIBLE PART:-

The fruit is cooked and eaten as a vegetable.

FOOD USE:-

Fruit pulp is usually eaten raw as a dessert, often with a little sugar. Seeds may be roasted and eaten as a snack.



Cucumis melo

(A) Branch with male flowers (B) fruit (C) Female flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 96 g, Energy - 13 kcal, Proteins - 0.4 g, Carbohydrate - 2.5 g, Calcium 10 mg, Phosphorus - 25 mg, Iron - 0.5 mg, Thiamine - 30 mg, Riboflavin - 0.03 mcg, Niacin - 0.2 mcg, Vitamin C - 7.0 mg (Weerakoon, 1993) .

The juice of the fruit after being impregnated with impure carbonate of potash and steamed in hot ash, is used as a diuretic for cases of difficulty in passing urine and other urinary complaints (Jayaweera, 1980; Wickramarchchi, 1988).

ENVIRONMENTAL RESPONSE:-

Tolerant to a wide range of environmental conditions. Soils with high organic contents and good water retaining capacity are ideal for melon. Grows well in altitudes below 500 m.

CULTIVATION:-

General propagation is by seed. 2-3 seeds are sown 1-2 cm deep in prepared holes or on mounds or ridges and later thinned to 1 plant per site. If seedlings are used they should be transplanted when 10-15 cm high.

Spacing - Rows 1.3-2 m apart, 60-90 cm between plants.

Irrigation - Generally grown under irrigation.

Fertilizer - Plants respond well to organic manuring, main requirements of inorganic fertilizers are Ca, N and K.

Time of harvest - 3-4 months after planting when some fruits are indicated by an abscission crack where the fruit is attached to the fruit stalk.

STORAGE:-

Fruits may be stored at low temperatures. Removal of field heat immediately after harvesting is essential.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Cucumis sativus***

VERNACULAR NAMES:-

SINHALA	:	*Pipingna*
TAMIL	:	*Pipingkay-Peerkangkai*
ENGLISH	:	Cucumber

DESCRIPTION:-

A medium-sized, hairy, tendril climber

LEAVES:- Simple, alternate, 11-16 cm long, 10-14 cm broad, broadly ovate-cordate, acuminate, 5 veined, shallowly 3-5 lobed, hairy on both sides, veins prominent below. Petioles 5-8 cm long, cylindrical, hairy.

FLOWERS:- Unisexual on the same plant, bright yellow, male flowers in axillary, clusters. Female flowers solitary, about 3 cm in diameter.

FRUITS:- Pendulous, variable in shape and size nearly globular to oblong and elongated with scattered spinous lubercles and warb, particularly when young, flesh pale green with characteristic cucumber odour, many seeded seeds flat, white, 8-10x3-5 mm . 50 seed per g (Tindall, 1993).

DISTRIBUTION:-

It has been believed that *Cucumis Sativus* originated in Northern India. Cultivated throughout India, Sri Lanka, Indo-China and Philippine Islands (Tindall, 1993).

EDIBLE PARTS:-

Fruit and Young leaves.

FOOD USE:-

Fruit is eaten as a vegetable. Small unriped fruits are pickled. Young leaves are occasionally eaten as a green vegetable.

Cucumis sativus

(A) Branch (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 96.5 g, Energy -13.0 Kcal, Proteins - 0.4 g, Fat - 0.1 g, Carbohydrates - 2.5 g, Calcium - 10 mg, Phosphorus - 25.0 mg, Iron - 1.5 mg, Thiamine - 30 mcg, Niacin - 0.2 mg, Vitamin C - 7.0 mg (Perera et al., 1979).

The fruit contains dextrose, saccharose, ascorbic acid, ascorbic acid oxidase and fixed oil. Seed kernels contain approximately 42 per cent oil and 42 percent protein. The fruit is a good source of iron and calcium containing very little vitamins B, C and G. The leaves contain urea.

ENVIRONMENTAL RESPONSE:-

Sandy looms with high organic contents are suitable for vigorous growth optimal temperature range is 21-28^{0}C. Water requirement is high but under the humid conditions leaf diseases are increased. Elevations below 1200 m are good for normal growth.

CULTIVATION:-

Areas for cultivation - Can be grown in the wet zone and dry zone in *Maha* season.

Planting season - In the wet zone throughout the year and in *Maha* season in the dry zone.

Land preparation - Remove weeds and make plant holes 30 x 30 cm, add 3 kg of organic manure per hole, mix with soil and heap to about 10 cm above ground. Trellises should be
1.5 m high, when vines are trained and inverted trellises, leave only eight laterals.

Planting material - Seeds

Planting and spacing - Monocroping - Dibble 3-4 seeds to a depth of 2-3 cm in planting holes placed in 1 m x 1 m. Intercroping can be intercroped with Okra in the same planting hole, spacing should be 120 x 90 cm.

Irrigation - Keep soil moisture at field capacity. Water should flow between beds along the drains and soak only the planting holes.

Fertilizer - NPK should be applied before planting.

Time to harvest - when fruits turn yellow or dark green.

Harvest - Avoid pulling of vines by using a sharp implement to remove fruits.

Yield - 5-8 T/ha.

STORAGE :-

Fruits normally remain fresh for about 1 week, after which dehydration leads to shrinking, low quality and bad taste.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Cucurbita maxima***

VERNACULAR NAMES:-

SINHALA	:	*Wattakka, Ratalabu*
TAMIL	:	*Pushanikkai*
ENGLISH	:	Pumpkin, Winter Squash, Squash Gourd

DESCRIPTION:-

A large climbing or prostate, annual, hispid herb, tendrils 4-fid

LEAVES:- Simple, alternate, large, a little broader, orbicular in outline, cordate with very deep sinus, faintly 5-lobed, hairy, shallowly serrate. Petioles about 20 cm long, hispid.

FLOWERS:- Regular, large, yellow, about 12 cm long, monoecious. Peduncles longer in male flowers, male flowers calyx campanulate at base segments 5, linear, corolla campanulate. Female flowers, calyx and corolla almost the same as in the male flowers (period almost throughout the year) (Jayaweera, 1980).

DISTRIBUTION:-

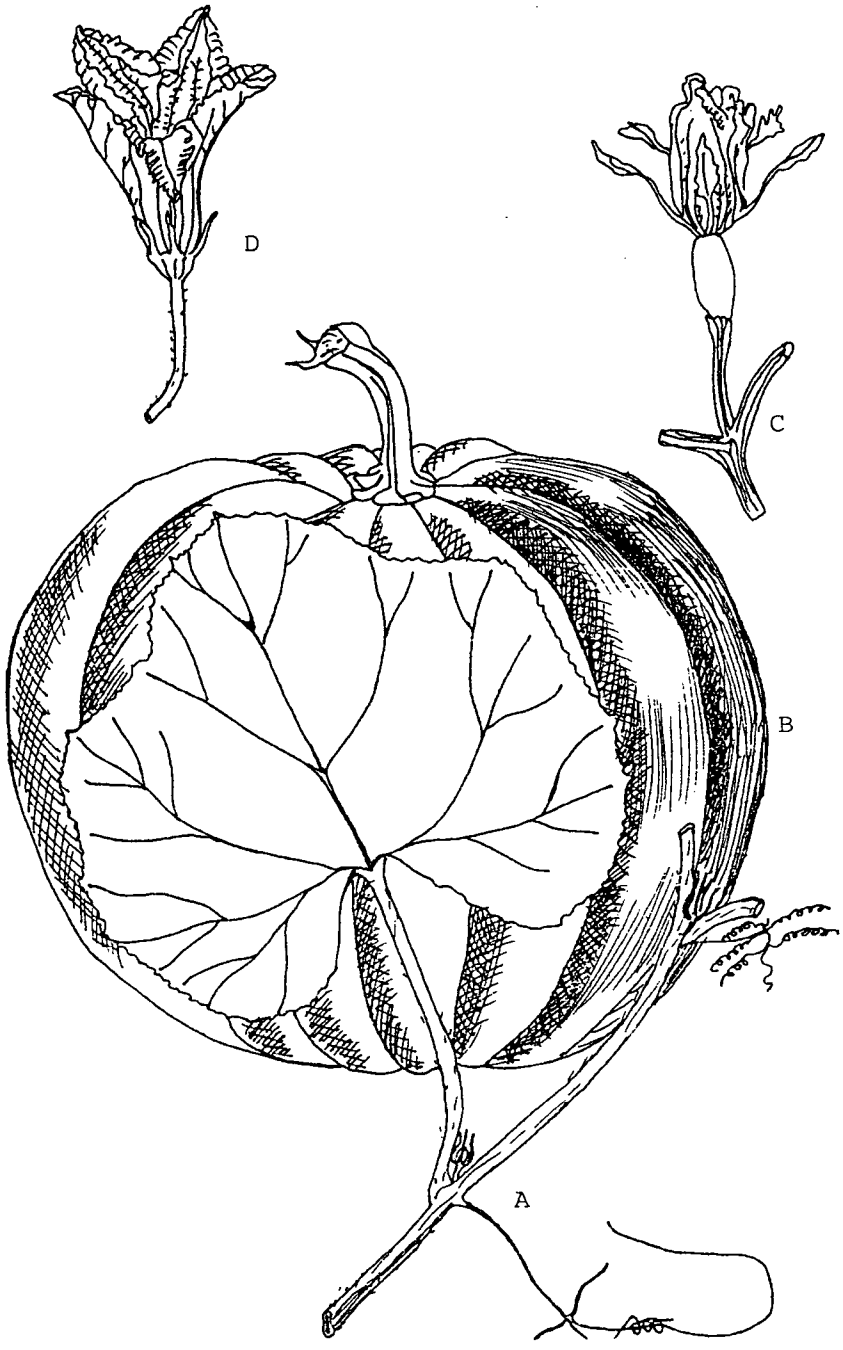
It is a native of South America. India is the secondary centre of diversity. Cultivated throughout India, Sri Lanka and in most region of the world. In Sri Lanka, it grows best in the dry zone especially after the rains (Tindall, 1993).

EDIBLE PARTS:-

Fruits, young shoots, flowers and seeds.

FOOD USE:-

Fruit is a famous vegetable among the Sri Lankans specially among villagers. Young leaves and flowers are used as spinach. Seeds are added to soups, cearial breakfast and also roasted and eaten as a snack.



Cuburbita maxima

(A) Branch (B) Fruit (C) Female flower (D) Male flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit).
Moisture -90 g, Energy -35.0 kcal, Proteins - 1.2 g, Fat - 0.1 g, Carbohydrates - 7.0 g, Minerals, Calcium - 20.0 mg, Phosphorus - 40 mg, Iron - 0.8 mg, Thiamine -50 mcg, Riboflavine -80 mcg, Niacin -0.6 mg, Calcium - 10 mg.

(Leaves)
Moisture - 81.9 g, Energy - 57 kcal, Proteins - 4.6 g, Fats - 0.8 g, Carbohydrates - 7.9 g, Calcium 392 mg, Phosphorus - 112 mg.

(Seeds - dry)
Moisture - 3.7 g, Energy - 543 kcal, Proteins - 29 , Fats - 40.4 g, Carbohydrates - 25.1 g, Calcium 33 mg, Phosphorus - 714 mg, Iron - 9.9 mg, Vitamin - Carotene - 235 mcg, Thiamine - 400 mcg, Riboflavin - 140 mcg, Niacin - 3.2 mg (Perera et al., 1979).

The fruit contains fat, protein, vitamin A, sugar, two pigments cucurbitene and cucurbitaxanthin, niacin, riboflavine. The young shoots are good sources of calcium, iron, phosphorus, vitamin B and also contain hydrocyanic acid and ascorbic acid, ascorbic acid oxalate. The seeds contain a fixed oil, saponin, a protein called edestin and an active principle. The seeds are employed as a vermifuge, given with sugar for tape worm (Jayaweera, 1980).

OTHER USES:-

In some countries, pumpkin is used as an animal feed.

ENVIRONMENTAL RESPONSE:-

Requires high temperature of 25-30^{0}C, and low humidity. Soils with high organic contents and pH of 5.5 - 6.8 are ideal for normal growth. Grows well in altitude below 2000 m.

CULTIVATION:-

Propagation is by seeds. Five seeds are normally planted together, 2-4 cm deep on ridges, mounds or in prepared beds or holes. Alternatively, container-sown seedling may be transplanted when they are 10-15 cm high. The ideal time for sowing is at the beginning of the rains. Seed rate is 5-7 kg/ha. Spacing rows 20 cm apart with 60-100 cm between plants, ridges or mounds 75-90 cm apart each way.

Irrigation - It is required at regular intervals particularly during dry periods.

Fertilizer - NPK before sowing or planting.

Time of harvest - Leaves are ready to pick in 35- 60 days, while harvesting of fruits can be done 80-140 days from sowing or planting.

Harvesting - As soon as the plant vines are about 60 cm length, fruits before the seeds begin to ripen, and when the skin begins to harden.

Yeild - Up to 15 t/ha.

STORAGE:-

Fruit can be stored for up to 6 months depending on the variety.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Lagenaria siceraria***

Syn: *L. Vulgaris, L. Leucantha*

VERNACULAR NAMES:-

SINHALA	:	*Diya-labu*
TAMIL	:	*Surakkai*
ENGLISH	:	Bottle Gourd, Calabash Gourd, Trumpet Gourd.

DESCRIPTION:-

A moderate-sized, softly tomentose, tendril climber with 5 angled stems.

LEAVES:- Simple, alternate, petiolate with tendrils and flowers at their axils, lamina 13-20 cm long and as broad, broadly ovate or orbicular, faintly 5-lobed, acute, deeply cordate at base, dentate, softly hairy on both sides, veins prominent below. Petioles 8-13 cm long.

FLOWERS:- Large, brownish white, unisexual, regular, solitary,both male and female flowers on the same plant.

FRUITS:- Large, dumbbell-shaped, indehiscent. Seeds many, white, horizontally compressed with a marginal groove (Jayaweera, 1980).

DISTRIBUTION:-

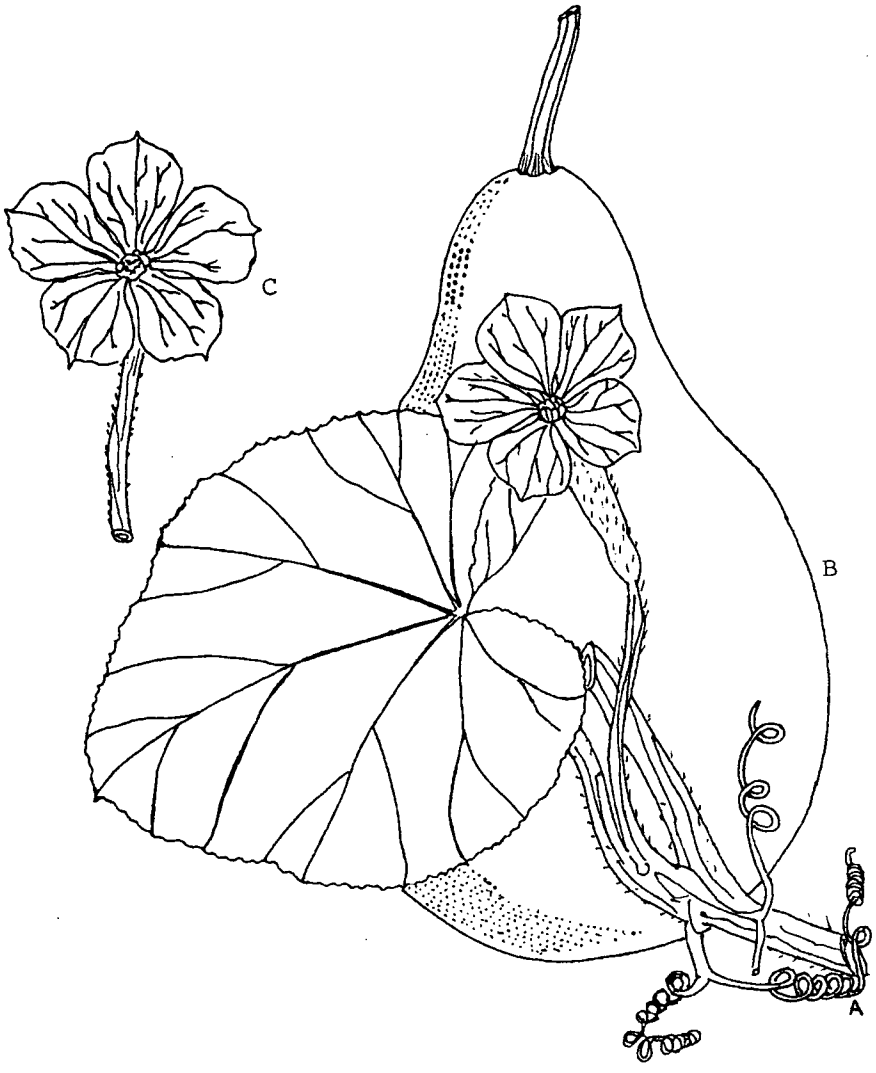
Indigenous to tropical Africa. It is one of earliest crops grown in tropics. Archaeological remains in Mexico date from 7000 BC (Tindall, 1993). It is frequently cultivated in India, Sri Lanka and Philippine Islands.

EDIBLE PARTS:-

The fruit, young leaves and shoots.

FOOD USE:-

Young fruits are eaten as a cooked vegetable. The young leaves and shoots are eaten as a pot herb.



Lagenaria siceraria

(A) A portion of a stem. (B) Fruit. (C) Male flower from front.

NUTRITIONAL AND THERAPEUTIC VALUE:

(Fruit)
Moisture - 96,1 g, Energy - 12 kcal, Proteins - 0.2 g, Fats - 0.1 g, Carbohydrates - 2.5 g, Calcium - 20 mg, Phosphorus - 10 g, Iron - 0.7 mg, Thiamine - 30 mcg, Riboflavin-10 mcg, Niacin- 0.2 g (Perera et al., 1979).

(Leaves)
Moisture - 83 g, Energy - 43 kcal, Protein 4.4 g, Fat - 0.3 g, Carbohydrate - 8 g, Phosphours - 88 mg, Iron - 7.4 mg (FAO, 1968).

The fruit contains Niacin, Riboflavine and Aneurin. It is a good source of Iron, Calcium, Phosphorus and Vitamin B. The seed contains a fixed oil and saponin. The pulp is useful for cough and as an antidote to certain poisons. The oil from the seeds is an emollient and applied on the head for relief from headaches (Jayaweera, 1980).

OTHER USES:-

Hard shells of the fruits, which are of many shapes, are used for various domestic utensils such as bowls, bottles and containers of many types. They were used before invention of pottery in many regions.

ENVIRONMENTAL RESPONSE:-

Soils with high organic matters and natural pH values. Well drainage is essential. Requires moderate rainfall. Grows normally at altitudes below 500 m.

CULTIVATION:-

Propagated by seed. It is usually cultivated near the house on mounds of well manured soil. 2-4 seeds are sown per mound later thinned to one. Alternatively, seeds may be sown in the nursery and transplanted at the 3-leaf stage.

Spacing - Ridges or holes, 120-180 cm apart. Seed rate 4-5 kg/ha.

Irrigation - Required at regular intervals to maintain moist soil conditions, particularly during dry weather.

Fertilizer - Plenty of farmyard manure and NPK before planting.

Time to harvest - Immatured fruits 70-90 days, mature fruits 100-120 days or more. Harvesting as a vegetable, gather while still young and tender, as a gourd, when totally ripe. The neck of the fruit is cut and the flesh is bored out as completely as possible.

Yeild - A plant produces about 20 gourds. Normal yeild is about 25 T/ha.

STORAGE:-

Young fruits, if undamaged can be kept in cool at a relative humidity of about 60%, for 7-14 days. It should be possible to dry them.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Luffa acutangula***

VERNACULAR NAMES:-

SINHALA	:	*Daravetakolu, vetakolu*
TAMIL	:	*Peeram, Pekunkai*
ENGLISH	:	Ridged Gourd, Fence Gourd, Angled Loofah

DESCRIPTION:-

A stout annual, climbing by means of tendrils, stems 5 angled, glabrous often scabrid, tendrils 3-fid and the young parts slightly pubescent;

LEAVES:- Simple, alternate, large, pale green, 6-23 cm long and as broad, orbicular in outline, very cordate at the base,usually more or less palmatifid. lobes acute, distantly denticulate, finely scabrous on both sides.

FLOWERS:- Male flowers many in axillary, 12-20 flowered racemes, each flower carrying a small, fleshy bract near the base bearing 3 or 4 large immersed (glands); female flowers solitary in the same axils as the males or separate; (period- throughout the year).

FRUITS:- 15-30 cm long, clavate oblong tapering to the base, very obtuse, smooth longitudinally ribbed or almost winged with 10 sharp angles or ridges; Seeds numerous, 1.2 cm long,oblong - ovoid, much compressed, slightly corrugated on the sides and black in colour. Both fruit and seeds are toxic to fish (Jayaweera, 1980).

DISTRIBUTION:-

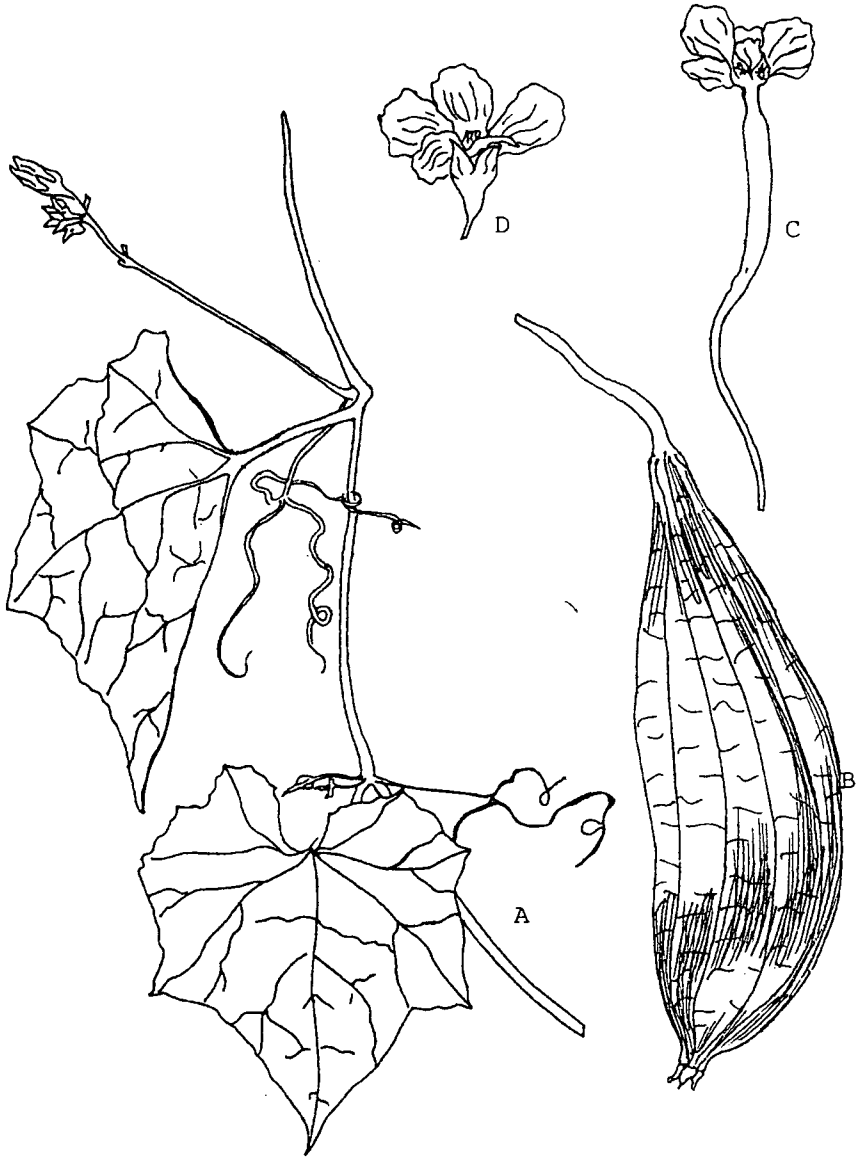
Indigenous in India and in Malay Archipelago (Jayaweera, 1980; Tindall, 1993; Querol, 1993). It is frequently cultivated in Sri Lanka in the mid and low country and also in other tropical countries.

EDIBLE PART:-

Young fruits and young shoots.

FOOD USE:-

Young fruits are eaten as a vegetable. Young shoots are also edible.



Luffa acutangula

(A) Branch (B) Fruit (C) Female flower (D) Male flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 94 g, Energy - 19 Kcal, Proteins - 1.1 g, Fats - 0.2 g, Carbohydrates - 4 g, Calcium - 2 mg, Phosphorus - 30 mg, Iron - 0.7 mg, Riboflavin - 140 mcg, Niacin-0.3. (Tindall, 1993).

The fruit contains an amorphous bitter principle, luffeyine and it is a good source of Iron, Calcium, Phosphorus and Vitamin B. The seeds contain a fixed oil which consists of the glycerides of palmitic,stearic and myristic acids. Both vegetative and reproductive organs contain hydrocyanic acid. The bruised leaves are applied locally to splenitis, hemorrhoids and leprosy and the expressed juice dropped into the eyes of children for granular conjunctivitis. The fruit is used in combination with other drugs in the treatment of snake-bites. The dried fruits are powdered and made into a snuff for treating jaundice. The oil extracted from the dry seeds is used in skin diseases. The root is used as a purgative in Russia and in India, while in the latter country it is used for dropsy as well (Jayaweera, 1980; Wickramarachchi, 1986).

ENVIRONMENTAL RESPONSE:-

Moderate rainfall is required for optimal growth and can be cultivated in dry periods under irrigation. Soil with a high content of organic matter and good drainage are essential. Grows well at the elevation below 500 m.

CULTIVATION:-

Planting material is seeds which are sown on mounds, ridges or in prepared holes, and later thinned to leave single seedlings.

Spacing - Mound 75-100 cm apart or 60-90 x 60-90 cm. Seed requirement is 4.0 - 5.0 kg/ha, hand pollination of female flowers are normally required.

Irrigation - Required during dry periods.

Fertilizer - NPK is applied before planting which is followed by application of nitrogen fertilizer till flowering.

Harvesting - Harvesting varies from 40-70 days from sowing.

Yeild - Plant may produce 15-20 fruits.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Luffa cylindrica***

Syn :- L. aegyptiace

VERNACULAR NAMES:-

SINHALA	:	*Niyan-wetakolu*
TAMIL	:	*Pichuknu*
ENGLISH	:	Sponge Gourd, Smooth loofah

DESCRIPTION:-

Annual, tendril, clamber with 5-angled, stout, twisted stems, young parts slightly pubescent;

LEAVES:- Simple,alternate, large 10-20 cm long, orbicular in outline, often broader than long, very cordate at base, usually more or less 7-lobed, lobes acute,distantly denticulate, finely scabrous on both sides; petioles 2.5-7.5 cm long, angular, slightly scabrous.

FLOWERS:- Regular, yellow, unisexual, monoecious. Male flowers numerous in racemes 10-20 cm long. Female flowers solitary,over 5 cm long on peduncles 7.5-10 cm in length, calyx segment lanceolate, acute; Flowers in July

FRUITS:- Very large 15-30 cm or more long, cylindrical or somewhat trigonous, not ribbed, blunt at the end. Seeds oval about 1.2 cm long, much compressed,narrowly, winged, gray, rough on the sides (Jayaweera, 1980).

DISTRIBUTION:-

Centre of origin is possibly India (Tindall, 1993). Cultivated throughout India, Sri Lanka and Philippine Islands. It is common in native gardens in the low-country up to an altitude of 1000 m.

EDIBLE PARTS:-

Young fruits and young shoots

FOOD USE:-

The fruit is eaten as a vegetable.

Luffa cylindrica

(A) Branch (B) Fruit (C) Female flower (D) Male inflorescence.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 95.2 g, Energy-17 kcal, Proteins - 0.5 g, Fats - 0.1 g, Carbohydrates - 3.6 g, Calcium - 18 mg, Phosphorus - 26 mg, Iron - 1.5 mg, Riboflavin - 10 mcg, Niacin-0.2 mcg, Vitamin C - 5 mg (Perera et al., 1979).

(Leaves)
Moisture - 90 g, Energy - 27 kcal, Proteins - 5.1 g, Fat - 0 g, Carbodydrate - 4 g, Fibre 1.5 g, Calcium - 56 mg, Phosphours - 140 mg, Iron -11.5 mg, Carotene - 9240 mcg, Thiamine 0.05 mg, Riboflavine - 0,06 mg, Vitamin C - 95 mg (FAO, 1972).

Weather records that the fruit fibre contains cellulose,xylene, manna, galactan and lignin. The seeds contain a fixed oil and the fruit, saponin and abundant mucilage. The leaves are prescribed in skin diseases and orchitis. In Java the juice of the leaves is given for amenorrhoea. The fresh fruit is considered and cooling beneficial to the intestines and tonic to the genital organs. The seeds are said to be emetic and cathartic. An infusion of the seeds is a drastic purgative and useful anthelmintic. In Cambodia, the fruit is used as a diuretic (Jayaweera, 1980).

OTHER USES:-

Loofah sponge, which is the fibre vascular network of ripe fruit is used as bath sponges and for cleaning purposes and in the manufacture of pot holders, sabber mats, bath mats etc.

ENVIRONMENTAL RESPONSE:-

Soils with a moderate content of organic matter, well drained soil is suitable for optimal growth. Soils of pH 5.5-6.5 are favourable. Tolerant to day temperature 25^0C. Grown at altitudes below 1000 m.

CULTIVATION:-

Propagation is by seed taken from riped fruits. Seeds are sown direct, 2-3 cm deep on mounds or ridges or seedlings may be raised in containers and transplanted. Supporting poles or trellis are required for the vines.Hand pollination of the female flowers in the early morning is recommended.

Spacing - Mounds 75-90 cm apart, 45-60 cm between plants, or 90-120 cm each way, depending on the vigor of the cultivar.
rows - 1.5 - 1.8 m apart, with plants 20-25 cm on the row.
seed rate - 3-5 kg/ha for a plant population of 3000-5000 plants/ha.

Irrigation - A fairly high level of soil moisture needs to be maintained throughout the growing period.

Fertilizer - NPK before planting or sowing, followed by the application of liquid N fertilizer until flowering.

Time to harvest- Immature fruits in 70-80 days from sowing or transplanting, when 15-20 cm in length. Mature fruits in 100-150 days.

Harvesting- Young fruits are picked while still green and less than 20 cm in length.

Yeild - An individual plant gives 20-25 fruits.

STORAGE:-

Undamaged and immature fruits can be stored for a week at normal room conditions. They can be stored for 10-14 days in a refrigerator.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Momordica charantia L.***

Syn :- M. Muricata

VERNACULAR NAMES:-

SINHALA	:	*Kariwila*
TAMIL	:	*Pavatkai, Pakal*
ENGLISH	:	Bitter Gourd, Bitter Cucumber, Balsam Pear.

DESCRIPTION:-

An annual tendril climber with somewhat twining, much branched, 5 - angled, roughly pubescent stems, young parts hairy.

LEAVES:- Simple, alternate, 6-12.5 cm long almost circular in outline,very deeply cordate at base, palmately cut to beyond the middle into 7 or 9 lobes, lobes acute, apiculate coarsely spinous-dentate, pubescent on veins on both sides, petioles 2.5-5 cm long, channelled above and narrowly bordered with decurrent leaf-bases.

FLOWERS:- Regular, lemon yellow, unisexual, monoecious, solitary, axillary on slender, peduncles 5-7.5 cm long, usually with a large, sessile, rotundate, entire bract on the lower half and often close to the base.

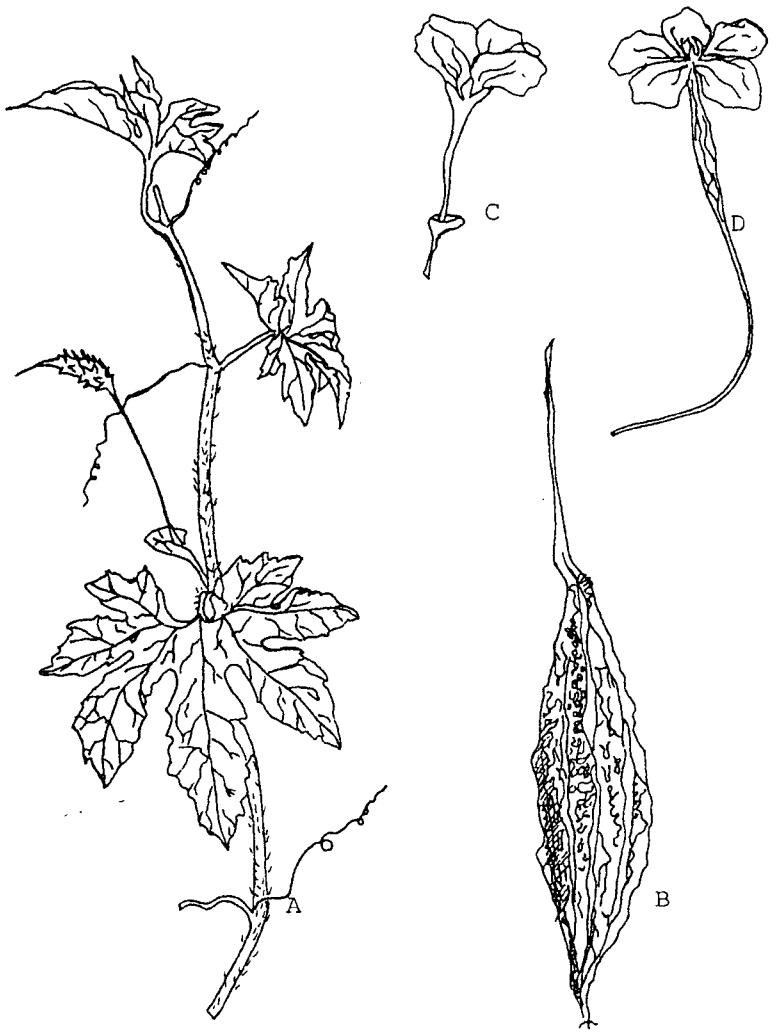
FRUITS:- Large, 7.5-15 cm long, pendulous, fusiform, usually pointed or beaked,orange coloured when ripe, enclosed in a red pulpy envelop (Jayaweera, 1989).

DISTRIBUTION:-

Place of origin is not known, expect that it was in the old world. Cultivated throughout India, Sri Lanka, Malaysia, China and Tropical Africa. In Sri Lanka it is cultivated in the low country up to 330 m altitude (Jayaweera, 1980; Tindall, 1993).

EDIBLE PART:-

The fruit, tender leaves and shoots



Momordica charantia

(A) Portion of a plant. (B) Fruit. (C) Female flower. (D) Male flower.

FOOD USE:-

The green fruit is used as a vegetable in spite of it is bitterness. Tender leaves and shoots are eaten as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 92.4 g, Energy - 25 Kcal, Proteins - 1.6 g, Fats- 0.2 g, Carbohydrates - 4.2 g, Calcium - 20 mg, Phosphrus - 70 mg, Iron - 1.8 mg, Carotene - 126 mcg, Thiamine - 70 mcg, Riboflavin - 90 mcg, Niacin - 0.5 mg, Vitamin C - 88 mg (Perera et al., 1979).

The whole plant including unriped fruit, contains probably two alkaloids one of which is momordicine, glucoside-like substance an aromatic ethereal oil, a fixed oil traces of a fatty acid and carotene. The fruit is a good source of Iron, Calcium, Phosphorus and Vitamin B. The seeds yield a purgative oil high in saponin content. The fruits and leaves are anthelmintic and used as a vermifuge. They are also useful for piles, leprosy and jaundice. The leaves are used in the treatment of colic. The fruit is a tonic and stomachic and useful for rheumatism, gout and diseases of the spleen and liver. In large doses it is a drastic purgative and is considered abortifacient. In Cuba the whole plant is used in the treatment of diabetes and chronic ulcers in the stomach. The seed is administered as an anthelmintic in Brazil and Congo. Juice of the leaves is given for children's coughs in the Philippines (Jayaweera, 1980; Wickramarachchi, 1986; Tindall, 1993).

ENVIRONMENTAL RESPONSE:-

Grown in hot climates. Adapted to a wide variation of rainfall. Soils with high organic content are ideal. Grows well below the altitude of 500 m.

CULTIVATION:-

Areas of cultivation - mostly cultivated in lowlands of wet and intermediate zones. Propagated by seed. Seeds sown direct on well prepared beds, ridges or in small pits. Plants require supporting poles or trellis. 2-3 seeds are sown per site, later thinned to one. Seeds are viable for up to 4 months.

Spacing - 60 -75 cm apart with 30-38 cm between plants or 50 x 50 cm each way.

Seed rate - 4-4.5 kg/ha.

Irrigation - Required during dry periods to maintain adequate soil moisture.
Fertilizer - NPK before sowing, followed by applications of fertilizer at intervals during the growing period.

Time to harvest - Flowering occurs in 30-35 days and young fruits are ready in 50-70 days from sowing.

Yeild - Normal yeild would be 8-10 t/ha.

STORAGE :-

Immature, undamaged fruits can be stored for 4-5 days. Under the temparature of 1 - 2^0C, and in a humidity of 85-90%, fruits can be stored for up to 20-30 days.

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Momordica dioica***

VERNACULAR NAMES:-

SINHALA : *Thumbakariwila, Tumba*
TAMIL : *Palupalagakalungai*

DESCRIPTION:-

A dioecious, perennial, tendril,climber with tuberous roots, stems slender, somewhat compressed and 2-edge or cylindric and furrowed striate;

LEAVES:- Simple, alternate, variable, 5-10 cm long 4-7 cm broad, broadly ovate in outline very cordate at base, acute entire or more or less deeply cut into 3 or 5 lobes, distantly dentate or denticulate, thin, quite glabrous and shining on both sides.

FLOWERS:- Regular, unisexual pale lemon yellow, dioecious, solitary, peduncle 3-5 cm long, slender, glabrous or finely pubescent at the top, in the male with a large hooed bract a little below the flower and enclosing it, in the female with a minute bract below the middle. Flowers from June to August.

FRUITS:- Oblong-ovoid 5-6.3 cm long, beaked, glabrous, evenly covered with equal-pointed papillae, many seeded, seeds broadly oblong, compressed, slightly and irregularly corrugated, enclosed in a red pulp (Jayaweera, 1986).

DISTRIBUTION:-

Grows throughout India, Sri Lanka and Singapore. In Sri Lanka it is naturally grown in low-country-dry zone and is famous among Sri Lankans as a seasonal vegetable (Jayaweera, 1980).

EDIBLE PART:-

The fruit .

FOOD USE:-

Fruits are eaten as a cooked vegetable

Momordica dioica

(A) Male plant. (B) Part of a stem of a female plant. (C) Another form of male plant. (D) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The leaves of the female plant are used as an aphrodisiac, anthelmintic and in asthma, bronchitis, hiccough and piles. The tuberous root is an expectorant and used in urinary complaints. The roasted root is applied to stop bleeding from piles. The fruit is stomachic, laxative and cures asthma,leprosy, bronchitis, excessive salivation and heart ailments. The root of the male plant is useful in all kinds of poisoning, including snake-bites, and for elephantiasis (Jayaweera, 1980).

FAMILY:- CUCURBITACEAE

BOTANICAL NAME:- ***Trichosanthes anguina***

Syn: *T. Cucumerina*

VERNACULAR NAMES:-

SINHALA	:	*Pathola*
TAMIL	:	*Podalangai, Padivilangu*
ENGLISH	:	Snake-gourd

DESCRIPTION:-

An annual tendril climber with long, slender, furrowed,slightly hairy leafy stems, tendrils 3-fid;

LEAVES:- Simple, alternate, 10-12.5 cm long, broadly ovate, more or less 3-5 lobed, lobes broad, acute, glabrous or nearly so above, more or less pubescent;

FLOWERS:- Regular,white, unisexual, monoecious, male flower in axillary 8-15, flowered racemes, female flower solitary and axillary, male flower peduncles of racemes 10-15 cm long, slender striate;

FRUITS:- About 0.3-0.9 m long, green striped with white changing to bright orange colour when ripe (Jayaweera, 1980).

DISTRIBUTION:-

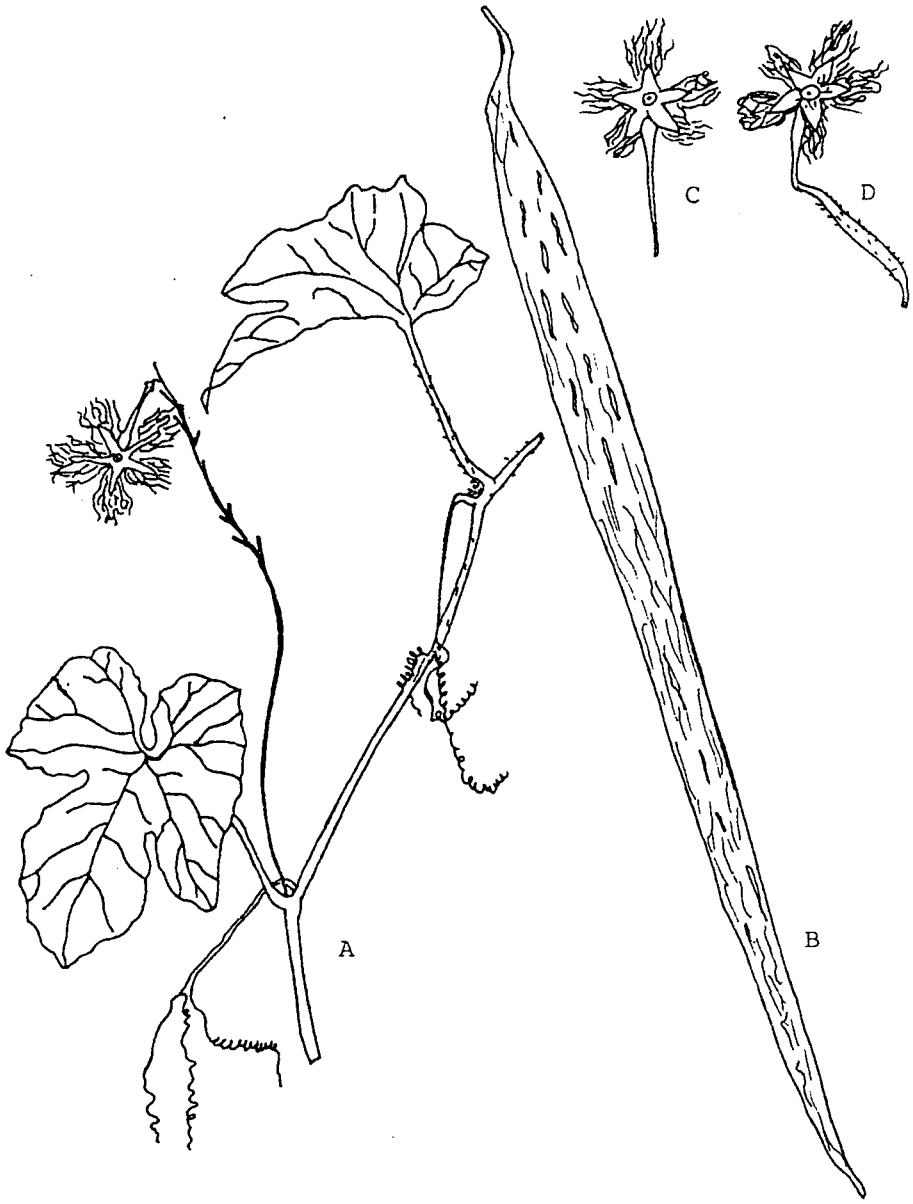
Centre of origin is India (Purseglove, 1968, Tindall, 1993; Rice et al; 1993). Snakegourd widely distributes in Tropics from India to Australia. Widely cultivated in the hotter parts of India, Sri Lanka, Malaysia and China, but never found in a wild state. In Sri lanka it is extensively grown in the mid and low-country.

EDIBLE PART:-

The fruit.

FOOD USE:-

The fruit is eaten as a vegetable.



Trichosanthes anguina

(A) Portion of a plant. (B) Fruit. (C) Male flower. (C) Female flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 94.6 g, Energy -18 Kcal, Proteins - 0.5 g, Fats - 0.3 g, Carbohydrates - 3.3 g, Calcium - 26 mg, Phosphorus - 20 mg, Iron - 0.3 mg, Carotene - 96 mcg, Thiamine - 40 mcg, Riboflavin - 60 mcg, Niacin - 0.3 mg (Perera et al; 1979).

In Indo-China, the plant is used as a purgative and vermifuge. The fruit is considered an emetic and anthelmintic in the Philippine Islands (Jayaweera, 1980).

CULTIVATION:-

Areas for cultivation - In the wet zone and in *Yala* season in the dry zone.

Planting season - Following heavy rains.

Land preparation - Wet zone - Prepare the land free of weeds. Dry zone - Plough to a depth of 20-30 cm and harrow to a fine tilth. Prepare planting holes 30 x 30 x 30 cm. Mix 3 kg of organic manure in the planting holes with soil and heap it about 10 cm above the ground level.

Planting material - Seeds 4-6 kg/ha of seeds is required.

Planting and spacing - Distribute 3 seeds /hole, well spaced to a depth of 2 cm 3 weeks after germination, and vines are tied with strong horizontal trellis about 2 m high.

Time to harvest - 0-75 days after planting. When colour of fruits is green to powdery white.
Harvest - Avoid pulling fruits by using a sharp instrument to remove pods from vines.
Yeild - One plant produces 6-10 fruits per year.

STORAGE:-

Fruits remain fresh for 7 10 days if handled carefully.

FAMILY:- CYCADACEAE

BOTANICAL NAME:- *Cycas circinalis*

VERNACULAR NAMES:-

SINHALA : *Madu*

DESCRIPTION:-

A palm like tree with a cylindric trunk about 5 m tall, simple or forked, clothed with the compacted woody bases of petioles.

LEAVES:- In a terminal crown of two kinds, simple short sessile subulate, woolly prophylla 5-7.5 cm long and long petioled pinnate leaves 1.5-2.7 m long. Petioles 45-60 cm long with short deflexed spines near the base, leaflets 25-30 cm long, 1.2 cm wide; linear- lanceolate,acuminate, subfalcate, bright green, glabrous and shining, mid-rib prominent beneath, inflorescence, dioecious, male cone 30-60 cm long, shortly peduncled, erect, woolly, cylindric-ovoid consisting of short axis, female inflorescence consists of a whorl of long, spreading, woolly carpophylls each about 30 cm long, 2.5-3.7 cm wide, narrowed into a long stalk, clothed with buff tomentum, crenate or spinous-serrate,bearing 3-5 pairs of naked or othotropous ovules above the middle (Jayaweera, 1980).

FRUITS:- Orange red, each containing a large seed with copious endosperm.

DISTRIBUTION:-

Grows in India, Sri Lanka, Java, Sumatra, Madagascar and East Tropical Africa. In Sri Lanka it is found in the moist regions upto 150 m attitude (Jayaweera, 1980).

EDIBLE PART:-

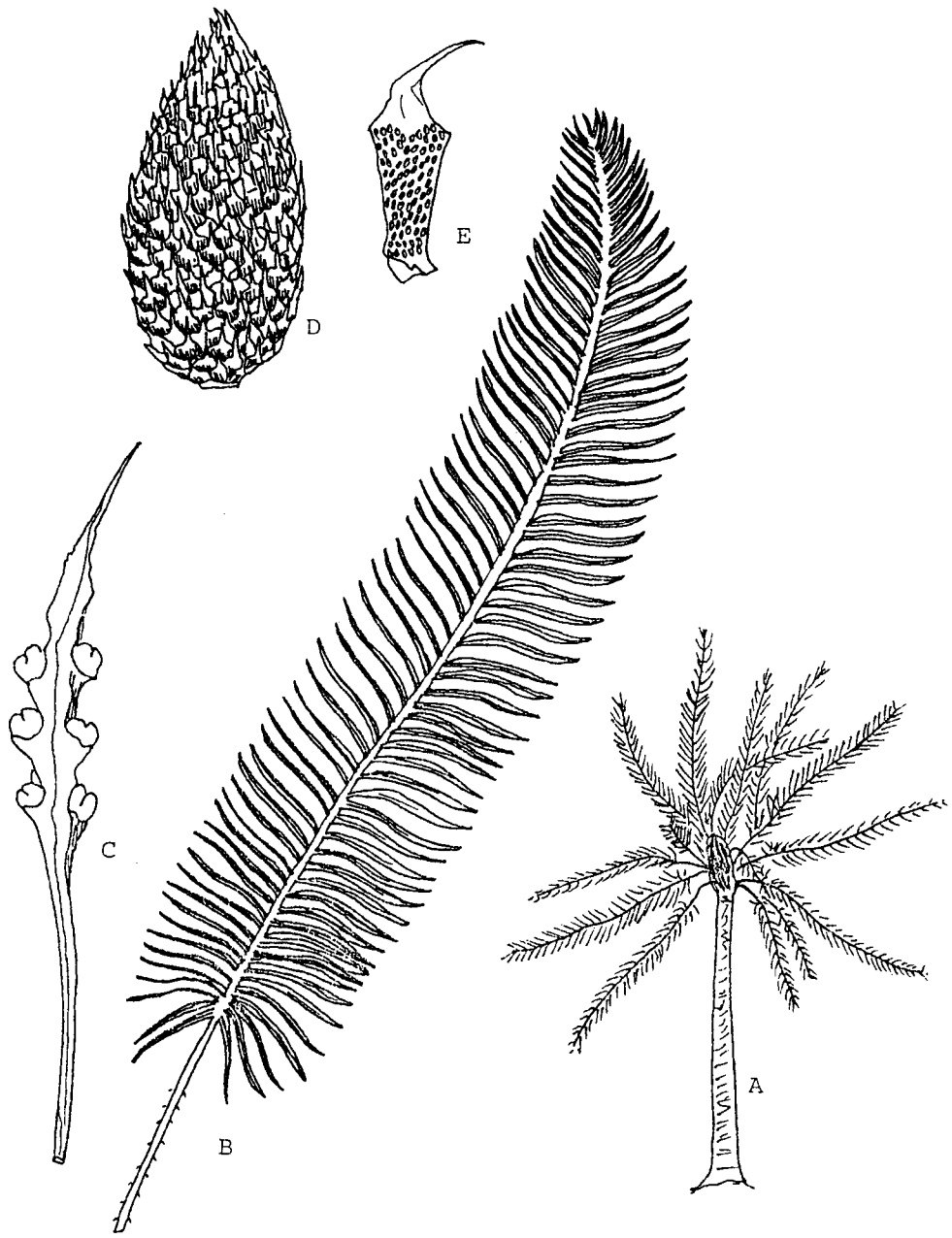
Young leaves and the seeds.

FOOD USE:-

Young leaves are prepared as a green vegetable while edible seed flour is used in many ways as rice flour.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The young leaves are cooked and eaten for piles and hemorrhoids. The leaves and seeds are useful for chronic constipation (Jayaweera, 1980).



Cycas circinalis

(A) Male tree (B) Leaf. (C) Female carpophyll with naked ovules. (D) Male cane. (E) Scale, showing the anothers and the under surface.

OTHER USES:-

It is planted in home gardens as a exotic plant.

STORAGE:-

Sun-dried endosperm can be kept for a long time in dry and cool places.

FAMILY:- DIOSCOREACEAE

BOTANICAL NAME:- ***Dioscorea alata***

Syn :- D. atropurpurea, D. sativa

VERNACULAR NAMES:-

SINHALA	:	*Raja ala, Rata ala, Kiri kondol*
TAMIL	:	*Rasavalli, Kannai*
ENGLISH	:	Greater yam, Water yam, Winged yam and Asiatic yam

DESCRIPTION:-

A glabrous climbing vine, growing to 15 m, exceptionally to 30 m. Stems square in cross-section, occasionally thorny, winged, membranous, twining in a clock-wise direction, adventitious roots sometimes formed.

LEAVES:- Petiolate, winged at base, variable in size and shape, rounded or ovate with acute apex, phyllotaxy normally opposite, alternate on juvenile stems.

FLOWERS:- Plants dioecious , unisexual, male flowers 1-2 mm in diameter, in panicles produced in leaf axills up to 30 cm in length, female flowers on shorter axillary racemes.

FRUIT:- 3 winged capsules 20-30 mm in length, 3 - locular, 2 seeds/locale (Tindall, 1993).

DISTRIBUTION:-

It originated in South East Asia, possibly in the Assam - Burma region, distributed at an early date throughout many parts of the tropics, including Indonesia, Papua New Guinea and the Pacific Islands, reaching Africa and tropical America in the 16th century (Ustimenko, 1989; Querol, 1992; Tindall, 1993; Rice et al., 1993). It is cultivated in South-East Asia (Southern India, Malaysia, Indonesia, the Philippines, Papua New Guinea), West Africa and most tropical countries. In Sri Lanka it grows in the wet zone up to 1500 m

EDIBLE PARTS:-

The tubers.

Dioscorea alata

(A) Plant. (B) Tuber.

FOOD USE:-

In Sri Lanka mature tubers are boiled, roasted or fried and eaten. It is a good substitute for potatoes. Frequently, water yams are used to make curry.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 76 g, Energy - 87 kcal, Protein - 1.9 g, Fats - 0.2 g , Carbohydrates -20 g, Calcium - 38 mg, Phosphorus - 28 mg, Iron - 1.9 mg, Carotene -5 mcg, Thiamine - 0.1 mg, Riboflavin - 0.04, Niacin - 0.5 mg, Vitamin C - 6 mg (Perera et al., 1979).

ENVIRONMENTAL RESPONSE:-

Cultivated in both wet and dry areas. For optimal growth well distributed rainfall of 1000-1500 mm is required. Well drained soils with high organic content are suitable for water yam. Photosensitive and day length less than twelve hours are needed for tuberization, grown at altitudes below 1000 m.

CULTIVATION:-

Area for cultivation - Although it can be grown in both wet and dry zone, in most cases it is cultivated in mid-and low country wet zone.

Planting season - generally the *Yala* season is suitable. When planting is done in April or mid- that May, harvest can be obtained in December and January .

Planting materials - It is propagated vegetatively by means of tuber cutting, small tubers and aerial tubers, but normal method is cutting of tubers.

Land preparation - It involves clearing of land and making either planting holes or trenches. If planting holes are used, it should be 60 x60x 60 cm and 90 cm apart. When trenches are used for planting the width and depth should be 60 cm and 90 cm between two trenches.

Planting and space - The usual practice is to plant one sprouted seed set or yam, per pit, at a depth of about 15 cm. In trenches, sprouted seed yams or sets are planted at a spacing of 75 cm, to a depth of 6 inches. After emergence, the vines are stalked. Bamboo to 4 m feet tall can be used for stalking.

Fertilizer - It responses well to organic manures. Farmyard manure at the rate of up to 20 t/ha is applied.

Irrigation - Since yams are normally planted at the beginning of the rains, they mature towards the end of the wet season, irrigation is not normally required.

Time to harvest - The crop is usually ready for harvest around December -January. About this time the leaves begin to wither and finally drop

Harvesting - The yams are lifted by digging them out.

STORAGE:-

The tubers should be firm and free of obvious defects such as bruises or cuts incurred during harvesting since several post-harvest fungi can invade the damaged tubers. Generally they are kept for a reasonably long period if they are stored in a cool dry place.

FAMILY:- DIOSCOREACEAE

BOTANICAL NAME:- ***Dioscorea bulbifera***

Syn :- D. crispata, D. heterophylla

VERNACULAR NAMES:-

SINHALA	:	*Udala*
TAMIL	:	*Kodi*
ENGLISH	:	Lesser yam, Asiatic yam, Chinese yam

DESCRIPTION:-

A climbing, glabrous vine, stem up to 10 m in length, twining in an anti-clockwise direction. Stem cylindrical normally spineless, 1-8 mm in diam, edible aerial tubers or bulbils freely produced in the leaf axils.

TUBERS:- Underground tubers are smaller than those of most other *Dioscorea spp.*, sometimes absent, when produced, tubers are often in pairs, outer covering hard, flesh bitter and unpalatable, underground tuber skin red or brown, flesh white, aerial tubers large, liver shaped. Normally 0.5 kg, sometimes up to 1.2 kg.

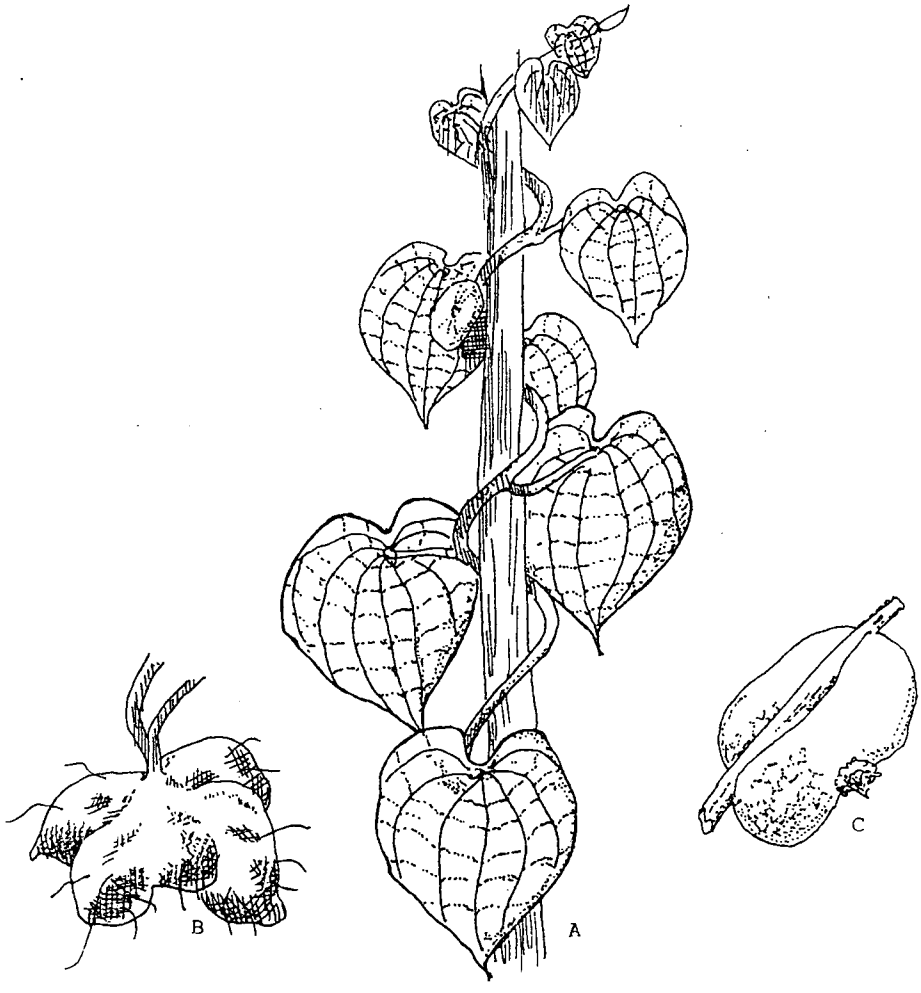
LEAVES:- Simple, pale green, either alternate or opposite, rarely stipulate, cordate at the base, acuminate, up to 30 cm in length, petiole and large at the base, often with projections encircling the stem.

FLOWERS:- Dioecious, unisexual, larger than those of most cultivated yams, sessile, perianth green, white or pink, spreading, male spikes slender, up to 20 cm in length, female spikes usually paired, ovary inferior.

FRUIT:- Elongated, 3-locular, winged, 2-5 cm in length, 1-5 cm in diam. Seeds surrounded by membranous wing, flattened rarely formed under normal cultural conditions (Tindall, 1993).

DISTRIBUTION:-

Origin is Asia in the Indo-Malaysian region and spreading later to the South Pacific and the West Indies. Wild forms grow in both Asia and Africa and it appears possible that a centre of diversity also existed in Africa. It is cultivated in South-East Asia (India, Malaysia, Thailand, Sri Lanka, the Philippines), Pacific Islands, China, West Africa, South and Central America (Tindall, 1993).



Dioscorea bulfifera

(A) Plant. (B) Tuber. (C) Aerial tuber.

EDIBLE PARTS:-

The tubers

FOOD USE:

Tubers are boiled and eaten.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 74 g, Energy - 102 kcal, Protein - 1.5 g, Fat - 0.2 g, Carbohydrate - 24 g, Calcium - 12 mg, Phosphorus - 35 mg, Iron - 0.8 m, Thiamine - 0.1 mg, Riboflavin - 0.01 mg, Niacin - 0.8 mg, Vitamin C - 15 mg (FAO, 1972).

ENVIRONMENTAL RESPONSE:-

Cultivated in both wet and dry areas. For optimal growth well distributed rainfall of 1000-1500mm is required. Well drained soils with a high organic content are suitable for water yam. Photosensitive and day length less than twelve hours are needed for tuberization, grows at altitudes below 1000 m.

CULTIVATION:-

Planting materials - It is propagated vegetatively by means of tuber cutting, small tubers and aerial tubers, but the normal method is cutting of tubers.

Area for cultivation - Although it can be grown in both the wet and dry zones in most cases it is cultivated in mid-and low-country wet zone.

Planting season - generally the *Yala* season is suitable. When planting is done in April or mid May, harvest can be obtained in December and January .

Land preparation - It involves clearing of land and making either planting holes or trenches. If planting holes are used, it should be 60 x 60 x 60 cm and 90 cm apart. When trenches are used for planting the width and depth should be 60 cm and 90 cm between two trenches.

Planting and space - The usual practice is to plant one sprouted seed set or yam, per pit, at a depth of about 15 cm. In trenches, sprouted seed yams or sets are planted at a spacing of 90 cm, to a depth of 5 cm. After emergence the vines are stalked. Bamboo to 4 m tall can be used for stalking.

Fertilizer - It responses well to organic manures. Farmyard manure at the rate of up to 20 t/ha is applied.

Irrigation - Since yams are normally planted at the beginning of the rains, they mature towards the end of the wet season, irrigation is not normally required.

Time to harvest - The crop is usually ready for harvest around December -January. About this time the leaves begin to wither and finally drop

Harvesting - The yams are lifted by digging them out.

STORAGE:-

The tubers should be firm and free of obvious defects such as bruises or cuts incurred during harvesting since several post-harvest fungi can invade the damaged tubers. Generally they are kept for a reasonably long period if they are stored in a cool dry place.

FAMILY:- DIOSCOREACEAE

BOTANICAL NAME:- ***Dioscorea esculenta***

Syn: D. crispata, D. heterophylla, D.S. sativa

VERNACULAR NAMES:-

SINHALA	:	*Kukulala, Katukukulala, Javala*
TAMIL	:	*Mothakavalli*
ENGLISH	:	Potato yam, Aerial yam, Air potato

DESCRIPTION:-

A climbing vine, up to 2-3 m, stems climbing in an anti-clockwise direction. Roots fibrous, roots near the soil surface often spiny. Stem cylindrical, spiny, relatively weak, 1-3 mm in diameter, sometimes purple at base.

TUBERS:- Small, ovoid separate, 5-20 per plant, almost cylindrical, up to 10 cm in diameter, 10-20 cm in length, skin sometimes covered in fine root hairs, otherwise smooth, flesh yellow or white with sweet flavour, no toxic alkaloids, little fibre.

LEAVES:- alternate, smooth textured, 10-12 cm in length, 10-15 cm across, apex acute, petioles hirsute, often with 4 spines at base.

FLOWERS:- Dioecious, unisexual plants disecious, male flowers in spike like racemes, female flowers also in spikes, flowering is rare in most cultivars. Seeds are rarely produced (Tindall, 1993).

DISTRIBUTION:-

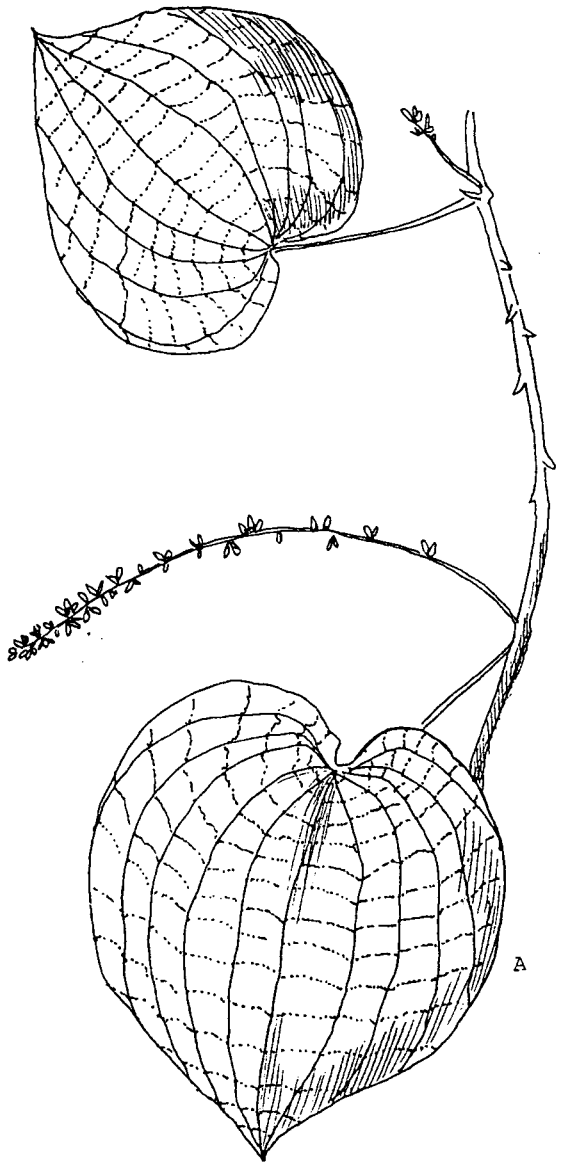
Native of Indo-China (Ustimenko, 1989), possibly Burma and Assam (Tindall, 1993) and now widely grown in Tropical Asia, Oceanic, West Indies and Africa.

EDIBLE PARTS:-

The aerial bulbils and tubers.

FOOD USE:-

Aerial bulbils and tubers are boiled and eaten.



Dioscorea esculenta

(A) Portion of the stem.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Tuber)
Moisture - 70 g, Energy - 112 Kcal, Protein - 3.5 g, Fat - 0.1 g, Carbohydrate - 25 g, Calcium - 62 mg, Phosphorus - 53 mg.

(Bulbil)
Moisture - 79 g, Energy -78 kcal, Protein 1.4 g, Fat - 0.2 g, Carbohydrate - 18 g, Calcium - 40 mg, Phosphorus - 58 mg, Iron - 2 mg (FAO, 1968).

Pounded tubers are used on swellings; the decoction is given for rheumatism and as a diuretic. Tuber is a fair source of Vitamin B (De Pauda and Pancho, 1989).

ENVIRONMENTAL RESPONSE:-

Cultivated in both wet and dry areas. for optimal growth well distributed rainfall of 1000-1500mm is required. Well drained soils with high organic content are suitable for water yam. Photosensitive and day length less than twelve hours needed for tuberization, grown at altitudes below 1000 m.

CULTIVATION:-

Planting materials - It is propagated vegetatively by means of tuber cutting, small tubers and aerial tubers, but the normal method is cutting of tubers. Area for cultivation - Although it can be grown in both wet and dry zone in most cases it is cultivated in mid- and low country wet zone.

Planting season - generally the *Yala* season is suitable. When planting is done in April or mid May, harvest can be obtained in December and January .

Land preparation - It involves clearing of land and making either planting holes or trenches. If planting holes are used, it should be 60 x60x 60 cm and 90 cm apart. When trenches are used for planting the width and depth should be 60 cm and 90 cm between two trenches.

Planting and space - The usual practice is to plant one sprouted seed set or yam, per pit, at a depth of about 15 cm. In trenches, sprouted seed yams or sets are planted at a spacing of 90 cm, to a depth of 15 cm. After emergence the vines are stalked. Bamboo to 4 m tall can be used for stalking.

Fertilizer - It responses well to organic manures. Farmyard manure at the rate of up to 20 t/ha is applied.

Irrigation - Since yams are normally planted at the beginning of the rains and they mature towards the end of the wet season, irrigation is not normally required.

Time to harvest - The crop is usually ready for harvest around December -January. About this time the leaves begin to wither and finally drop.

Harvesting - The yams are lifted by digging them out.

STORAGE:-

The tubers should be firm and free of obvious defects such as bruises or cuts incurred during harvesting since several post-harvest fungi can invade the damaged tubers. Generally they are kept for a reasonably long period if they are stored in a cool dry place.

FAMILY:- DIOSCOREACEAE

BOTANICAL NAME:- ***Dioscorea pentaphylla***

VERNACULAR NAMES:-

SINHALA	:	*Katuala, Katavala*
TAMIL	:	*Allai*
ENGLISH	:	Buck yam.

DESCRIPTION:-

Root-tubers 5-6 feet long, stem slender, glabrous, more or less prickly, especially towards the base, often tuberiferous in the leaf axils.

LEAVES:- Alternate, 3-5 foliate, glabrous or sparingly pubescent beneath, petiole 1-4 inches, leaflets 2-6 inches, shortly petiolate, oval obovate or lanceolate, acuminate, suspidate or sub-caudate, membranous, base acute, lateral oblique at the base.

FLOWERS:- Male flowers in very slender racemes 0.5 -1.5 inches, long which are solitary or binet on a slender flexuous tomentose rhachis 6-12 inches long, female flowers in axillary, flexuous, pendulous, tomentose spike 2-6 in long. Flowers in August. Pale greenish fragrant.

FRUITS:- 3/4 inches long, quadrantly oblong, refuse at both ends, glabrous. Seeds 0.5 inches long wing terminate, longer and broader, the short oblique nucleus (Dassanayake et al., 1995).

DISTRIBUTION :-

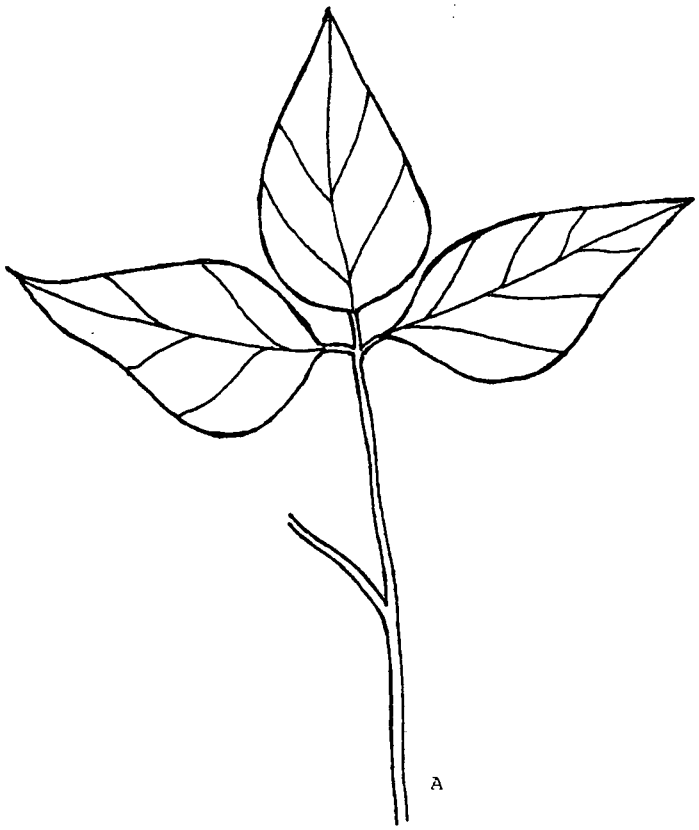
Native of South-East Asia. It is not cultivated, grows naturally in the warmer, moist areas in Sri Lanka.

EDIBLE PARTS:-

The tubers.

FOOD USE:-

Steam boiled tubers are eaten.



Dioscorea pentaphylla

(A) Branch. (B) Tuber.

FAMILY:- DIOSCOREACEAE

BOTANICAL NAME:- ***Dioscorea spicata.***

VERNACULAR NAMES:-

SINHALA : *Gonala*

DESCRIPTION:-

Root-tubers 0.6-1.0 m long, by 6 cm diameter, or more, pale brown, stem very long, upto 7 m very slender. Sparingly prickly glabrous, green, nottled with brown, not tuberiferous.

LEAVES:- Alternate, 5-25 cm long polymorphous from linear-oblong or lanceolate to oval, or orbicular, acute, acuminate, cuspidate, or caudate, 3-5 really 7 veined base cuneate or rounded. Petiole 2 cm stout, often prehensile.

FLOWERS:- Male spikes 8-20 cm, long, axillary or clustered very slender, quite glabrous really branched. Flowers sessile, 0.1202.0 cm in diameter, female flowers distant in solitary,axillary, pendulous spikes 15-30 cm long, glabrous. Flowers in September to January.

FRUIT:- Transively oblong, 3.7-5 cm diam, refuse at both ends coriaceous, carpels 0.5 circular or broader than long. Seeds broadly winged all round (Dassanayake et al., 1995).

DISTRIBUTION:-

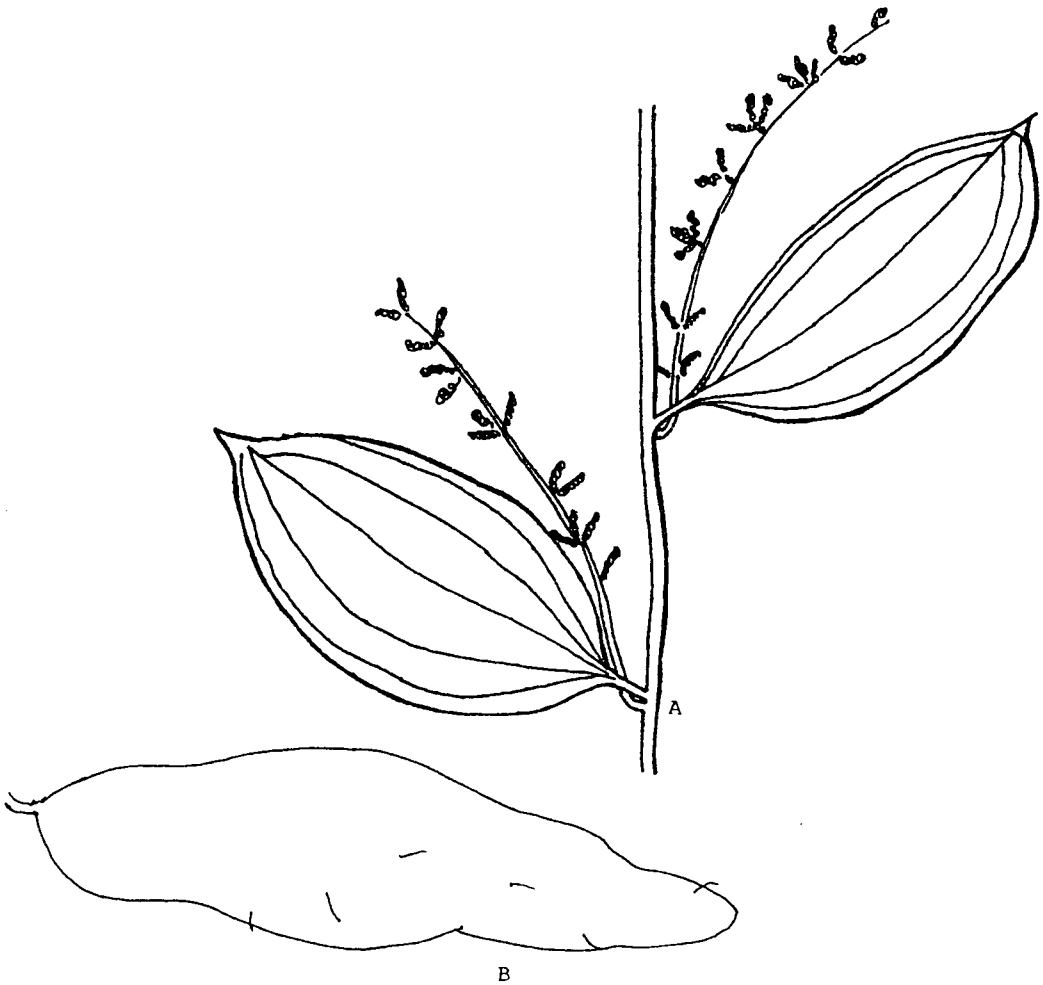
It is endemic to Sri Lanka.

EDIBLE PARTS:-

Tubers

FOOD USE:-

It is boiled or steamed and eaten.



Dioscorea spicata

(A) Branch. (B) Tuber.

FAMILY:- DIPTEROCARPCEAE

BOTANICAL NAME:- ***Shorea megistophylla***

VERNACULAR NAMES:-

SINHALA : *Mahaberaliya, Honda beraliya, Kana beraliya*

DESCRIPTION:-

Medium sized tree to large tree 40 m tall, 3 m girth, with dense hemispherical growth. Bark surface towny brown.

LEAVES:- Lamina (10,5)13 - 23 x (4)5 -15 cm, large, oblong- elliptic, thickly coriaceous, drying chocolate to reddish brown.

FLOWERS: Panicle 13 long, 3 mm diameter, at base, with prominent bract scars, regularly alternately branched, erect, the branchlets 3 cm long and bearing 6 flowers. Flowers are white as also the inflorescence, calyx and overy. Flowering between February and April.

FRUITS:- Pedicel 8 mm long, stout, broadening into the fruit, 3 longer sepals 6 x 2 cm, broadly speculate, obtuse, tapering to 8 mm broad above the 13 x 5 mm broadly elliptic saccone thickened base 2 shorter leaves 15 -12 mm, ovate, subacuminate. 3 X 1,8 cm ovoid, prominently apiculate (Dassanayake and Fosberg, 1980)

DISTRIBUTION:-

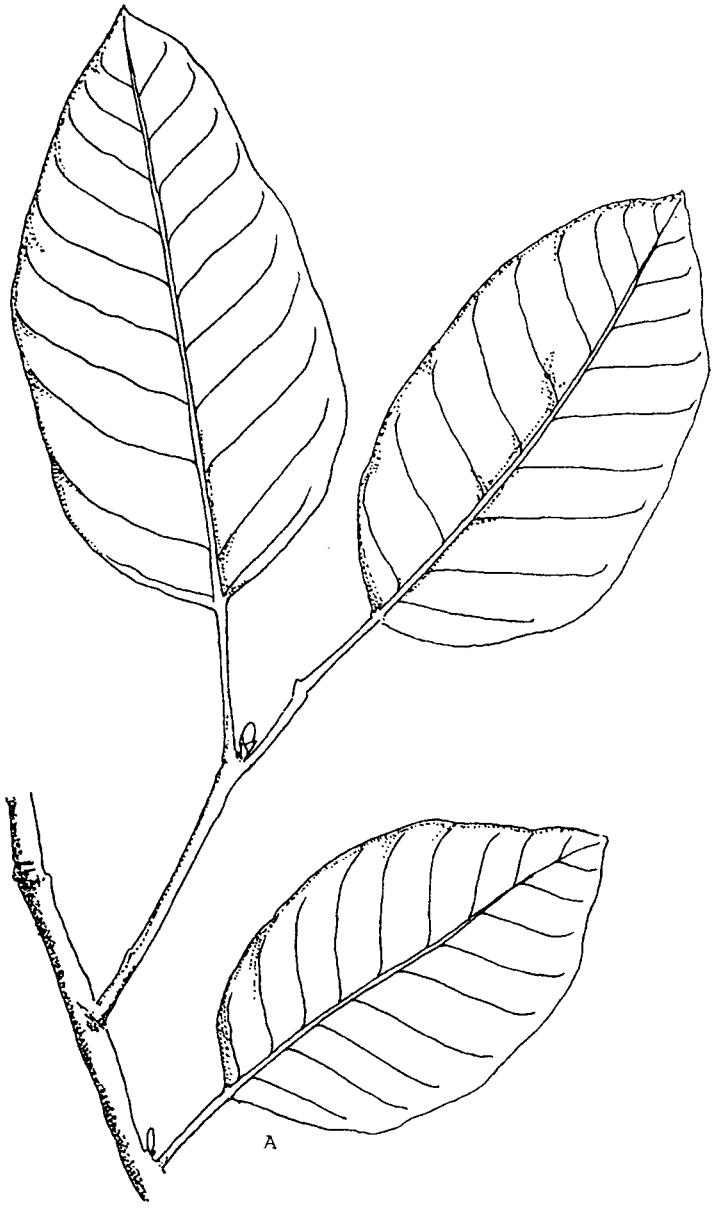
Shorea megistophylla is an endemic plant to Sri Lanka (Bandaranaike and Sultanbawa, 1991). It is widely distributed in rainforests in Sabaragamuwa and Western parts of the Southern Province (Dassanayake and Fosberg, 1980).

EDIBLE PARTS:-

The fruits.

FOOD USE:-

Dried fruit ground into flour is used in traditional preparations such as *pittu*.



Shorea megistophylla

(A) Branch.

OTHER USERS:-

Resin oozed out from the bark is used in traditional festivals.

STORAGE:-

Dried fruits are kept for a long time. Parboiling will increase the storage period of the seed.

FAMILY:- DIPTEROCARPCEAE.

BOTANICAL NAME:- ***Vateria copallifera***

VERNACULAR NAMES:-

SINHALA : *Hal*

DESCRIPTION:-

A large tree, 40 m tall, 4 m girth under forest conditions, but never so large in cultivation branches dense, ascending. Twigs and panicles densely persistently draw fulvous tufted tomentose.

LEAVES:- Lamina 11-50 x 5 x 18 cm large, broadly to narrowly oblong, thickly coriaceous, drying to dull towny - brown, with obtuse to cordate base and 8 mm long short abrupt tapering acute acumen.

FLOWERS:- Panicles 25 cm long, 4 cm diameter, at base, stout, with 12 cm long branches bearing 8 more or less seasonal flowers; bracts 10 x 6 mm, ovate, concave, acute. Flower bud 12 x 8 mm, lanceolate, relatively large, sepals hastate, subequal, imbricate at base only, subacute, petals cream, oblong, stamens 45-55, anthers yellow.

FRUITS:- Nut 111 x 7 cm, very large, ovid, apiculate, with 2.5 cm thick fibrous spongy pericarp and deeply imprened base (Dassanayake and Fosberg, 1980).

DISTRIBUTION:-

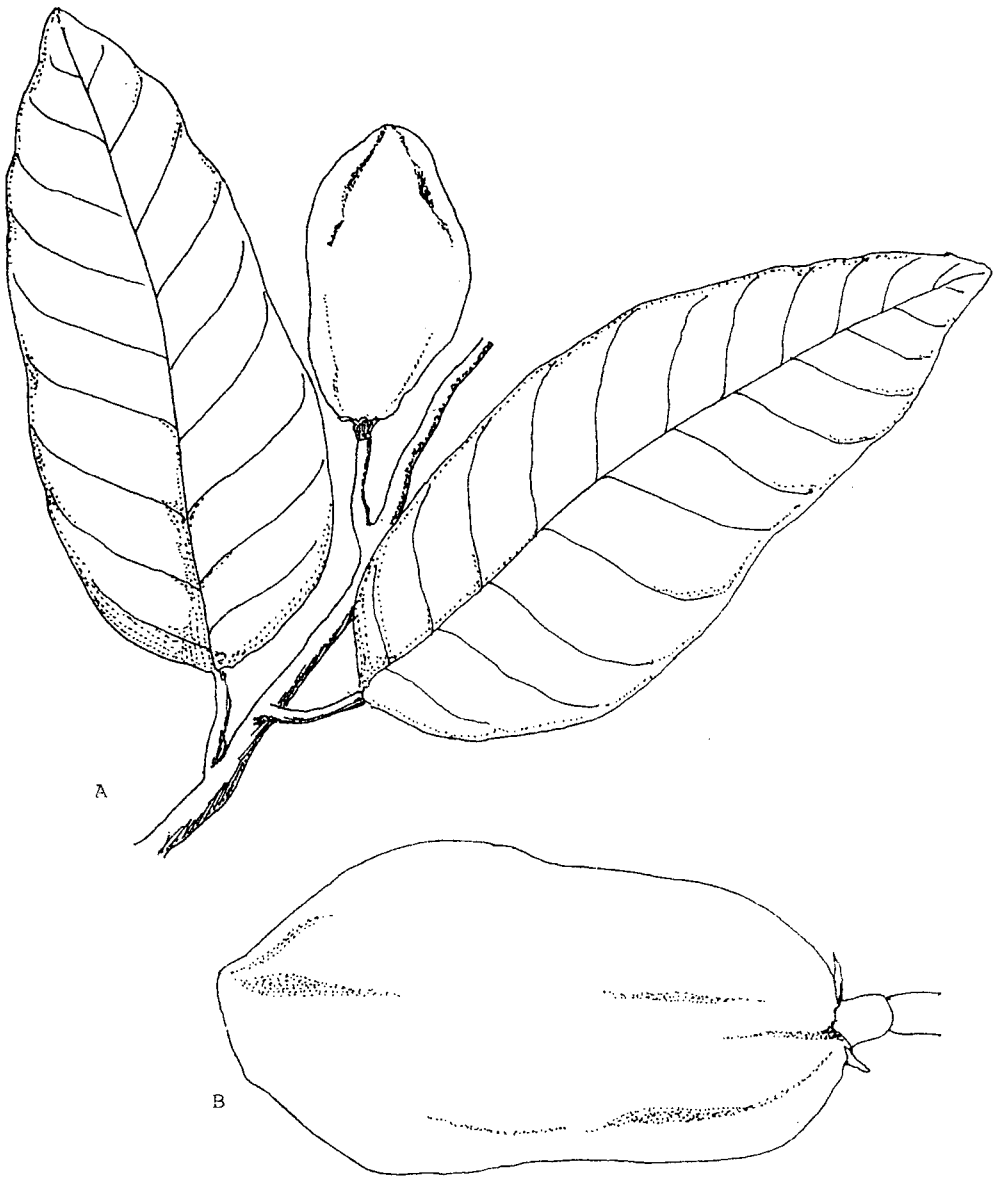
Vateria copallifera is endemic to Sri Lanka (Bandaranaike and Sultanbawa, 1991). Widespread in the wet zone, below 1000 m altitude from Colombo to Matara and Kandy (Dassanayake and Fosberg, 1980).

EDIBLE PARTS:-

The fruit

FOOD USE:-

The fruit is scraped and washed properly to remove the bitter taste (In villagers, scraped fruit is put into a gunny bag and kept in a water steam for one day to remove the bitter taste). Thereafter it is mixed with rice flour and the mixture is used in various traditional preparations.



Vateria copallifera

(A) Branch with a fruit. (B) Fruit.

OTHER USES:-

Resin is used for preparation of paints. Wood can be used in many ways, and specially used to manufacture tea boxes. Bark of the tree is added to pots which collect sap in coconut and kitul tapping to avoid the fermentation of the sap.

FAMILY:- EBENACEAE

BOTANICAL NAME:- ***Diospyros malabarica***

Syn: *D.glutenifara, D.embryopteris, D.peragrina, D.glutivosa, Embryototeris glutanifera, Garainia malabarica*

VERNACULAR NAMES:-

SINHALA	: *Thimbiri*
TAMIL	: *Tambilik-kay, Panichchai*
ENGLISH	: Riber Ebony

DESCRIPTION:-

A moderate-sized or large tree with a blakish bark, flaking off in pieces and many spreading branches, forming dense, wide head, young parts silkay.

LEAVES:- Simple, alternate, without stipules, numerous, 12.5-17.5 cm long, 2.5-9.0 cm long broad, oblong or oblong-lanceolate.

FLOWERS:- Small, regular, unisexual, yellow, sweet-scanted, dioecious, male flowers rather small, 2-5 together. Female flowers solitary, much larger than male, 2.5 cm diameter on short pedicels.

FRUITS:- Large, 3.7-8.7 cm diameter, subglobose, very thick, covered with a hard, rushy mealieness, readily detached, yellow, pericarpthia, pulp viscid and glutiaous seeds 4-8 oblong, flattened, smooth, reddish brown, embedded in the pulp (Jayaweera, 1980)

DISTRIBUTION:-

It orgiginated probably in South and Southeast Asia. Grows in India, Sri Lanka, Burma, Thailand, Malay Archipelago and Java. In Sri Lanka, it is common in the dry zone lowlands, specially by streams and lakes.

EDIBLE PARTS:-

Fruits.

FOOD USE:-

Tender portion around the seed is eaten as mangosteen.

Diospyros malabarica

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

A poultice of the bark can be applied to boils and tumours; a decoction of the bark mixed with ghee is a very efficacions dressing for burns. A powder of the root bark can be given like coffee for coughs. An extract of the fruit in doses of one to fine grains with water, three times a day is an excallent remedy for chronic diarrhoea and dysentry (Jayaweera, 1980).

The fruit juice is an efficacions agent which checks bleeding. An infusion of the fruit is an excellent gargle for sore throats.

In the past, labour rooms in village houses were made out of *thimbiri* which gave darkness and this has been found to be good for the new born baby. Therefore the labour room was called "Thimbiri Geya". This was also the wood used for making furniture for the labour room since the wood contains antiseptic properties. The oil extracted from the seeds called *Tunika* oil is used with success in diarrhoea and dysentery (Fernando, 1993).

OTHER USES:-

The viscid juice of the fruit is used for daubing the bottoms of boats and an infusion of it for staining fishners. Timber is used in many ways.

FAMILY:- ELAEOCARPACEAE

BOTANICAL NAME:- ***Elaeocarpus serratus***

Syn: *Canarium albnm*

VERNACULAR NAMES:-

SINHALA	:	*Veralu*
TAMIL	:	*Veralikkai*
ENGLISH	:	Ceylon Olive

DESCRIPTION:-

A moderate sized tree, with a rather broad or irregular crown. Branches-crowded, leaves scarred. Bark gray or grayish brown, rather smooth.

LEAVES:- Crowding, about 2-4 inches by 1 to 1.5 oval, tapering at base often slightly bladed on petiole, glabrous, dark green above, pale below, becoming dull yellow before falling.

FLOWERS:- Numerous, small about 1.5 inches diameter, white of an offensive sickly odour. Inflorescence in axillary racemes the flowers hanging and alternatively arranged.

FRUITS: A drupe, ovoid, smooth, about 1 or 1.5 inches long, with fleshy pulp of a sub acid flavour (when ripe), very astringent (when unripe) (Dassanayake et al.,1995).

DISTRIBUTION:-

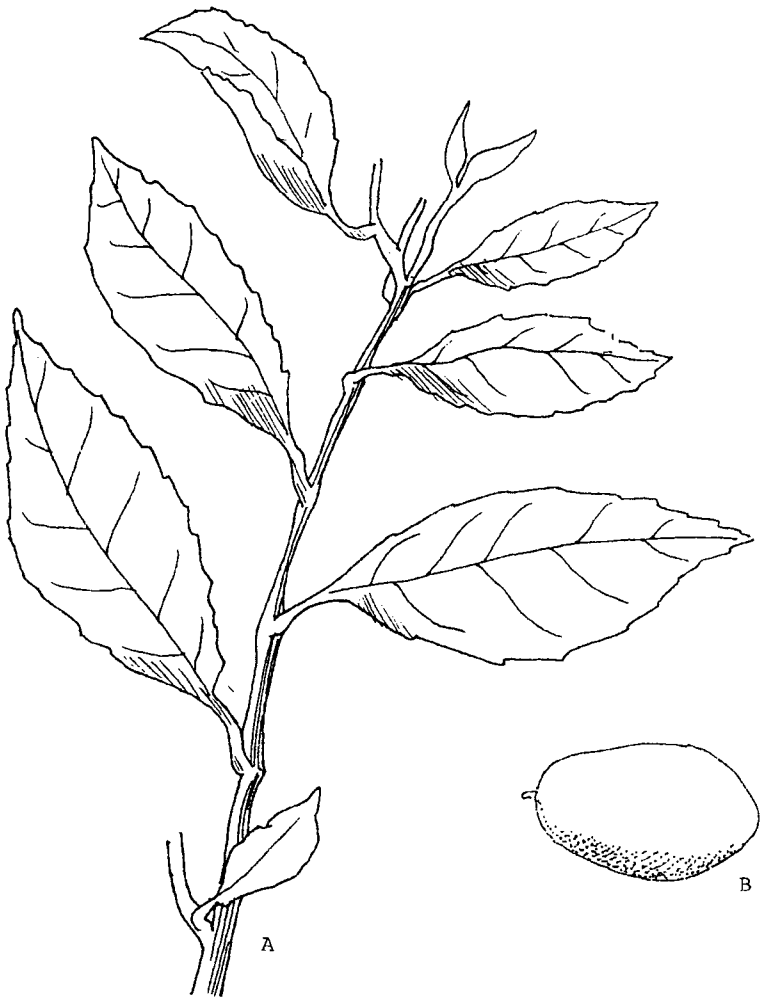
A common tree in the dump forests in the West and center of the Island up to 800 m especially in the intermediate zone. Some of it is relatives - *Gal veralu*, *Thiththa veralu* - are endemic to Sri Lanka which grows in Sinharaja forest.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Ripe fruit is eaten fresh matured fruits either eaten boiled or fresh. It is used in preparation of salads. A delicious drink can be made with blended fruit pulp, milk and sugar.



Elaecarpus serratus

() Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 80.2 g, Energy - 72 kcal, Protein - 1.2 g, Fats - 1.2 g, Carbohydrate - 16.2 g, Calcium - 18 mg, Phosphorus - 29 mg, Iron - 2.1 mg, Carotene - 330 mg, Thiamine - 20 mg, Riboflavin - 110 mcg, Niacin - 0.4 mg, Vitamin C - 20 mg (Perera et al., 1979).

The fruit of the species has been used as a cure for tapeworm. Leaf juice is good for drandruff (Department of Ayurveda).

CULTIVATION:-

It is grows in a wild and semi-wild state and also in home gardens.

STORAGE:-

Undamaged mature fruits can be stored for one week. Ripe fruits are not suitable for storing due to their soft skin.

FAMILY:- EUPHORBIACEAE

BOTANICAL NAME:- ***Antidesmaa bunius***

VERNACULAR NAMES:-

SINHALA : *Karawala Keballa*

DESCRIPTION:-

Small tree, with grayish-brown bark, young parts pubescent.

LEAVES:- Rather large, 4-6 inches, lanceolate or obovate- lanceolate, tapering at base, slightly acuminate, apiculate, glabrous and shining.

FLOWERS:- Numerous, rather lax, male sessile, female slightly stalked. (Trimen, 1974)

DISTRIBUTION:-

Sri Lanka, India, Burma and Malaysia (Trimen, 1974).

EDIBLE PARTS:-

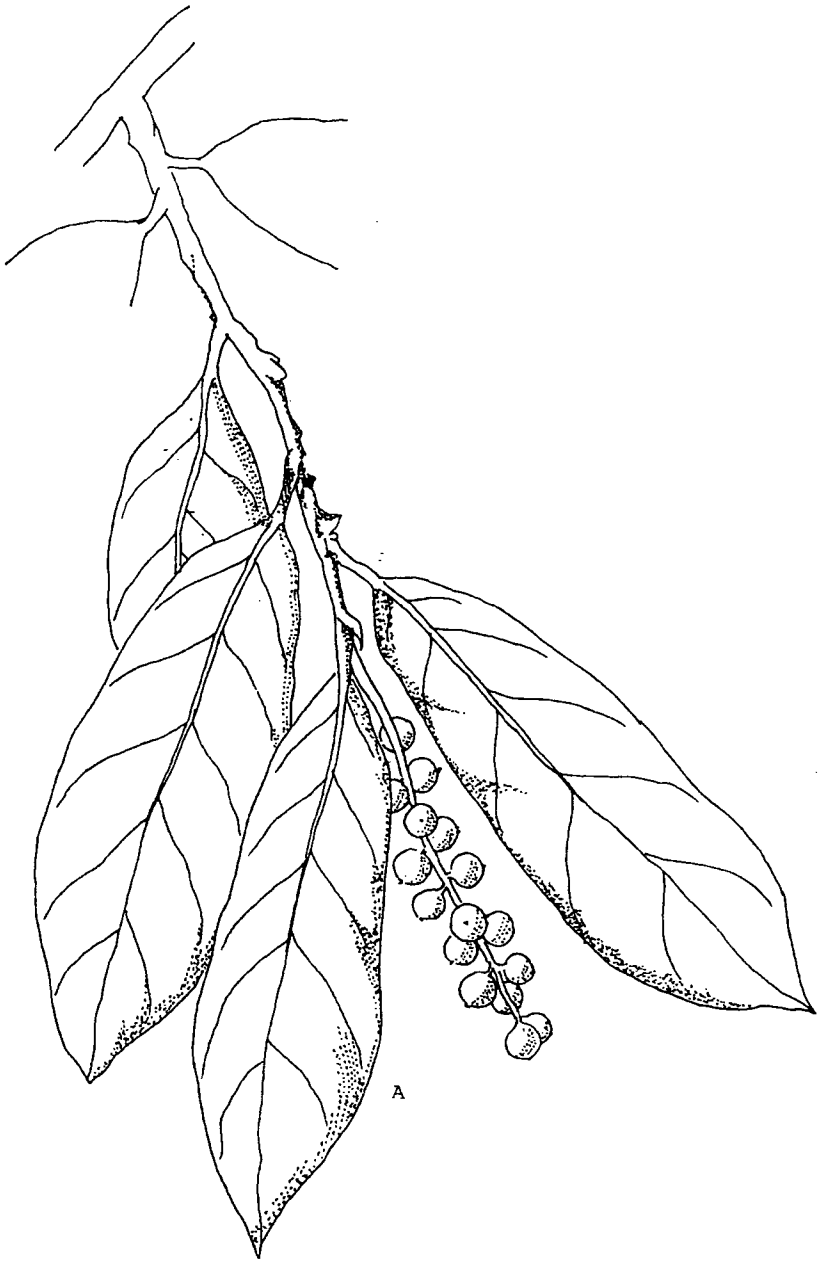
Fruit

FOOD USE:-

Ripe fruit is eaten fresh

NUTRITIONAL AND THERAPEUTIC VALUE:-

Young leaves are used to treat for piles. Fruits are used to prepare a medicine for eyes.



Antidesmaa buninus

(A) Branch.

FAMILY:- EUPHORBIACEAE

BOTANICAL NAME:- ***Baccaurea metleyana***

VERNCULAR NAMES:-

SINHALA : *Gadu Guda, Muna Mudakkan*
ENGLISH : Rambeh, Rambai

DESCRIPTION:-

A handsome tree up to 20 cm high.

LEAVES:- Large oval leaves.

FRUIT:- Smooth velvety berries, 3-4 cm in diameter and become yellow when ripe. The flesh is whitish translucent, the segments containing the seeds and has a sweet acid taste (Macmillan, 1956).

DISTRIBUTION:-

Native to South East Asia. It was introduced to Sri Lanka in 1883. It grows well in the wet zone (Macmillan, 1956).

EDIBLE PARTS:-

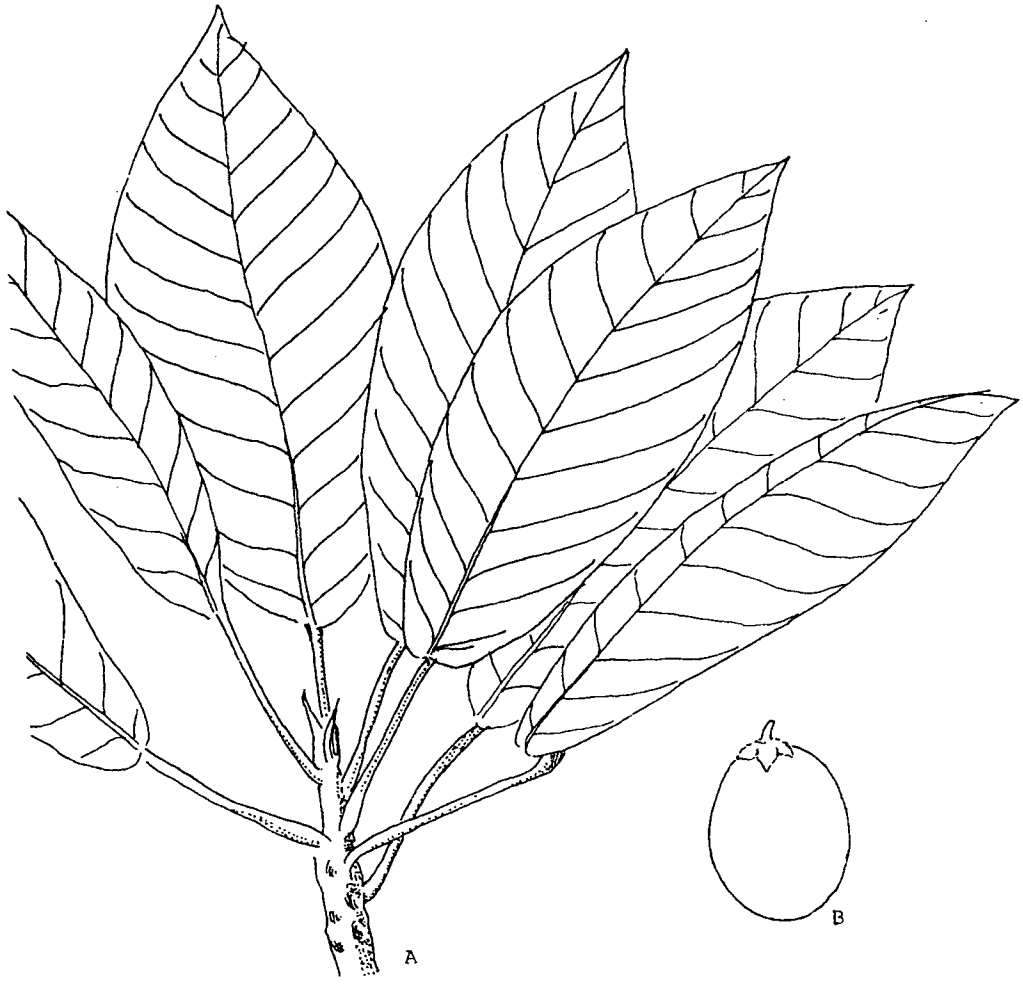
The fruit

FOOD USE:-

Sour, sweet inner portion of ripe fruit is eaten fresh.

CULTIVATION:-

Propergated by seed. It is cultivated in homegardens.



Baccaurea metleyana

(A) Branch. (B) Fruit.

FAMILY :- EURPHORBIACEAE

BOTANICAL NAME:- ***Drypetes sepiaria***

VERNACULAR NAMES:-

SINHALA : *Wira*
TAMIL : *Virai, Weerapalam*

DESCRIPTION:-

A moderately large tree with very grooved stem, more or less buttressed at the base. Bark pale gray, and dull white, smooth, rather thin, branches very irregular, often clustering and sending up erect shoots, twigs numerous.

LEAVES:- Alternate, very variable in size, about 5 cm long by 3 cm wide, ovate or broadly oval, subcordate at base, rounded at apex, entire, stiff, dark glossy-green above, dead green below.

FLOWERS:- Small, pale yellowish-white, opetalous. Males in axillary clusters, females nearly stalkless.

FRUIT:- Small, bright red, very sweet much eaten by bears(Trimen, 1974).

DISTRIBUTION:-

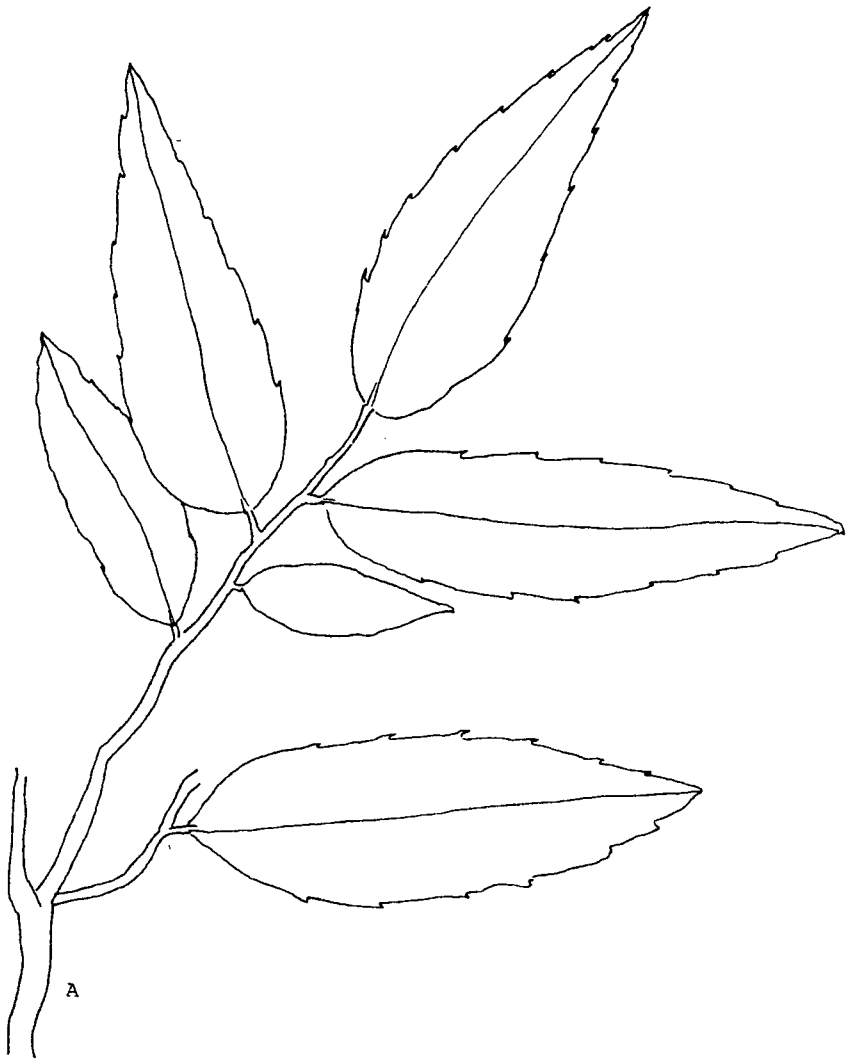
Endemic to Sri Lanka (Trimen, 1974).

EDIBLE PARTS:-

The fruit

FOOD USE:--

Ripe fruits are eaten fresh.



Drypetes sepiaria

(A) Branch.

FAMILY:- EUPHORBIACEAE

BOTANICAL NAME:- ***Manihot esculentus***

Syn: *M. utilissima, M. aipi, M. dulais, M. palmera*

VERNACULAR NAMES:-

SINHALA	:	*Mangnokka, Maiyokka*
TAMIL	:	*Maravalliklangu*
ENGLISH	:	Cassava, Manioc

DESCRIPTION:-

The manioc plant is also called tapioca plant or cassava. It has tall thin stems which show along their length leaf scars. The stem displays a range of colours varying from green, greenish white light red or deep red, depending on the variety. The plant possesses large edible roots rich in starch, and it is for these tubers the plants are cultivated.

LEAVES:- The colour of the petioles, as well as the veins of the leaves, correspond to the colour of the stems in each case. The leaves are either 5 or 7 lobed depending on the variety .

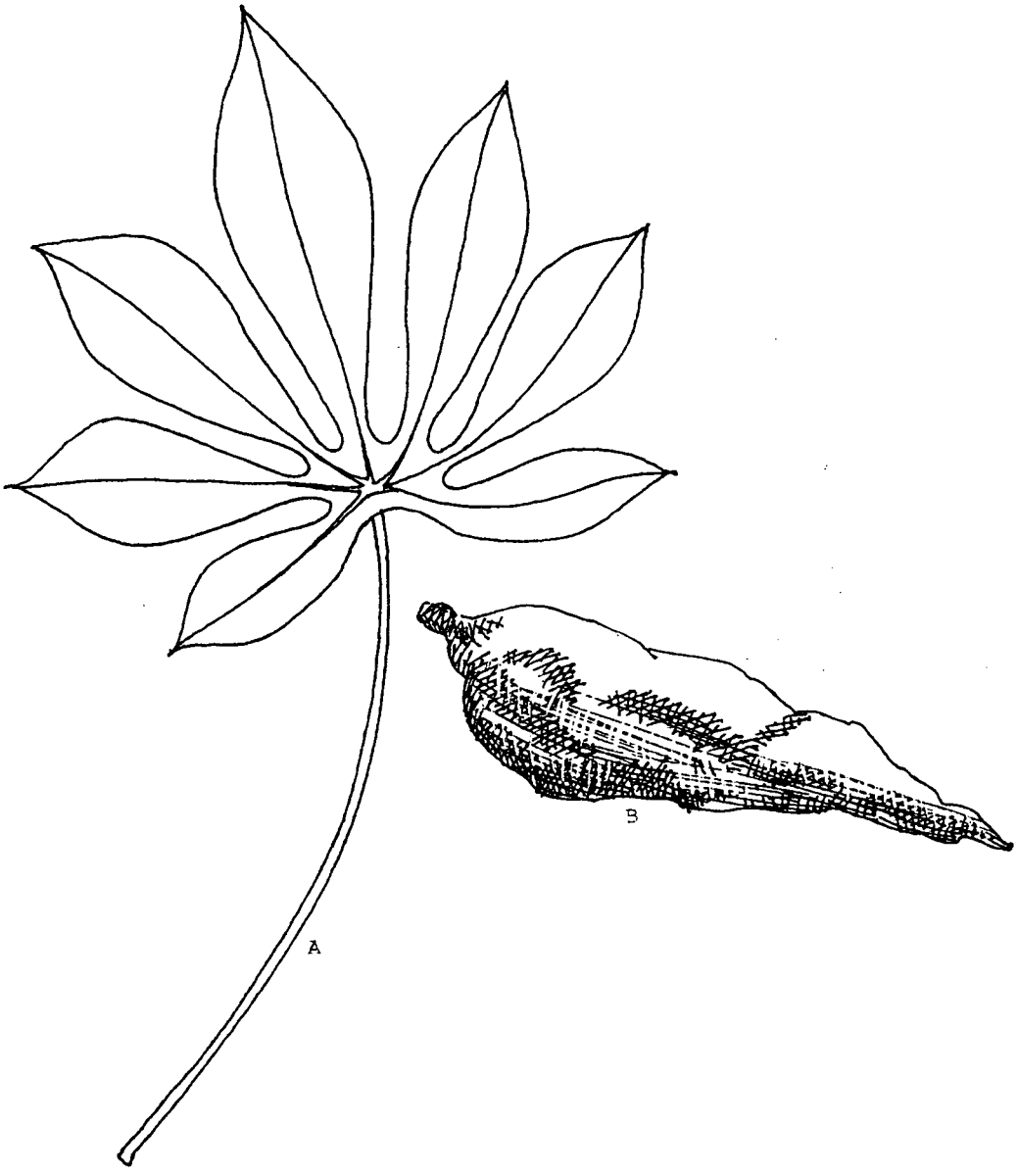
FLOWERS:- The plants do not flower under cultivation. The family is characterized by the possession of unisexual flowers, which may occasionally undergo abortion (Tindall, 1993).

DISTRIBUTION:-

It is a plant of the New world. It originated from two centers in America, i.e. (i) Mexico and parts of Guatemala, (ii) North-Eastern Brazil. Cassava was taken from Brazil to Re'umon in 1739 and then to Madagascar. It was brought to Sri Lanka from Mauritius in 1786 and to Calcutta in 1794 (Tindall, 1993).

EDIBLE PARTS:-

The roots and young leaves



Manihot esculantus

(A) Leave. (B) Root.

FOOD USE:-

Mature roots can be prepared in various ways. It is either boiled and eaten or cooked as a curry. In Africa, a paste is prepared using manioc flour. Boiled tubers are sliced into chips and sun-dried. They can be used during food scarcity. Young leaves are used as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Root)
Moisture - 59.4 g, Energy - 157 Kcal, Proteins - 0.7 g, Fats - 0.2 g, Carbohydrates - 38.1 g, Calcium - 50 mg, Phosphorus - 40 mg, Iron - 0.9 mg, Thiamine - 50 mcg, Riboflavin - 100 mcg, Niacin - 0.3 mg, Vitamin C - 25 mg.

(Leaves)
Moisture - 91.0, Energy - 28 kcal, Protein - 2.0 g, Fat - 0.3 g, Carbohydrates - 4.0 g, Calcium - 80 mg, Iron - 2.5 mg, Carotene - 300 mcg, Thiamine - 80 mcg, Riboflavin - 200 mcg, Niacin - 0.5 mg, Vitamin C-50 mg. (Perera et al., 1979).

Pounded leaves are applied as a compress to the head in fevers and headaches. Decoction of the bark of the trunk is considered antirheumatic. Bark decoction is anthelmintic. The pounded tuber is applied to ulcerated wounds; also considered antiseptic, and is used to preserve meat. Starch from tuber is used for rash of children (Pauda et al., 1987).

ENVIRONMENTAL RESPONSE:-

Tolerant to a wide variation of environmental conditions. Sandy or sandy loam soil is preferable. Optimal temperature for ideal growth is around 25^{0}C. It is a short day plant. Required rainfall is between 500-2500. Grows well altitudes below 1500 m.

CULTIVATION:

Areas for cultivation - The crop can be grown successfully in the low-country and mid-country wet zones and in drier areas.

Planting season - In the drier areas the crop is planted during *Maha*. In the low-country and mid-country wet zone, it can be planted both during the *Maha* and *Yala* seasons.

Land preparation - Land preparation involves the loosening of the soil to a depth of about 30 cm, as the roots of manioc go deep into the soil. The land should be ploughed and the soil well prepared by breaking down the colds, removing stubble and roots etc., and bringing the soil to a loose condition.

Planting material - It consists of stem cuttings obtained when harvesting a previous crop. A cutting of about 20 cm and having 4-6 nodes from the middle portion of the stem constitutes the best planting material. The cutting should have a slanting cut to enable the cuttings to be pushed into the soil.

Spacing - The cuttings should be planted erect, into the moist soil so that about 3 nodes show above ground. There are other ways of planting where cuttings are laid flat and pushed into the soft mud, and slanted planting. Manioc cuttings are best spaced 1 m each way.

Irrigation - Rarely necessary since the crop is generally established before the end of the wet season.

Fertilizer - NPK may be applied before planting to ensure early and adequate leaf production.

Time to harvest - Maturity of the roots can be determined by digging a few trees before harvest. In general, yellowing of the leaves, and the development of brown layers of cork on the stem are signs of maturity of the roots.

Harvest - Manioc is harvested by carefully digging round the plants, so as to avoid damaging the roots.

STORAGE:-

It is not advisable to store harvested manioc for more than 24 hours. As such, the harvest should be so staggered to lift only quantities as immediately required at any one time.

FAMILY:- EUPHORBIACEAE

BOTANICAL NAME:- ***Phyllanthus emblica***

Syn: *Embilica Officinalis*

VERNACULAR NAMES:-

SINHALA	:	*Ambula, Awusada-Nelli, Nellika*
TAMIL	:	*Amalagam, Nellikkai*
ENGLISH	:	Emblic Myrobalan Tree, Indian Gooseberry, Anola

DESCRIPTION:-

A small or middle-sized tree, about 10 m high, with a crooked trunk and spreading branches, bark thin, grey with numerous bosses whence arise the leaf-bearing branchlets, young parts pubescent.

LEAVES:- Simple, alternate very numerous, closely placed distichous, overlapping spreading, nearly sessile, about 1.2 cm long, linear strap-shaped, rounded at base, subacute, glabrous paler beneath.

FLOWERS:- Unisexual, small, greenish yellow, monoecious, apetalous and axillary; male flowers very small, numerous on slender pedicels in axillary fascicles; female flowers few nearly sessile; Flowers during October

FRUIT:- Globose 1.2-1.6 cm diameter, fleshy, pale green or yellow of 3 sub-dehiscent, 2-seeded, crustaceous cocci enclosed in a thick fleshy coat; seed 6, trigonous (Jayaweera, 1980).

DISTRIBUTION:-

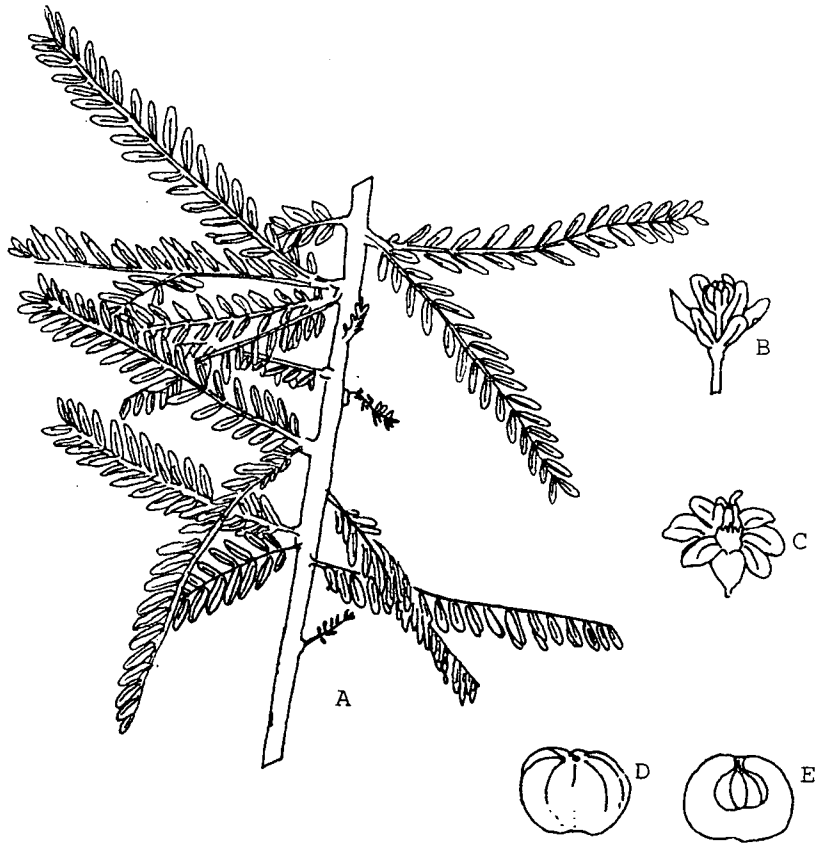
Indian gooseberry is said to be indigenous to tropical and sub-tropical parts of India, Sri Lanka, Malay, Peninsula and China (Firminger, 1947). In Sri Lanka it is very common in exposed places on patana land in the moist regions upto 1300 m altitude.

EDIBLE PART:-

The fruit

FOOD USE:-

Riped fruit is eaten fresh. Various syrups are made from fruits.



Phyllanthus emblica

(A) Branch. (B) Male flower. (C) Female flower. (D) Fruit. (E) Longitudinal section.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 81.8 g, Energy - 58 Kcal, Proteins - 0.5 g, Fats - 0.1 g, Carbohydrates - 13.7 g, Calcium - 50 mg, Phosphorus - 20 mg, Iron - 1.2 mg - Carotene - 9 mcg, Thiamine - 30 mcg, Riboflavin - 10 mcg, Niacin - 0.2 mg, Vitamin C - 600 mg (Perera et al., 1991).

The pericarp of the fruit is often used in decoctions along with other ingredients and externally on boils with cow ghee to promote suppuration. The root bark and fruit are astringent. The unripe fruit is cooling, laxative and diuretic. Exudation from incisions on the fruit is applied externally on inflammation of the eye. The juice of the bark with honey and turmeric is given for gonorrhoea. An infusion of the leaves with fenugreek seed is given for chronic diarrhoea. The fruit is rich in Vitamin C and A. A decoction of the fruit with stems of *Tinospora cordifolia* is a well-known remedy for various urinary diseases (Jayaweera, 1980).

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Arachis hypogaea***

VERNACULAR NAMES:-

SINHALA	:	*Kaju-Kadala, Kirikaju, Ratakaju.*
TAMIL	:	*Nilakkadalai, Verkkadalai*
ENGLISH	:	Ground nut, Peanut, Earth nut.

DESCRIPTION:-

An annual herb about 30 cm high with a thick, erect, angular more or less hairy, pale green stem and several elongated prostrate branches.

LEAVES:- Alternate, long stalked with large, stiff, erect, linear, attenuate stipules agnate for about half their length to the petioles, abruptly pinnate with two pairs of opposite leaflets, leaflets 2.5-5 cm long, broadly oblong-oval or obovate with a small mucro at apex.

FLOWERS:- Irregular, bisexual, golden yellow, sessile several densely crowded, together in the axils of the lower leaves or solitary, each subtended by a stipule-like eared bract about 1.2 cm long very acuminate, and each with two small opposite linear smaller bracts beneath the calyx.

FRUITS:- Pod about 2.5 cm or more, below the surface of the ground at the extremity of a stiff decurved stalk 5-7.5 cm long, which has grown beneath the ovary after the fall of the flower. Flowers during July and August (Jayaweera, 1981).

DISTRIBUTION:-

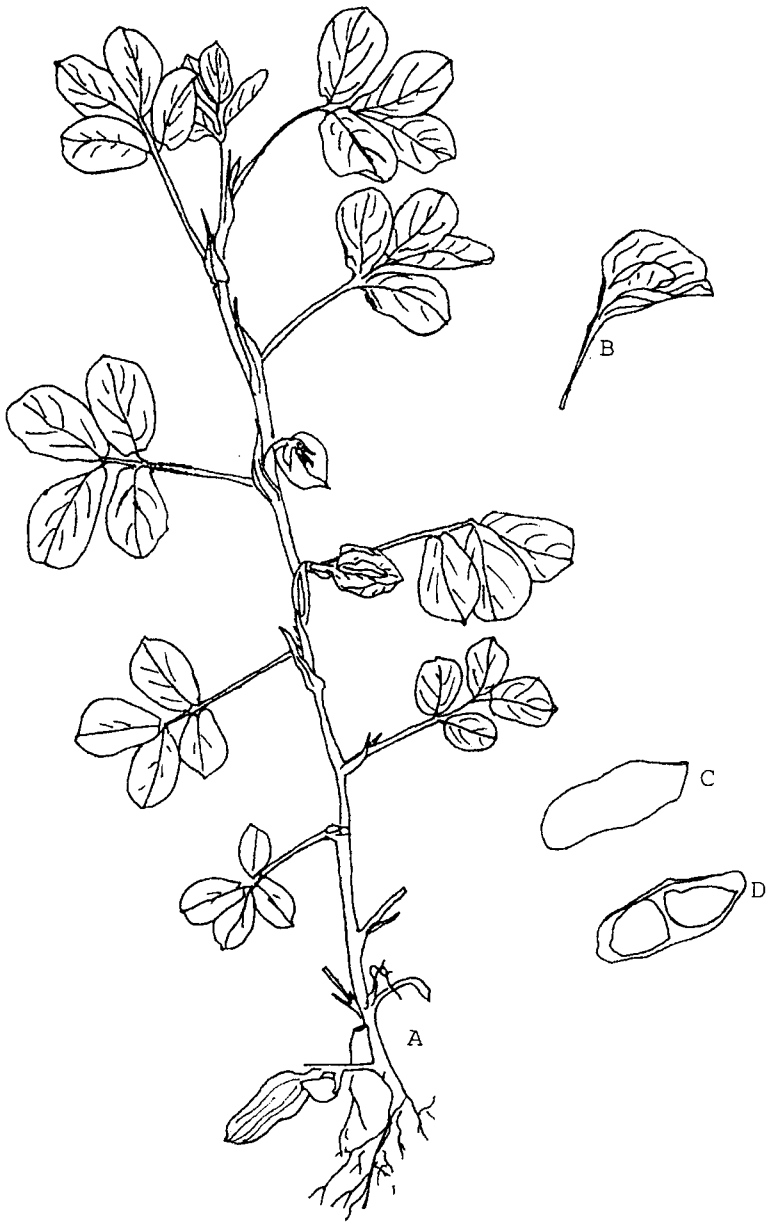
A native of Tropical America (Tindall, 1993 and Querol, 1992). and now widely distributed and cultivated in tropical and sub tropical regions of America, Africa and Asia including India and Sri Lanka.

EDIBLE PARTS:-

The nut.

FOOD USE:-

Fried or roasted nuts are eaten as a snack. Edible seed oil is widely used in culinary purposes. It is used for confectioneries. Pea nut butter is popular since it is cholostrol free.



Arachis hypogaea

(A) Whole plant. (B) Flower. (C) Fruit. (D) Fruit opened.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 3 g, Energy - 567 Kcal, Proteins - 25.3 g, Fats - 40.1g, Carbohydrates - 26.1 g, Ca - 90 mg, Phosphorus - 350 mg, Iron - 2.8 mg, Carotene - 37 mcg, Thiamine - 900 mcg, Riboflavin - 130 mcg, Niacin - 19 mg (Perera et al., 1979).

The oil extracted from the seed contains glycerides of palmitic, oleic, stearic, lignoceric, linoleic and arachidic acids. The peanut meal contains sugar, starch and nitrogenous and fatty matter. Three alkaloids, betaine, choline and arachine are found in the seed (Jayaweera, 1981).

OTHER USES:-

As it belongs to the family *Fabaceae* it can fix atmospheric nitrogen. Therefore it is widly used in crop rotation and mixed cropping.

ENVIRONMENTAL RESPONSES:-

Well drained, loose in texture soils are suitable. Required high organic matters, calcium, potassicum and phosphorus content. Although ideal soil pH is 6.5, most varieties are tolerent to wide range of pH.

Average temperature should be 22-27^{0}C. Rainfall of 750-1250 mm is required for optimal growth. A dry period is required for the ripening of the underground fruits. All types of ground nut are daylength neutral.

CULTIVATION:-

Areas for cultivation - Soils suitable for ground nut cultivation are present extensively in the Northern, North-Central and Eastern Provinces in Sri Lanka.

Planting season - Ground nuts can be grown in the *Yala*, anywhere in the dry zone provided irrigation facilities are available. Under rainfed conditions in the Northern, North-Central and Eastern Provinces, ground nuts are cultivated in the *Maha*, where the planting commences around mid-October with the first *Maha* rains.

Land preparation - Thorough preparation of the seed bed is essential for ground nuts. A properly prepared soil helps in the penetration of the pegs. For this purpose several tillage operations become necessary. Groundnuts may be planted on the flat or on ridges. Two or three weedings become necessary till the plants produce sufficient foliage to shade out the weeds.

Spacing - The usual spacing adopted for creeping varieties is 30 cm between rows. In the case of erect varieties a spacing of 20 - 25 cm between rows is common.

Seed rate - The seed rate in the case of erect varieties is around 80 kg of shelled nuts per hectare.

Irrigation - In the dry-zone it is suitable to water in *Yala* season but a heavy rate of watering will reduce the yield.

Fertilizer - If the soil is adequaltely supplied with the major nutritionts, no additional fertilizer is generally required.

Time to harvest - In erect varieties flowering commences in 60 days and the bulk of the flowering is completed in a fortnight. Harvesting can be commenced in about 100 days.

Harvest - Samples should be pulled out of the ground to see whether the pods have matured. All the plants can be pulled out with the pods, by tugging from the base. With creeping varieties however,other difficulties arise since these varieties set pods all along the creeping stem, and the whole field has to be dug up during harvest.

Yeilds - Yeilds vary according the duration of life cycle, climate and crop density from 500-1500 kg seeds per hectare.

FAMILY :- FABACEAE

BOTANICAL NAME:- ***Cassia auriculata.***

Syn :- Senna auriculata

VERNACULAR NAMES:-

SINHALA	:	*Ranawara*
TAMIL	:	*Avarai*
ENGLISH	:	Tanner's cassia

DESCRIPTION:-

A large, much branched shrub with smooth cinnamon brown bark and closely pubescent branchlets.

LEAVES:- Alternate, stipulate, paripinnate compound, very numerous, closely placed, rachis 8.8-12.5cm long,narrowly furrowed, slender, pubecent, with an erect linear gland between the leaflets of each pair, leaflets 16-24, very shortly stalked, 2-2.5 cm long, 1-1.3 cm broad.

FLOWERS:- Irregular, bisexual, large, bright yellow nearly 5 cm across. Flowers from February to March. (Jayaweera, 1981).

DISTRIBUTION:-

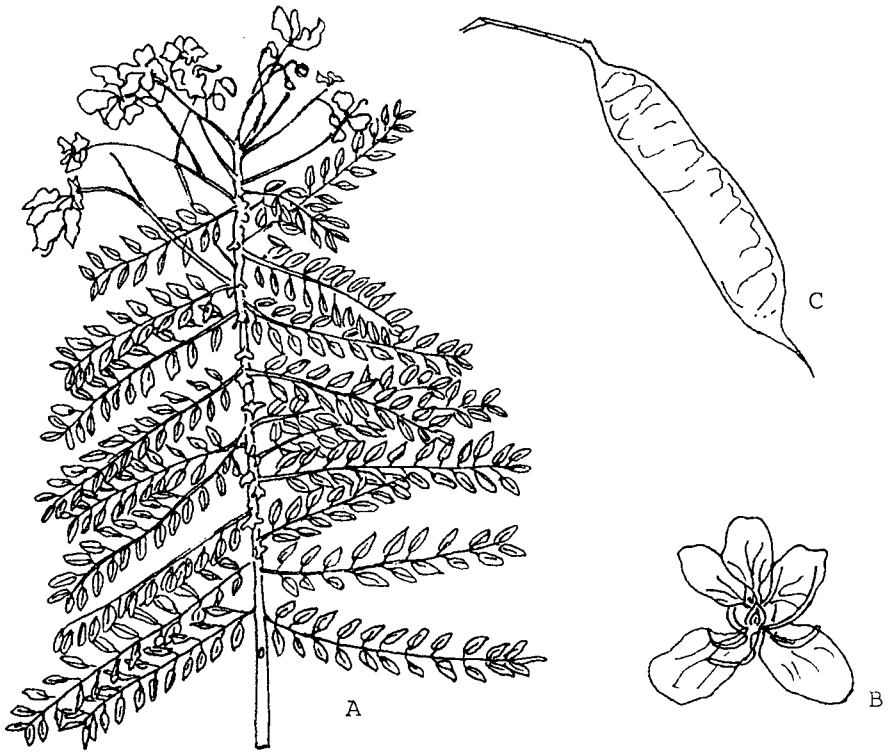
Origin is India. Grows in the dry regions of India and Sri Lanka and is naturalized in Tanganyika. It is common along the see coast and the dry zone in Sri Lanka (Jayaweera, 1981).

EDIBLE PARTS:-

The leaves and flowers.

FOOD USE:-

Leaves and flowers are eaten as a vegetable. Infusion of flowers is occasionally used as a drink.



Cassia auriculata

(a) Branch. (B) Flower, front view. (C) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

This plant is said to contain a cardiac glucoside, sennapicrin and saponin. The leaves and bark yield oxymethylanthraquinone, while the latter contains tannin in addition. The root is used in decoctions for fevers, diabetic diseases of the urinary system and constipation. The leaves have laxative properties. It is also supposed to improve complexion in women. The powdered seed is also used for diabetes and applied to the eye, in cases of chronic purulent conjunctivitis. In Africa, the bark and seeds are used for rheumatism, eye diseases, gonorrhoea, diabetes and gout (Jayaweera, 1981).

STORAGE:-

Flowers are sun-dried.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Cassia occidentalis***

VERNACULAR NAMES:-

SINHALA	:	*Penithora*
TAMIL	:	*Nettandagarai, Peyavirai*
ENGLISH	:	Fetid cassia

DESCRIPTION:-

A coarse annual, 30-90 cm high, stem slightly branched nearly glabrous, furrowed, purplish.

LEAVES:- Alternate, stipulate, paripinnate leaflets 8 or 10, on very short stalks, 5-10 cm long, narrowly ovate-lanceolase, rounded or unequal at base, gradually attemuasea to a very acute apex, glabrous, very shin dark green above.

FLOWERS:- Irregular, bisexual, large, bright orange,yellow, 3 cm or more across, pedicel 1.2 cm long; usually in pairs at the axils of leaves. Sepclss pete is 5.

FRUITS:- A legume 8.8-11.5 cm long 6 cm wide, erect, stiff, linear, slightly compressed between the seeds. Seeds 20-30, compressed ovoid, polished at one end, shining, very hard olive green. Flowers in March, June etc (Jayaweera, 1981).

DISTRIBUTION:-

It is a native of Tropical America and grows in the Tropics including India, Sri Lanka and Philippine Islands. It is very common in the low country in Sri Lanka (Jayaweera, 1981).

EDIBLE PARTS:-

Leaves

FOOD USE:-

Young leaves are eaten as a green vegetable

Cassia occidentalis

(A) Terminal portion of branch. (B) Fruit pod. (C) Flower lateral view. (D) Flower with the perianth removed showing the stamns and the pistil.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 84.9 g, Energy - 49.0 kcal, Protein - 5.0 g, Fat - 0.8 g, Carbohydrates - 5.5 g, Calcium - 330.0 mg, Phosphorus - 52 mg, Iron - 12.7 mg, Vitamin C - 17.9 mg. (Gopalan et al., 1971).

The plant is purgative, tonic and febrifuge. It is used for rheumatism, fever and dropsy. Externally, it is used in the form of an ointment for ringworm, eczema and other silicon diseases. The root is used in intermittent fevers and as a tonic and diabetes in dropsy and liver complaints. The plant is a snakebile remedy.

FAMILY:- FABACEAE.

BOTANICAL NAME:- ***Cassia tora***

Syn :- Senna tora

VERNACULAR NAMES:-

SINHALA	:	*Peti-tora.*
TAMIL	:	*Senavu.*
ENGLISH	:	Fetid cassia.

DESCRIPTION:-

An annual fetid herb, 30- 90 cm high with spreading glabrous branches.

LEAVES:- Alternate, stipulate, paripinnate compound, rachis 2.5-5 cm long, stout, furrowed, slightly pubescent with a linear, yellow gland above between the leaflets of the lower one or two pairs of leaflets, leaflets three pairs in all, very shortly stalked, 2.5-3.7 cm long, the terminal pair the largest.

FLOWERS:- Irregular, bisexual, pale orange, yellow, about 1.8 cm across solitary or in pairs axillary, pedicels slender, 1.8 cm long, flowers from January to August (Jayaweera, 1981).

DISTRIBUTION:-

Grows throughout the tropics generally including India, Sri Lanka and Philippine Islands. It is found in the low country in Sri Lanka by roadsides and is very common in the waste grounds of the dry regions (Jayaweera, 1981).

EDIBLE PART:-

Leaves

FOOD USE:-

Young leaves are eaten as a green vegetable.

Cassia tora

(A) Branch. (B) Lateral view of flower. (C) Longitudinal section of flower.

The seeds contain a glucosidal substance somewhat similar to emodin in composition, phytosterine and glucosenine. The leaves contain a principle similar to cathartic. The leaves are laxative and are useful in habitual constipation and hemorrhoids. The seeds have antiparasitic properties and are applied on ringworm and scabies. In the Philippine Islands the entire plant in decoction is given as a vermifuge and purgative. In Indo-China the pods are used for dysentry and ophthalmia. In China the seeds are used both externally and internally for all types of eye diseases, liver complaints and boils (Jayaweera, 1981).

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 85.7 g, Energy - 45.0 kcal, Protein - 4.0 g, Fat - 0.5 g, Carbohydrates - 6.1 g, Calcium - 397.0 mg, Iron - 83.0 mg, Carotene - 25.0 mcg, Thiamine - 30.0 mcg, Riboflavin - 300.0 mcg, Niacin - 1.2 mg, Vitamin C - 99.0 mg (Gopalan et al., 1971).

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Cynometra cauliflora***

VERNACULAR NAMES:-

SINHALA	:	*Naminan, Nan-nan*
ENGLISH	:	*Num-num*

DESCRIPTION:-

A small tree about 15 m tall.

LEAVES:- Leaves with 1 pair of leaflets, leaflets obovate to obovate-oblong or obovate-lanceolate, about 5.5-16.5 cm long, 1.6-5.6 cm wide, obtuse or brevicuminate at the apex, glabrous on both surfaces, sometimes pubescent on the petiolules.

FLOWERS:- Inflorescences cauliflorous, usually on the trunk, sometimes on the roots, bracts 10 mm long, bractelts 1,5 mm long, inserted on the pedicels about 3-3-6 mm long.

FRUITS:- The fruit is a large, wrinkled, thick, fleshy seeded pod , rather semi-circular shape in large numbers on trunk near the ground or on the lower most portitions of the branches, cheifly in May and June (Macmillan, 1956).

DISTRIBUTION:-

A native of Malaysia and India (Macmillan, 1956; Wickramarachchi, 1988) introduced in to Sri Lanka in the early period, apparently before mid- 18th century.

EDIBLE PARTS:-

The fleshy fruit .

FOOD USE:-

The fleshy fruit is eaten fresh. It is also cooked and eaten.

Cynometra cauliflora

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The seeds yield a medicinal oil.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Dialium ovoideum***

VERNACULAR NAMES:-

SINHALA	:	*Galsiyabala*
TAMIL	:	*Kaduliem Palam, Kallu-pullium*
ENGLISH	:	Velvet Tamarind.

DESCRIPTION:-

A moderately large tree, with pale brown or light reddish gray bark. Branches slender, smooth.

LEAVES:- Rather small, imparipinnate, rachis from 2 to 3 inches, thin, cylindrical, smooth. Leaflets 2 pairs, and a terminal one alternate about 1 inch on short talks, lanceolateorovate, rounded base, bluntly acuminate, dark glossy green.

FLOWERS:- Very small, white, arranged in erect many forked pyramidal terminal panicles.

FRUITS:- Pod nearly an 2.5 cm in diameter, and nearly round, densely coated with velvetty brown hairs. Seed solitary, coated with a fine spongy matter of a sweetish-acid flavour (Trimen, 1984).

DISTRIBUTION:-

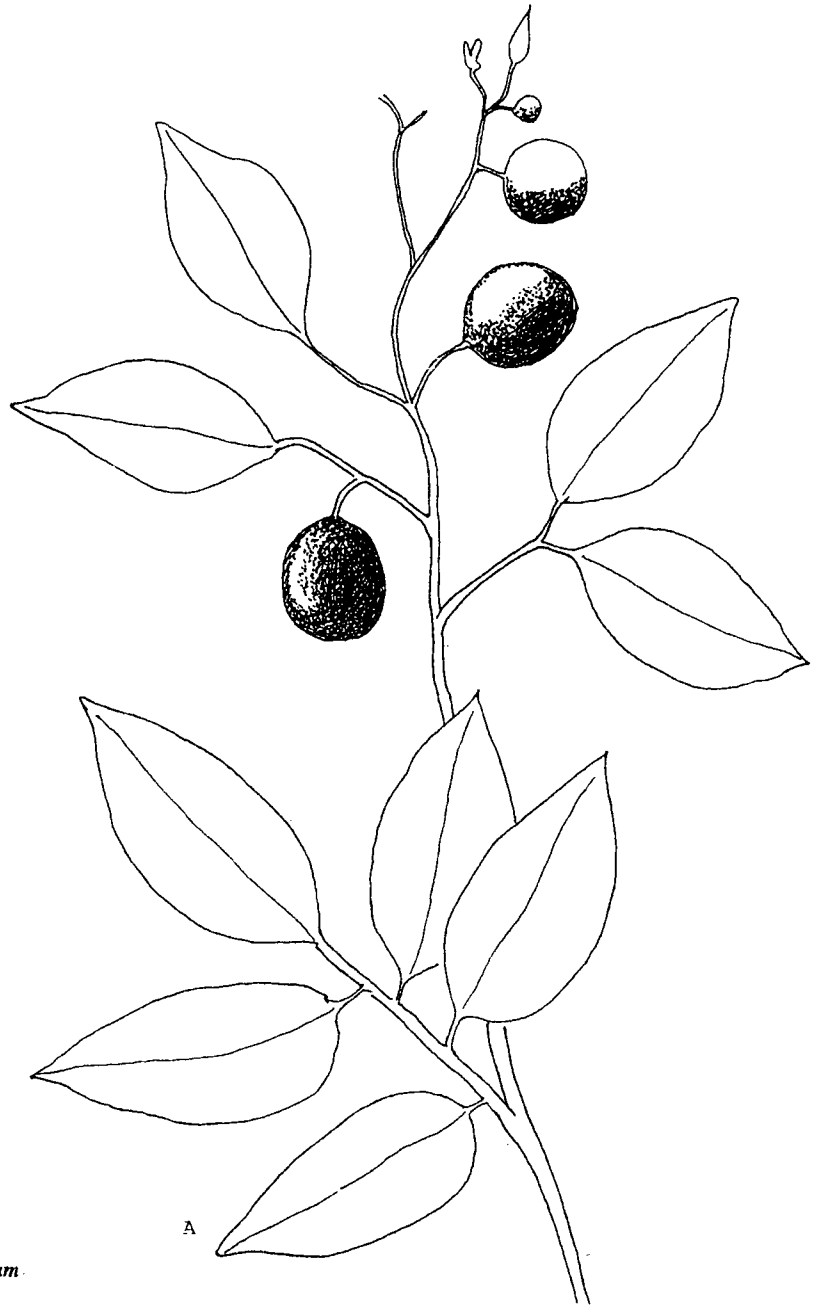
Can be found in Moneragala in Uva, and on the summit of "Westminster Abbey" and Trimen records from the East of Kandy.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Ripe fruits are eaten fresh as a fruit.



Dialium ovoideum

(A) Branch with fruits.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Dolichos biflorus***

Syn :- D. uniflorus

VERNACULAR NAMES:-

SINHALA	:	*Kollu*
TAMIL	:	*Kollu*
ENGLISH	:	Horse Gram, Madras Gram

DESCRIPTION:-

An annual hairy herb with nearly erect stems and climbing branches.

LEAVES:- Compound, trifoliate, leaflets nearly equal, often lobed, 2.5-5 cm long, ovate-lanceolate, entire, acute, lateral leaflets nearly sessile and the terminal one stalked;

FLOWERS:- Yellow 1.2-1.8 cm long, solitary or in small, axillary, nearly sessile, clusters, bracts lanceolate, calyx-tube very short. Flowers in August and September.

FRUITS:- Pod flat curved, scimitar-shaped, 3-5 cm long, 0.6 cm broad, hairy, tipped with persistent hook-like style base; seeds 5-7, compressed, uniform, gray or reddish brown (Jayaweera, 1981).

DISTRIBUTION:-

A plant of the old world. Cultivated in all tropical countries including India and Sri Lanka. Now its cultivation is extreamly neglected and limited to dry zone areas in Badulla and Digamadulla Districts of Sri Lanka (Jayaweera, 1981).

EDIBLE PARTS:-

The seed

FOOD USE:-

It is boiled and eaten. It is also made into curries.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 11.8 g, Energy - 321 Kcal, Proteins - 22 g, Fats -0.5 g.

Dolichos biflorus

(A) Whole plant. (B) Lateral view flower. (C) Longitudinal section of pod showing seeds.

An infusion of the seed is used in rheumatic complaints, enlargement of the spleen and pain in the liver. A decoction of the seed is given in menstrual derangements and to promote the discharge of lochia. The flour obtained from the seed is applied on the body to relieve profuse sweating (Jayaweera, 1981).

STORAGE:-

Seeds should be cheaved and sun-dried to 10% moisture or less before storage.

FAMILY:- FABACEAE

BOTANICAL NAME :- ***Phaseolus aureus***

Sign: Vigna radiata, V.auraus

VERNACULAR NAMES:-

SINHALA	:	*Mun, Mun-eta*
TAMIL	:	*Passippayaru*
ENGLISH	:	Green Gram, Mung bean.

DESCRIPTON:-

An annual herb with an erect branching stem of about 60 cm covered with spraeding deflexed hairs.

LEAVES:- Alternate, stipulate, 3-foliate with stipels, rachis long, hairy, leaflets 5-7.5 cm long, ovate, acute more or less hairy on both sides, thin, the lateral ones dilated on lower side, stipules peltately attached near the base, ovate, acuminate;

FLOWERS:- Irregular, bisexual, pale yellow, about 1.2 cm long, shortly stalked, 4-6 crowded at the end of stout hairy peduncles shorter than leaves.

FRUITS:- A legume, 5-6.2 cm long, linear, nearly cylindricle, shortly stalked, more or less hairy with spreading hairs; seeds 8-12, small, 3-4 mm long, oblong-ovoid, truncate or blunt at the ends, green or blackish (Jayaweera, 1981).

DISTRIBUTION:-

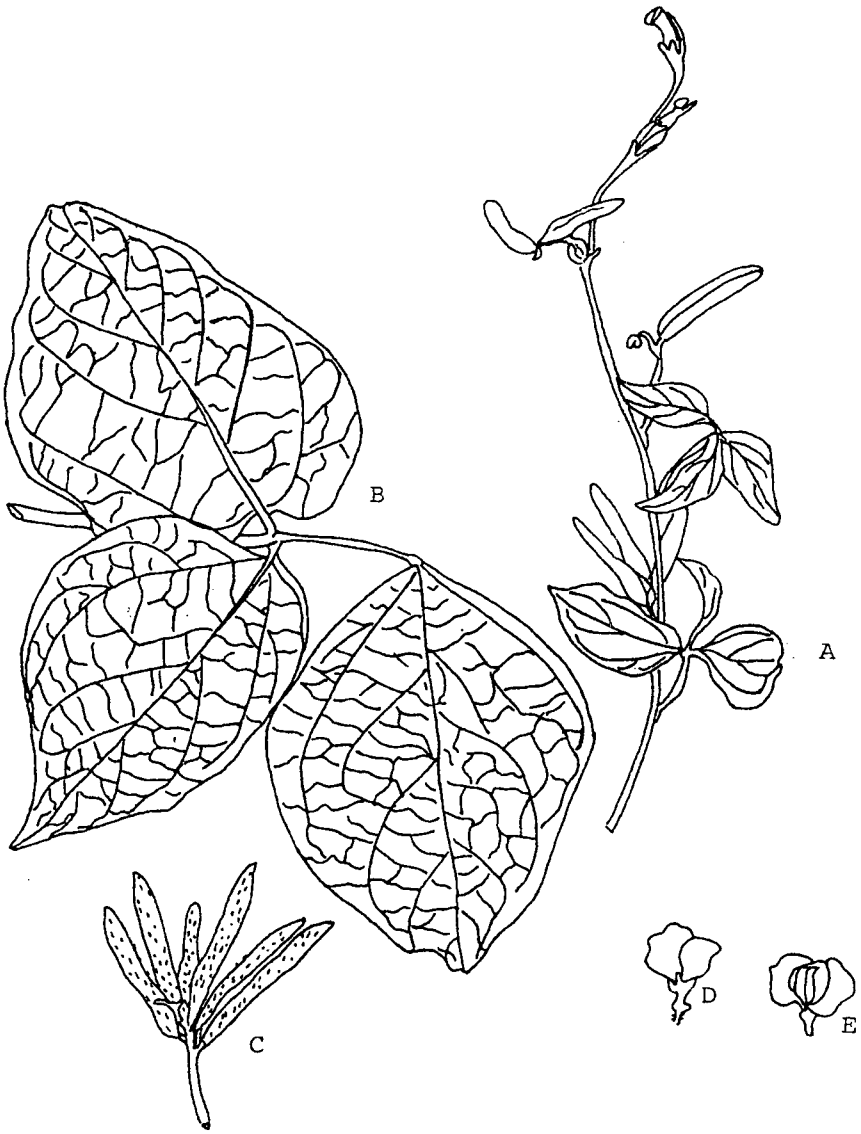
It is a native of India, introduced to Southern China, Indo-China and Indonesia at an early date (Ustimenko, 1980; Tindall, 1993). This herb is extensively cultivated in India, Sri Lanka, Malaysia, China and Philippine Islands. It thrives in the dry regions of Sri Lanka.

EDIBLE PARTS:-

Seeds.

FOOD USE:-

Seeds are boiled and eaten, and also used for curries. Seed flour is used for making of traditional sweet meats. Mun dhal is a good substitute for lentil.



Phaseolus aureus

(A) Twig with leaves, flowers and pods. (B) Leaf. (C) Group of pods. (D) Flower ventral view. (E) Flower front view.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 10.1 g, Energy - 348 Kcal, Proteins - 24.5 g, Fats - 1.2 g, Carbohydrates - 59.9 g, Calcium - 75 mg, Phosphorus - 405 mg, Iron - 8,5 mg, Carotene - 49 mcg, Thiamine - 720 mcg, Riboflavin - 210 mcg, Niacin - 24 mg (Perera et al., 1979).

The seed contains a high percentage of carbohydrates and protein. It is a fair source of vitamin A and B. When the seed is sprouting, it is an excellent source of vitamin C, which is absent in the unsprouted condition. Medicinally it is used externally and internally for paralysis, rheumatism, affection of the nervous system, piles and liver complaints. The root is said to be a narcotic. In Africa, the powdered bean is applied on tumours and abscesses to promote suppuration. It is also a remedy for scorpion sting (Jayaweera, 1981).

OTHER USES:-

It is used in crop rotation as it enriches the soil in nitrogen.

ENVIRONMENTAL RESPONSE:-

Well-drained, fertile, fairly dry soils are preferable grows well even in high temparatures such as 30 - 36^{0}C. Crop is drought-resistant. A rainfall of 700 - 900 mm is adequate for normal growth. It grows at an altitute below 2000 m. Both long and short day varieties are in cultivation, but day length neatral varieties are also in cultivation.

CULTIVATION :-

Areas for cultivation - The unirrigated highlands which would otherwise lie fallow during the *Yala* season offer possibilities for green gram cultivation. The main districts of cultivation are Jaffna, Polonnaruwa, Kurunegala, Badulla, Colombo and Ratnapura.

Planting season - It can be planted mid-season in the *Maha* after the heavy rains have ceased. *Yala* planting is usually around April, with the first light showers, in dry zone areas. In the low country wet zone, mid-season planting is the best.

Land preparation - Land preparation for green gram is similar to that for cereals, except for the fact that most often, a very fine tilt is not attempted, and only a rough tilt is secured. About two cultivations are usually necessary, the first about 20 days after germination, and the second a fortnight later.

Spacing - Green gram can be sown as a pure crop, or as a mixed crop.
When sown as a mixed crop, it becomes usually subordinate to a taller, and longer aged crop. When drilled in rows, a spacing of 25 cm between rows is common.

Seed rate - The seed rate for a pure crop is about 15 kg per ha.

Irrigation - It is grown under irrigation in the *Yala* season and can obtain better harvest than in *Maha*, grown under rainfed conditions.

Fertilizer - Well responds to mineral fertilizer.

Time to harvest - Green pods can be picked for vegetable about 70 days from planting. After a month's time the pods are dry, and the crop is ready for harvest.
Harvest- Plants may be harvested by pulling them out with their roots. They are then stacked for about a week on a threshing floor,after which they may be threshed either by beating with sticks, or trampling with the feet of oxen.

STORAGE:-

Dried, cleaned seeds are stored in a dry place.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Phaseolus mungo***

Syn :- Vigna mungo

VERNACULAR NAMES:-

SINHALA	:	*Undu*
TAMIL	:	*Pani-payir, Ullundu*
ENGLISH	:	Black gram

DESCRIPTION:-

An annual herb with stems 30-60 cm high, clothed with brownish silky hairs.

LEAVES:- Alternate, pinnately trifoliate, leaflets dark green, membranous, 5-10 cm long, stipules persistent and striate.

FLOWERS:- Irregular, bisexual, yellow.

FRUITS:- Pod subcylindric, 3.8-6-3 cm long, hairy with 10-15 green seeds (Jayaweera, 1981).

DISTRIBUTION:-

A native of India and cultivated throughout India (Ustimenko, 1980; Tindall, 1993). It is also cultivated by communities in South East Asian Countries. It has been cultivated from early times.

EDIBLE PARTS:-

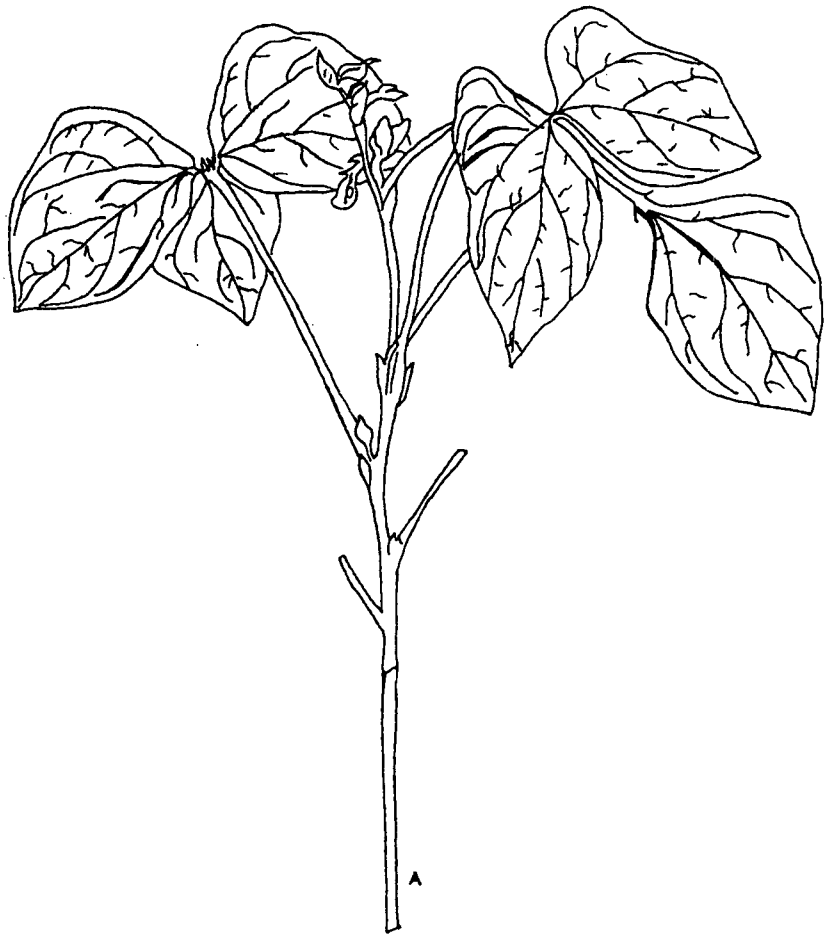
Seeds

FOOD USE:-

It occupies a prominent place in Tamil culinary. Seeds are ground into flour and mixed with rice flour and used in various traditional preparations.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 10.9 g, Energy - 347 Kcal, Proteins - 24 g, Fats - 1.4 g, Carbohydrates - 59.6 g, Calcium - 154 mg, Phosphrus - 385 mg, Iron - 9.1 mg, - Carotene - 38 mcg, Thiamine -420 mcg, Riboflavin - 200 mcg, Niacin - 2 mg (Perera et al., 1979).



Phaseolus mungo

(A) Branch with leaves and flowers.

The seeds are frequently used medicinally, both externally, and internally for paralysis, rheumatism and ailments of the nervous system. They are used in the treatment of fever, piles, cough and liver diseases. The root is said to be a narcotic. The grain is a nourishing food and promotes bowel movement (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Soils with a relatively high texture are suitable. The plant resists drought and requires about 850 mm of rainfall. Grows well at high temparatures such as 25-35^{0}C. It can be grown at an elevation up to 2000 m.

CULTIVATION :-

Areas for cultivation - The unirrigable highlands of the dry zone, offer possibilities for black gram cultivation during *Maha*. In the low country and mid-country wet zone, it should be possible to raise successful crops during *Yala*.

Planting season - Black gram is a three-month crops and should be planted immediately after the heavy monsoon rains in *Maha*, around the middle of November. For *Yala* planting, sowing should commence around the middle of April.
Land preparation - The land is prepared with one ploughing, followed by working with a blade harrow or cultivator. Only a rough tilt is attempted. About two inter-cultivations are given in the first 20 days after planting, and the second one is given a fortnight later.

Spacing - The seeds are generally sown broadcast, and ploughed in or drilled in rows 25 cm apart.

Seed rate - The seed rate is about 15 kg per hectare.

Irrigation-In *Yala* season it is grown under irrigation and can obtain better yields than in *Maha* season grown under rainfed conditions.

Pests/ Diseases - Similar to green gram.

Time to harvest - Flowering commences in about 7 weeks after planting, the pods being ready for gathering, in about 3 months from the planting date.

Harvest- The green pods used as a cooked vegetable can be harvested within 60-80 days after sowing. Pods become ready for gathering, about 3 months from planting of seeds. The plants are pulled by the roots, stacked on a threshing floor for about a week and threshed by flailing or treading under the feet of oxen.

Yield - Average yeild 500-650 kg/ha.

STORAGE :-

The seeds are dried, cleaned and stored.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Psophocarpus tetragonolobus***

VERNACULAR NAMES:-

SINHALA	:	*Dambala*
ENGLISH	:	Winged Bean, Goa Bean

DESCRIPTION:-

The winged been is twining, glabrous, perennial herb, treated as an annual crop in cultivation. An important feature of the root system is the production of long lateral roots which run horizontally close to the soil surface and which become thickened and tuberous. Stems are produced each year from the rootstock, which reach a length of 2-3 m and ridged.

LEAVES:- Trifoliate, petioles long and grooved on upper surface, pulvinus at base, stipeles small, lanceolate, leaflets broadly ovate, entire, acute glabrous beneath up to 15 x 12 cm.

FLOWERS:- Inflorescence an axillary raceme up to 15 cm long with up to 10 flowers, white or purple colored, and they are self-pollinated .

FRUITS:- Pods are four sided, with characteristic wings, vary in length from 6-36 cm, and contain from 3-20 seeds each. The globular-shaped, shining seeds may be white, yellow brown, black and vary in weight 300 mg (Tindall, 1993).

DISTRIBUTION:-

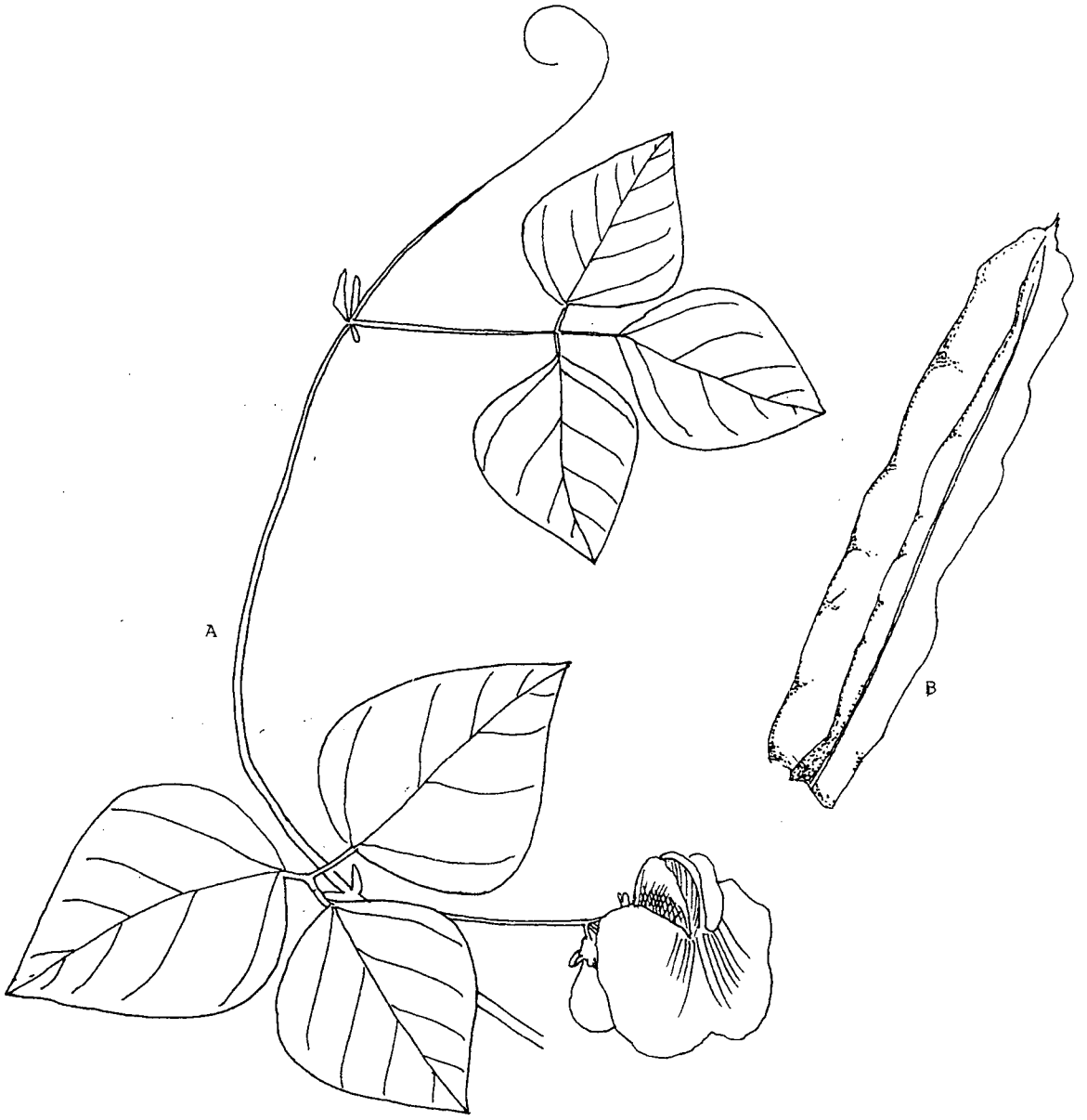
Origin is probably from Tropical Asia. It is cultivated in Tropical Asia, West and East Africa, the Caribbean and in many tropical areas (Querol, 1993).

EDIBLE PARTS:-

The flowers, pods, roots and seeds.

FOOD USE:-

The immature pods, leaves and flowers are eaten as a vegetable. The tubers, roots of some varieties are also eaten.



Psophocarpus tetragonolobus

(A) Branch with flowers. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Seeds)
Moisture - 10 g, Energy - 405 kcal, Protein - 32.8 g, Fats - 17.0 g, Carbohydrate - 36 g, Calcium - 80 mg, Phosphrus - 250, Iron - 2.0 mg, Thiamin - 0.08 mg (Perera et al., 1979).

(Fresh pods)
Moisture - 92 g, Energy - 25 kcal, Protein - 2.1g, Fats - 0.3 g, Carbohydrate - 4 g.

(Roots)
Moisture - 75 g, Energy - 91 kcal, Protein - 2.89, Fats - 0.6 g, Carbohydrate - 20 g (Weerakoon, 1993).

ENVIRONMENTAL RESPONSE:-

Requires a well distributed rainfall of 1500-2500 mm. Elevation up to 2000 m is considered suitable for satisfactory growth. Good drainage is essential. Medium loam soils are generally suitable.

CULTIVATION:-

Areas for planting - Except hill countries in well distributed rain fall areas of high and low - country wet zone winged bean can be cultivated.

Planting season - In early October

Land preparation - Land should be worked in order to attain fine tilt and weed free land.

Planting material - seeds.

Planting and spacing - Soaking of seeds for 12-24 hours in water will increase germination of seeds and watering becomes necessary if there is no rain after planting. Seeds are planted at the rate of 3 in each hole in 3 cm deep and after germinating 2 plants are thinned 1 leaving healthy plant in each hole.

Time to harvest - The first green pods are ready for picking about 10 weeks after sowing. About 2 weeks after pollination the succulent pod reaches its full length and can be used as a green vegetable. After 6 weeks the seeds are mature and can be harvested. Tubers are harvested 4-8 months after sowing when they reach 2-4 cm in diameter, and 8-12 cm in length.

STORAGE :-

In a relative humidity of 90%, storage up to three weeks is possible, with a weight loss up to 20%.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Sesbania grandiflora***

Syn :- Aeschynomena grandiflora

VERNACULAR NAMES:-

SINHALA	:	*Kathuru-murunga*
TAMIL	:	*Acham, Agatti, Muni, Peragatti*
ENGLISH	:	Agathi

DESCRIPTION:-

A slender tree, 6-9 m tall.

LEAVES:- Alternate, paripinnate compound, 15-30 cm long, leaflets 16-30 pairs, linear-oblong, sessile, 3 cm long, 1 cm wide, dark green above, lighter below, scantily pubescent on the lower surface.

FLOWERS:- Irregular, bisexual, white, 2-4 inpendulous axillary racemes, 9 cm long.

FRUITS:- Pod about 50 cm long with numerous seeds. Flowers almost throughout the year (Jayaweera, 1981).

DISTRIBUTION:-

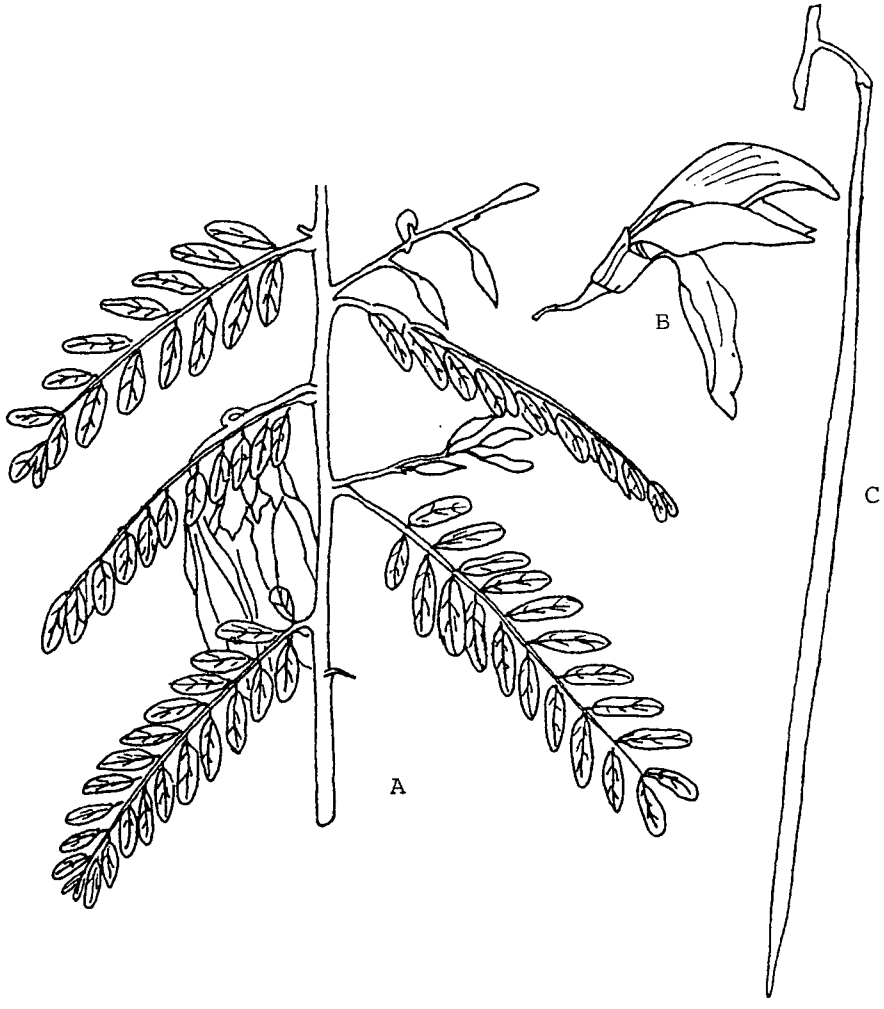
Grows in Malaysia and North Australia and is cultivated elsewhere. In Sri Lanka it is a common garden plant grown in humid and lowcountry (Jayaweera, 1981).

EDIBLE PARTS:-

Leaves, flowers.

FOOD USE:-

Leaves and flowers are eaten as a green vegetable.



Sesbania grandiflora

(A) Branch with leaves and flowers. (B) Flower lateral view. (C) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Leaves)
Moisture - 73.1 g, Energy - 93 Kcal, Proteins - 8.4 g, Fats -1.4 g, Carbohydrates - 11.8 g, Calcium - 1130 mg, Phosphrus - 80 mg, Iron - 3.9 mg, Carotene - 5400 mcg, Thiamine - 210, Riboflavin - 90 mcg, Niacin - 1.2 mg, Vitamin C - 169 mg (Perera et al., 1979).

(Flowers)
Moisture - 92.9 g, Energy - 26 kcal, Proteins - 1.0 g, Fats - 0.5 g, Carbphydrates - 4.4 g, Calcium - 9 mg, Phosphorus - 5 mg, Vitamin C - 73 mg (Weerakoon, 1993).

The flowers of this tree are rich in Calcium, Iron and Vitamin B. The root bark contains tannin and gum. The root bark of the red flowered variety is made into paste with water and applied on rheumatic swellings. The juice of the flowers is dropped into the eye to clear dimness of vision. The expressed juice of the tender leaves and flower is a popular remedy for nasal catarrh and headache and is blown up the nostrils to bring out mucus to relieve pain in the frontal sinuses (Jayaweera, 1981).

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Tamarindus indica***

Syn :- T. occidentalis

VERNACULAR NAMES:-

SINHALA	:	*Siyambala*
TAMIL	:	*Ambilam, Egin, Indam, Kinjam, Palap, Puli*
ENGLISH	:	Tamarind

DESCRIPTION:-

A large tree, 20-25 cm tall with wide-spreading branches, bark very rough and dark brown.

LEAVES:- Alternate with small, linear,very caducousstipules, abruptlypinnate, 7.5-10 cm long, leaflets 10-20 pairs, opposite, 1.2-2.5 cm long, sessile, articulated, seton obliquely and overlapping, oblong, usually very blunt, unequal bases, entire, rather thick, veined beneath.

FLOWERS:- Irregular, bisexuai, white or pale yellow, stalked, readily articulating, arranged in lax, fewflower dracemes which are axillary or terminal on short lateral branches shorter than leaves. Calyx narrowly funnel-shaped below, divided in to 4 ovate-lanceolate, acute.

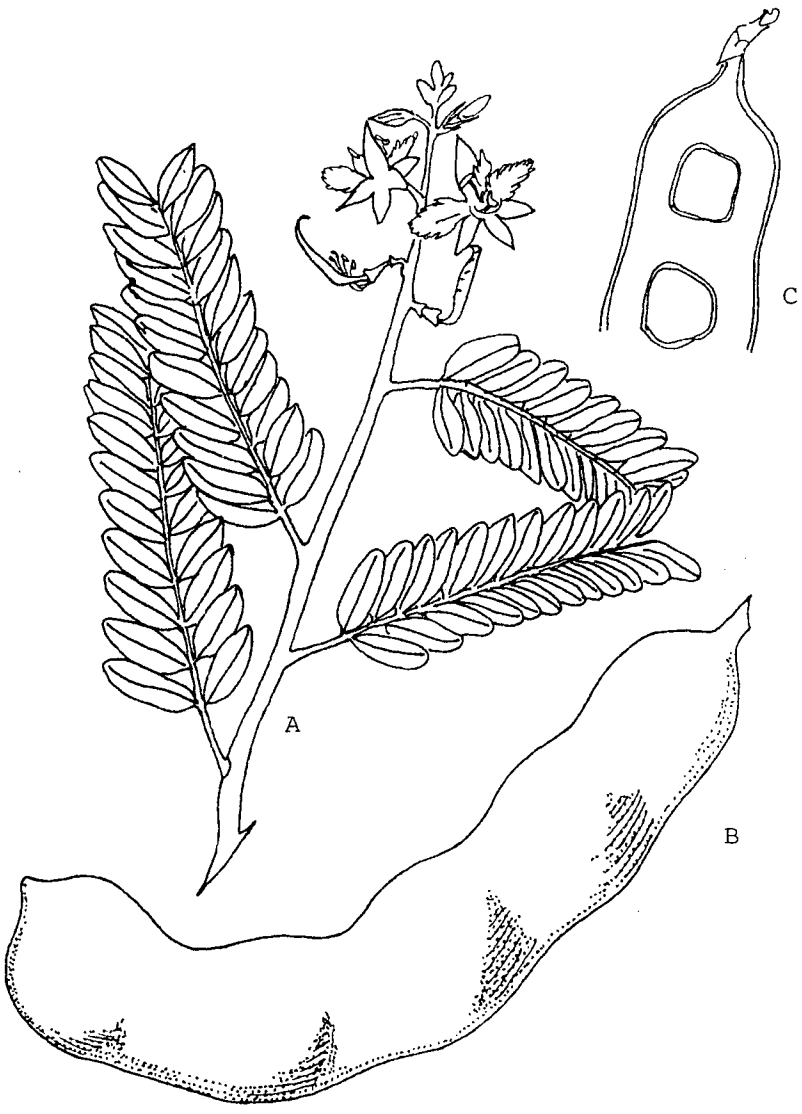
FRUITS:- A pendulous pod, slightly compressed, 7.5-15 cm long, somewhat curved, nearly smooth, pale chocolate brown, pericarp thin. Seeds 2-8, each lodged in a carrity in the pulp lined with a tough membrane (Jayaweera, 1981).

DISTRIBUTION:-

A native of Tropical Africa but grown extensively in the hotter parts of India, Sri Lanka, Malaysia, Thailand, Philippine Islands, Java and Pacific Islands (Bose and Mitra, 1985). In Sri lanka it is not commercially cultivated, grows naturally, especially in the dryzone.

EDIBLE PARTS:-

The fruit, leave and flowers.



Tamarindus indica

(A) Twig with leaves and raceme of flowers. (B) Fruit pod. (C) Longitudinal section of a part of the fruit pod.

FOOD USE:-

Ripe fruit pulp is used for flavouring curries. Ripe fruits are eaten fresh as a fruit and also used in preparation of cordials and toffees. Tamarind soup, called puliyanam is famous among the Tamil community. Young leaves and flowers are eaten as a vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Pulp)
Moisture - 20.9 g, Energy - 283 Kcal, Proteins - 3.1 g, Fats - 0.1 g, Carbohydrates - 67.4 g, Calcium - 170 mg, Phosphrus - 110 mg, Iron - 10.9 mg, Carotene - 60 mcg, Riboflavin - 70 mcg, Niacin - 0.7 mcg, Vitamin C -3 mcg.

(Leaves)
Moisture - 70.5 g, Energy - 115 Kcal, Protein - 5.8 g, Fats - 2.1 g, Carbohydrates - 18.2 g, Calcium - 101 mg, Phosphorus - 140 mg, Iron - 5.2 mg, Carotene - 250 mcg, Thiamine - 240 mcg, Ribofglavine - 170 mcg, Niacin - 4.1 mcg, Vitamin C - 3 mcg (Perera et al., 1979).

The pulp of the fruit contains citric, tartaric, oxalic, malic and succinic acids, bitartrate of potash, sugar and pectin while the seeds contain albuminoids, fats, carbohydrates, tannin and much mucilaginous material. The leaves ground into a paste with lime juice and heart wood of *Acacia chundra* are applied on boils to prevent suppuration and inflammatory swellings. A decoction of the leaves is used as a formentation on boils and abscesses. The testa of the seed macerated with vinegar or lime juice is applied on the face to prevent formation of pimples. Internally the leaves and pulpactas cholagogue laxatives are often used for congestion of the liver, habitual constipation and hemorrhoids. The ripe fruit is regarded as a refrigerant digestive, carminative and laxative. The powdered seed is used to dress boils and the flower is given internally as a remedy for jaundice. It is externally applied on eye diseases and ulcers (Jayaweera, 1981).

OTHER USES:-

The heart wood is very durable and used in furniture-making as it takes on a good polish.

ENVIRONMENTAL RESPONSE:-

Adapt to various soil types. Ideal pH range is 5.5 to 6.8. Optimal temperature is 20-30^{0}C. A rainfall of 700-3000 mm is required. Grows at altitutes below 1500 m.

CULTIVATION:-

It is commonly grown by seed, but can also be propagated vegetatively. Germination is more rapid after pretreatment, methods include soaking in cold water for 4-5 days and soaking in warm water for 24 hours. Seed may be sown directly in the field into pits which have been previously prepared with well-decomposed manure that has had time to settle. Alternatively, seedlings may be raised in the nursery, either in beds or in containers, using light porous soil. Seedlings should be transplanted in the field at least 20 cm apart when they are 60-70 cm tall, during the rainy season.

Spacing - 7-10 m apart each way, or wide spacing on fertile soils.
Vegetatively produced trees are smaller and spacing can be reduced.

Irrigation - If possible, tamarind should be irrigated during the first dry season.

Fertilizer - It is required for good production.

Time to harvest- Under favourable conditions trees start to bear fruits at about 5 years, but 8-12 years are more usual. Fruiting can be continued for 60-120 years.

Harvesting - This should not take place before the pods are fully ripe. If picked too young they are acid and fibrous. Pods are usually cut with a knife or scissors as they are firmly attached to the tree. The tree should not be shaken to release fruits, as it damages branches will reduce yield.

STORAGE:-

Stored as a salted, sun-dried pulp.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Vigna catiang***

Syn : Vigna synensis, Phascolus, cylindricus, V. cylindrica.

VERNACULAR NAMES:-

SINHALA	:	*Cowpea*
TAMIL	:	*Cowpea*
ENGLISH	:	Cowpea

DESCRIPTION:-

It is an annual, somewhat erect plant, which in certain types requires stakes for support, while others generally spread on the ground as a low bush. The stems are thin and rounded, and glabrous except at the nodes.

LEAVES:- They are pinnately trifoliate with a long petiole. The leaflets are large, dark green in colour, and ovate in shape.

FLOWERS:- Inflorescence is a raceme with a long peduncle. The flowering part is nodose, and depending on the variety bears white, light pink or light blue conspicuous flowers.

FRUITS:- The pods are rounded and thin and again depending on varieties vary in length, from 1.5 to 2.0 cm inches on the one hand and 8-10 cm on the other. Seeds too vary in size and colour (Senewirathne and Appadurai, 1966).

DISTRIBUTION:-

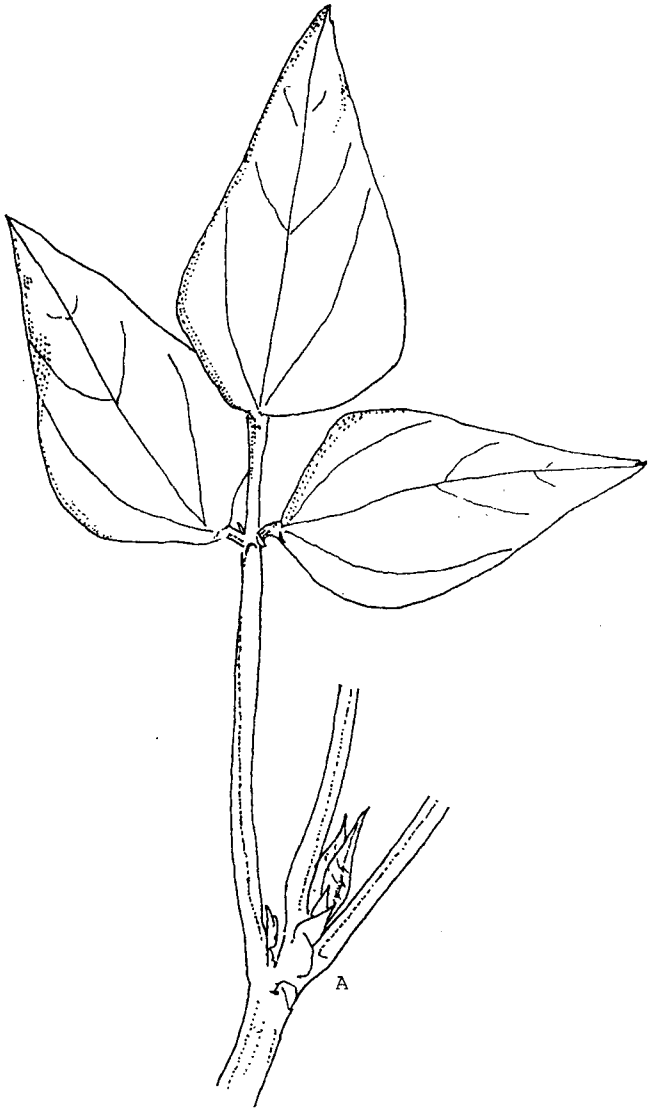
Centre of origin could be India or China. Cowpea is cultivated in Tropical Asia, Africa, Tropical America and Carribbean (Senewirathne and Appadurai, 1966).

EDIBLE PARTS:-

Fresh pods and seeds.

FOOD USE:-

Cowpea pods and seed are boiled and eaten.



Vigna catiang

(A) Branch.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Dried seeds)
Moisture - 11 g, Energy - 338 kcal, Protein - 22.5 g, Fat 1.4 g, Carbohydrate - 61 g, Calcium - 5.4 mg, Phosphrus - 104 mg, Thiamine - 0.08 mg, Riboflavin - 0.9 mg, Niacin - 4.0 mg, Vitamin C - 2 mg (Perera et al., 1979).

CULTIVATION:-

Areas for cultivation - Dry zone conditions are definitely more favourable and the crop may be raised successfully anywhere in the dry zone during *Maha*, and in those areas of the dry zone during the *Yala*.

Planting season - *Yala* and *Maha*.

Land preparation - The land should be worked to a depth of about 2.5 to 3.5 cm repeatedly, in order to attain a fine tilth.

Planting Materials - Propagated by seed

Planting and space- Plant manually on ridges or flat beds, depending on field drainge. There should be 1 plant/hill with spacing 30 cm between rows and 15 cm between plants.

Irrigation - The frequency of application of water is every 4 days during the first 3 weeks and then every 7 days.

Weed control- Weeding is usually manual,but chemical weed control is practicable.

Pests and diseases - This can be attacked by bean and cowpea pod bores, sap sucking bugs, plant lice and base collar rot, fungal wilt, anthracnose, cowpea yellow mosaic virus and stem rot are the common diseases.

Time to harvest - When pods are straw colour .

Harvest - When the crop matures uniformly it can be harvested in one operation by cutting the plants close to the ground, when uneven maturity occurs it has to be taken in several picks.

STORAGE:-

Seeds should be cleaned and sun-dried to 10% moisture or less before storing.

FAMILY:- FABACEAE

BOTANICAL NAME:- ***Vigna marina***

Syn: V. Lutea, Dolichos gangeticus, D Lutecus, Phaselous marinus.

VERNACULAR NAMES:-

SINHALA	:	*Lima karal, Mekaral*
TAMIL	:	*Kodeppayam, Pudalangai*
ENGLISH	:	Lima bean

DESCRIPTION:-

A perennial herb with trailing, prostrate branches which are quite glabrous.

LEAVES:- Alternate,3-foliate with stipels, rachis 5-7.5 cm long, swollen at base, leaflets stalked, equal, glabrous, stipules small, lanceolate.

FLOWERS:- Irregular, bisexual, yellow,about 1.2 cm long on slender pedicels, in short racemes at the end of the stiff, axillary peduncles usually exceeding leaves.

FRUITS:- Legume 5-6.2 cm long, rather broadly linear, sub-cylindrical, turgid with thickened sutures, slightly curved, apiculate, glabrous or nearly so, seeds 5-8, black, nearly globose, 0.3 cm long. Flowers in July (Jayaweera, 1981).

DISTRIBUTION:-

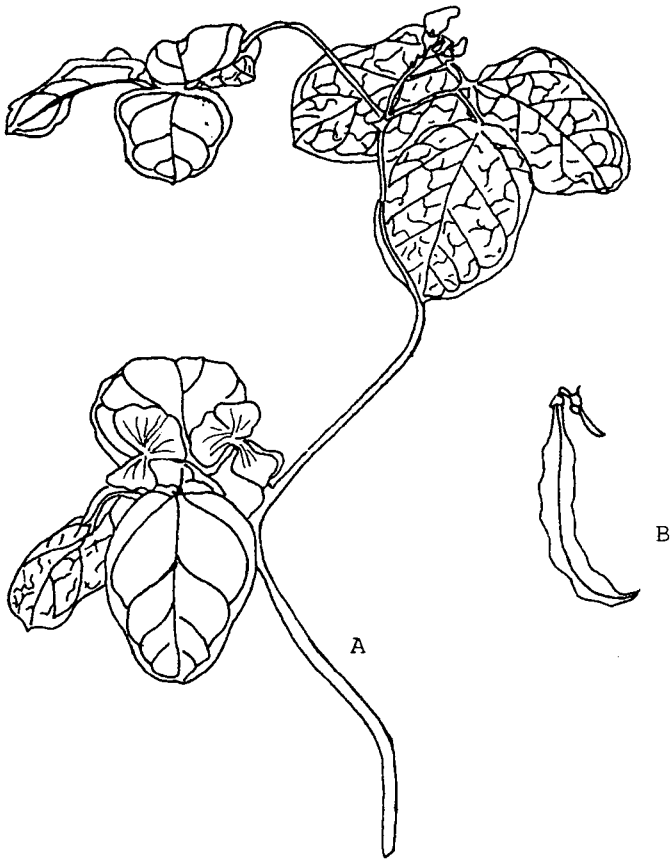
Grows in India, Sri Lanka and Burma. It is rare in Sri Lanka and confined to the moist regions on or near the coast of Colombo, Galle, Matara etc (Jayaweera, 1981).

EDIBLE PART:-

The immature pods and seeds.

FOOD USE:-

Tender pods are eaten as a vegetable and seeds are boiled and eaten.



Vigna marina

(A) Portion of a branch with leaves and flowering racemes. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Seeds)
Moisture - 12.0 g, Energy - 326 kcal, Protein - 20 g, Fats 1.5 g, Carbohydrate - 58.0 g, Calcium - 90 mg, Iron - 6 mg, Thiamine - 500 mcg, Riboflavin - 140 mg, Niacin - 1.5 mg (Perera et al., 1979).

The seed is considered a diuretic. It is antibilious and used for liver complaints and jaundice (Jayaweera, 1981).

FAMILY :- FLACOURTIACEAE

BOTANICAL NAME:- ***Flacourtia cataphracta***

Syn :- F. jangomus

VERNACULAR NAMES:-

SINHALA : *Rata-uguressa*
TAMIL : *Saralu, Talisam*

DESCRIPTION:-

A small tree about 9 m high with a fairly smooth, pale brown bark, stems up to 75 cm in girth often armed low down with stout, compound spines.

LEAVES:- Simple, alternate, 5-10 cm long, 2.3-3.8 cm broad, oblong or ovate, acuminate, crenate-serrate, glabrous, 3-5 nerved at base dark green above and shining on both surfaces, petioles 3.5-5 mm long, minutely pubescent.

FLOWERS:- Small, dioecious 2.5-3.8 mm diameter in glabrous, few flowered racemes 7.5-25 mm long.

FRUITS:- An indehicent berry, fleshy, 1.8-2.3 cm long obovoid, green turning purplish brown when ripe. Flowers during June (Jayaweera, 1981).

DISTRIBUTION:-

Grows in India, Malaysia; and Burma. It is cultivated in Sri Lanka (Jayaweera, 1981).

EDIBLE PARTS:-

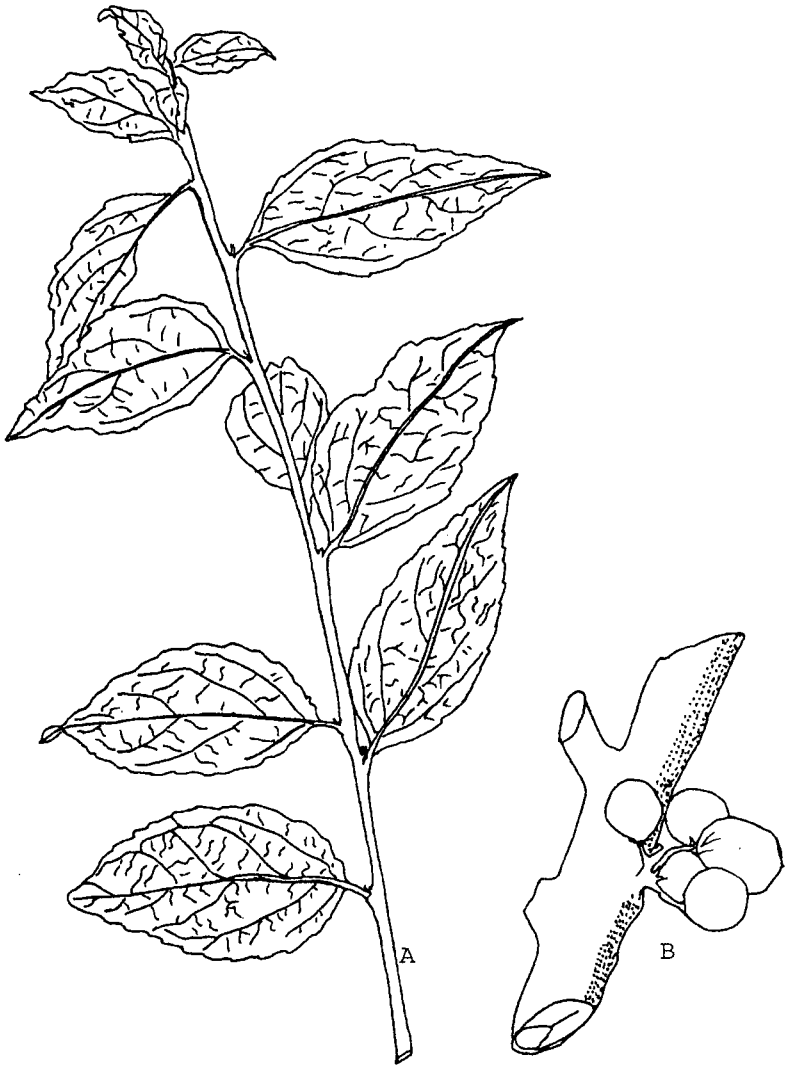
The berries

FOOD USE:-

The ripe berries are eaten fresh as a fruit. Jams are also made out of this

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 77.7 g, Energy - 83 Kcal, Proteins - 0.5 g, Fats - 0.1 g, Carbohydrates - 19.9 g, Calcium - 43 mg, Phosphorus - 85 mg.



Flacourtia cataphracta

(A) Branch with leaves. (B) Portion of stem with fruits.

The leaves and young shoots possess astringent and stomachic properties and are prescribed for diarrhoea. A decoction of the bark is given for biliousness and is also used as a gargle for sore throat. The fruit is in useful bilious condition, relieves nausea and checks purging.

CULTIVATION:-

It grows in homegardens

STORAGE:-

Undamaged fruits are kept as a layer for 3-4 days.

FAMILY:- FLACOURTIACEAE

BOTANICAL NAME:- ***Flacourtia ramontchi***

Syn :- F. sapida

VERNACULAR NAMES:-

SINHALA	:	*Uguressa, Katulovi*
TAMIL	:	*Katu-Kali, Sottaikala*
ENGLISH	:	Sapida, Governers plam, Ramontchi

DESCRIPTION:-

A shrub or small tree, deciduous, armed with auxillary spines and often with tufts of branched spines on the stem.

LEAVES:- Simple, alternate, variable 2.9 cm long, 2.5 cm broad, ovate, broadly elliptic, obovate or suborbicular, crenate or serrate, acute, acuminate or rounded at apex, glabrous or pubescent above, petioles 5-8 mm long.

FLOWERS:- Dioecious, greenish yellow in short, simple or branched, usually tomentose racemes, sepals 4-5, imbricate, about 2 mm long, ovate or orbicular, hispid and ciliate. Petals absent.

FRUITS:- A globose, red or dark brown or dark purple berry, 0.8-1.2 cm diameter with 8-13 hard seeds. Flowers in January and July (Jayaweera, 1981).

DISTRIBUTION :-

Grows in the dry forests of the Indian Peninsula and Burma. It is cultivated in Sri Lanka in the mid-low country Kandy, Bibile and Nilgala (Jayaweera, 1981).

EDIBLE PARTS:-

The fruits

FOOD USE:-

The ripe berries are eaten fresh as fruits. Jams, jellies and fruit drinks can be prepared from the fruit.

Flacourtia ramontchi

(A) Branch with leaves. (B) Branch with fruits.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 74.2 g, Energy - 94 Kcal, Protein - 0.5 g, Fats - 0.6 g, Carbohydrates - 24.2g, Calcium - 10 mg, Phosphrus - 30 mg, Iron - 0.5 mg, Carotene - mcg, Vitamin - 6 mg (Perera et al., 1979).

The fruit is a cholagogue and astringent and is used for internal hemorrhages and bleeding from hemorrhoids. The root is an expectorant and diuretic and is useful for fevers accompanied with congestion of the liver, for acute laryngitis, bronchitis, pyelitis, cystitis and gonorrhoea. The fruits are given for jaundice and enlarged spleen. In Dacca, the seeds are ground into a paste with turmeric and applied on women after child birth to prevent rheumatic pains. The gum forms an ingredient of mixtures given for the treatment of cholera. In Madagascar the root is prescribed for nephritic colic (Jayaweera, 1981).

CULTIVATION:-

It regenerates naturally from seeds and coppies. Propagation is usually by means of root suckers or budding on root-stocks of related species. The seed coat is hard, so pretreatment by soaking or scarification might improve germination.

Spacing - The trees have a branching habit and should be spaced about 12-16 m apart.

Harvesting - fruits are strongly attached to the tree, so they are usually picked from the tree on ripening.

STORAGE:-

Ripe fruits can be stored for 4-5 days when they are kept in thin layers.

FAMILY:- LAMIACEAE

BOTANICAL NAME:- ***Solemostemon rohindifolius***

syn: Colors rotundifolius, c.dyseataricus, Plectranthus tuberosus, Plectranthus tuberosus, P.tuberoses.

VERNACULAR NAMES:-

SINHALA : *Innala, Ratala*
ENGLISH : Hause potato, Country potato, Coleus potato

DESCRIPTION:- An annual herb, with prostrate or ascending habits, shem is succulent, 15-30 cm in length.

LEAVES:- Some forms with a central purple making on lamina, aromatic.

FLOWERS:- Borne on elongated, terminal racemes, small, violate in colour.

ROOT TUBERS:- Small dark brown, formed in clusters around the base of the stem (Tindall, 1993).

DISTRIBUTION:-

Possibly of Ethiopian origin, now distributed in South East Asia and Tropical Africa (Tindall, 1993). In Sri Lanka it is cultivated in various areas like Matara, Galle, Ratnapura, Colombo, Matale, Kurunegala and Kalutara districts.

EDIBLE PARTS:-

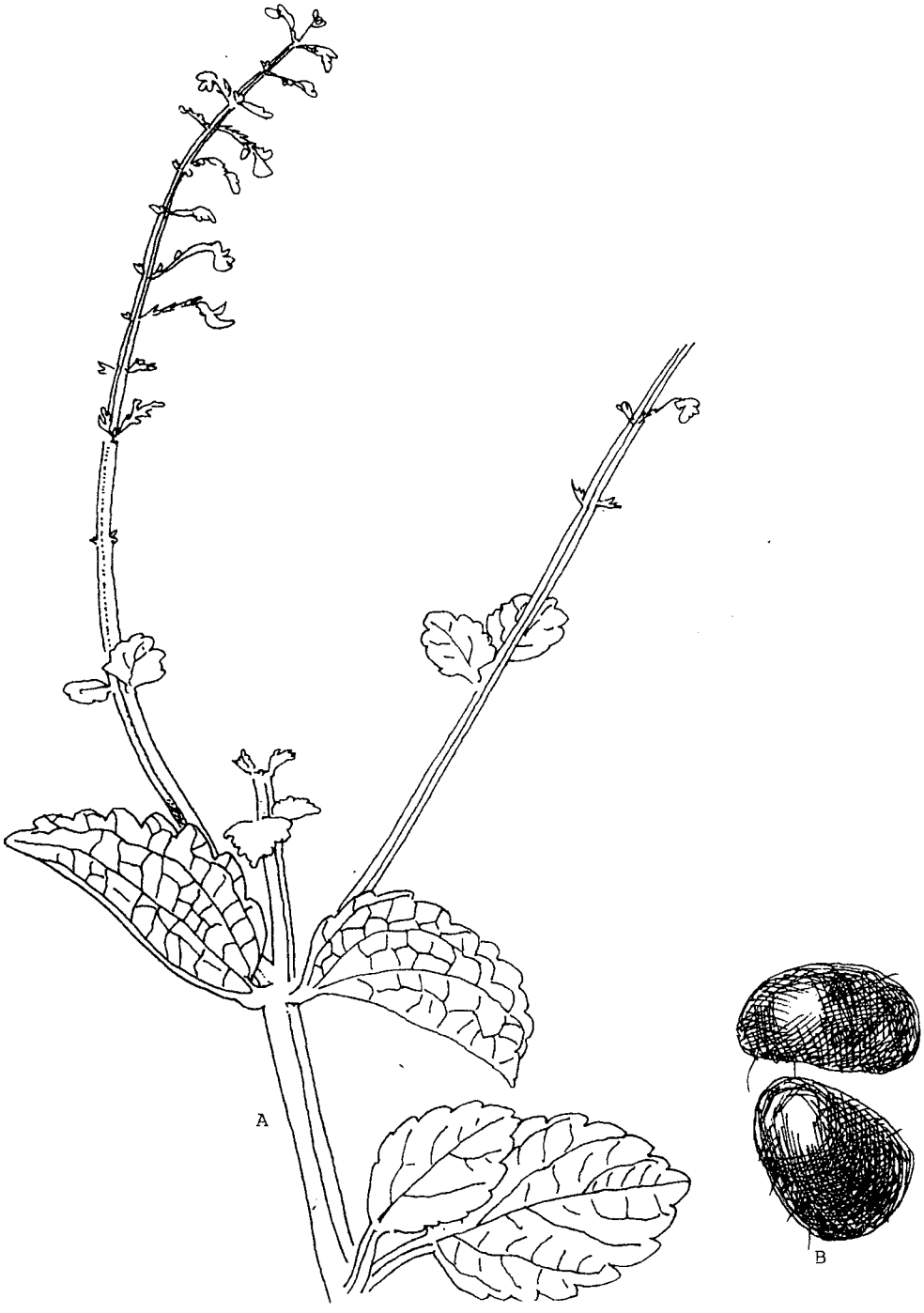
The tubers.

FOOD USE:-

Innala is eaten as potatoes and is a good substitute for potatoes.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 76 g, Energy - 94 Kcal, Protein - 1.3 g, Fats - 0.2 g, Carbohydrates - 22 g, Calcium - 17 mg, Phosphrus - Iron - 6,0 mg, Thiamine - 0.05 mg, Riboflavin - 0.02 mg, Niacin 0 mg, Vitamin C-1.00 mg (Tindall, 1993).



Solemostemon rohindifolius

(A) Branch with inflorescence. (B) Tubers.

ENVIRONMENTAL RESPONSE:-

Well drained sandy soils are good. Adapted to high rainfall, but well distributed rainfall is ideal for good yeild, low night temperatures promote tube development.

CULTIVATION:-

Area for cultivation - It is grown largely in the low and mid country wet zone. It is a common crop in the river banks of the Kandy district.

Planting season - It is cultivated in the *Yala* season. Tubers commence germinating about end of March.

Land preparation - It is usually planted on ridges. The land is ploughed about two weeks prior to planting and harrowed to break up the clods and make the ridges.

Planting and space - There are three general methods in planting *Innala*. In these three methods, cuttings are used for planting. In ordinary planting, cuttings about 1.5 cm long and having 3-4 leaves at the top end, are used. They are planted in rows down the ridges, 2.0 cm from each other. Planting depth is usually about 2.5 cm. In coiled method, cuttings about 2.0 cm long are used. A length of about 12.5 cm of the more mature portion is coiled and planted in holes made along ridges. In horizontal planting, cuttings are placed horizontally across the ridge, two at a time in opposite directions and almost touching each other.

Irrigation - During dry periods plants should be irrigated.

Fertilizer - Liberal application of organic manure to the ridges or mounds before planting followed by NPK.

Time to harvest - harvest is commenced by the end of December or early January when the plants begin to die.

Harvest - Harvest commences by the end of December or early January, when the plants begin to die. The tubers can be easily lifted from the soil using hand forks or other simple implements as they are formed very near the surface.

Yeild - Yeild of *Innala* varies between 6-12 tons per ha.

STORAGE:-

Tubers deteriorate rapidly if left in the soil after they have become mature. Ventilated storage has been found to be successful if the tubers are packed in dry sand in cool shaded conditions.

FAMILY:- LAURACEAE

BOTANICAL NAME:- ***Cinnamomum zeylanicum***

Syn :- C. aromaticum

VERNACULAR NAMES:-

SINHALA	:	*Kurundu*
TAMIL	:	*Cannalavangapattai, Karuva Pattai*
ENGLISH	:	Cinnamon

DESCRIPTION:-

A moderate-sized or large tree with a rather thick, reddish bark, glabrous young parts and finely silky buds.

LEAVES:- Simple, opposite or sub-opposite without stipules, variable in size,7.5-25 cm long, oval or lanceolate-oval, subacute at base, slightly acuminate, obtuse, glabrous, stiffly coriaceous, strong, 3 or 5 nerved with fine, reticulate venation, shining above, bright pink when young, petioles 1.2-2.5 cm long, stout, flattened above.

FLOWERS:- Regular, bisexual or monoecious, pale yellow, small, numerous or rather long, slightly pubescent pedicels in sub-terminal panicles longer then leaves.

FRUITS:- About 1.2 cm long, oblong-ovid, surrounded by much enlarged perianth, dry or fleshy, dark purple. Seed without endosperm (Jayaweera, 1981).

DISTRIBUTION:-

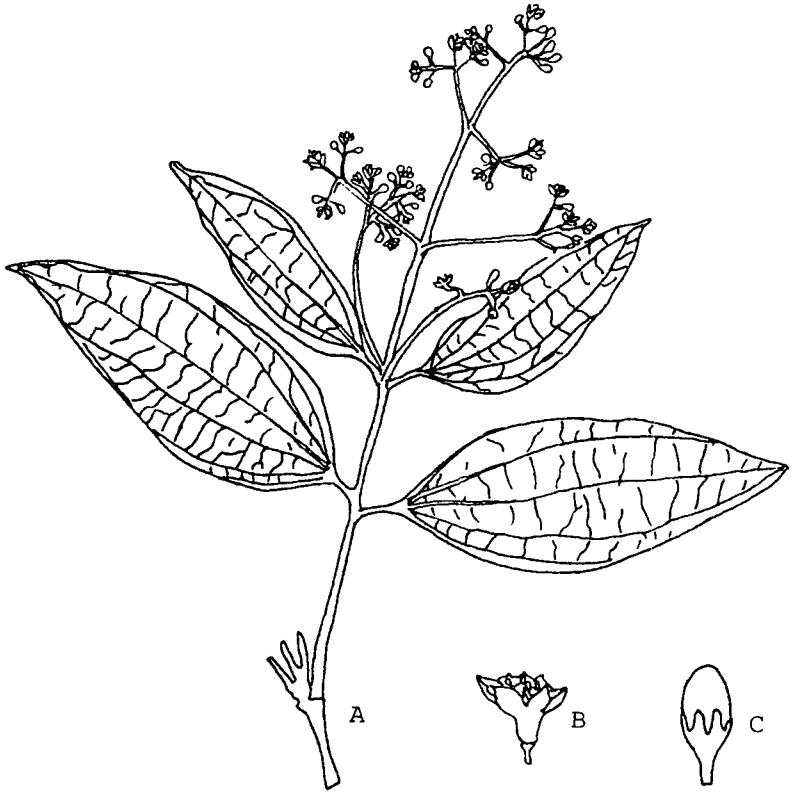
Indigenous to Sri Lanka, commonly cultivated in most parts of the low-country. It is also cultivated in India, Burma, Malaysian Peninsula.

EDIBLE PARTS:-

The bark, bark oil, leaves oil.

FOOD USE:-

The bark is used as an ingredient for culinary purposes. Oil extracted from bark and leaves is used for food and medicine.



Cinnamomum zeylanicum

(A) Branch with leaves and infloresoence. (B) Flower lateral view. (C) Fruit.

NUTRITIONAL VALUE AND THERAPEUTIC VALUE:-

(Cinnamon bark)
Moisture - 12 g, Energy - 229 Kcal, Proteins - 12 g, Fats - 7.8 g, Carbohydrates - 200 g, Calcium - 440 mg, Iron - 17 mg, Thiamine - 100 mcg, Riboflavin - 400 mcg, Niacin - 24 mg (Perera et al., 1979).

The chief component of cinnamon is the essential oil which consists of cinnamic aldehyde in variable proportions of hydrocarbons. The bark contains besides the oil, sugar, mannite, starch, mucilage and tannic acid. The oil from the leaves contains eugenol which is useful in the perfume and flavouring industries. The oil from the roots contains camphor, eucalyptol and safrot. The seeds contain fat. The bark of the tree is used for dyspepsia, flatulence, diarrhoea, dysentery, vomiting, bronchitis, gangrene of the lungs and phthisis. The bruised bark is steamed and used externally as a fermentation on boils and abscesses to prevent suppuration. The oil is a rubefacient, crystaline cinnamic acid and is anti-tubercular and used as an injection in phthisis. Cinnamon is also given for cramps of the stomach, toothache and paralysis of the tongue and used in massive doses in the treatment of cancer (Jayaweera, 1981).

STORAGE:-

Dried bark can be stored for a long time in dry containers.

FAMILY:- LAURACEAE

BOTANICAL NAME:- *Neolitsea Cassia*

Syn :- N. involucrata

VERNACULAR NAMES:-

SINHALA : *Davulkurundu, Kudu-Dawula, Wal-Kurudu*

DESCRIPTION:-

A small tree with a thick, smooth gray bark, slender branchlets and minutely puberulous small buds.

LEAVES:- Simple,alternate, without stipules, numerous, closely placed at the end of branches, 7.5-12.5 cm long, lanceolate, tapering to both ends, obtuse or subacute, petioles 0.8-1.8 cm long and slender.

FLOWERS:- Regular, dioecious in small sessile clustered, 4-5 flowered umbels, bracts 4 forming an involucre of two pairs.

FRUITS:- Globose or oblong-ovoid, dark purple. Flowers in April (Jayaweera, 1981).

DISTRIBUTION:-

Grows in India, Sri Lanka and Malaysia. It is very common in the moist regions in Sri Lanka up to 1300 m altitude (Jayaweera, 1981).

EDIBLE PARTS:-

Leaves.

FOOD USE:-

The juice of the leaves is used in the preparation of certain sweetmeats.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The bark and leaves are used for treatment of fractures.

Neolitsea cassia

(A) Branch with leaves and clusters of flowers. (B) Cluster of flowers with bracts. (C) Group of male flowers.
(D) Female flower -lateral view.

OTHER USES:-

The powdered leaf is used for dusting the cut surface of coconut inflorescences in the process of toddy tapping.

FAMILY:- LILIACEAE

BOTANICAL NAME:- *Allium ascalonicum*

Syn: A. Cepa L. variety aggregasum

VERNACULAR NAMES:-

SINHALA	: *Ratu-lunu.*
TAMIL	: *Irravengayam, Irulli, Sinna Vengayam*
ENGLISH	: Shallot, Red Onion.

DESCRIPTION:-

A perennial herb usually grown as an annual, 15-50 cm high with ovoid, red subteranean bulbs, 1.5-2.5 cm diameter, with accessory bulbs giving off slender fibrous roots below.

LEAVES:- 3-5 to a bulb, hollow, linear, 20-30 cm long, 0.4-0.8 cm broad, fistulae, terete, glucose, bases sheathing, papery, conical, fleshy above the stem forming the bulb.

FLOWERS:- Regular,bisexual,white 6 mm diameter, many in terminal, long-peduncled, rounded, umbels 2.5-3.5 cm diameter. (period-During March).

FRUIT:- Flat, Kidney-shaped. 2 cm long and as broad enclosed in the persistent perianth segment; 1-round seeded, 1.2 mm diameter, glabrous and shining, depressed at the hilum (Jayaweera, 1981).

DISTRIBUTION:-

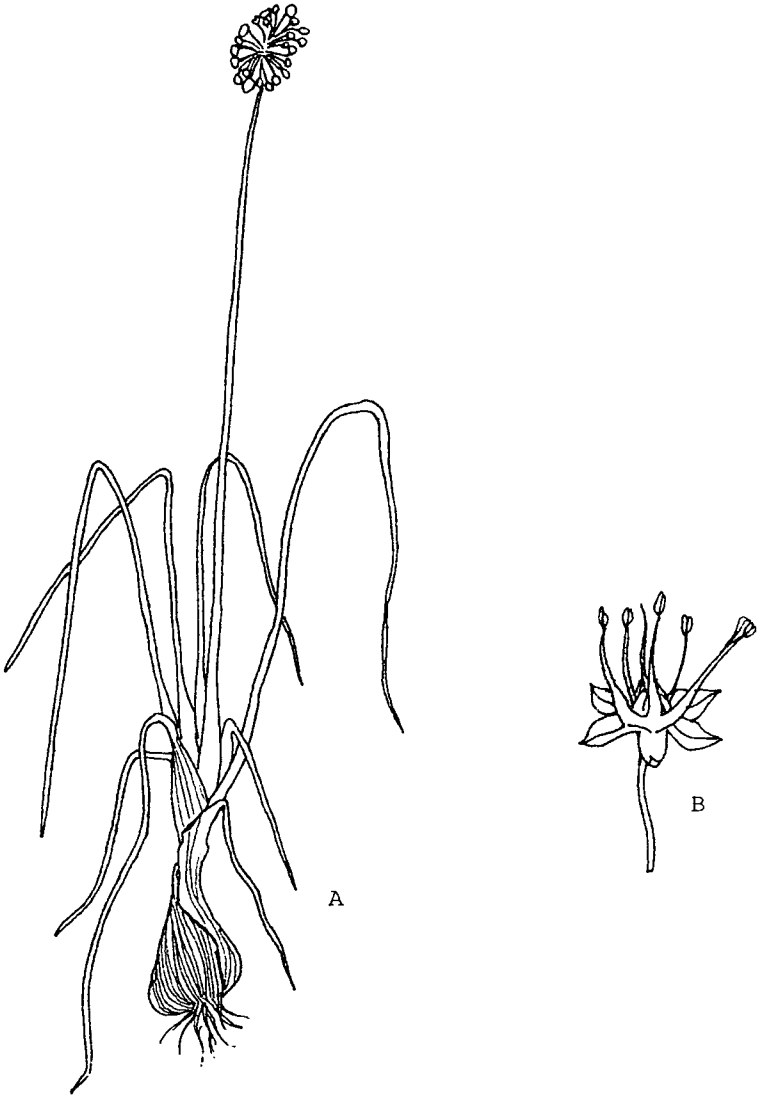
Centre of origin is Western Asia. (Jayaweera, 1981 and Tindall, 1993). Cultivated in many tropical countries including India, Sri Lanka, Malaysia, Java and Philippine Islands. In Sri Lanka, it thrives best in the Jaffna Peninsula Vavuniya, Kurunegala, Matale, Wellawaya and Kalpitiya areas.

EDIBLE PARTS:-

Bulbs and green leaves.

FOOD USE:-

Onion bulbs take a great place in Sri Lankan culinaries. It is eaten fresh or used for salads, curries and pickles. Green leaves are eaten as a vegetable.



Allium ascalonicum

(A) Whole plant. (B) Flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(100 g of leaves)
Moisture-87.6 g, Energy-41.0 Kcal, Protein -0.9 g, Fat -0.2 g, Carbohydrate -8.9 g, Ca-50 mg, P-50 mg, Fe-9.5 mg, Vitamin-A-297 mg, Thiamine-0 mg, Riboflavin-30 mg, Niacin-0.3 mg, C-17mg.

(100 g of bulbs)
Moisture - 84.3 g, Energy - 59 kcal, Protein - 1.8 g, Fats - 0.1 g, Carbohydrate - 12.6 g, Calcium - 40 mg, Phosphorus - 60 mg, Iron - 1.2 mg), Carotene - 15 mcg, Thiamin - 80 mcg, Riboflavin - 20 mcg, Niacin - 0.5 mg, Vitamin C-2 mg (Perera et al., 1979)

The bulbs are useful as an anthelmintic, stomachic, tonic and for asthma. They are diuretic, carminative and aphrodisiac. They are also used for diarrhoea, choleraic attacks, headaches, amenorrhoea, inflammation and pains in the body, loins and the joints. A small piece of a bulb placed in the meatus cures earache. In Malaysia, the juice of the bulbs with turmeric juice is a remedy for stomach ache in children. In tropical Africa the juice is rubbed on the body in cases of fever. In Ghana, a mixture of the bulb with palm oil and capsicum, heated in the sun, is given for fever (Jayaweera, 1991).

ENVIRONMENTAL RESPONSE:-

Loose, sandy soils with a high organic matter contents are preferable. Tolerant to high temperature up to 30^0C and below 20^0C the bulbs are not formed. As a long day plant it gives higher yields when the day length is longer.

CULTIVATION:-

Red onions have been traditionally grown in the Northern Province under irrigation. It can be grown successfully in the dry areas where irrigation facilities are available. Now it is cultivated in Kalpitiya area.

Planting season-In Jaffna it is not uncommon to grow red onions three times a year. The main planting times are January, April and July. April-May planting gives the highest yields, and hence the largest area is planted during this time.

The land for onion cultivation should be prepared so as to provide a loose and fine seed bed. In areas subject to heavy rainfall during the growing period, the land could be prepared into ridges and furrows and planting could be done on the ridge. For irrigation 3 x 3 beds are satisfactory.

Propagation is by seed bulbs. When seed bulbs are used, about 750 - 800 kg would be required for a hectare. When seed bulbs are used for planting, the usual practice is to cut off the apex of the bulb, to promote shoot growth, prior to planting. The bulbs are planted in rows 15 cm apart, at a spacing of 10 cm within the row.

Irrigation - For irrigated onions, square basins about 4 x 4 m are common in Jaffna. Prior to planting, water is impounded into the basins, just enough to wet the soil for planting of the bulbs.

Fertilizer - Red onions reponed well to manuring. Prior to planting cattle manure at the rate of 2 tons/ha is forked into the soil.

Inter-cultivation - Inter-cultivation in the case of red onions is aimed at controlling the weeds, and in the case of basin irrigated onions, at loosening the soil; inter cultivation will tend to form a crust at the surface.

Time to harvest - The onion crop matures in about 2.5 to 3 months from planting.

Harvest - Yellowing of the leaves is an indication of maturity of the crop. Harvesting should be done in dry weather, and harvested onions left to dry in the shade, before storing.

Yield - About 25 tons per hectare.

STORAGE :-

Red onions should not be stored in heaps, as this results in sweating. They should be stored in well ventilated storage houses in thin layers, or in onion baskets.

FAMILY:- LILIACEAE

BOTANICAL NAME:- ***Allium sativum***

VERNACULAR NAMES:-

SINHALA	: *Sudu lunu, Hela lunu*
TAMIL	: *Vellavengayam, Vellaippudu, Ulli.*
ENGLISH	: Garlic

DESCRIPTION:-

A bulbous herb with a short, flat axis giving off slender and very thin papery scales which are enlarged and dilated below and bear at their axils large, oblong-ovoid, sessile bulbs pressed together with the outer ones curved to form collectively a lobed white tapering bulb. Flowering stem terminal.

LEAVES:- 7 or 8 all from the root-stock, each of which is continued upwards as a complete cylindrical membranous tube, obliquely truncated the mouth with a short,annular ligule, blade broadly linear, flat, spreading, glabrous and bright glucose green.

FLOWERS:- Regular, bisexual, very long stalked, projecting beyond the bulbil (Jayaweera, 1981).

DISTRIBUTION:-

Originated in the Mediterranean Genetic Centre (Querol, 1993), where it grows in a semi-wild state. Garlic appears to have been cultivated in all parts of the world from the earliest times. In Sri Lanka, it is cultivated in the up-country districts. (Jayaweera, 1981).

EDIBLE PARTS:-

Bulbs, Tender leaves.

FOOD USE:-

It is widely used for flavoring dishes and also eaten as a vegetable curry. It is an important ingredient of Sri Lankan pickles. Both bulbs and leaves are marinated and eaten.

Allium sativum

(A) Whole plant. (B) Flower

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Bulbs)

Moisture - 66g, Energy - 122 kcl, Protein - 7.0 g, Fat - 0.3 G, Carbohydrate - 2.5 G, Calcium - 26 mg, Phosphorus - 109 mg, Iron - 1.2 mg, Thiamine - 0.23 mg, Riboflavin - 0.08 mg, Niacin -0.4 mg, Vitamin C - 7 mg.

(Leaves)
Moisture - 87 g, Energy - 12 kcal, Protein - 2.1 g, Fat - 0.5 g, Carbohydrate - 9 g, Calcium - 116 mg, Phosphorus - 56 mg, Iron - 0.4 mg, Thiamine - 0.08 mg, Riboflavin - 0.16 mg, Niacin - 0.7 mg, Vitamin C - 38 mg (Knott and Deanon, 1967).

The uninjured bulb contains calories, water soluble amino acid, allicin. The bulb contains a volatile oil,allin, allisin, allyl disulphide, allyl propyl-disulphide, inulin, choline and myrosinase. Medicinally, it is a stimulant, carminative, anthelmintic, diaphoretic, diuretic and expectorant. It is gastric stimulant and aids the digestion and absorption of food. It has a special influence in controlling the bronchial and pulmonary secretions. As a diuretic, it is used in dropsy. Externally, as a liniment it is used in infantile convulsions, asthma facial paralysis, gout and sciatica. With mustard, it is used for paralytic and rheumatic affections. Garlic is also employed as a specific for leprosy. In the Philippines, the bulbs are prescribed for high blood pressure (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Fertile, well drained sand, with good moisture retaining properties give good results. Relatively high temperatures (about 30^0) is required. Grows well at the elevation between 500-2000 m, long days favour bulb development.

CULTIVATION:-

Areas for cultivation- The most suitable areas for garlic cultivation are the higher and cooler elevations in Sri Lanka, like Welimada, Palugama, Haputale, Ohiya, parts of Walapane and Uda Hewaheta. It can be grown also in the mid-country areas, but here the environmental conditions are not so suited to the cultivation of garlic and generally poor yields are obtained.

Planting season - Planting of garlic in the areas mentioned above usually commence around the middle of May, during the intermediate phase of the South West monsoon.

Land preparation - Since garlic is a deep rooted crop, it needs a certain amount of deep tillage. The usual practice is to work the soil to a depth of at least 20 cm.

Planting material - Planting material in garlic consists of the little bulbs or cloves which can be separated from the compound bulbs.

Spacing - Spacing is in rows 30-40 cm apart, with 10-15 cm between plants.

Seed rate - about 500-700 kg are required to plant 01/ha.

Time to harvest - When planted in May, garlic can be harvested around September. The crop takes about 5 months from planting to reach harvesting stage.

Harvest - Harvesting usually involves digging the bulbs out, or pulling the plants out by hand when the soil is loose and friable, after which the plants are tied together by the leaves and left out to dry. Later the roots may be washed, the leaves trimmed and the bulbs dried before marketing.

STORAGE:- Dried bulbs are kept in well aerated bags.

When required for storage of seeds, leaves of the bulbs should not be trimmed. Bundles of about hundred can be tied together and hung till required. Bulbs may be stored at 0^0C for 150 days or at 25-30^0C for 90 days at the humidity of 70% or less. Good air circulation is essential. In Russia and Eastern European countries, both leaves and bulbs are marinated and kept for a long time.

FAMILY:- LILIACEAE

BOTANICAL NAME:- ***Asparagus racemosus***

Syn :- A. volubilis

VERNACULAR NAMES:-

SINHALA	:	*Hathawariya*
TAMIL	:	*Kilavari, Nirmittan, Sadamulam*
ENGLISH	:	Wild asparagus.

DESCRIPTION:-

A tall, rambling and scandent, spinous, excessively branched under the shrub with a tuberous root stock, branches triquetrous, spines 0.6-1.2 cm long, straight or sub-recurved.

LEAVES:- Reduced to minute scales bearing at their axils tufts of slender, trigonous cladodes which are 2-6-nate, 1.2-1.8 cm long, 6 mm broad in the middle, acicular, falcate, finely acuminate at both ends.

FLOWERS:- Regular, bisexual, white, fragrant, very minute in solitary or fascicled many-flowered racemes 2.5-5 cm long, rarely branched, pedicels very slender, 4 mm long, jointed at or about the middle.

FRUITS:- A berry, globose or didynamous, 1-2 seeded, 4-6 mm diameter. Flowers in February (Jayaweera, 1981).

DISTRIBUTION:-

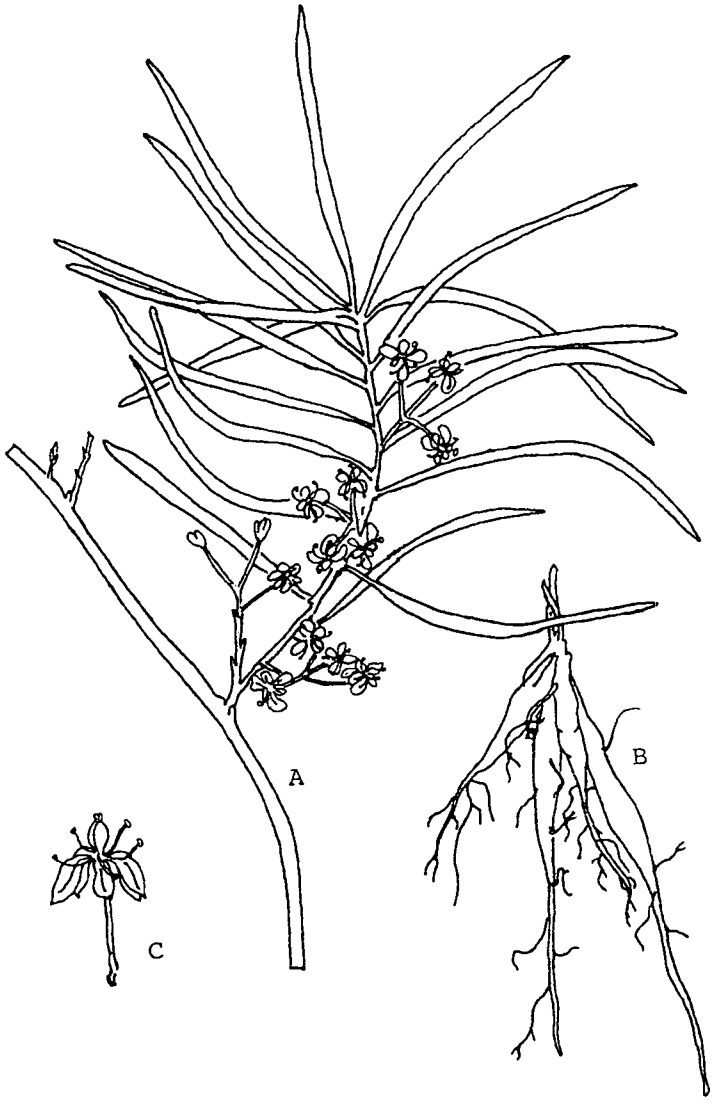
Grows throughout the tropical and sub-tropical regions of India, Sri Lanka, Tropical Africa, Java and Australia. (Jayaweera, 1981; Warrier et al., 1993). It is common in Sri Lanka in the low-country, mostly in the dry regions like Trincomalee, Puttalam, Jaffna, Mihinthale, Bintenna etc.

EDIBLE PARTS:-

The leaves, tubers.

FOOD USE:-

Juice extracted from leaves is added for the preparation of a porridge. Tubers are boiled and eaten.



Asparagus racemosus

(A) Branch with cladodes and racemes. (B) Tuberous roots. (C) Flower, lateral view.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The tuberous roots of this plant are used as are fragrant, demulcent, diuretic, aphrodisiac, alterative, anti-diarrhoeic and anti-dysenteric. They are used in chronic rheumatism, dyspepsia and diarrhoea. In India the tubers are used as an aphrodisiac and as a cure for barrenness in women and to increase sexual vigour. They are also are used for urinary and kidney diseases, strangury and retention of urine. The leaves boiled and applied on boils and swellings (Jayaweera, 1981, Department of Aurveda, 1985; Warrier et al., 1993).

FAMILY :- MALVACEAE

BOTANICAL NAME:- ***Hibiscus esculentus***

Syn : Abelmoschus esculentus

VERNACULAR NAMES:-

SINHALA	:	*Bandakka*
TAMIL	:	*Vendal, Vandikkai*
ENGLISH	:	Ladies finger, Okra

DESCRIPTION:-

A large annual herb reaching a height of 1-2 m, stem thick, erect, stiff, cylindrical, rough with long spreading hairs, sparingly branched.

LEAVES:- Simple, alternate on very long hispid petioles, stipules linear-subulate, hairy, deciduous, blade large variable, often 20 cm or more long, palmately veined, deeply cut into 3-5 acute lobes which are broad and shallow in the lower ones and deep and narrow in the upper ones.

FLOWERS:- Large, regular, bisexual, solitary in axils of leaves on short, thick hispid peduncles much dilated at the summit.

FRUITS:- Capsule 7.5-25 cm long, narrowly oblong or fruit form tapering to a blunt point at apex, cylindrical with short scattered hairs, pericarp dry, chartaceous, dehiscing loculicidally into 8-10 valves with a single row of seeds in each chamber. Flowers all the year round. Seeds nearly round, large smooth, brown exalbuminous (Jayaweera, 1981).

DISTRIBUTION:-

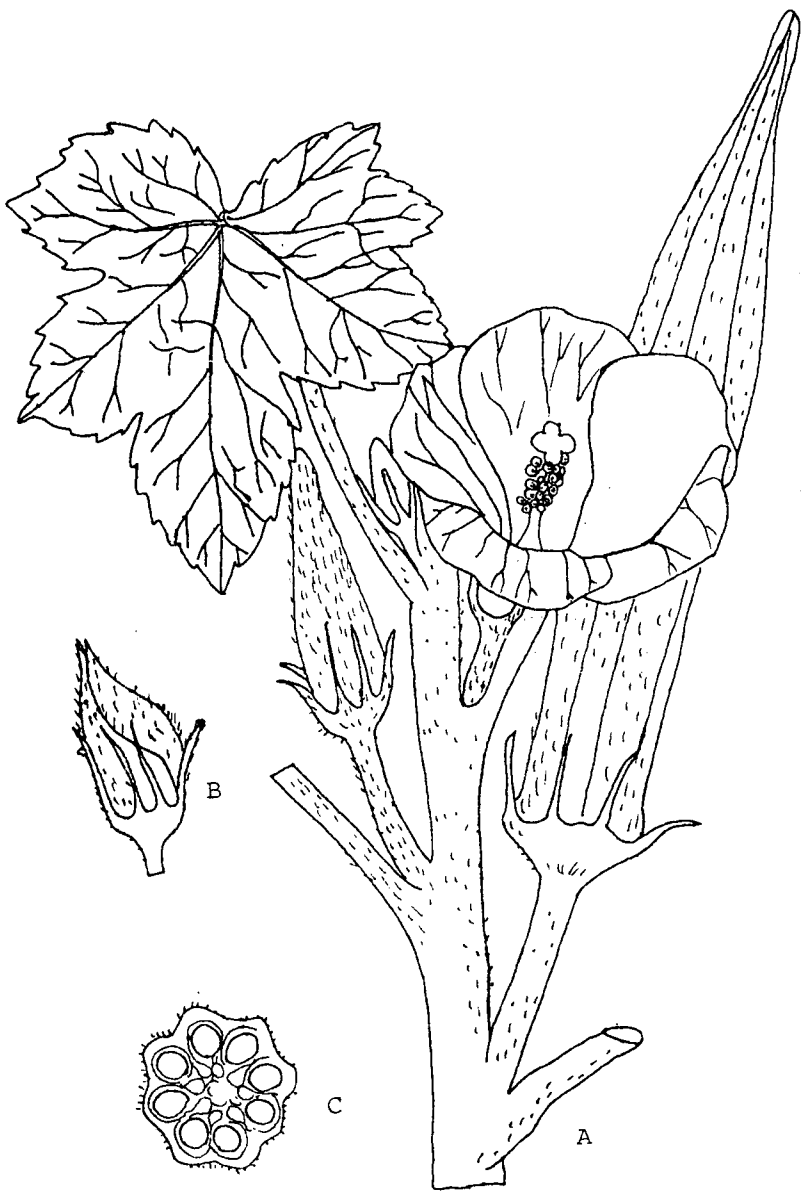
It is probably a native of Africa (FAO, 1981 and Querol, 1992) and cultivated throughout the tropical countries.

EDIBLE PARTS:-

The fruit

FOOD USE:-

The tender capsules are used as vegetables either boiled or sliced and fried.



Hibiscus esculentus

(A) Upper portion of a plant. (B) Bud showing the calyx and epicaln. (C) Transverse section of fruit.

NUTRITIONAL AND THERAPEUTIC VALUE :-

Moisture - 89.6 g, Energy - 35 Kcal, Proteins - 1.9 g, Fats 0.2 g, Carbohydrates - 6.4 g, Calcium - 66 mg, Phosphorus - 56 mg, Iron - 1.5 mg, Carotene - 52 mcg, Thiamine 70 mcg, Riboflavin - 100 mcg, Niacin - 0.6 mcg, Vitamin C - 13 mg (Perera, et al., 1979).

The leaves, roots and fruits contain much mucilage. The green fruit abounds in mucilage, pectin and starch. Fruits are boiled in milk and given for coughs. They are also useful in the form of a decoction for catarrha ailments, gonorrhoea, painful micturition and dysuria. The oil extracted from the seed is edible (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Grown in a wide range of soil types. Optimal temperate for normal growth is between 20-30^{0}C. Watering is necessary in dry periods. Normally cultivated in lowlands below 500 m altitude.

CULTIVATION :-

Areas for cultivation - Common vegetable in both wet and dry zone lowlands in Sri Lanka.

Planting season - Grown in the main rain season.

Planting materials - Seeds.

Planting and space - Seeds should be sown in deeply cultivated soil on ridges or beds, 1.5-2.5 cm deep, 2-3 seeds/hole, and later thinned to one. Alternatively seeds may be sown in nurseries and later transplanted. Rows 60-80 cm apart, with 20-40 cm between plants

Seed rate - 8-10 kg/ha

Irrigation - In arid areas, or in the dry season extra water may be required till the fruiting period.

Fertilizer - NPK fertilizer is applied for planting. Dressing of N fertilizer is recommended at pod set periods.

Time to harvest - Young pods can be harvested, two months from the sowing, continuing for a period of about 1-2 months.

Harvesting - Successional harvesting of young pods is recommended.

Yield - 2-3 t/ha.

STORAGE:-

Fruits may be stored dry, as whole or sliced or powdered. Alternatively they can be canned or pickled. For storing fresh, bright, green and firm fruits which are free from injury are selected and stored by placing them in the shade under damp sacking. If they are stored at 7-10^{0}C with a relative humidity of about 95%, they could be kept for up to ten days.

FAMILY:- MARANTACEAE

BOTANICAL NAME:- ***Maranta arundinacea***

Syn :- M. romossima

VERNACULAR NAMES:-

SINHALA	:	*Hulankiriya, Araluk*
TAMIL	:	*Aruruttukkilangu*
ENGLISH	:	Arrowroot Plant.

DESCRIPTION:-

A herbaceous perennial with a creeping, definite rootstock giving off (beneath the terminal buds) lateral, solid, fleshy, cylindrical thickened branches (rhizome) curving upwards, covered with large, imbricated, thin, pale brown or white scales and afterwards ringed with their scars. Plant height is 1-1.5 m.

LEAVES:- Numerous with long sheaths splat completely down one side, and either enveloping the stem or standing a little away from it.

FLOWERS:- Shortly stalked, slightly nodding, pedicels somewhat thickened beneath the flower, arranged in pairs at the ends of rather long ones.

FRUITS:- Small, crowned with the remains of the sepals, smooth, oblong-ovoid, pericarp leathery (Jayaweera, 1982).

DISTRIBUTION :-

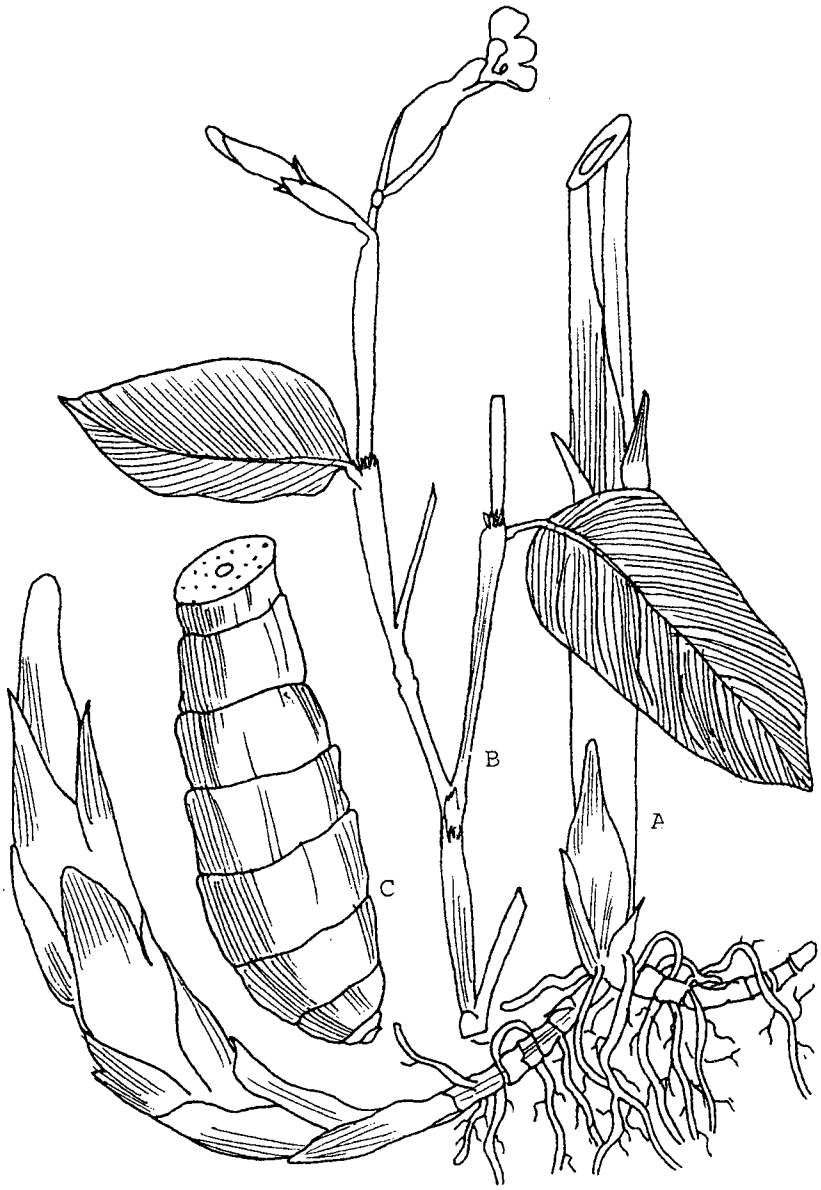
A native of Tropical America (Purseglove, 1972; Querol, 1993) and now frequently cultivated in all tropical regions of the world including India, Sri Lanka, Java, Philippine Islands and the West Coast of Africa.

EDIBLE PARTS:-

Roots.

FOOD USE:-

The boiled tubers are eaten directly. Arrow root flour is especially used as a infant food. Arrow root starch which has a high viscocity can produce a very smooth jelly or paste.



Maranta arundinacea

(A) Base of flowering stem and rhizome branch. (B) Top portion of a branch of flowering plant. (C) Portion of mature rhizome.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 15 g, Energy - 340 Kcal, Proteins - 0.2 g, Fats - 0.g, Carbohydrates - 85 g, Calcium - 7 mg, Phosphorus - 0 mg, Iron - 1.0 mg.

The tubers of the plant contain starch, fibre, fat, albumin, sugar and gum. In the West Indies, they are often used for poulticing wounds. The starch is a nutrient, emollient and demulcent for bowel complaints and diseases of the urinary organs. The extracted juice of the rhizome is an antidote for food poisons and bites of venomous snakes (Jayaweera, 1982).

CULTIVATION:-

Area of cultivation - Mid and low country wet zone.

Land preparation - The land is ploughed.

Planting material - bites (selected tips of rhizomes)

Spacing - They are planted 5-7.5 cm deep and about 30 cm apart.

Harvesting - The rhizomes mature at 10-12 months when the leaves turn yellow. Yield very enormously and range from 7.5-37 tones of rhizomes per hectare.

FAMILY:- MORACEAE

BOTANICAL NAME:- ***Artocarpus altilis***

Syn: *A. communis, A. incisa*

VERNACULAR NAMES:-

SINHALA	:	*Rata Del*
TAMIL	:	*Iirapilakai*
ENGLISH	:	Bread fruit, Breadnut

DESCRIPTION:-

A handsome striking monoecious evergreen trees stout twigs and large pinnatifid leaves Twigs 10-20 mm thick, tipples 10-25 cm long. Lamina up to 60 x 20 cm with 1-5 or more pairs of pinnate leaves. Petiole 30-60 mm long, stout. Male head 12-30 x 1, 2-3 cm, cylindric to cloves, pendent becoming yellow. Female head stiffly upright, stigma simple or bified, exerted, green to yellow, set with conical processes 15 x 5 mm, varying simply aureoles in seedless varieties, fruiting perianth not fleshy. Peduncle 4-13 cm long. Seeds 25 x 20 15 mm, cylyledous somewhat unequal (Purseglove, 1968).

DISTRIBUTION:-

The breadfruit is believed to be a native of Indonesia, (Purseglove, 1968; Rakitin and Durmanov, 1989), but it is now widely distributed in the low land tropics. In Sri Lanka it grows in the costal line of the wet zone.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Boiled fruit is used as a starchy staple in the Pacific Islands and in the Caribbean area. It is boiled and eaten as a staple or supplementary food. Breadfruit curry is also made. Dried bread fruit slices are fried and eaten mixing with salt and either chilli powder or sugar (honey).

Artocarpus altilis

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 70.0 g, Energy - 113 Kcal, Proteins - 1.5 g, Fats - 0.4 g, Carbohydrates - 26.0 g, Calcium - 25 mg, Iron - 1.0 mg, Carotene - 0 mcg, Thiamine - 100 mcg, Riboflavin - 60 mcg, Niacin - 1.2 mg, Vitamin C - 20 mg (Perera, et al., 1979).

ENVIRONMENTAL RESPONSE:-

Grows well in low altitudes of the humid tropic. Requires a rainfall of 1500-2500 mm. Optimal temperature is 22-30^{0}C.

CULTIVATION:-

It is usually propagated vegetatively. This is normally done by root cuttings of 3 cm diameter and 20 cm length. They are planted in seed beds horizontally and 10-15 m apart. Plants bear fruits 2-6 years depending on the variety. Fruits are harvested before fully ripe. Mature trees bear 750 fruits per year each weighing 0.75-2 kg.

STORAGE:-

Undamaged fresh fruits can be stored for 5-6 days. Dried and sliced breadfruits are normally kept in dry containers for prolonged storage.

FAMILY:- MORACEAE

BOTANICAL NAME:- ***Artocarpus heterophyllus***

Syn : A. integra A integrifolia

VERNACULAR NAMES:-

SINGHALA	:	*Kos, Herali, Pana*
TAMIL	:	*Murasabalam, Pilaka*
ENGLISH	:	Jak fruit tree

DESCRIPTION:-

A large evergreen tree glabrous except the young shoots, bark red-brown containing a milky latex inside.

LEAVES:- Simple, alternate 10-20 cm long elliptic or obovate, acuminate entire or those of the young shoots sometimes lobed, dark green and shining on the upper surface, rather rough beneath, base narrowed, main nerves 7 or 8 pairs, petioles 1.2-2.5 cm long, stipules large, glabrous soon caduceus.

FLOWERS:- Unisexual, monoecious, densely crowded on globose or oblong axillary receptacles often mixed with scales, male flowers perianth 2-4 lobed or partite.

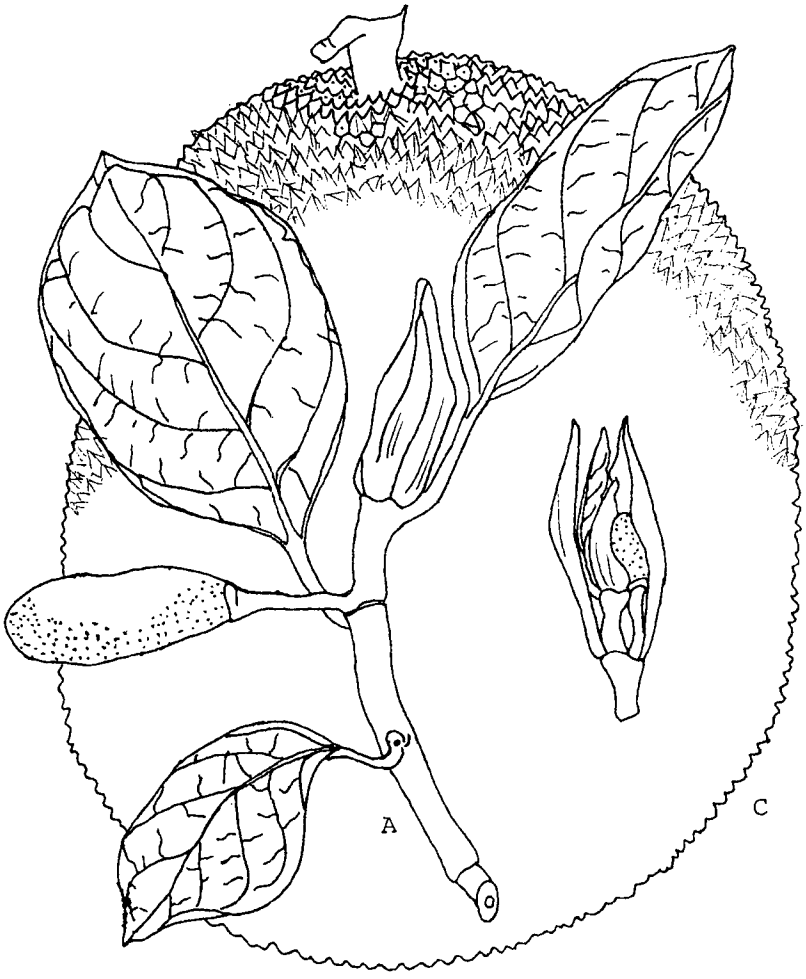
FRUITS:- Large, globose or cylindrical 30-75 cm long 15-30 cm broad, hanging on short stalks from the trunk and lager branches. Seeds pendulous, large, oblong, exalbuminous, testa membranous, cotyledons unequal. Bearing of fruits is from October to January (Jayaweera, 1982).

DISTRIBUTION:-

A native of Western parts in India (Bose and Mitra, 1985) and cultivated in moist tropical countries including Sri Lanka, where it flourishes mostly in the mid and low-country.

EDIBLE PARTS:-

The fruit and young leaves



Artocarpus heterophyllus

(A) Stem with leaves and female inflorescence. (B) Male inflorescence. (C) Mature fruit.

FOOD USE:-

It is called "rice tree" due to its vast importance as a source of food. Fruits are a valuable food item which are eaten at various stages of their maturity. They are called by different names in Sinhalese at different stages of their maturity. Young immetive fruits are called *"Polos"*, mature fruits as *"Kos"* while ripe is called as *"Waraka"* or *Wela*. Tender portion and seeds of the mature fruit is boiled and eaten especially in the villages during the season. Unmature fruit (*polos*) is used to prepare *polos mallum* or *polos ambula* (curry). Tender segments of ripe fruits (*wella and Waraka*) have an aromatic flavour and are sweet in taste.

Sun-dried segments and seeds are eaten during the off-season. Young leaves are eaten as a green vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Jak, tender portion)
Moisture - 84 g, Energy - 51 kcal, Proteins - 2.6 g, Fats - 0.3 g, Carbohydrates - 9.4 g, Calcium - 30 mg, Phosphorus - 40 mg, Iron - 1.7 mg, Thiamine - 50 mcg, Riboflavin -40 mcg, Niacin - 0.2 mg, Vitamin C - 14 mg.

(Jak, ripe portion)
Moisture - 77.2g, Energy - 84 kcal, Protein - 1.9 g, Fat - 0.1 g, Carbohydrates - 18.9 g, Calcium - 20 mg, Phosphorus - 30 mg, Iron - 500 mg, Carotene - 54 mcg, Thiamine - 30 mg.

(Jak seeds)
Moisture - 60.9 g, Energy - 151 g, Proteins - 4.3 g, Fats - 0.4 g, Carbohydrates - 32.6 g, Calcium - 35 mg, Phosphorus - 126 mg, Iron - 1.2 mg, Carotene - 25 mcg, Thiamine - 180 mcg, Riboflavin - 50 mcg, Niacin - 0.5 mg, Vitamin C - 17 mg (Perera, et al., 1979).

The fruit contains a high carbohydrate content but is deficient in calcium and iron. The seeds are rich in starch. The pulp of the fruit is rich in vitamin C. The leaves are used in skin diseases and the root for diarrhoea and fever. The roots are also used for skin diseases and as an antiasthmatic. The milky and juicy stuff mixed with vinegar is applied on swellings and abscesses. The starch from the seeds is given in bilious colic and the roasted seeds have an aphrodisiacal action. An infusion of the mature leaves and bark is given for stones in the bladder and for diabetes (Jayaweera, 1982; Wikramanayake, 1996).

OTHER USES:-

The leaves are used to feed livestock, especially goats. The yellow heart wood is valuable timber and also yields a yellow dye.

ENVIRONMENTAL RESPONSE:-

Well drained, deep alluvial soil is more suitable. Grows at altitudes below 1500 m.

CULTIVATION:-

Areas for cultivation - Can be grown under various agro-ecological conditions. In Sri Lanka it is grown specially in wet zone areas.

Land preparation - It consists of merely of digging holes large enough to accommodate the bole of soil that goes with the planting material.

Planting material - It is commonly grown from seeds which are obtained from mother trees. After extraction seeds should be planted fresh since they do not retain viability for long periods of time.

Planting and space - The plants should be set in the prepared holes 10.0 x 9.0 m apart from each other and the roots are covered with the top soil mixed with compost or well decomposed manure if available. The soil around the base of the plant is pressed down to remove large air spaces and to make the plant stand erectly and firmly in the ground.

Time to harvest - The stage of maturity at which fruits are harvested depends on the intended use. When used as a vegetable, immature fruits are picked when they are rather dark green. The production of a dull, hallow sound, when tapped, is considered as the most reliable indicator that the fruit is mature but not ripe. Harvesting at this stage permits fruit to be handled and distributed to distant markets or held for longer periods before consumption.

Harvest - Harvesting is done at various levels of maturity as immature or mature or ripe according to the need of the people.
Yield - A good tree yields 400 - 700 kg per annum.

STORAGE:-

Sun-dried segments and seeds (*Atukos*) can be stored more than a year. It is a very good source of food for off-season. Heaping seeds covering with a dry layer of sand (*welikos eta*) can be kept for more than six months. Mature (*kos*) and ripe (*waraka*) segments are canned and stored for a long time.

FAMILY:- MORACEAE

BOTANICAL NAME:- ***Artocarpus nobilis***

VERNACULAR NAMES:-

SINHALA	:	*Bedi-Del, Wal-Del, Sinhala Del*
TAMIL	:	*Aresini-pilaka, Asiri-pillakai*
ENGLISH	:	Wild breadfruit

DESCRIPTION:-

A large tree with immense crown, stem, stout, cylindrical, with large wide spreading roots and boughs. Bark thick, dull-brown, often much coated with lichenous growths, irregularly furrowed, exfoliating in an unequal scale of flakes.

LEAVES:- Alternate, large, 25-45 cm by 17-30 cm wide, broadly ovate, oblique or abruptly tapered at base, rounded at apex to an abrupt deflexed tip, dark green above, much paler below.

FLOWERS:- Monoecious, males spikes, females dense, on a terminal or axillary club-like in receptacle 15-20 cm long. Seeds many, globose, about 1.25 cm in diameter, pale chestnut brown (Macmillan, 1956).

DISTRIBUTION:-

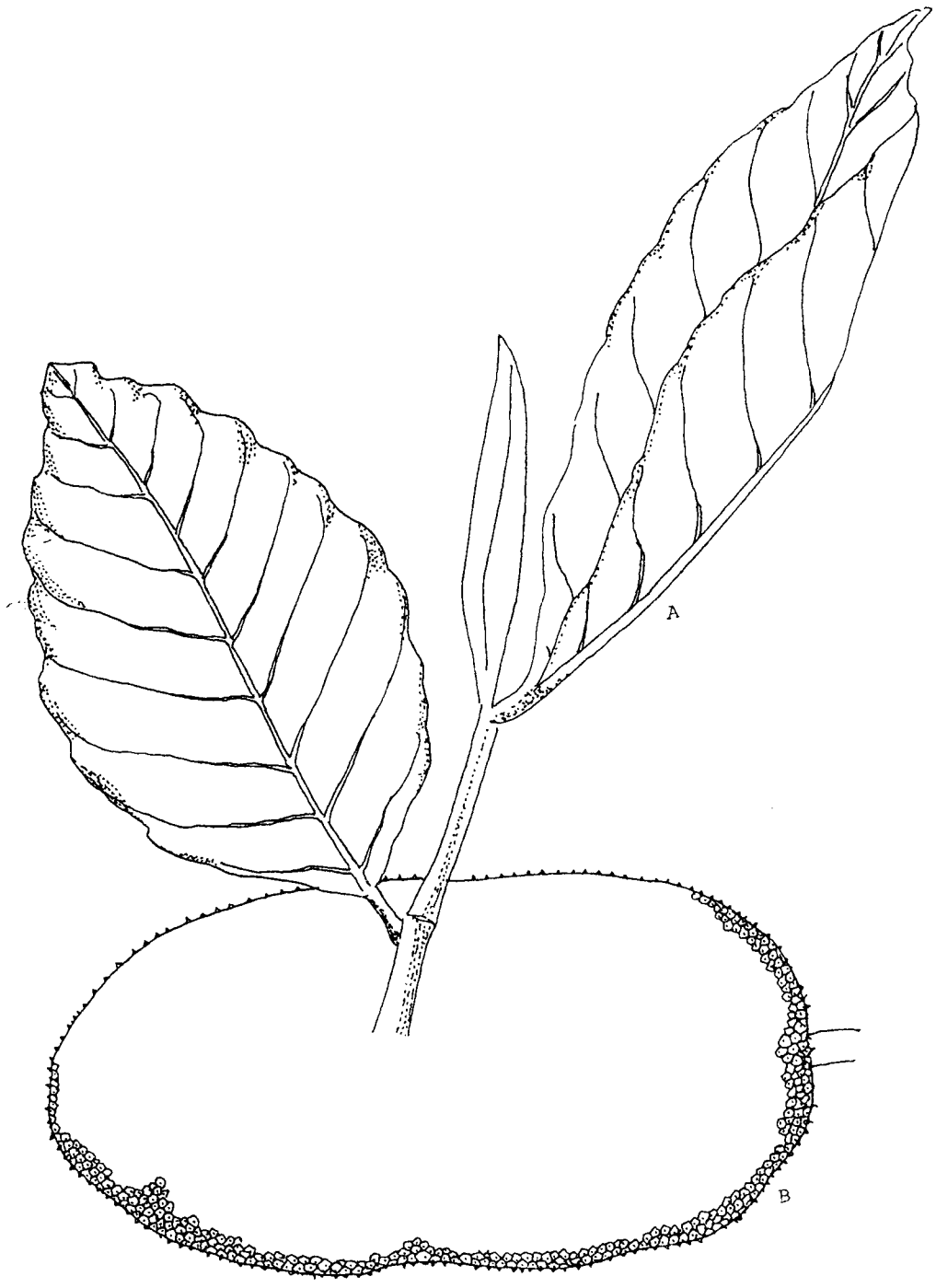
It is an endemic plant to Sri Lanka (Bandaranaike and Sultanbawa, 1991). In Sri Lanka it is found in the low-country up to 800 m altitude, but much less common in the dry zone.

EDIBLE PARTS:-

Fruit, seeds

FOOD USE:-

Excavations done in *Kitulgala* indicate that the prehistoric men used to eat roasted seeds of wild breadfruit 12,500 years ago. Tender portion and seeds are boiled and eaten. Since the seeds contain a higher percentage of oil, they are roasted and eaten as a snack.



Artocarpus nobilis

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Latex is used to treat warms. Seeds are good for Asthma patients. Seed oil is used in traditional medicine.

OTHER USES:-

Timber is hard which can be used in many ways.

STORAGE:-

Dried seeds can be stored for a long time in a dry and cool container.

FAMILY:- MORACEAE

BOTANICAL NAME:- ***Ficus racemosa***

Syn :- F. glomerata

VERNACULAR NAMES:-

SINHALA	:	*Attikka*
TAMIL	:	*Adam, Anai*
ENGLISH	:	Fig

DESCRIPTION:-

An evergreen tree 18-20 m high with glabrous, pubescent or scaberulous shoots.

LEAVES:- Simple, alternate, 10-17.5 cm long, oblong-ovate or lanceolate.

FLOWERS:- Unisexual, of 3 kinds, males, females and imperfect females of gall flowers crowded along with bracteoles on the inner walls of a fleshy, short peduncled, subglobose, pyriform or subturbinate receptacle 3.1 cm diameter, glabrous or pubescent, umbilicus depressed, basal bracts 3, triangular-ovate.

FRUITS:- Reddish about 3 5 cm long. Flowers in November(Jayaweera, 1982).

DISTRIBUTION:-

Grows in India, Sri Lanka and Burma (Jayaweera, 1982). It is common on banks of streams in the moist low-country in Sri Lanka up to an altitude of 800 m. It is a plant known to people in very early times, and one of the trees frequently mentioned in the Bible.

EDIBLE PARTS:-

Fruit

FOOD USE:-

Fruits are sliced and cooked as a vegetable.

Ficud racemosa

(A) Branch with leaves. (B) Branch containing fruits.

NUTRITIONAL AND THERAPEUTIC VALUE:-

An infusion of the bark or the expressed juice of the unripe fruit is given for menorrhagia, haempotysis and urinary diseases. The milky juice is administered for piles and diarrhoea. The powdered leaves are used for bilious ailments. The root is useful for dysentery and the sap of the root for diabetes and hemorrhoids. The juice of the root is a tonic and given for gonorrhoea. The bark is also used to extract poison from wounds caused by cats and also given to cattle suffering from rinderpest. Figs make a good hair wash.

FAMILY:- MORINGACEAE

BOTANICAL NAME:- ***Moringa oleifera***

Syn :- M. pterygosperma

VERNACULAR NAMES:-

SINHALA	:	*Murunga*
TAMIL	:	*Achuram, Murangai*
ENGLISH	:	Drumstick Tree, Indian Horse Radish

DESCRIPTION:-

A small tree with a corky bark and soft wood, young parts tomentose.

LEAVES:- Alternate, usually 3-pinnate, 45 cm long, rachis slender, thickened, articulated at the base, pinnae and pinnules opposite, deciduous, rachided very slender, articulated and with a gland at the articulations, ultimate leaflets opposite.

FLOWERS:- Irregular, bisexual, white in large puberulous panicles, calyx cup-shaped, 5-cleft, segments unequal, petiolate, deciduous from above the base.

FRUITS:- Pods (capsules) 45 cm long, 9-ribbed, 1-chambered, beaked, loculicidally 3-valved. Seeds many, 3-angled, angles winged, exalbuminous (Jayaweera, 1982 and Ekanayake and Chandrasekera, 1989).

DISTRIBUTION:-

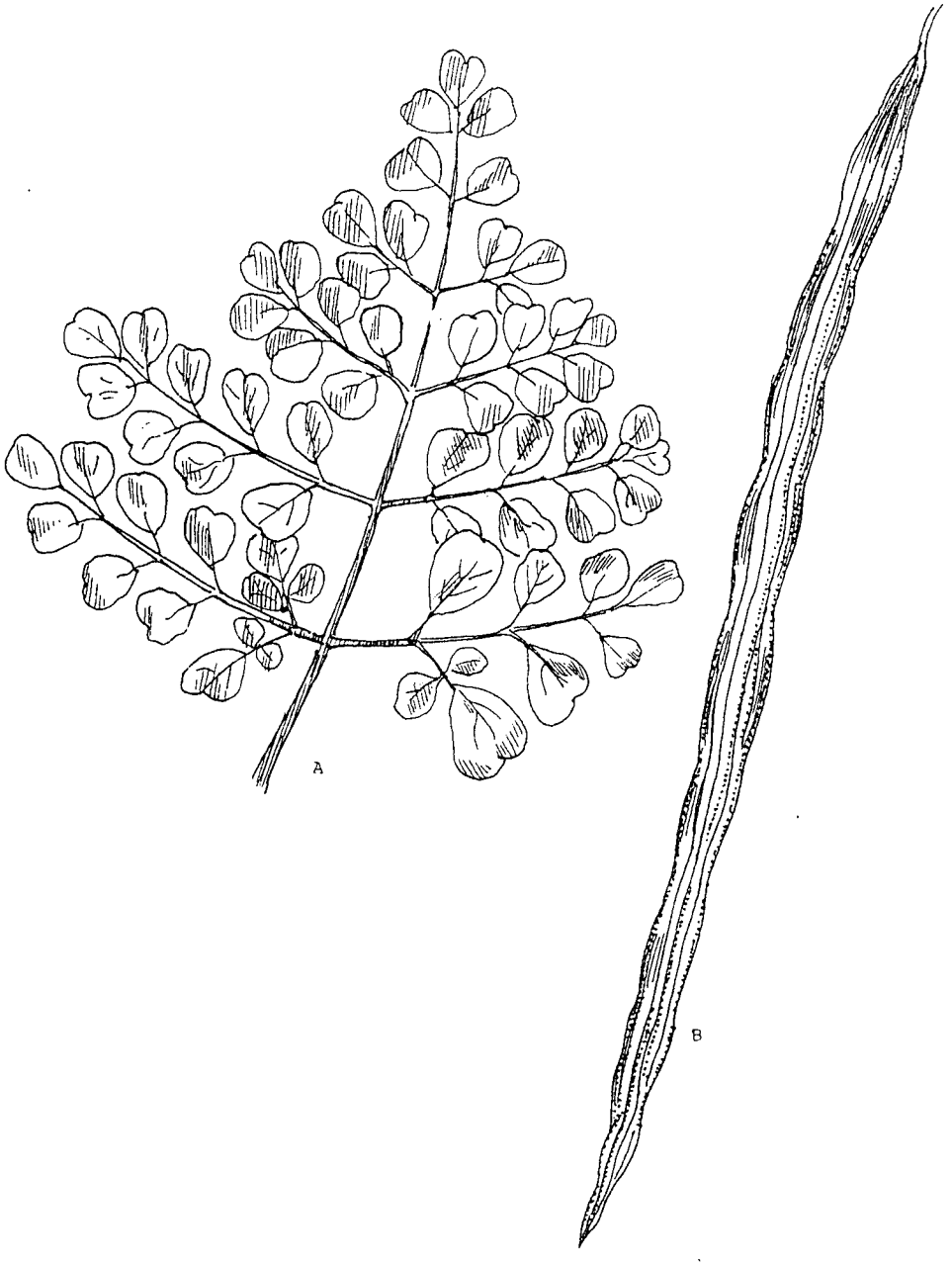
Grows in the forests of Western Himalayas and frequently cultivated in India, Sri Lanka, Burma, Philippine Islands and East Africa. In Sri Lanka it is often grown in the dryzone, especially in Jaffna, Mannar and Puttalam. (Jayaweera, 1982).

EDIBLE PARTS:-

The fruit, leaves and bark.

FOOD USE:-

Unmatured capsules and leaves are eaten as a vegetable. Leaves and antidote bark of the tree are used in food preparation. Leaves are used when ghee is melted, one preparation of Tamil traditional cultivation. Bark is used in preparation of prawns, crabs and pickles and it is believed that the bark protects users from possible poisoning.



Moringa oleifera

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 86.9 g, Energy - 26 Kcal, Proteins - 2.5 g, Fats - 0.1 g, Carbohydrates - 3.7 g, Calcium - 30 mg, Phosphorus - 110 mg, Iron - 5.3 mg, Carotene - 110 mcg, Thiamine - 50 mcg, Riboflavin - 70 mcg, Niacin - 0.2 mg, Vitamin C - 120 mg.

(Leaves)
Moisture - 75.9 g, Energy - 92 kcal, Proteins - 6.7, Fats - 1.7 g, Carbohydrates - 12.5 g, Calcium - 440 mg, Phosphorus - 70 mg, Iron 7.0 mg, Carotene - 6780 mcg, Thiamine - 60 mcg, Riboflavin - 50 mcg, Niacin - 0.8 mcg, Vitamin - 220 mg (Perera, et al., 1979).

The bark contains alkaloids moringine and moringinine, two resins, mucilage and an inorganic acid. The root yields an essential oil and the seeds contain traces of an acrid acid, a pungent alkaloid and bean oil. The bark exudes a gum with the properties of traganth and used for tanning. The leaves and fruits are rich in calcium, iron and are good sources of phosphorus. The fruit is also rich in protein (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:-

Tolerant temperature up to 48^0C. Requires less moisture and a rainfall of 300-500 mm is enough for normal growth. Grows in lowlands below 500 m.

CULTIVATION:-

Areas for cultivation - In Sri Lanka it is common in the dryzone.

Planting season - It is planted just before the onset of the rains.

Planting material - Propagated by cuttings or seeds.

Seeds are collected from mature and well-developed pods. They are soaked in cowdung water for a day and sown direct at site, or on a raised seedbed.

Spacing - For hedges: plant at close spacing, about 30 cm apart, for trees: 4-5 m either way.

Time to harvest - Jaffna: After two years. Flowering occurs during the dry season or at the same time as the new leaves appear. Branches of the thickness of a walking-stick on bearing trees are selected and cut into 1 m lengths. They are planted erect, about 30 cm deep.

STORAGE:-

Leaves are dried and crushed for storage. Seeds or whole pods are dried and stored for short periods of time.

FAMILY:- MUSACEAE

BOTANICAL NAME:- ***Musa sapientum***

VERNACULAR NAMES:-

SINGHALA	:	*Kessel, Ramba*
TAMIL	:	*Vaalai*
ENGLISH	:	Banana, Plantain

DESCRIPTION:-

Rootstock stoloniferous, stem erect, 8-12 feet long.

LEAVES:- The fully developed stem carrying 10-12 functional leaves, very stoutly petioled, 1.3 -1.6 m long, oblong, bright green above, paler beneath, spike decured, about as long as the leaves, or shorter, glabrous. Peduncle about 1.5 inches diameter, below the inflorescence, green, glabrous.

FRUITS:- The fruit is a berry, 10 cm long, obovate-oblong, slightly curved, suddenly constricted at the apex and the base into a stout pedicel 0.6-1.2 cm long (Simmonds, 1970).

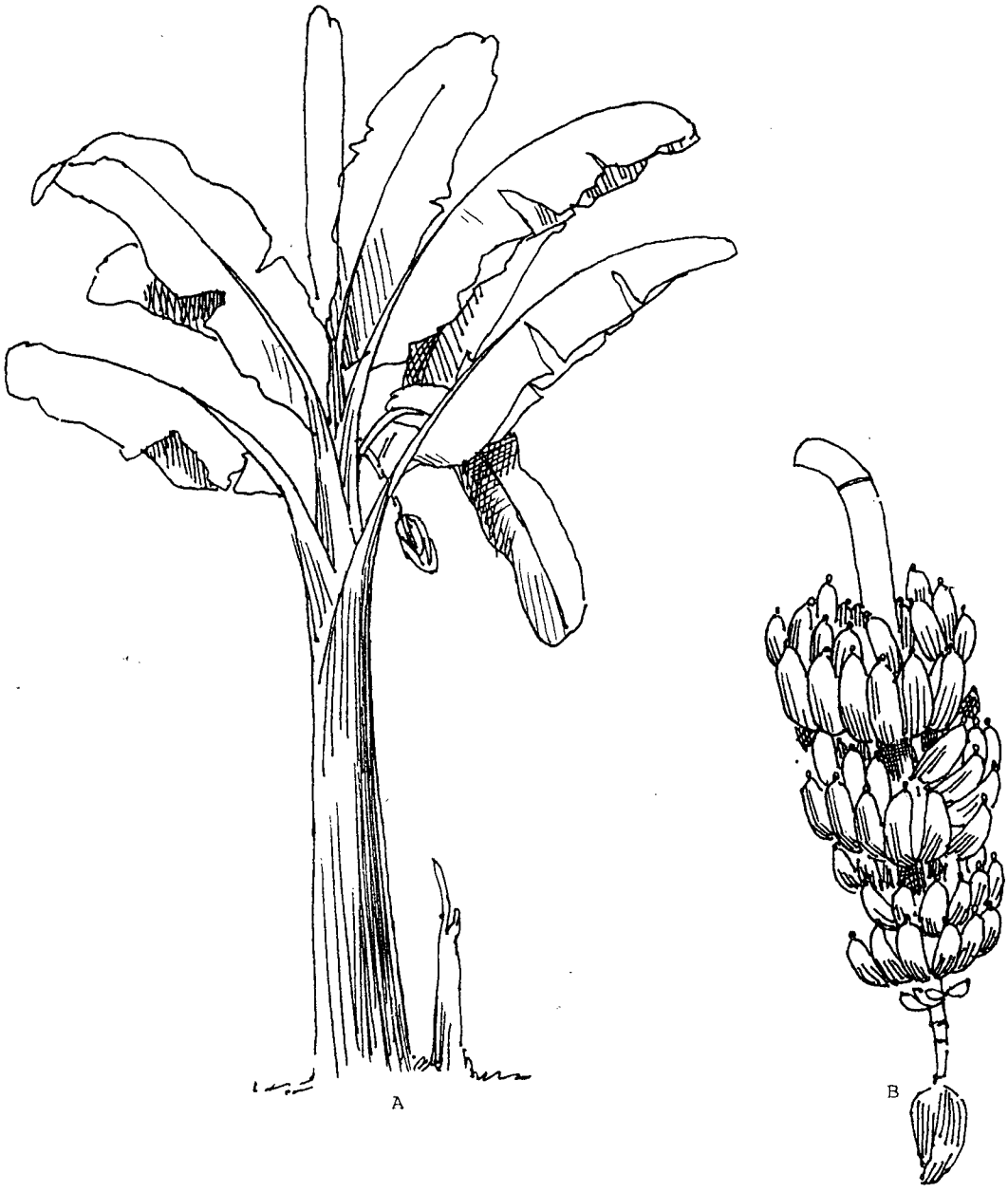
DISTRIBUTION:-

Centre of origin is probably Assam, Burma and Thailand (Simmonds, 1970; Purseglove, 1972; Querol, 1992). In Sri Lanka it grows in the dry zone, Intermediate and Wet zones. It is one of first food items of man. According to the exavations wild banana was eaten by prehistoric men. King Alexander, the Great found bananas growing in the valley of Indus river as early as 327 BC. The banana was perhaps transported into the Pacific by the migration of Polynesians about the time of Christ.

Now it is widely cultivated all over the tropics.

EDIBLE PARTS:-

The fruits, inner portion of the psedostem and inflorescence.



Musa sapientum

(A) Plant. (B) Bunch of fruits.

FOOD USE:-

One of most popular and widely cultivated fruits all over the world. Wild types of banana were used as a source of food by prehistoric men. The ripe fruits are eaten fresh, used for preparation fruit salads, drinks, sweet meets and desserts. Cooking types are used for preparation of curries. Inner portion of the pseudostem and flowers (inflorescence) are cooked as a vegetable. A dried ripe banana product called banana figs is famous in some countries.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Banana -ripe)
Moisture - 70.1 g, Energy - 116 kcal, Protein - 1.2 g, Fats - 0.3 g, Carbohydrate - 27.2 g, Calcium - 17 mg, Phosphorus - 36 g, Iron - 0.9 mg, Carotene - 78 mcg, Thiamine - 50 mcg, Riboflavine - 80 mcg, Niacin - 0.5 mg, Vitamin C - 7 mg.

(Plantain)
Moisture - 83.2 g, Energy - 64 kcal, Protein - 1.4 g, Fat - 0.2 g, Carbohydrate - 14.0 g, Calcium - 10 mg, Phosphorus - 29 g, Iron - 0.6 mg, Carotene - 30 mcg, Thiamine - 50 mcg, Riboflavin - 20 mcg, Niacin - 0.1 mg, Vitamin C - 12 mg.

(Plantain flower)
Moisture - 89.9, Energy - 34 kcal, Protein - 1.7 g, Fat - 0.7 g, Carbohydrate - 5.1 g, Ca - 32 mg, P - 42 g, Fe - 1.6 mg, Carotene - 27 mcg, Thiamine - 50 mcg, Riboflavin - 20 mcg, Niacin - 0.4 mg, Vitamin C - 16 mg.

(Plantain stem)
Moisture - 88.3, Energy - 42 kcal, Protein - 0.5 g, Fat - 0,1 g, Carbohydrate - 9.7 g, Calcium -10 mg, Phosphorus - 10 g, Iron - 1.1 mg, Carotene - 0 mcg, Thiamine - 20 mcg, Riboflavin - 10 mcg, Niacin - 0.2 mg, Vitamin C - 7 mg (Perera, et al., 1979).

According to *Ayurveda*, some cultivars of banana are hot while some are cool. Corm of the plant is used in snake bytes. Fruit paste is applied on burns and sores. (Department of Agriculture, 1995).

ENVIRONMENTAL RESPONSE:-

Grows well in fertile soils with a pH 5.5-7.0, temperature of 24-29^{0}C is considered optimal. Wind speed more than 18 m/s will destroy the banana plants specially at the stage of fruiting.

CULTIVATION:-

Areas for cultivation - In wet, intermediate and dry zone depending on suitable varieties.

Land preparation - It should be prepared in order to get a good texture, depth and drainage.
Planting holes are dug 40 cm square and about 35 cm deep and filled with a mixture of soil and organic matter.

Planting materials - There are three types of planting materials, suckers, buts and bits. Usually suckers are used for propagation.

Planting and space - Suckers are removed from the mother plant when they are 3 months old and 90-105 cm in height. Cut the leaves of young suckers prior to planting. The but or bit should be so placed in the holes that the top is about 15 cm below the surface after the soil is filled in and tamped down. Spacing between holes is 2.4-3 m and wider spacing is for fertile soils.

Fertilizer - Banana needs considerable amounts of mineral nutrients, specially nitrogen and potash. Nitrogen should be applied at short intervals; phosphates and potash may be applied in the planting hole and thereafter twice yearly.

Harvesting - The time from planting to harvesting for the plant crop is 9-18 months, depending on the cultivar and agro-climatic conditions.

STORAGE:-

Ripe fruits can be stored for 3-4 days. Therefore it is harvested unripe and stored. Ripe fruits mixed with honey and dried (figs) can be kept for a long time. Plantains can be stored more than banana and around 2 weeks after which it would wither and lose its eatable quality. Sliced and sun-dried plantains can be stored for quite a long time. It can be sliced and fried and kept alone or as pickle.

FAMILY:- MYRTACEAE

BOTANICAL NAME:- ***Eugenia caryophyllata***

Syn :- *Caryophyllaus aromaticns, E. aromatic ; E. caryophyllus, Syzygium aromaticum*

VERNACULAR NAMES:-

SINHALA	:	*Karabu-neti, Lamanga*
TAMIL	:	*Ilavangappu, Karuvappu, Kiramb*
ENGLISH	:	Clove

DESCRIPTION:-

A small tree about 10-13 m height with numerous, horizontally spreading slender branches forming a dense pyramidal crown, bark pale yellowish gray, smooth with glabrous buds.

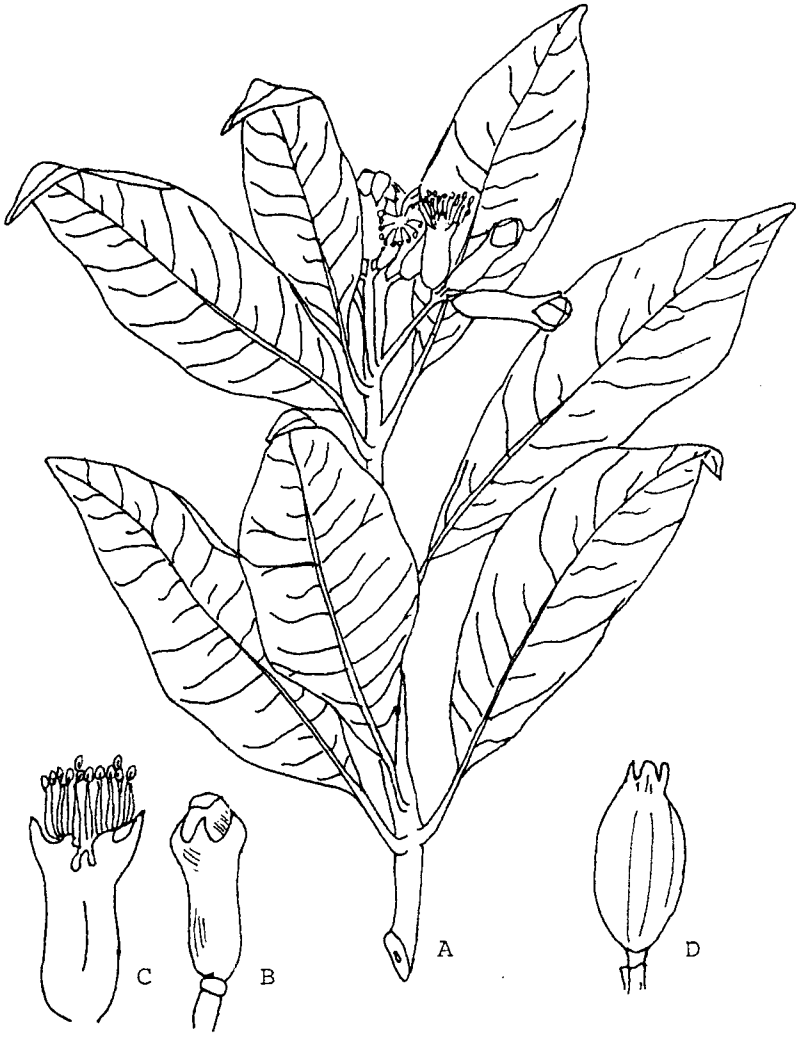
LEAVES:- Opposite, numerous, 7.5-15 cm long including the petioles, dark green and shining on the upper surface, paler beneath with the mid-rib and parallel lateral veins prominent.

FLOWERS:- Regular, bisexual, jointed to short stalks, arranged in groups of three at the extremities of the short articulated branches of small terminal paniculate cymes, bracts small, non-deciduous. Calyx about 1.2 cm long, glabrous, somewhat rough with numerous immersed glands, whitish at first, then green and finally crimson, the lower part cylindrical-compressed oblong, solid fleshy, concave, spreading teeth.

FRUITS:- Fleshy about 2.5 cm long, obovoid-oblong, crowned by the persistent inflexed calyx teeth and the style, smooth purple, pericarp 3 mm thick. Seed solitary, large, occupying the whole of the interior of the fruit, testa thin and membranous, cotyledon large. Flowers from January to March (Jayaweera, 1982).

DISTRIBUTION:-

A native of Moluccas, five islets lying off the coast of the larger island of Dilolo, North-East of Celebres. It is no longer found there as the trees have been wilfully destroyed but it is now largely cultivated in the neighboring islands of the Amboyna group. It was introduced to China by 220 B.C. when, it is recovered, courtiers held cloves to their mouths in order to sweeten their breath when addressing the emperor.



Eugenia caryophyllata

(A) Branch. (B) Flower bud. (C) Longitudinal section of flower. (C) Fruit.

It is also grown in Sumatra, Malaysia, Penang, Mauritius, Bourbon, Guiana, Brazil and in West Indian Islands and Zanzibar. In Sri Lanka it is grown in the mid-country, up to an elevation of700 m.

EDIBLE PARTS:-

Dried unopened flower buds.

FOOD USE:-

Cloves is used as a spice. It is also used in manufacturing of sauces and pickles.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 23 g, Energy - 293 Kcal, Proteins - 5 g, Fats - 9 g, Carbohydrates - 48 g, Calcium - 740 mg, Iron - 5 mg, Thiamine - 100 mcg, Riboflavin - 200 mcg, Niacin - 2 mcg (Perera, et al., 1979).

The principal constituent of cloves is the volatile oil, caryophyllin, a neutral tasteless substance and eugenic, a considerable proportion of gum, tannic acid and salicylic acid. The clove is regarded as a carminative, stomachic and stimulant. It causes thirst and nausea in children suffering from worms and indigestion. Along with other ingredients, it cures colic, diseases of the chest and throat, cough, hiccough, asthma, diarrhoea and urinary diseases. Clove oil is used for toothache (Jayaweera, 1982; Wikramanayake, 1996).

OTHER USES:-

Clove oil, produced by the distillation of cloves, stems and leaves is used in the manufacture of perfumes and as a flavoring in medicine and dentistry.

CULTIVATION:-

Areas for cultivation - Wet zone upcountry areas in Sri Lanka.

Planting materials - seeds.

Spacing - 10 x 10 m, 10 x 5, 5 x 5 m. Shade and windbreaks are necessary in the early stage of growth. They may be obtained by interplanting or cutting leaves from the forest. Trees begin to flower in about 6 years and production of healthy trees continues until 70-80 years or even longer.

STORAGE:-

Sun-dried cloves can be kept for a long time in dry and cool places.

FAMILY :- MYRTACEAE

BOTANICAL NAME:- ***Psidium guajava***

VERNACULAR NAMES:-

SINHALA	:	*Pera*
TAMIL	:	*Koyya, Sengoyya*
ENGLISH	:	Guava

DESCRIPTION:-

A shrub or small tree 3-7 m high, the bark scaly and greenish brown, young branchlets 4-angled.

LEAVES:- Simple, opposite, oblong-elliptic to oval, 7.5-15 cm long 3.5-5 cm broad, acute or rounded at apex, finely pubescent below, the veins conspicuously impressed on the upper surface and raised below, petioles 5-8 mm long.

FLOWERS:- Regular, bisexual, white, about 2.5 cm across. Solitary and axillary or 2-3 altogether on slender peduncles, pedicels 1.2-1.8 cm long and stout.

FRUITS:- A globose, ovoid or pyriform berry 2.5-10 cm long commonly yellow with white, yellow or deep pink flesh, glabrous and crowned with the persistent calyx lobes.
Flowers and fruits almost throughout the year (Jayaweera, 1982).

DISTRIBUTION:-

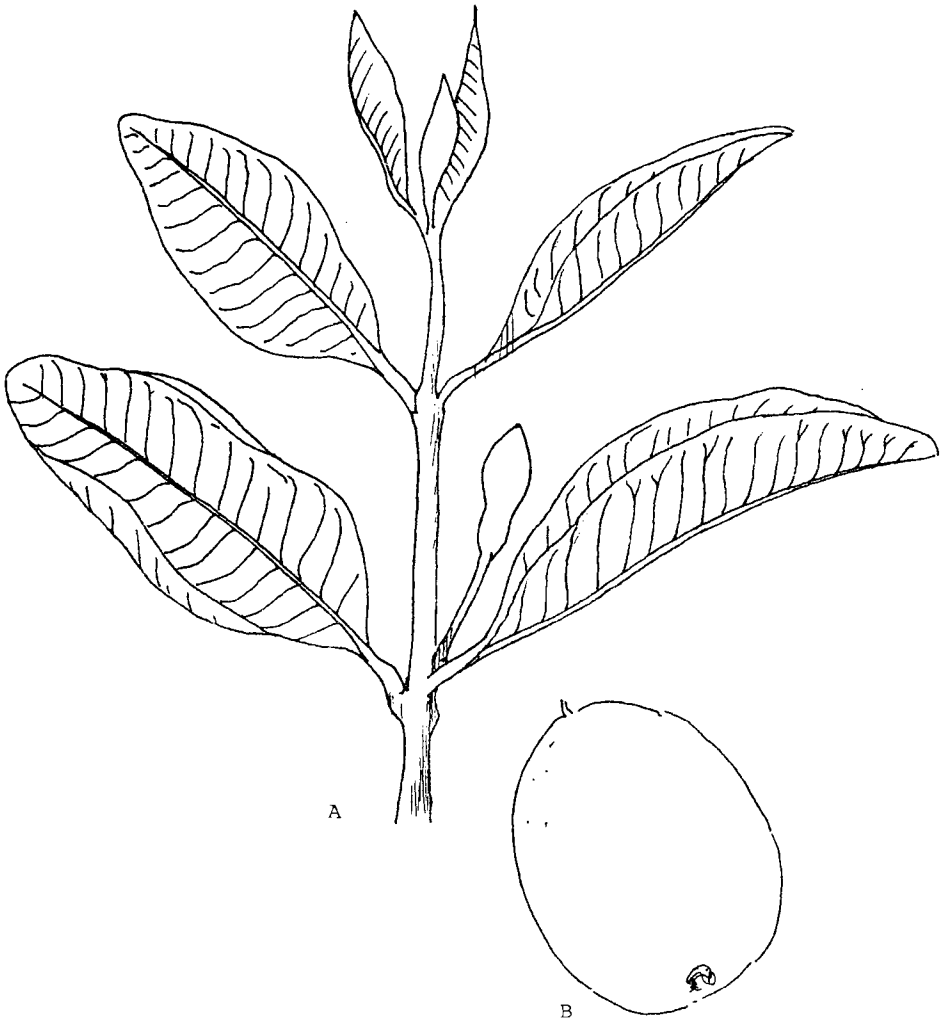
A native of Mexico (Purseglove, 1968; Bose and Mitra, 1985). but it is now often cultivated and naturalized in most tropical countries. It thrives in medium and high elevation up to 1500 m in Sri Lanka. A wild form of this variety grows as a common weed in waste ground bearing small round berries which are pale yellow when ripe, used for making jelly.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Matured and ripe fruits are eaten fresh. Nectar and jam is prepared from Guava.



Psidium guajava

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 81.7 g, Energy - 51 kcal, Proteins - 0.9 g, Fats - 0.3 g, Carbohydrates - 11.2 g, Calcium - 10 mg, Phosphorus - 28 mg, Iron 1.4 mg, Thiamine - 30 mcg, Riboflavin -30 mcg, Niacin - 0.4 mcg, Vitamin C - 212 mg. (Perera, et al., 1979).

The leaves of this tree contain a fixed oil and a volatile oil. The fruit contains "glycosen" saccharose and protein. The bark and roots are rich in tannin and the fruit in vitamin C content, particularly in the skin and outer flesh. The leaf yields 3 antibacterial substances namely avicularin, guaijaver in and another. The bark of the tree is used in the form of decoction for diarrhoea and dysentery and also as a mouthwash for swollen gums. The leaves are chewed for toothache. An infusion of the leaves is recommended for cerebral ailments, nephritis and cachexia in West Indies, while the pounded leaves are applied to rheumatism and an extract used for epilepsy and cholera. The water in which the fruit is soaked is beneficial for diabetes. The juice of the fruit and leaves is an antidote for manioc and cannabis poisoning (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:-

Adapted to a wide range of soils and temperatures. Favourable temperature is 15-30^{0}C. Requires annual rainfall of 1000-3000 mm. Grows at altitudes below 1700 m.

CULTIVATION:-

Areas for cultivation - It is cultivated both in wet and dry zone lowlands.

Planting material - Usually propagated by seed, but it is preferable to propagate by vegetative means. A variety of methods can be employed; cuttings under closed conditions, or root suckers, patch budding, side veneer and approach grafting, and marketing. Seeds may be planted in boxes at a depth of 1.2 cm. When 5-6 cm high, the seedlings are transplanted into a bed at 20 cm spacing, or into polythene bags. Spacing 4.5-7 m, depending on variety and soil conditions, is required

Time to harvest - Normally , trees bear fruits 2 years after transplanting. They are in full bearing at 8 years and cropping may continue for 30 years or more. The fruits mature 5 months after flowering.

Harvest - Fruits are normally hand-picked while still firm, when the skin colour starts to change from green to yellow. During the season, picking every 2-4 days is usually required.

STORAGE:-

Ripe fruits keep for less than one week at ambient temperatures (out of the sun). If picked while immature, they can be kept for about 4 weeks at 8-10^{0}C.

FAMILY:- MYRTACEAE

BOTANICAL NAME:- ***Syzygium aqueum***

Syn:- Eugenia aqueum

VERNACULAR NAMES:-

SINHALA	:	*Wal Jambu, Pini Jambu*
ENGLISH	:	Watery rose apple

DESCRIPTION:-

20 m long, 4 m girth short crooked ribbed trunk. Tawny brown flaky bark and dense dark irregularly oblong crown. Parts entirely glabrous. Twigs stout, much branched pale rust-brown, at first buntty quadrangular.

LEAVES:- Young brilliant crimson, lamina 4.5-23 x 1.5-11 cm, elliptic-oblong, coriaceous, drying dark red brown beneath.

FLOWERS:- 10, in short terminal or sub-terminal axillary cymes, subsessile or shortly pedicellate calyx tube 1,5-3 cm long, funnel, 5 leaped, segments, pale pinkish white.

FRUITS:- 2 cm diameter, globose, red-coloured with a prominently 8 mm diameter, persistent cymes ring (Jasen, 1985; FAO, 1990).

DISTRIBUTION:-

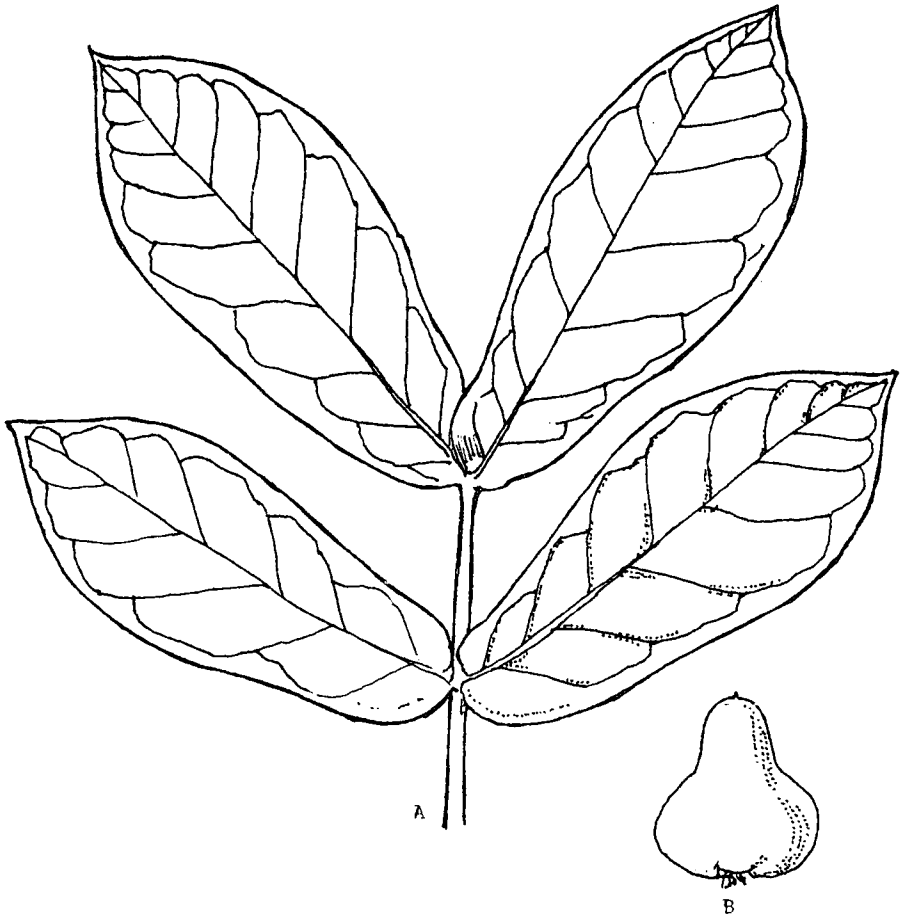
It is a native of Southern India. Wild form grows commercially in Indonesia under humidtropical conditions. In Sri Lanka, watery rose apple trees grows in homegardens of wet zone.

EDIBLE PARTS:-

Fruit

FOOD USE:-

Ripe fruits are eaten fresh. It may be prepared as a syrup or a fruit drink.



Syzygium aqueum

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 89.1 g, Energy - 39 kcal, Proteins - 0.7 g, Fats - 0.2 g, Carbohydrate - 8.5 g, Calcium - 10 mg, Phosphorus - 30 mg, Iron - 0.5 mg, Thiamine - 10 mcg, Riboflavin - 50 mg, Niacin - 0.4 mg, Vitamin C - 3 mg (Perera, et al., 1979).

OTHER USES:-

Timber is hard and durable.

FAMILY:- MYRTACEAE

BOTANICAL NAME:- ***Syzygium caryophyllatum***

Syn :- Myrtus caryophyllata, Eugenia corymbosa

VERNACULAR NAMES:-

SINHALA	:	*Dan, Heen-dan*
TAMIL	:	*Marungi*

DESCRIPTION:-

A brush or shrubby tree with a smooth gray bark, slightly compressed young twigs scurfy and orange brown.

LEAVES:- Simple, opposite, exstipulate, 6.2-8.7 cm long, ovate-oval, acute at base, rounded, obtuse or very shortly and bluntly acuminate, glabrous, shining and bright apple green on the upper surface, rather pale beneath, lateral, veins numerous, fine but rather conspicuous beneath, petioles 0.6 cm long.

FLOWERS:- Regular, bisexual, white, small, numerous, nearly sessile, cymes terminal, corymbose, trichotomies, buds ovoid-globose.

FRUITS:- A depressed-globose, inky purple black, berry juicy, shining and 1-1.2 cm long. Period of flowering February to May (Jayaweera, 1982).

DISTRIBUTION:-

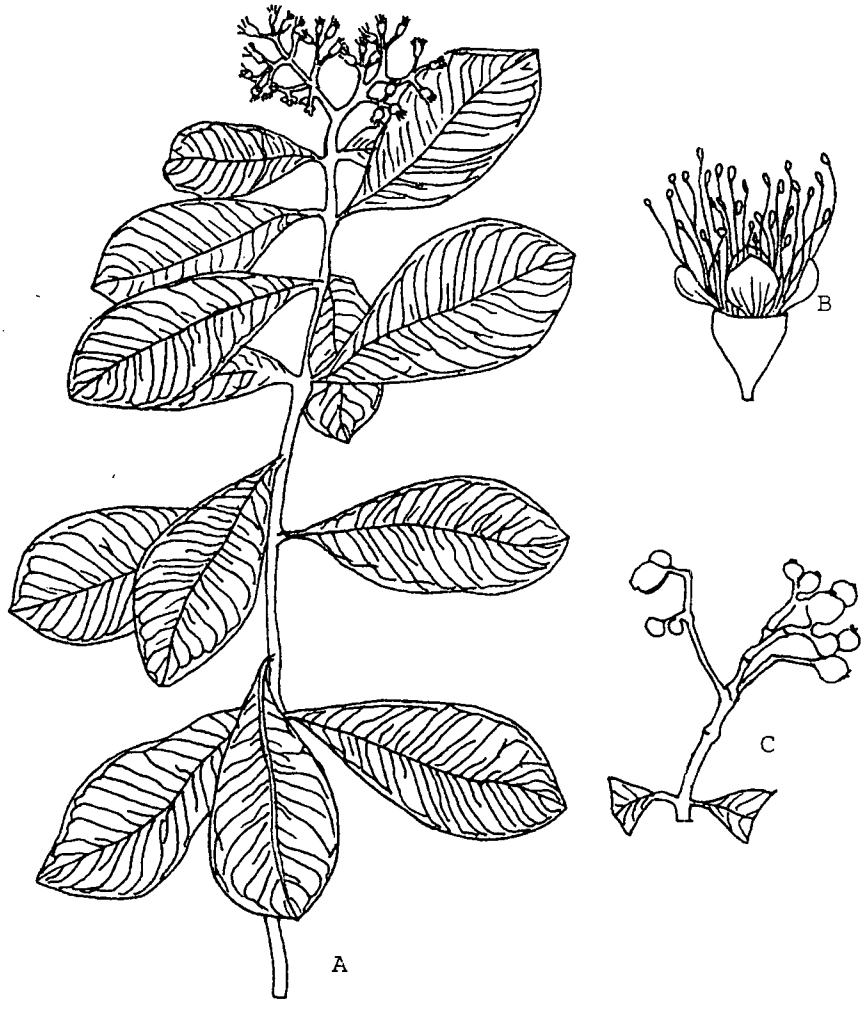
Grows in South India, Sri Lanka and Borneo. It is very common especially in open sandy places in the low-country, both in the moist and dry regions of Colombo and Negombo in Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Ripe berries are eaten fresh.



Syzygium caryophyllatum

(A) Branch with leaves and flowers. (B) Flower, lateral view. (C) Twig bearing fruits.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 70.5 g, Energy - 104 kcal, Proteins - 11.6 g, Fats - 0.4 g, Carbohydrates - 23.5 g, Calcium -17 mg, Phosphorus - 47 mg, Iron - 1.5 mg, Thiamine - 70 mcg, Riboflavin - 170 mcg, Niacin - 1.3 mcg, Vitamin C - 37 mg.

The leaves and bark of this tree are applied on burns, boils and ulcers and are given internally for diabetes. The seeds are used as a purgative (Jayaweera, 1982).

STORAGE:-

Ripe fruits are barely stored.

FAMILY :- MYRTACEAE

BOTANICAL NAME:- ***Syzygium cumini***

Syn :- Eugenia cumini

VERNACULAR NAMES:-

SINHALA	:	*Madan, Maha-dan*
TAMIL	:	*Arugadam, Kottainagam, Naval*
ENGLISH	:	Black Plum, Jambolan, Java plum

DESCRIPTION:-

A large tree with a thick rough gray bark and cylindrically compressed exfoliating twigs.

LEAVES:- Simple, Opposite, exstipulate, 7.5-8.7 cm long, oval or oblong-oval, tapering to the base, acute or subacute at apex, glabrous, not shining, rather thin, light bright green.

FLOWERS:- Regular, bisexual, white, honey-scented, small, on short pedicels, cymes about 7.5 cm long, lax, pedunculate with slender divaricate branches.

FRUITS:- 1-1.2 cm long, ovoid, often lop-sided, crowned with the truncate calyx limb (Jayaweera, 1982).

DISTRIBUTION:-

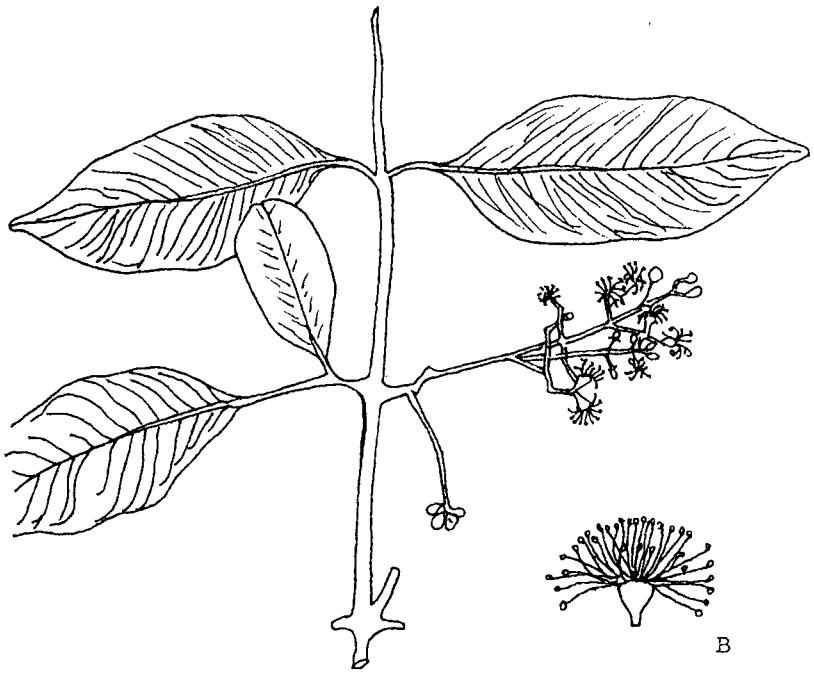
The original home of *Jambolan* is India or East Indies (Singh, 1969). Grows in India, Sri Lanka, Malaysia and Philippine Islands. It is common in both wet and dry regions up to 1,000 m in Talaimannar, Jaffna, Maturata, Trincomalee etc. in Sri Lanka.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Ripe fruits are eaten fresh.



Syzygium cumini

(A) Branch. (B) Flower lateral view.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 83.7 g, Energy - 62 kcal, Proteins - 0.7 g, Fats - 0.3 g, Carbohydrates - 14 g, Calcium - 15 mg, Phosphorus - 15 mg, Iron - 1.2 mg, Vitamins - Carotene - 48, Thiamine - 30 mcg, Riboflavin - 10 mcg, Niacin - 0.2 mg, Vitamin C - 18 mg. (Perera, et al., 1979).

The bark contains tannins, gallic acid and a crystalline substance called jambosine. A decoction of the bark is given internally for diarrhoea and dysentery. Externally, it is used for cleaning ulcers and as a mouth wash for spongy gums. A fine paste of the bark with cow's milk cures bloody discharge in dysentery. A syrup prepared from the juice of the ripe fruit is useful for enlarged spleen and chronic diarrhoea. The ripe fruit or the pulverized seed is taken as a remedy for diabetes as they check the conversion of starch in to sugar. (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:-

Jambolan requires a deep loam and well draind soil. It is successfully grown under tropical and sub-tropical conditions; early rains are beneficial to proper growth, development and ripening fruits.

STORAGE:-

It is poorly stored due to its thin skin and they must be kept in thin layers.

FAMILY:- MYRTACEAE

BOTANICAL NAME:- ***Syzygium jombos***

Syn: Eugenia jambos

VERNACULAR NAMES:-

SINHALA	:	*Veli Jambu*
TAMIL	:	*Seeni Jambu*

DESCRIPTION:-

A small tree 10 m tall, 50 cm grith, with defuse branch bark gray brown, smooth all parts glabrous. Twigs red-brown, terete, smooth.

LEAVES:- Lamina 9-20 x 1.5-5.5 cm, narrowly, lanceolate, thickly coriaceous, semi-pendent, base, a cumen to 3 cm long, slender, nerves C 14-20 pairs.

FLOWERS:- 10 in short terminal or subterminal axillate cymes, subsesile or shortly pedicellate, clays tube 1.5-3 cm long, 5 leped, segments 6 cm long and petals 12 x 8 mm, oblong, obtuse, pale pinkish white.

FRUITS:- 2,5 x 2 cm obturbinate, white shortly pedicellate, prominently crowded by a 1.5 cm diameter, ring or persisting level (Jasen, 1985; FAO, 1990).

DISTRIBUTION:-

West Malaysia (FAO, 1990)and lowlands of Sri Lanka.

EDIBLE PARTS:-

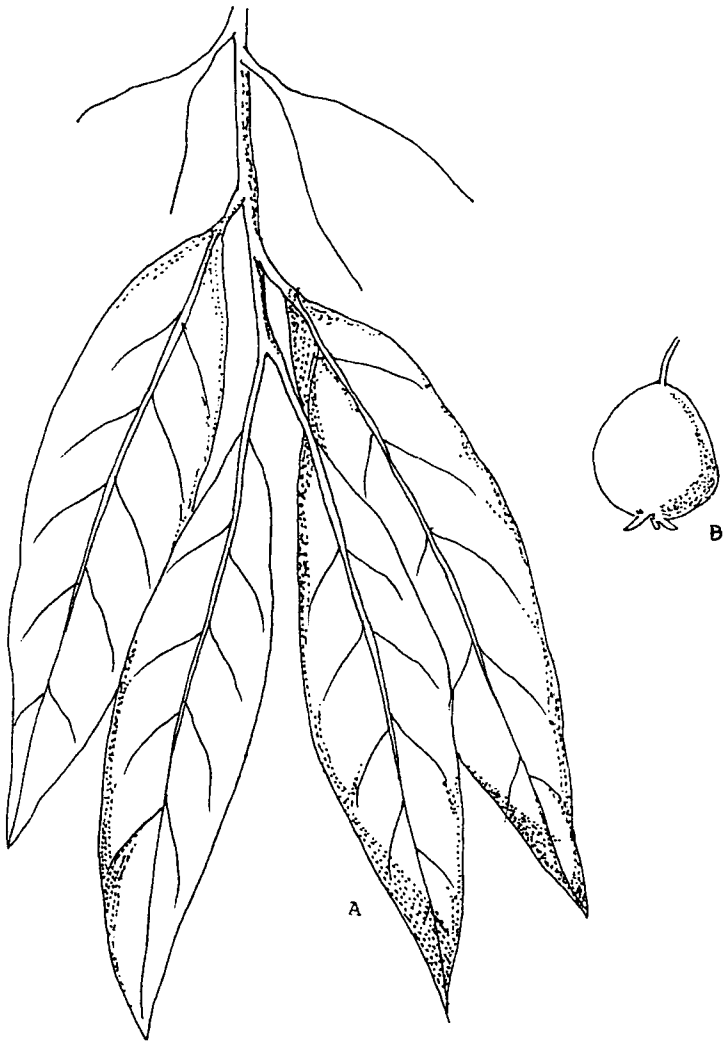
The fruit.

FOOD USE :-

Fruits can be eaten fresh, but it is rather insipid and not popular. It is preferred cooked, in preserues, and in this form it is greatly appreciated.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 89.1 g, Protein - 0.7 g, Fat - 0.2 g, Cabohydrate - 9.7 g, Minerals - 0.3 g (FAO, 1982).



Syzygium jombos

(A) Branch. (B) Fruit.

OTHER USES:-

Timber is good for construction purposes. It is also good for both firewood and charcoal.

CULTIVATION:-

Cultivated in homegardens in Sri Lanka.

FAMILY:- MYRTACEAE

BOTANICAL NAME:- ***Syzygium malaccensis***

Syn:- Eugenia malaccensis

VERNACULAR NAMES:-

SINHALA	:	*Jambu*
TAMIL	:	*Peria Jambu*
ENGLISH	:	Malay rose apple

DESCRIPTION:-

A medium sized tree 20 cm tall, with smooth grey-brown lenticellate patchily flaked bark and dense oblong shiny leaved crown. Twigs stout, pale brown, terete.

LEAVES:- Lamina 16-30 x 5-13 cm, elliptic, subcoriaceous, base narrowly cuneate, qelman 1-2 cm long, slender, tapering.

FLOWERS:- 1 cm long short axillary cymes, bright pence, calyx 15 x 18 mm, funnel-shaped with 4.5 x 4 mm sub-orbicular rotate segments. Petals 10 x 8 mm, elliptic, obtuse, cupped, stamen 2 cm long.

FRUITS:- 4 x 3.5 cm, obtarbinate, pale pinkish white, succulent, with 1.5 cm diameter terminalring of persisting segments. The seed is known to be poli-embryonic (Jasen, 1985; FAO, 1990).

DISTRIBUTION:-

Indigenous to Malaysia but it also grows in India, Indonesia, Java, Sri Lanka. Commonly cultivated in homegardens of wet zone lowlands of Sri Lanka (Jasen, 1985; FAO, 1990).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Fruits are eaten fresh. Fruits excluding seeds are boiled with sugar to prepare sweet meets, called as *Jambu dosi*.

Syzygium malaccensis

(A) Branch. (B) Fruit.

CULTIVATION:-

It is cultivated in homegardens.

STORAGE:-

It can be stored 3-5 days in fresh.

FAMILY:- NYMPHAEACEAE

BOTANICAL NAME:- ***Nelumbo nucifera***

Syn :- Nelumbium nuciferum

VERNACULAR NAMES:-

SINHALA	:	*Nelum, Tamburu, Padma, Aravinda*
TAMIL	:	*Ambal, Sivapputamarai*
ENGLISH	:	Chinese Water-lily, Lotus

DESCRIPTION:-

A large aquatic herb with a slender, elongated, branched, creeping stem with tufts of roots at notes.

LEAVES:- Very large, some erect, others horizontal and floating at the ends of very long, rough, prickly petioles, 30-60 cm diameter, concave or flat, rotundate, entire, radially veined, glabrous, and glucose.

FLOWERS:- Regular, bisexual, white or rose-coloured, sweet-scented, solitary, large, 10-25 cm diameter, at the ends of very long, erect, asporous pedicels coming off from the nodes of the stem and sheathed at the base. Period of flowering February to August (Jayaweera, 1982).

DISTRIBUTION:-

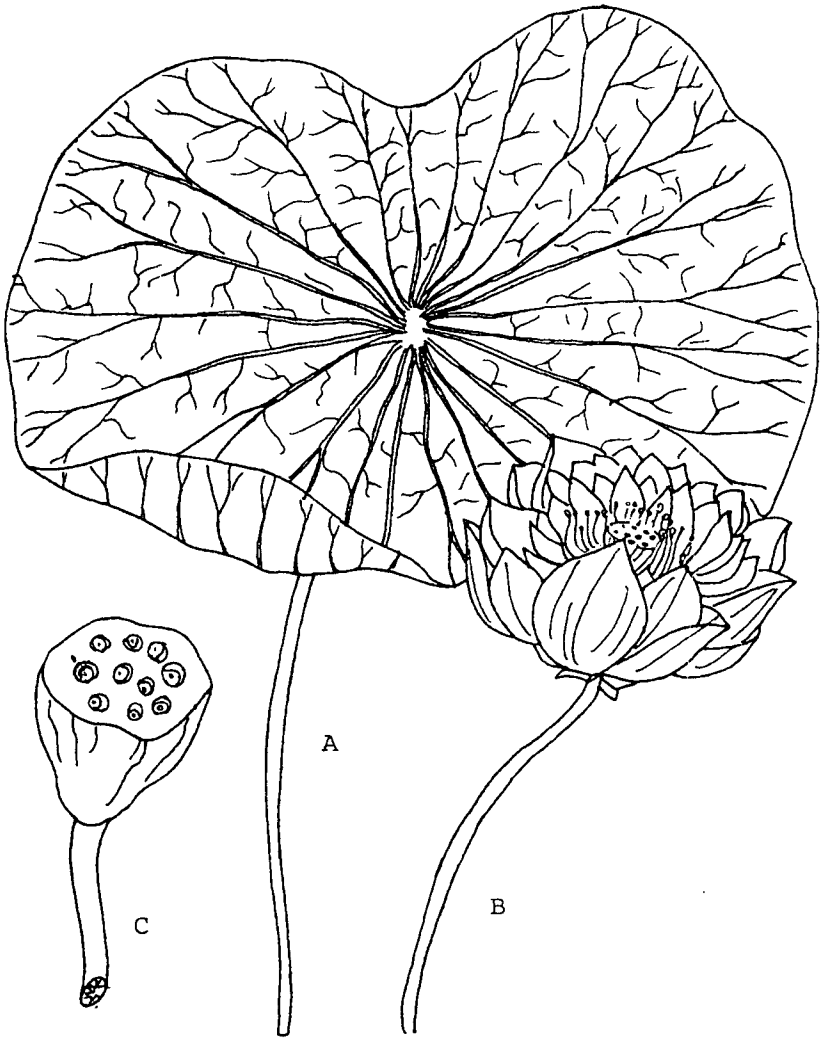
Grows in stagnant water throughout the warmer regions from Persia to Australia. (Jayaweera, 1982).It is common in tanks in the dry zone in Sri Lanka.

EDIBLE PARTS:-

Rhizome and seeds.

FOOD USE:-

The rhizome is frequently used as a vegetable and the seeds divested of their testa are roasted or ground into flour and eaten. Unripe seeds can be eaten fresh.



Nelumbo nucifera

(A) Leaf with petiole. (B) Flower lateral view. (C) Fruit with seeds.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(100 g of root portion)
Moisture - 83.9 g, Energy - 53 Kcal, Proteins - 1.7 g, Fats - 0.1 g, Carbohydrates - 11.3 g, Calcium -21 mg, Phosphorus - 74 mg, Iron - 0.4 mg, Thiamine - 100 mcg, Vitamin C -22.

(100 g of seeds)
Moisture - 10 g, Energy - 324 Kcal, Proteins - 17.2 g, Fats - 2.4 g, Carbohydrates - 64 g, Calcium - 36 mg, Phosphorus - 294 mg, Iron - 2.3 mg. (Perera, et al., 1979).

The seeds of the plant contain alkaloid, nulumbine, while the leaves have nuciferine and an alkaloid. The seeds contain protein, fat, carbohydrates, vitamin C and asparagine. The stamens of the flowers are used for bleeding piles and debility and weakness in children. An aqueous extract of the fresh rootstock of the white flowered variety is given internally for snake-bite poisoning, especially that of the cobra.

The flower is also made into syrup and given for coughs, dysentery and to check hemorrhages from bleeding piles. The seeds are made into a paste and applied on leprosy and other skin diseases. The milky juice of the leaves and flower stalk is given for diarrhoea (Jayaweera, 1982).

OTHER USES:-

Flowers are used for religious ceremonies. Leaves are used for wrapping purposes as well as for lunch sheets.

STORAGE:-

Undamaged rhizomes are kept for 5-7 days in shady places. Dried seeds are kept well in dry and cool places.

FAMILY:- NYMPHAEACEAE

BOTANICAL NAME:- *Nymphaea lotus*

VERNACULAR NAMES:-

SINHALA	:	*Olu, Et-olu*
TAMIL	:	*Ambal, Allitamarai*

DESCRIPTION:-

An aquatic herb with a short, erect roundish, tuberous rootstock.

LEAVES:- Very long, cylindrical, submerged petioles leaf blades horizontal, floating, petlate, 15-20 cm diameter. Sagittate-rotundate, glabrous on the upper surface, finely velvety tomentose beneath, veins very prominent.

FLOWERS:- Solitary, regular, bisexual, white, pale or dark rose-coloured, fragrant, open only in the morning, very large, 12.5-17.5 cm diameter, on very long, usually pubescent peduncles.

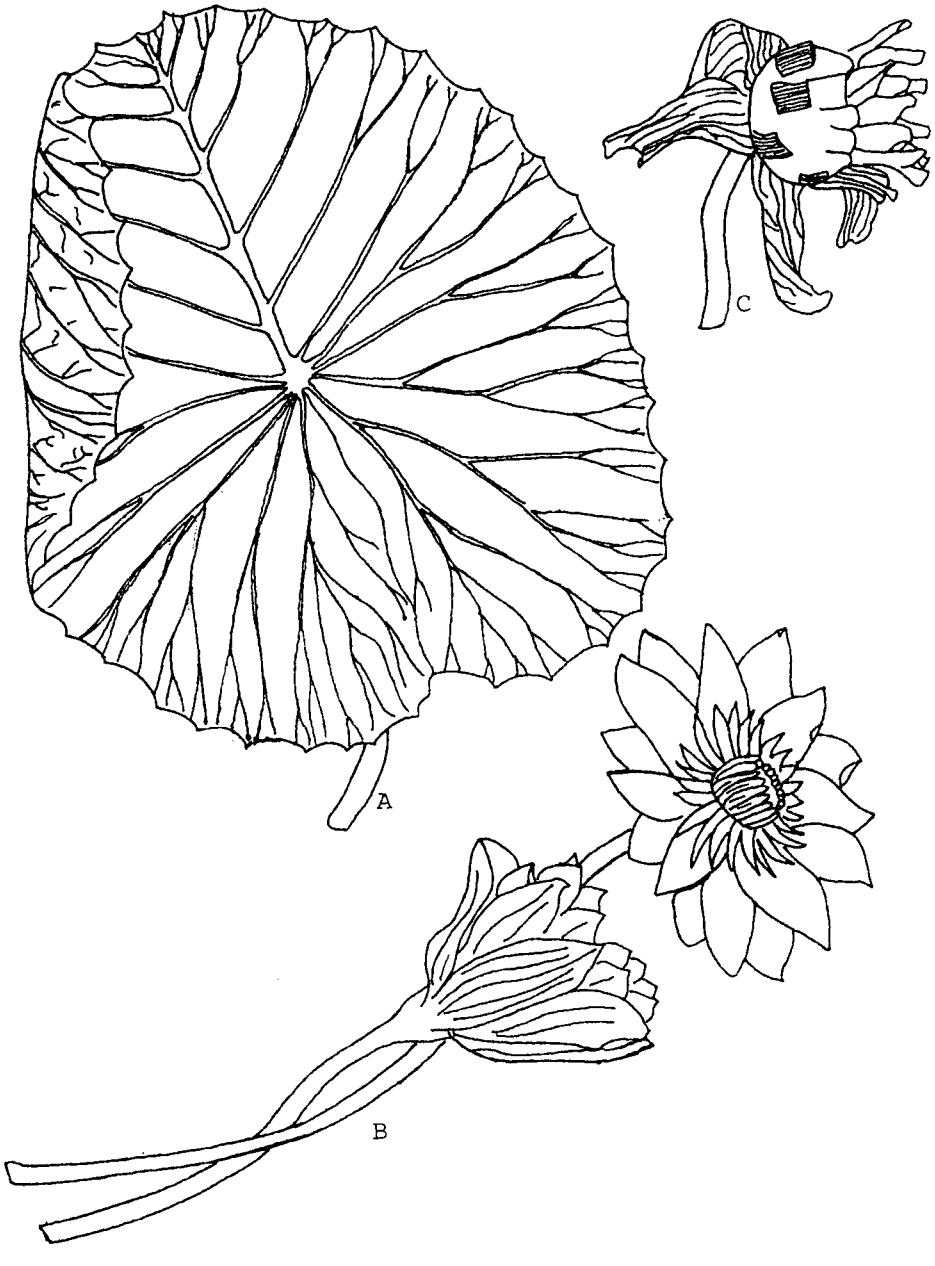
FRUITS:- Globular, 3.2 cm diameter, spongy berry, green crowned with erect connivens still appendages. Seeds ovoid globular, ribbed with vertical lines of little tubercles and very minutely and transversely striate, aril white, transparent. Flowers throughout the year (Jayaweera, 1982).

DISTRIBUTION:-

A common aquatic herb which grows throughout Tropical Asia, Africa, Java and Philippine Islands (Jayaweera, 1982). It is very common in streams, ponds and tanks throughout the low-country upto 1000 m altitude in Sri Lanka.

EDIBLE PARTS:-

The seeds and stem.



Nymphaea lotus

(A) Leaf. (B) Flower lateral view. (C) Fruit with persistent sepals.

FOOD USE:-

Husked seeds are boiled and eaten as rice. Often it is mixed with rice and boiled. The seed converted into flour is used for making bread in China and East Indies while it is boiled and eaten in the Philippine Islands. Young leaves stem is prepared as vegetable.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The plants contain an alkaloid and glucoside. The powdered rootstock is given for dyspepsia, diarrhoea, piles and urinary ailments. A decoction of the flower is given for palpitation of the heart. It is also supposed to be a blood purifier and aphrodisiac. The seeds are eaten by diabetic patients. The juice of the fruits made in to a cunjee with grains of *setaria italica* is given with salt for snakebite poisoning followed by blood in the urine. The rhizome is prescribed for cystitis, nephritis, fevers and insomnia. In Africa it is given for jaundice, urinary troubles and hemorrhoids (Jayaweera, 1982).

OTHER USES:-

Flowers are used in religious ceremonies.

STORAGE:-

Seeds should be stored in air tight containers for prolonged storage.

FAMILY:- OXALIDACEAE

BOTANICAL NAME:- ***Averrhoa bilimbi***

VERNACULAR NAMES:-

SINHALA	:	*Bilin, Bilimbi*
TAMIL	:	*Kochittamarattai*
ENGLISH	:	Bimlimbi, Cucumber Tree

DESCRIPTION:-

A small tree 5-7 m tall, rusty pubescent on young parts and petioles, bark reddish brown.

LEAVES:- Alternate, imparipinnate, exstipulate, each containing 11-35 leaflets, pinnae entire, 3.7-5 cm long, 1.8 cm broad, oblong, more or less pubescent on both surfaces, base usually rounded.

FLOWERS:- Regular, bisexual, small fragrant, arising from the trunk and branches in villous panicles.

FRUITS:- Fleshy, large drooping, oblong berry 5-10 cm long furrowed lengthwise, indehiscent. Seeds flat and exarillate. Flowers from March to May and during November (Jayaweeera, 1982).

DISTRIBUTION:-

Grows in India and Malaysia; known only as a cultivated and naturalized plant in tropical countries. It is a common garden plant in the mid and low-country in Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

The fruits.

FOOD USE:-

Fresh fruits are eaten in fresh. It can be cooked and eaten as a vegetable. Jams, Chutney, Pickles are made from the fruit. Candied *Bilin* is added as raising to the fruit cakes and pies.

Averrhoa bilimbi

(A) Twig with a compound. (B) Flower lateral view. (C) Inflorescence.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 94.48 g, Energy - 19 kcal, Proteins - 0.5 g, Fats - 0.3 g, Carbohydrates - 3.5 g, Calcium - 15 mg, P-10 mg, Fe - 1.2 mg, Vitamins - Carotene - 18 mcg, Thiamine -90 mcg, Riboflavin 40 mcg, Niacin - 0.6 mg, Vitamin C - 32 mg (Perera, et al., 1979).

The fruit of this plant contains potassium oxalate. A decoction of the leaves of this tree is given for inflammation of the rectum in Java. A paste of the leaves is applied for mumps, rheumatism and pimples. The juice of the fruit made into a syrup is used in cases of hemorrhage from bowels, stomach and internal hemorrhoids (Jayaweera, 1982).

OTHER USES:-

It is used in cleaning brassware.

CULTIVATION:-

Common in homegardens in the wet zone of Sri Lanka.

STORAGE:-

Bilin fruits contain a lot of water and soft skin. Therefore it can not be stored effectively. Sun-dried salted fruits are stored in dry containers for prolonged keeping.

FAMILY:- OXALIDACEAE

BOTANICAL NAME:- ***Averrhoa carambola***

Syn :- A. pentandra

VERNACULAR NAMES:-

SINHALA	:	*Camaranga, Cambaranka*
TAMIL	:	*Kandasagadam, Sisam*
ENGLISH	:	Carambola, Chinese Gooseberry, Star Fruit

DESCRIPTION:-

A small tree about 10 m tall, with close drooping branches, young parts finely pubescent or glabrate.

LEAVES:- Alternate, imparipinnate compound, exstipulate, leaflets 5-11, irritable to the touch, 3.7-6.2 cm long, 1.8-3 cm broad.

FLOWERS:- Regular, bisexual, in short axillary racemes, sometimes spraining from the bark. Flowering from May to August and in November.

FRUITS:- 7.5-12.5 cm long, ovoid, ellipsoid or oblong, acute angled with 3-5 deep ribs, yellow, very pulpy, fragrant. Seeds arillate (Jayaweera, 1982).

DISTRIBUTION:-

Carambola is believed to be a native of Malaysia or Indonesia (Querol, 1992). Grows in the Malaysian region and widely cultivated in the tropics. It is somewhat common in Sri Lanka often planted in the mid and low-country.

EDIBLE PARTS:-

Fruit.

FOOD USE:-

Ripe fruits are eaten fresh. Jellies and jams can be prepared from the fruits. It is also used in fruit salads, preserves and drinks.

Avenhoa carambola

(A) Twig with compound leaves. (B) Flower lateral view. (C) Mature fruit with ribs.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 87.4 g, Energy - 45 kcal, Protein 0.4 g, Fats - 0.3 g, Carbohydrates - 11.5 g, Calcium - 6 mg, Iron 0.9 mg, Carotene - 360 mcg, Thiamine - 30 mg, Riboflavin - 20 g, Vitamin C - 35 mg (Rice et al., 1993).

The fruit of this tree is a good source of iron and contains vitamin B and C in addition to oxalic acid and potassium oxalate. The seeds contain an alkaloid harmaline. A decoction of the leaves and fruit is given to arrest vomiting. The fruit is a good remedy for internal bleeding piles. It is a laxative, antiscorbutic, sialogogue and antiphlogistic. The seed is regarded as a narcotic and a good anodyne for asthma, colic and jaundice.

ENVIRONMENTAL RESPONSE:-

Grows in a wide range of soil types. However, it grows well in well drained and nutritious soils. Optimal pH is 5.2-6.2. Grows in tropics at altitudes below 900 m.

OTHER USES:-

It can be used in cleaning brassware.

CULTIVATION :-

It is a homegarden plant. It should be propagated clonally by grafting or air layering for reliable consistent fruit quality.

STORAGE:-

As fruits contain a lot of water, they cannot be stored in fresh for a few days. Cool storage at 5-10^{0}C extends the post-harvest life at least for three weeks.

FAMILY:- OXALIDACEAE

BOTANICAL NAME:- ***Oxalis corniculate***

Syn :- O. repens

VERNACULAR NAMES:-

SINHALA	:	*Embul-Embiliya, Embulpala*
TAMIL	:	*Paliakiri, Puliyarai*
ENGLISH	:	Indian Sorrel

DESCRIPTION:-

A perennial herb with a long slender subterranean creeping stem rooting at nodes and giving slender, ascending, much branched, pilose branches, roots tuberous.

LEAVES:- Alternate, trifoliate, stipulate, on very long slender, hairy petioles, leaflets sessile, over 1.2 cm long, broadly obcordate, glabrous, ciliate, stipules small agnate to petiole.

FLOWERS:- Regular, bisexual, yellow 1 cm long in little umbels of 1-3 on erect axillary peduncles greatly exceeding the leaves. Flowers throughout the year.

FRUITS:- 5-chambered loculicidal capsule 1.8 cm long, linear-oblong, pubescent, 5-angled with a short beak. Seeds surrounded by a white, fleshy aril, testa strongly transversely ridged, brown (Jayaweera, 1982).

DISTRIBUTION:-

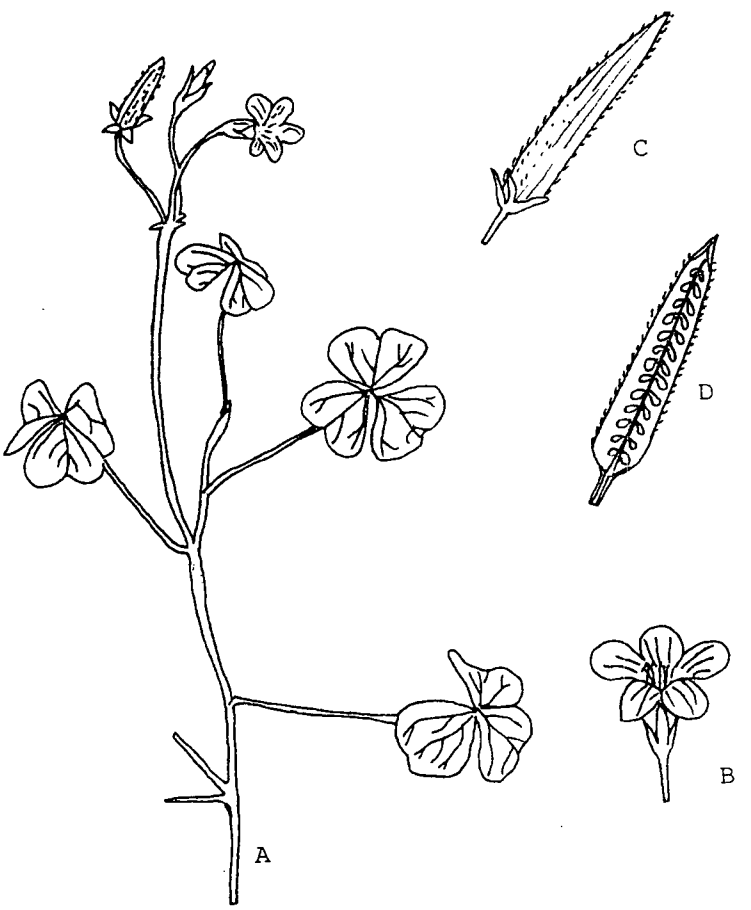
Grows throughout the warmer regions of the world. It is a very common need in Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

Fruits

FOOD USE:-

Ripe fruits are eaten fresh.



Oxalis corniculata

(A) Branch with leaves, flower and fruit. (B) Flower lateral view. (C) Longitudinal section of fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The plant contains acid oxalate of potassium. It is a cure of scurvy. The juice of the leaves boiled in cow ghee and curd is given for piles, strangury, prolapse, etc. The juice is also used for cleaning wounds and applied on itches. It is an antidote for mercurial, arsenic and Datura poisoning. The bruised leaves applied as a poultice on inflamed parts relieve pain (Jayaweera, 1982).

FAMILY:- PALMAE

BOTANICAL NAME:- ***Borassus flabellifer***

Syn :- B. flabelliformis

VERNACULAR NAMES:-

SINHALA	:	*Tal, Talgaha*
TAMIL	:	*Panai*
ENGLISH	:	Palmyra Palm

DESCRIPTION:-

A tall dioecious palm with a straight trunk 20-23 m tall and 60-70 cm diameter, black, scarred above swollen above the middle and again contracted upwards.

LEAVES:- Palmately fan-shaped 2-3.3 m diameter. Rigidly coriaceous, many-cleft into lanceolate or linear 2-fid lobes 0.6-1.3 m long with spinulose margins.

FLOWERS:- Bisexual male flowers in small scorpiod spikelets, densely clothed with imbricating and mixed with scaly bracteoles, exerted seriatim from the bracts as the spikes lengthen. Female flowers large, globose, about 2.5 cm diameter. Perianth fleshy.
Period March to April.

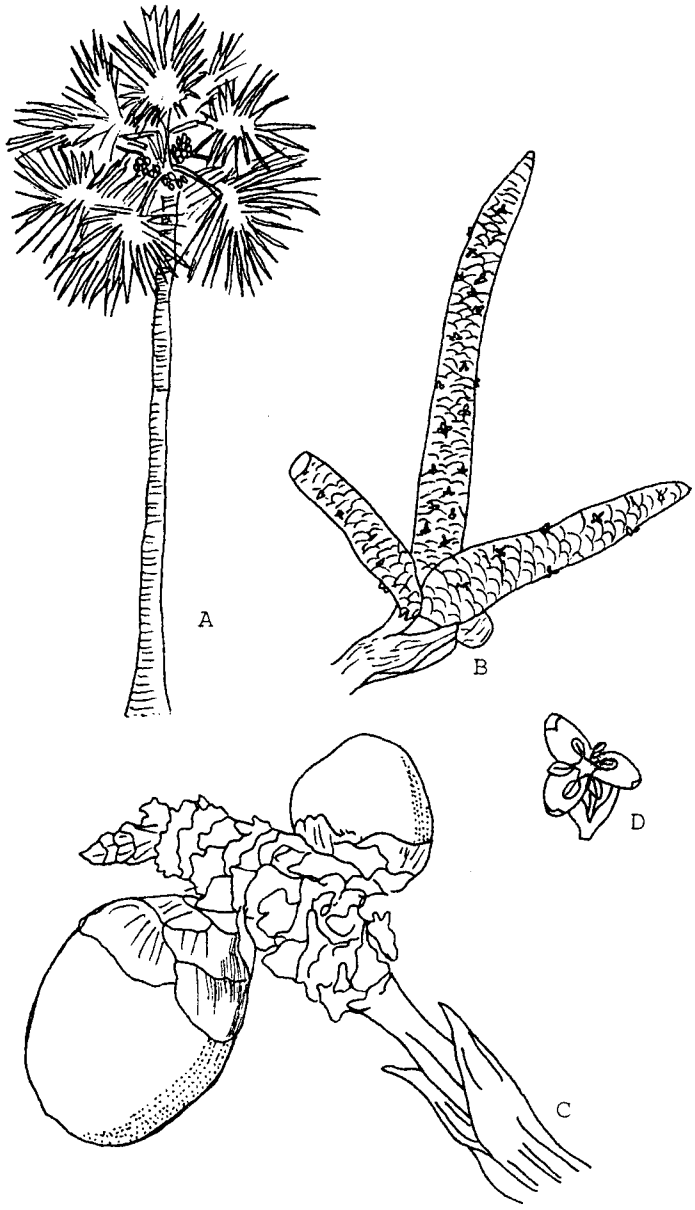
FRUITS:- A broadly obovoid drupe, 20 cm diameter. Seated on greatly enlarged perianth, mescocarp fleshy and fibrous, pureness 1-3, 6.2 cm broad, obordate, compressed, black. Seeds compressed testa adherent to the endocarp, apical in the hollow endosperm (Jayaweera, 1982).

DISTRIBUTION:-

Grows in India and Burma. It is very common in the dry regions especially in the desert and sandy tracts near the coast in Sri Lanka (Purseglove, 1972; Jayaweera, 1982)

EDIBLE PARTS:-

Fruit and germinating seed root.



Borassus flabellifer

(A) Full grown palm. (B) Male spadix with spikes. (C) Fruits. (C) Male flowers.

FOOD USE:-

The inflorescence is tapped for toddy, vinegar and jaggery. The orange colour juice extracted from mesocarp is sun dried as layers and eaten. Young nut water (liquid endosperm) is drunk. The germinating seeds are eaten either sun-dried or boiled.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 77.2 g, Energy - 87 kcal, Proteins - 0.7 g, Fat - 0.2 g, Carbohydrates - 20.7 g, Calcium - 9 mg, Phosphorus - 33 mg.

(Root)
Moisture - 74.7 g, Energy - 97 kcal, Protein - 1.76 g, Fat - 0.1 g, Carbohydrates 22.6 g, Calcium - 10 mg, Phosphorus - 40 mg, Iron - 0.7 mg, Carotene - 24 mcg, Thiamine 100 mcg, Riboflavin - 10 mcg, Niacin - 1.2 mg, Vitamin C - 17 (Perera, et al., 1979)

The sap of the plant contains sugar and ascorbic acid, while the pulp of the ripe fruit is rich in vitamins A and C. The toddy is beneficial for inflammatory ailments and dropsy. It is diuretic and is prescribed for chronic gonorrhoea and amoebiasis. The jaggery turned out from the sweet toddy is used for making remedies for cough and phlegm in the chest and is an antidote for food poisoning. The root is used for cholera and externally for exhaustion and difficult labour (Jayaweera, 1982).

OTHER USES:-

Dry leaflets have been used for writing by ancestors. Dried leaves are used to prepare hats, mats, purses etc. Palmyrah fibre is obtained from the base of the leaf of stalks.

STORAGE:-

Product of sap such as trickle, jaggery, vinegar can be stored for a considerable time. Juice of the mesocarp is sun-dried and stored. Dried germinating seeds can be stored for more than one year in dry places.

FAMILY:- PALMAE

BOTANICAL NAME:- ***Caryota urenes***

VERNACULAR NAMES:-

SINHALA	:	*Kitul*
TAMIL	:	*Tippilipana*
ENGLISH	:	Wine Palm, Fish Tail Palm, Toddy Palm, Indian Sago Palm

DESCRIPTION:-

A single stemmed monocarpic monoecious palm, 13-20 m tall, with pronounced internodes, growing in the wetter moisture parts of India, Sri Lanka, Burma and Thailand. C.spp. are unic among palms.

LEAVES:- *Kitul* has bipinnate leaves, which Coner (1966) regards as the primitive of the palm leaf (Purseglove, 1972). Leaves about 6 m long, may have pinnate ends in terminal leaflet, crowded fish tails, wedge-shaped, with no distinct midrib, but several prominent veins, tips broadly toothed.

FLOWERS:- It begins at the top of the stem when the palm is fifteen years old and downwards for several years, during which time the leaves die and break off. When flowering and fruiting has finished the trunk dies. Inflorescence subtended several bracts about a single peduncle, terminating in many simgle branches. Flowers arranged in groups of three with single female between 2 males, the later opening first and filling, male flower switch numerous stamens.

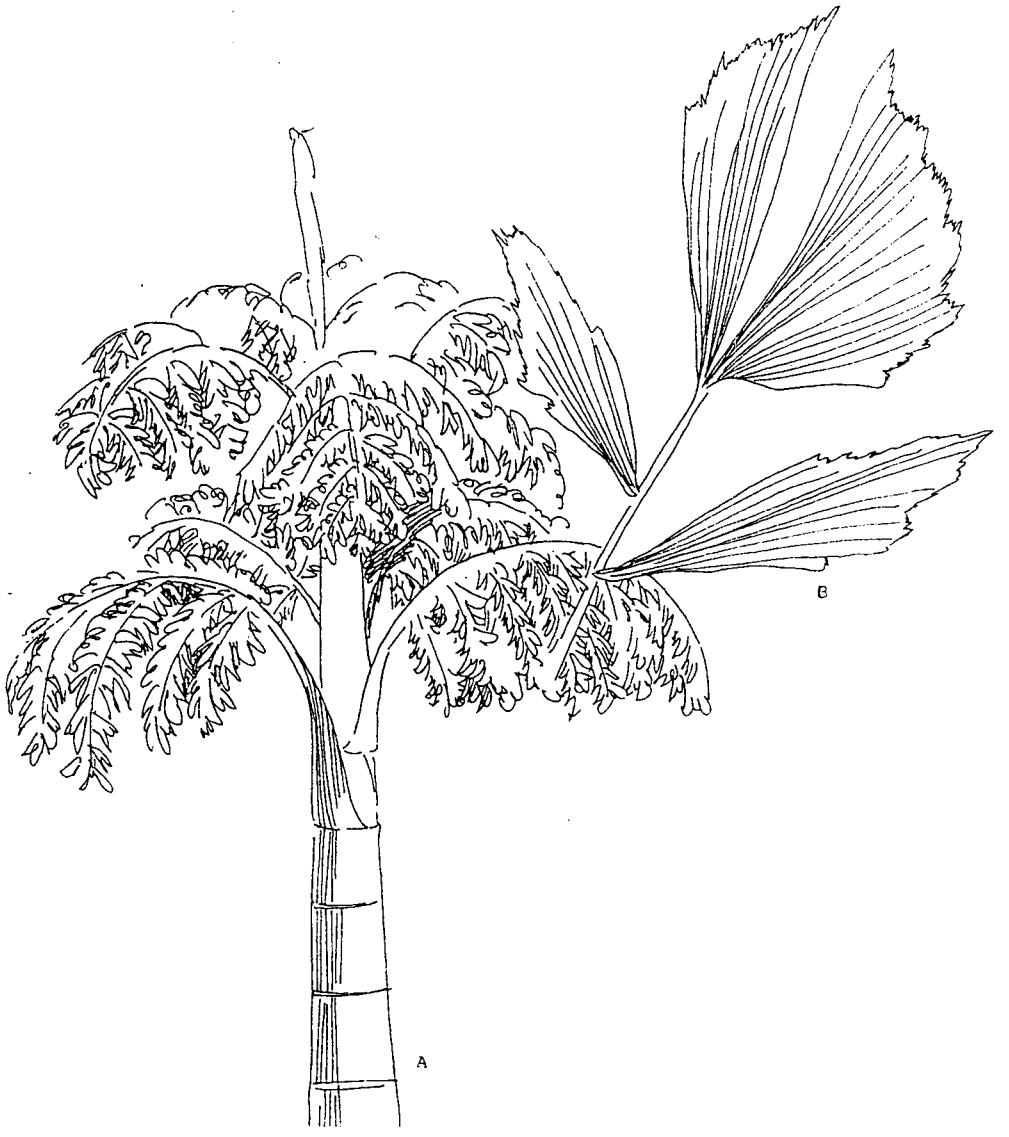
FRUIT:- Globular, about 2 cm in diameter red or yellow, 1-2 seeded, pericarp acrid and full of raphides (Jayaweera, 1982).

DISTRIBUTION:-

Centre of origin is hotter moisture places of India, Sri Lanka, Burma and Thailand. In Sri Lanka it grows both in lowlands and uplands up to 1,000 m. (Jayaweera, 1982).

EDIBLE PARTS:-

Sap from the inflorescence and palm cabbage.



Caryota urenes

(A) Plant. (B) Part of leaf.

FOOD USE:-

The inflorescence is tapped in India and Sri Lanka for the sap, which is used to prepare toddy, vinegar, trickle and sugar (jaggery). It is said that a single inflorescence yields 7-14 litres per day, and if several inflorescences are tapped on one palm, 20-27 litres may be produced. Trunk is ground into flour which is used to prepare porridge and *Talapa*. Grod, matured trees yield 30-40 kg of flour.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(100 g of *Kitul* flour)
Moisture - 13.1 g, Energy - 339 Kcal, Proteins - 2.4 g, Fats - 0.3 g, Carbohydrates - 81.7 g, Calcium - 130 mg, Phosphorus - 60 mg, Iron - 20 mg (Perera, et al., 1979).

The root bark and cabbage of this palm are used for treatment of rheumatic swellings and snakebite poisonits (Jayaweera, 1982).

OTHER USES:-

Leaves are used to feed elephants. Fibre obtained from the leaf sheaths is used for brooms. Hard wood is used in constructions.

STORAGE:-

Dried *Kitul* flour (sago) can be kept in dry and cool containers for a long time. Trickle can be stored for a long time in dry and clean containers. Traditionally trickle is kept in bags made from the leafbase of arecanut palms.

FAMILY:- PALMAE

BOTANICAL NAME:- ***Cocus nucifera***

Syn :- C. nana

VERNACULAR NAMES:-

SINHALA	:	*Pol*
TAMIL	:	*Tengai*
ENGLISH	:	Coconut

DESCRIPTION:-

A tall erect, monoecious, unarmed palm, trunk 13-28 m tall, 30-60 cm diameter, thickened and ascending at base, inclined, rarely forked.

LEAVES:- Compound, pinnate, 4-6 m long, leaflets 60-90 cm long, linear-lanceolate, acuminate, flaccid, bright green, petioles 1-1.6 m long, stout, unarmed.

FLOWERS:- Spadix at first erect, simply panicled, branches drooping, 1.3-2 m long, straw-coloured, upper parts of branches with numerous male flowers and the lower with 1 or 2 female flowers, male flowers small, yellowish, female flowers few, 2-bracteate.

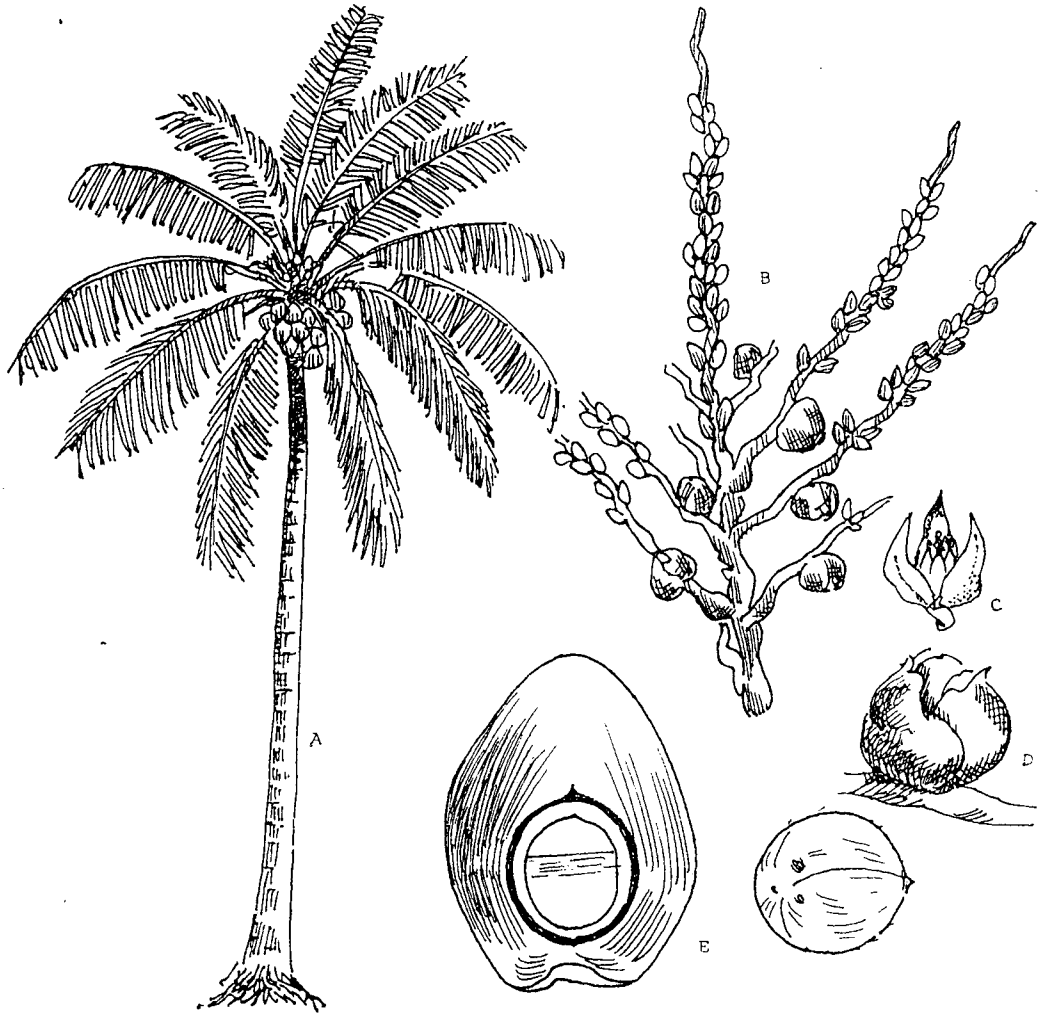
FRUITS:- Large trigonously obovoid, oblong or subghlobose drupe, 15-25 cm long, 1-seeded, pericarp thick, endocarp bony, endosperm forming a thick white layer of fleshy fibrous oily substance adherent to the membranous testa which again is adherent to the stony black endocarp (Jayaweera, 1982).

DISTRIBUTION:-

A native of Polynesia, (Purseglove, 1972) now cultivated in India. Cultivation of coconut in, Sri Lanka has a long history and according to *Mahawansa*, coconut cultivated by King Agrobodhi II about 589 A.D. (Child, 1974; Siriweera, 1993).Grows in Sri Lanka, Burma, Pacific Islands and other tropical countries. It is now universally cultivated in the mid and low-country in Sri Lanka.

EDIBLE PARTS:-

The fruit, sap, palm cabbage



Cocus nucifera

(A) Plant. (B) Inflorescence. (C) Male flower. (D) Female Flower. (E) Fruit.

FOOD USE:-

Coconut milk is a very important ingredient in Sri Lanka culinary. Milk is added to curries and preparation of various meals. Desiccated and grated coconut is also used in food preparations and confectionery. Coconut oil is the main oil source of Sri Lankan diet. Sap obtained from the tapping of infroluence is used for trickle, jaggery, toddy, liquor and vinegar production. Palm cabbage is also eaten fresh. Liquid endoiperum of young fruit is a famous drink. Coconut apple (haustorium) a soft spongy growth inside the fruit cavity, which is developed as nut germinates is eaten fresh for refreshment.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Coconut kernel mature).
Moisture - 51.7 g, Energy - 312 kcal, Protein - 5.2 g, Fats - 28.2, Carbohydrates - 16 0. g, Calcium - 23 mg. Phosphorus - 112 mg, Iron - 2.5 mg, Thiamine - 40 mcg, Riboflavin - 30 mct, Niacin - 0.8 mg, Vitamin 6,

(100 g of coconut milk prepared without water).
Moisture - 42.8 g, Energy - 430 Kcal, Proteins - 3.4 g, Fats - 41.0 g, Carbohydrates - 11.9 g, Calcium - 15 mg, Phosphorus - 140 mg, Iron - 1.6 mg, Vitamin - C-3 mg.

(Coconut oil)
Moisture - 0, Energy - 882 kcal, Protein - 0 g, Fats - 99.9 g, Carbohydrates - 0 g, Calcium -2.0 mg, Phosphorus - 3.0 mg, Iron - 0 mg.

(Coconut jaggary)
Moisture - 10.3 g, Energy -340 kcal, Protein - 1.0 g - Fats - 2.0, Carbohydrates - 83.5, Minerals - Calcium - 1638 mg, Phosphorus - 62 mg (Perera, et al., 1979).

Medicinally coconut water is useful as a diuretic and anthelmintic and was used as a substitute for saline during the war. The pulp of the young fruit is given for sun-stroke. The coconut milk obtained from the grated kernel is an aperient, diuretic, anthelmintic and used as a cure for diarrhoea, anaemia and for allaying urinary irritation. The oil is extensively used in the preparation of medicinal ointments and inflorescence of the palm is tapped for toddy in East Africa, India, Sri Lanka and other countries (Jayaweera, 1982).

OTHER USES:-

It is called as "The *Kapruka*" - (according to the Hindu legends, the *Kapruka* is the tree which gives every thing that person wishes) for its multiplicity of uses. Leaves are used to cover roofs, while the trunk is used for construction purposes. Coconut is very close to Sri Lankan culture. Therefore young leaves are used to decorate the

pandals in cultural and religions ceremonies. Oil is widely used in soap industry. It is used in cosmetics, and as an unguent Coconut cake (poonak) is used to feed animals. Coconut shell is used as a cup, or container. Buttons and combs are made from the shell. Charcoal is made from the shell which along with leaves are used as firewood. Coir obtained from the masocarp of the fruit is used to make chains, brushes and mattresses. Dried leaves, spathes of inflorescence, sheaf are used as firewood.

ENVIRONMENTAL RESPONSE:-

Grown in a vast range of soils, but well drained deep sandy or loam soils are best. Optimal rainfall is 1300-2300 mm. Rainfall below 1000 mm disturbs normal growth. Temperature of 27^0C is good for coconut. Grows well in lowlands.

CULTIVATION:-

Area for cultivation - Sandy, coastal wet zone lowlands in Sri Lanka.

Planting material - Nuts. At the first stage nuts are planted in nurseries. The nuts start to germinate in 11-12 weeks after planting. In general seedlings of 9-18 months are transplanted in the field.

Land preparation - In slopy areas, terracing and anti-erosion measures should be taken.

Spacing - In Sri Lanka it is planted 8-9 x 8-9 m apart in the holes of 1.0 x 1.0 x 1.0 m. At the time of planting organic and chemical fertilizers are also put into the holes.

Fertilizer - NPK, Ca and Mg fertilizer should be applied in order to get a good harvest.
Harvesting - Harvesting is done by climbers or (by using a) knife attached to a long bamboo pole. In Sri Lanka the usual practice is to harvest the nuts once in every two months.

Yield - Yield 50-180 nuts per plant.

FAMILY:- PALMAE

BOTANICAL NAME:- ***Corypha umbraculifera***

VERNACULAR NAMES:-

SINHALA	:	*Tala gas*
TAMIL	:	*Thalapanai*
ENGLISH	:	Thalipot palm

DESCRIPTION:-

An unbranched annulate palm with a huge, erect cylindric, straight trunk 10-25 m high, 60-90 cm diameter and trunk upto 1 m thickness after about 12 years and is covered with persistent leaf bases and dying after flowering and fruiting when about 40 years old.

LEAVES:- Very large brone at the crown, 2.6-5.3 m diameter, plicate, palmately cleft to about the middle in to 80-100 linear-lanceolate acute or bifid lobes, petioles 1.6-3.3 m long very stout, margins armed with short compressed dark spines.

FLOWERS:- Inflorescence, premedical, much branched with about a million flowers up to 7 m in length, it is the largest in the plant kingdom and it produces after 30-40 years. Flowers regular, bisexual, small.

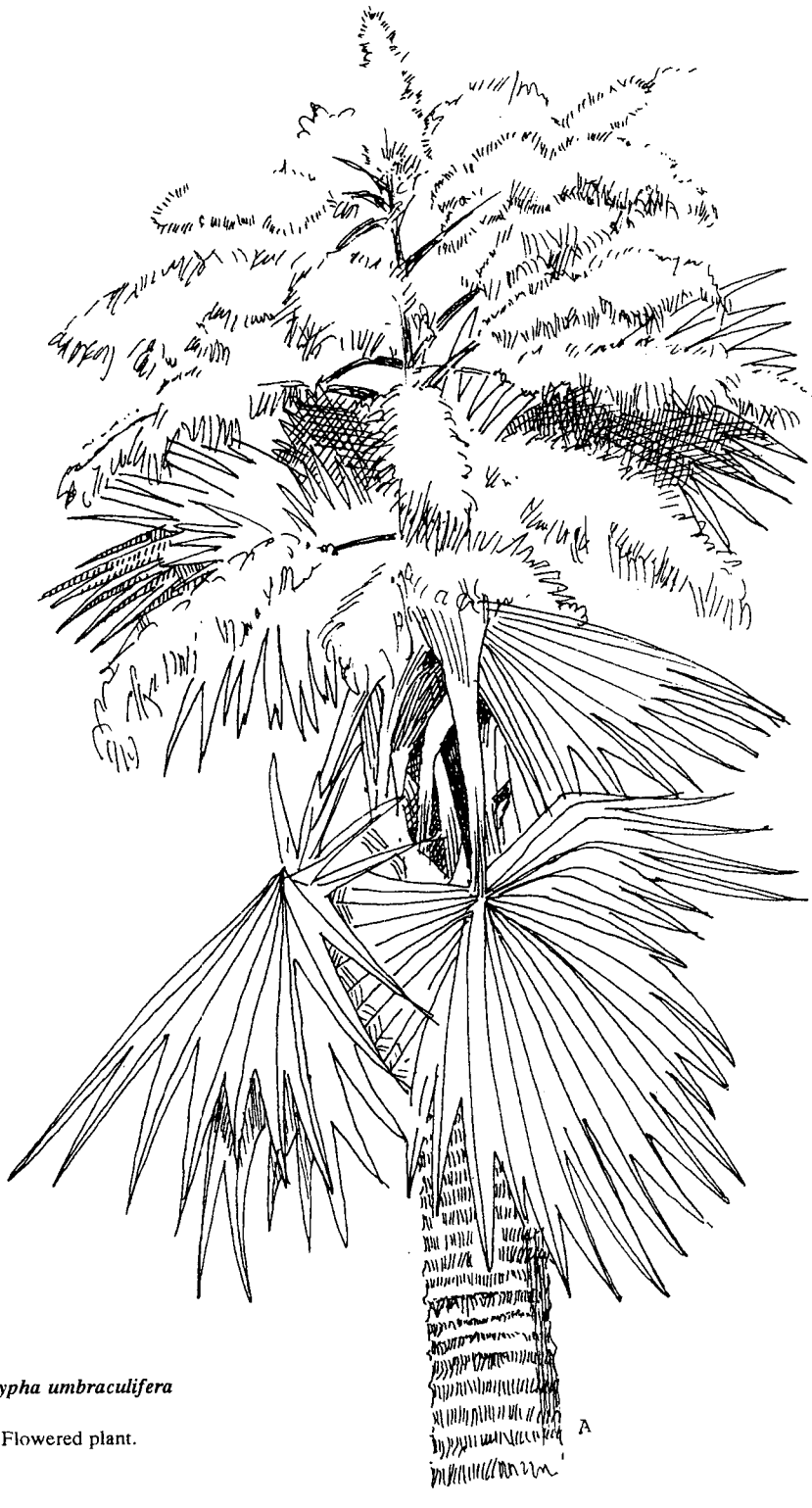
FRUITS:- A shortly stipitate, globose drupe 3.7 cm diameter. With two small arrested carpels at its base, grayish olive-coloured. Flowers between November and January when it has reached full maturity (Jayaweera, 1982).

DISTRIBUTION:-

Grown in Sri Lanka and some parts of India. Rather common in most regions in Sri Lanka below 800 m altitude (Jayaweera, 1982).

EDIBLE PARTS:-

Palm cabbage.



Corypha umbraculifera

(A) Flowered plant.

FOOD USE:-

The palm trunk is cut before flowering and sun-dried. Thereafter cabbage is ground into flour which is used to prepare paste (*thalapa*) and sweet meets. It is told that if the palm is cut after flowering, the flower tastes bitter. In drought and lean seasons, the villagers used to cut down the palm and distribute the flower among them. There was a belief that flowering of the palm was a bad sign; it brings disaster to the village and therefore palm is cut down before flowering. Robert Knox states that flowers give bad smell; therefore people used to the cut the tree before flowering. However, the truth is after flowering the stored food in the trunk is reduced; therefore it is necessary to cut down the plant to get a high yield of palm cabbage.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The starch extracted from the pith is given as a gruel for stomach disorders.

OTHER USES:-

Leaves are used to prepare "Ola leaves" which were widely used as writing materials before the introduction of paper. Leaves are also used to prepare fans, umbrellas, baskets, handbags, and purses.

FAMILY:- PALMAE

BOTANICAL NAME:- ***Nypa fruticans***

Syn :- Nipa fruticans

VERNACULAR NAMES:-

SINHALA	:	*Ginpol*
ENGLISH	:	Nipa Palm, Water Coconut

DESCRIPTION:-

A brackish water palm with a prostrate, branched rootstock, about 45 cm diameter, rooting along the lower surface, clothed with sheaths of old leaves, leafing and flowering at the ends of branches.

LEAVES:- Many, pinnatisect, erect and recurred, 5 m long and upwards, petioles 1.3-1.6 m long, leaflets. Innumerable, linear-lanceolate, shortly decurrent on the rachis, 1.3-1.6 m long, bright green above.

FLOWERS:- Unisexual, monoecious, spadix 1.3-2.3 m long, peduncle 1.3-1.8 m long, males in catkin-like branches of the spadix females crowded in a terminal head, male flowers small, surrounded by setaceous bracteoles, female flowers much larger than the males.

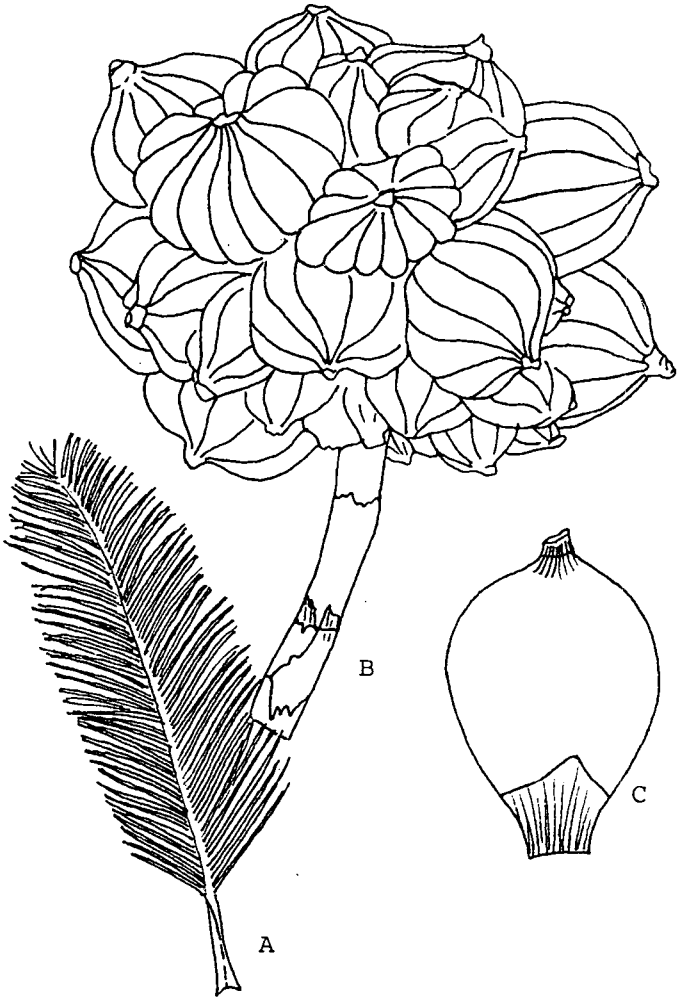
FRUITS:- A large globose syncarp, about 30 cm diameter, pericarp fleshy and fibrous, endocarp spongy and floury, seed erect as large as a hen's egg, grooved on one side, hilum broad, endosperm horny. Flowers in October (Jayaweera, 1982).

DISTRIBUTION:-

Grows in Sri Lanka, Burma, Malaysia, Queensland, but not in India. It is being found in the mouths of rivers in the South West coast of Sri Lanka (Purseglove, 1992; Jayaweera, 1982; Pinto, 1986).

EDIBLE PARTS:-

The sap, palm cabbage and fruit.



Nypa fruticans

(A) Leaf. (B) Syncarp with 1-seeded carpets crowded together. (C) Style carpet.

FOOD USE:-

Underexploited palm in Sri Lanka. The inflorescence is tapped for sap from which vinegar, sugar and toddy are made. It is usually tapped at it is second flowering at about five years of age. It is estimated that one hectare of Nipa palm can yield 3000 kg of palm sugar. The ripe cotyledons are separated and eaten as a snack.

OTHER USES:

The leaves are used for thatching mats and making baskets.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Medicinally, the juice of the young leaves with coconut milk is given for herpes. In Borneo, the ash of the roots is used for toothache and the fresh leaves in the treatment of ulcers. It is also used as a remedy for centipede bites (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:-

A mangrove plant.

FAMILY:- PALMAE

BOTANICAL NAME:- ***Phoenix zeylanica***

Syn :- P. sylvestris

VERNACULAR NAMES:-

SINHALA	:	*Indi, Wal-indi*
TAMIL	:	*Iichchampalam*
ENGLISH	:	Wild Date

DESCRIPTION:-

A dioecious palm with a trunk 2-7 m in height.

LEAVES:- Pinnatisect, sides of leaflets in duplicate in venation, leaflets many quadrifariously inserted, sub-equidistant, 17.5-20 cm long, linear-lanceolate, coriaceous, concave spreading at right angles, bright green. Spathe 20-35 cm long, keel ferocious.

FLOWERS:- Spadix about 30 cm long, peduncle stout, rachis flattened, branches of male 10-15 cm long, of female longer.

FRUITS:- About 1.2 cm long, 6 mm diameter, obovoid oblong, apiculate, red at length violet-blue, pericarp fleshy. Seed nearly as long as the fruit, ventrally grooved. Flowers during February (Jayaweera, 1982).

DISTRIBUTION:-

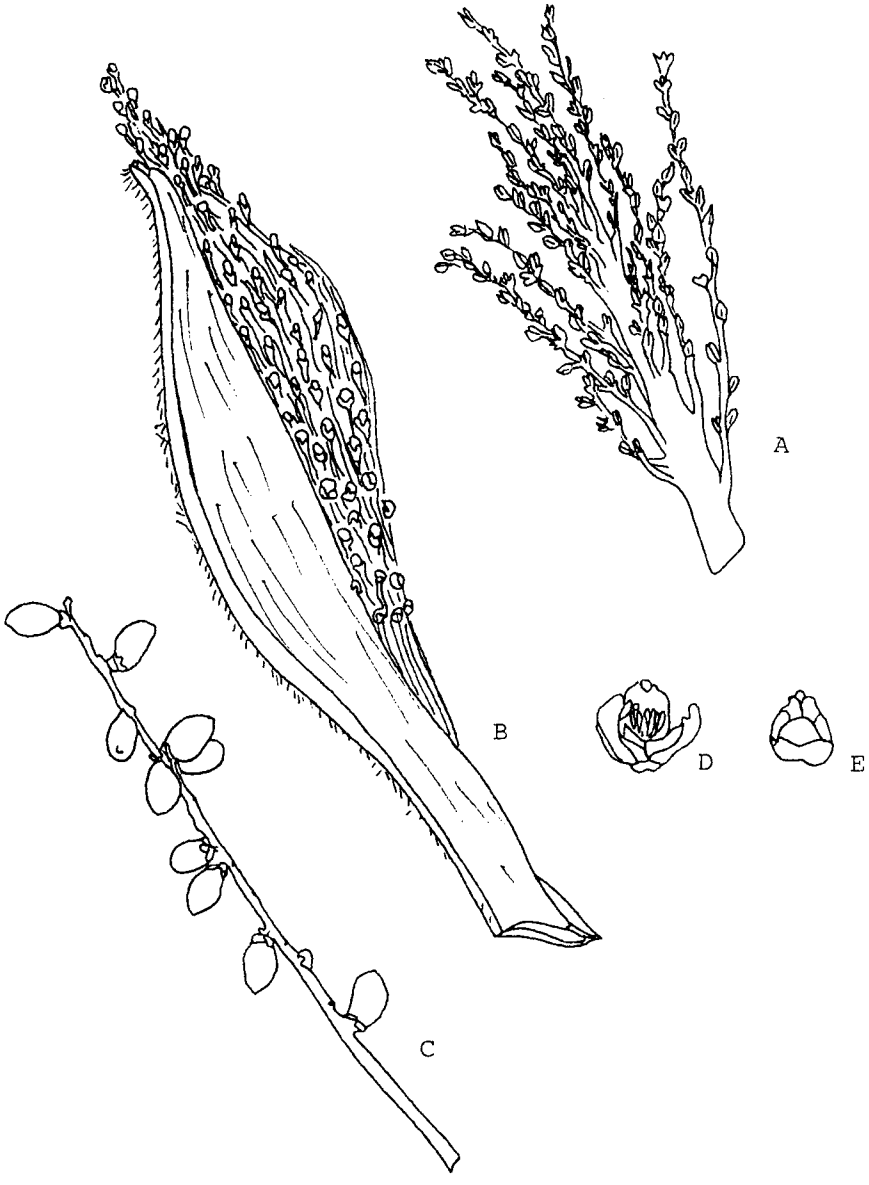
It is endemic to Sri Lanka (Bandaranaike and Sultanbawa, 1991). Very common in the moist low-country, especially along the Southern coast of Sri Lanka. It is endemic and very similar to *phoenix pusilla* which grows in the dry regions (Jayaweera, 1982).

EDIBLE PARTS:-

Fruit, palm cabbage.

FOOD USE:-

Ripe fruits are eaten fresh. Palm cabbage is a good snack.



Phoenix zeylanica

(A) Male spadix. (B) Female spadix with spathe. (C) Fruit. (D) Male flower. (E). Female flower.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The cabbage of this plant is used for gonorrhoea and gleety and externally as poultice along with other drugs on fractures. It is an antidote for poisons. The fruit is used as a vermifuge and the roots for toothache (Jayaweera, 1982; Department of Aurveda, 1985).

FAMILY:- PEDALIACEAE

BOTANICAL NAME:- ***Sesamum indicum***

Syn :- S. orientale

VERNACULAR NAMES:-

SINHALA	:	*Thala*
TAMIL	:	*Ellu*
ENGLISH	:	Gingelly, Sesame

DESCRIPTION:-

An annual herb with erect stems 30-60 cm high, puberulous with long ascending branches from base, stems and branches obtusely quadrangular in the upper part, furrowed.

LEAVES:- Opposite below, the upper ones usually alternate, very variable, the upper lanceolate, entire, 3-6 cm long, short petioled.

FLOWERS:- Irregular, bisexual, on very short erect puberulous pedicels, solitary and axillary. Flowers from May to August and sometimes throughout the year.

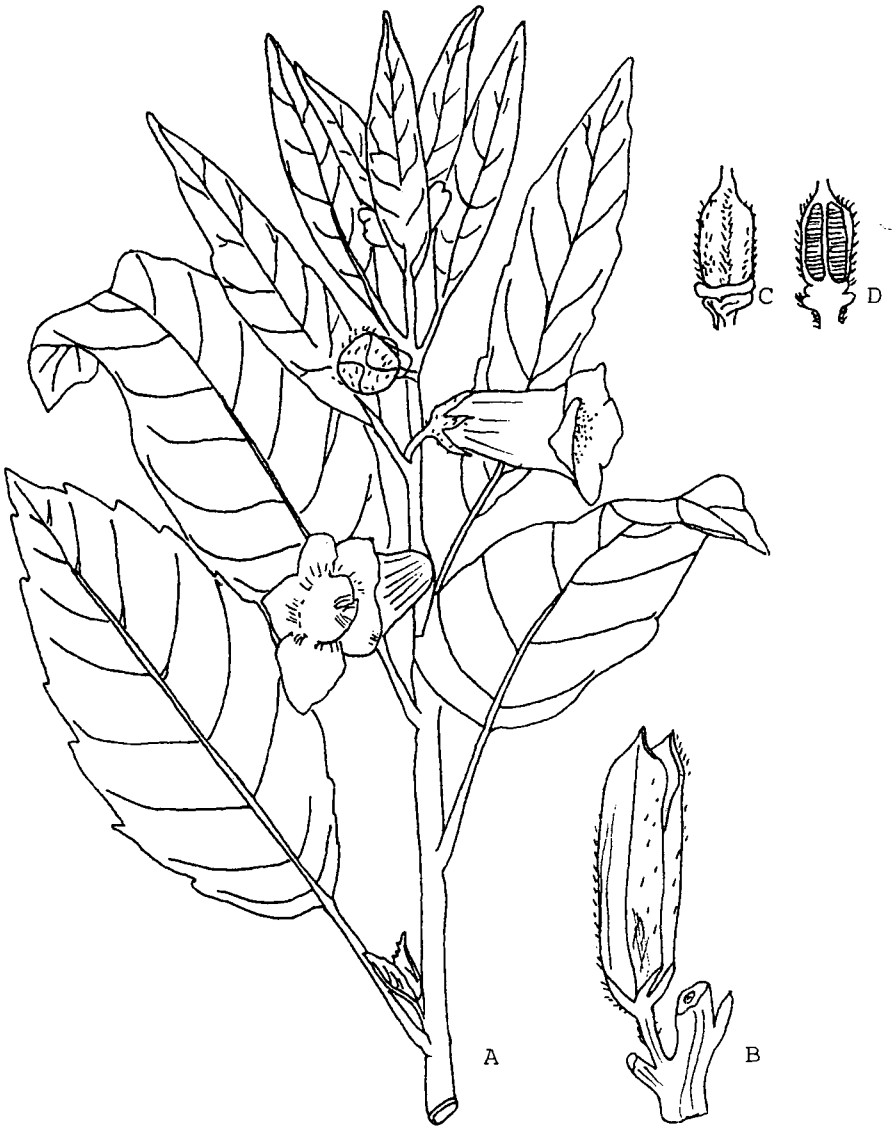
FRUITS:- A loculicidally dehiscent 2-valved capsule 1.5-2.8 cm long, bluntly quadrangular, shortly beaked. Seeds about 2 mm long, slightly compressed, glabrous, pale yellow, brown or black, exalbuminous, testa smooth (Jayaweera, 1982).

DISTRIBUTION:-

It is considered that sesame is a native of Tropical Africa and cultivated from prehistoric times (Ustimenko, 1980; Querol, 1992; Wikramanayake, 1976). Nayar (1979) has summarized early history of sesame and according to him there is archaeological, prehistoric and literacy evidence of sesame to the effect that it originated in Middle East, Egypt. Sesame has been identified at *Harappa*. It has grows in India from 4300 B.C. Cultivated in all warmer parts of the world, including India, and Sri Lanka. It is widely grown and naturalized in the dry zone, especially along roadsides, abandoned fields and waste areas in Sri Lanka.

EDIBLE PARTS:-

The seeds.



Sesamum indicum

(A) Upper part of plant with leaves and flowers. (B) Fruit showing denistence. (C) Ovary densely hairy. (D) Longitudinal section of ovary.

FOOD USE:-

It was the main oil crop when the population was concentrated in dry zone of Sri Lanka. Later, when the people shifted to the wet zone, coconut was replaced to play the role of gingelly. Still gingerly oil has a big demand among the Tamil community of the country. Seeds are used for confectionery purposes while the oil is used as an edible oil.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Seeds)
Moisture 5.3 g, Energy - 561 K.cal, Proteins - 18.3 g, Fats - 43.3 g, Carbohydrates - 25 g, Calcium - 1450 mg, Phosphorus - 570 mg, Iron - 10.5 mg, Carotene - 60 mcg, Thiamine -1010 mcg, Riboflavin - 340 mcg, Niacin - 4.4 mg.

(Oil)
Moisture - 0.1 g, Energy - 881 kcal, Proteins - 0.2 g, Fats - 99.7 g, Carbohydrates - 0.1 g, Calcium - 10 mg, Phosphorus - 5mg, K - 0.1 m, Carotene - 0, Thiamine - 10 mcg, Riboflavin - 70 mcg, Niacin - 0.1 mg, Vitamin C - 0 mg (Perera, et al., 1979)

The seeds of the herb contain a fixed oil, saccharose, pentosan, lecithin choline, phytine, conglutine, globulinel, legumin, etc. The leaf has much gum, tannin and chlorogenic acid. The oil consists of sesamolin and sterols. The leaves are used as a vermifuge and the stems for stomach ailments. The leaves mixed with water from a mucilage which is given for diarrhoea, dysentery, catarrh, bladder troubles, acute cystitis and strangury. The seeds are nourishing, diuretic and lactagogue and much used for making sweet meats. A plaster made of the seeds is applied on burns and scaldings. The oil is used for all purposes for which olive oil is used, such as lime liniments, oil-dressings of ulcers, suppurating wounds, etc. It is taken internally for gonorrhoea. The roots and leaves made into a lotion blackens and promotes the growth of hair. In other parts of Africa a decoction of the plant is drunk for malaria and the leaf chewed. (Jayaweera, 1982; Department of Aurveda, 1985).

OTHER USES:-

Gingelly oil is a hair oil and applied on skin too.

ENVIRONMENTAL RESPONSE:-

Although it is cultivated in various soils, the soils most suited for the cultivation of gingerly are the sandy loams. Temperature required is high, above 25^0C. It is moisture requirements are not exacting and in fact minimal.

CULTIVATION:-

Areas for cultivation - Gingelly is cultivated as a rain-fed crop in the dry zone of Sri Lanka.

Planting season - *Yala* season.

Land preparation - Land should be cleaned and ploughed.

Planting materials - seeds

Seed rate - 5 kg/ha.

Planting space - It is broadcast in normal practice.

Irrigation - As a chena crop it is not irrigated but under irrigation it may give a good harvest.

Harvesting - It is ready to be harvested when the bottom capsules are turning in to yellow. Plants are cut near ground level bound and stocked in the field to ripen. When the harvest is dried, heeps of plants are beaten with a stifle. It yields up to 1000-1200 kg/ha.

STORAGE:-

Seeds should be stored in air tight containers for prolonged storage and the moisture content must be reduced to less than 13% to prevent the growth of mould.

FAMILY:- PIPERACEAE

BOTANICAL NAME:- ***Piper nigrum***

VERNACULAR NAMES:-

SINHALA	:	*Gammiris*
TAMIL	:	*Aguttam, Arisu*
ENGLISH	:	Black Pepper

DESCRIPTION:-

A climbing perennial with cylindrical, dichotomously branched stems much thickened at nodes, glabrous, rooting, sparingly, shining.

LEAVES:- Simple, alternate, 12.7 - 17.5 cm long, ovate-oval, broadly-ovate or ovate-oblong to nearly orbicular, rounded or more or less cordate at base and oblique, acuminate acute, 5-9 veined.

FLOWERS:- Bisexual, sessile in axils of fleshy bracts with 2 lateral bracelets arranged in leaf-opposed spikes 5 cm long.

FRUITS:- Nearly globose, at first dark green about 6 mm long passing through orange-yellow to dull red when ripe in pendulous spikes 10-15 cm long, bracelets connate above forming the upper margin of a shallow nearly circular cup round the fruit (Jayaweera, 1982).

DISTRIBUTION:-

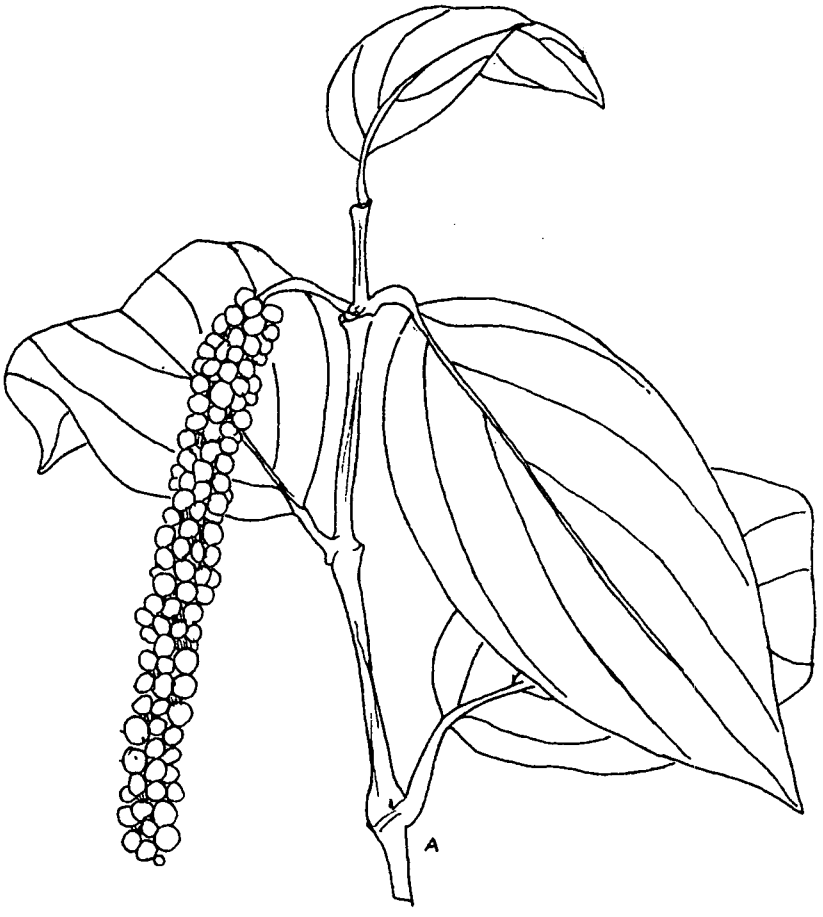
Peper is a native of the Western Ghats in India. It is one of oldest and the world's most important spice. It has been reffered to as an item of commerce in the treatises of Hippocrates and Theophrates.

Pepper appears to have been introduced to Africa in the 15th century (by the Portuguese) and the Americas in the 18th Century (by the French) respectively. Sri Lanka is one of the earliest locations of pepper.

It is also cultivated in India, Indonesia, Malaysia, Thailand, West Indies and South America (Purseglove, 1968; Jayaweera, 1981; Jansz et at., 1983 and Wikramanayake, 1996).

EDIBLE PARTS:-

The fruit.



Piper nigrum

(A) Twig with leaves and pendulous fruit-spike.

FOOD USE:-

Seeds are used as a condiment. They was widely used to taste foods before the introduction of chillies. Still Sri Lankans use very much of Black pepper to taste their preparations better. White pepper the fruit from which the mesocarp has bean removed, is used almsot exclusively as a direct spice.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 13.2 g, Energy - 304 kcal, Proteins - 11.5 g, Fats - 6.8 g, Carbohydrates - 49.2 g, Calcium -460 mg, Phosphorus - 198 mg, Iron - 16.8 mg, Carotene - 1.080 mcg, Thiamine - 90 mcg, Riboflavin -140 mcg, Niacin - 1.4 mg (Perera et al., 1983).

The quality of the spice is assessed on the contants of the aromatic steam volatila oils and the pungent alkaloids. The major pungent principle is piperine which constitutes 95% of the total pungent alkaloids. Black pepper contains an acrid resin, an oleoresin, a volatile oil, starch, gum, a fatty oil and piperovatine. Internally, pepper is a stomachic, carminative and induces secretion of bile. It is used in dyspepsia, flatulence, cough, hemorrhoids, intermittent fevers, piles and elephantiasis. It has been successfully used to stop vomiting in cases of cholera, and for paralytic and arthritic disorders. It is an antidote for shell-fish and mushroom poisoning. A liniment prepared out of black pepper it is useful for chronic rheumatism (Jayaweera, 1982; Jansz, 1983).

ENVIORNMENTAL RESPONSE:-

Pepper can be grown at all elevations up to 1000 meters above sea level. Adequate rainfall is, however, critical (a minimum of 175 cm) so as to ensure both flowering and pollination. Pepper cannot tolerate continuous strong wind. It thrives on loamy soils, rice in organic matter and well drained.

CULTIVATION:-

Areas for cultivation - The crop is suited for wet and inter mediate zone.

Planting season - Field planting is carried out at the begining of the rainy seasons.

Planting meterials - Young stem cutting. Pepper in Sri Lanka is rearly cultivated as a mono crop Normally mixed or intercropping are practised. They are grown on live supports such as *Gliricidia* species, *Erythrina indica* and *Erythina lithosperma*. Coconut, jak, mango and arecanut are commonly used for supports in homegardens. Regular pruning to promote branching is recommended.

Time to harvest - Pepper beigins to yeild within 4 years of planting. Main peaks of pepper harvests in Sri Lanka are in October-January and June - July. Pepper is mature and ready for harvest 6.5 to 7.5 months after flowering.

Harvest - Yeilds of pepper in Sri Lanka is reported to be low (1340-2500 kg/ha).

STORAGE:-

Sund-dried seeds can be stored in dry containers for a long time. On storage, it gradually loses oil and after 6 months storage 10-20% of the oil could be lost. Green (unripe) pepper can be dried canned or pickled and stored.

FAMILY:- POACEAE

BOTANICAL NAME:- ***Eleusine coracana***

Syn :- Conosurus coracanus

VERNACULAR NAMES:-

SINHALA	:	*Kurahan, Kurakkan*
TAMIL	:	*Kayur, Kelvagaru*
ENGLISH	:	Finger Millet, Ragi

DESCRIPTION:-

An annual grass, 60-120 cm high with long leaves often over topping the stem, 5-7 mm broad with compressed loose sheaths and ligule of hairs. Spikes 4-7, interrupted with their ends frequently incurred, rhachis often pubescent at base, somewhat 3-gonous. Spikelets much congested, awnless, 3-6 flowered.

FLOWERS:- Bisexual in volucral glumes 2, sub-equal, persistent membranous, strongly keeled, flowering lumes similar.

GRAIN:- Oblong or globose, pericarp loose, delicate, breaking up irregularly, seed globose, dark brown, smooth with a depressed black hilum and slightly flattened on one side (Jayaweera, 1982).

DISTRIBUTION:-

It is centre of origin is Africa. It was taken to India probably over 3000 years ago (Purseglove, 1972). In Sri Lanka, *Kurakkan* has been cultivated from earliest times and is considered as the second staple after rice (Siriweera, 1993).

EDIBLE PARTS:-

The grains.

FOOD USE:-

The grain is the main source of food when rice is in short supply. The grains are ground into flour which is used for *Pittu, Roti, Thalapa* and sweet meats.

Eleusine coracana

(A) Plant with roots, leaves and inflorescence.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture -13.1 g, Energy - 328 Kcal, Proteins - 7.3 g, Fats -1.3 g, Carbohydrates - 72 g, Ca - 344 mg, Phosphorus - 288 mg, Iron - 6.4 mg, Carotene - 42 mcg, Thiamine - 420 mcg, Riboflavin - 190 mcg, Niacin -1.1 mg (Perera, et al., 1979).

The seed of the grass contains eleusinin, an alcohol soluble protein and vitamins. In South Africa it is used with *Plumbago zeylanica* as an internal remedy for leprosy. The juice of the leaves is given to woman at child birth. In Indo-China, it is given as a vermifuge. It is a popular diuretic among the Vietnamese. The Indonesians eat it as a vegetable. In Goa, the flour is used as a remedy for chest conditions (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Well drained fertile soils are suitable. Drought resistant. Requires a rainfall of 500-880 mm; grows in altitudes below 1200 m.

CULTIVATION:-

Areas for cultivation - *Kurakkan* has been grown traditionally as a chena crop in the dry zone. In small holdings, it can be grown also in the low country wet zone. The main area for cultivation, however, lies in the unirrigable highlands of the dry zone.

Planting season - *Kurakkan* is a *Maha* crop. As such planting should commence with the first rains in October during this season. In the Jaffna Peninsula the crop is planted at different times during the dry season from February to September, under irrigation.

Land preparation - Seed bed preparation should be fairly intensive as this is a small seeded grain. The soil should be worked to a fine tilt, by repeatedly working the soil.

Spacing - Often grows in pure stands or in a mixture with sorghum, maize or vegetables. It is often grown as a first crop after clearing the land. Seeds are sown as early as possible, often well before the main rains start. Previously seeds were usually broadcast, but drilling is increasingly popular as it makes weeding and thinning easier.

Seed rate - About 22-35 kg/ha if broadcast, only 5.5 -10 kg/ha if drilled. Inter-cultivation for the purpose of weed control should commence about the 15th day.

Irrigation - Generally in the Dry zone it is cultivated under rain-fed conditions though in Jaffna it is cultivated under irrigation.

Fertilizer - Very little fertilization is done in chena cultivation.

Pests/Diseases - Comparatively pests and diseases attacks are very low.

Time to harvest - The crop is generally ready for harvest in about 4 months from sowing. Late varieties take about 5.5 months to mature. Since ripening is uneven at least two harvests should be taken at about 10 day intervals.

Harvesting - Generally hand harvested, the heads are cut off with a knife and often stored as heads, being threshed as required. Unthreshed heads produce 80-85 percent grain.

STORAGE:-

Earheads should be dried thoroughly in the sun prior to threshing. The earheads could then be stacked,and threshed for grains as required. In rural areas millet seed is stored on a heap, without threshing. The seeds dry quickly and are so small that insects cannot live inside them. Traditionally *Kurakan* was stored in the '*Kurahan Bisse*' (Traditional Silos) where it can be stored without loosing quality for several years. It is believed that keeping of whole panicles is effective than storing of grains. Millet can be stored on the head for up to 10 years without the use of insecticides, but fumigants are commonly used in commercial storage.

FAMILY:- POACEAE

BOTANICAL NAME:- *Oryza sativa*.

VERNACULAR NAMES:-

SINHALA	:	*Goyam, Wee*
TAMIL	:	*Arishi, Nellu*
ENGLISH	:	Paddy, Rice

DESCRIPTION:-

A tall annual grass, stem 0.6-3 m tall, erect or with a long stout creeping or floating base rooting at nodes, internodes long, smooth, nodes glabrous.

LEAVES:- Simple, alternate, 30-60 cm long, 0.6-0.8 cm broad, linear, acuminate, scabrid on both surfaces and on margins, base narrow, sheath 10-15 cm long, loose, smooth mouth with ciliate auricles.

FLOWERS:- Spikelets 1 - flowered 0.6- 0.8 cm long, erect, sessile or very shortly pedicelled; glumes 2 very small, pale as 2, equal about 3 or 4 times the length of the glumes, the lower palea somewhat gibbous above,blunt,acute or terminating in a sharp and articulating at base, the upper palea 3-veined,coriaceous with membranous margins beneath the palea, the rhachis is expanded into a small knob or callus, lodicules two, collateral, thick, fleshy, entire or 2- lobed, stamens 6 hypogynous.

FRUITS:- Grain - oblong, angular enclosed in the persistent pale not clear however are not adherent to it, pericarp very thin, adherent to testa (Jayaweera, 1981).

DISTRIBUTION:-

Two species of rice are cultivated *Oryza sativa* which originated in South East Asia. While *O. glaberrima* originated mostly in Africa. (Grist, 1975; Ustimenko, 1980) One of the earliest cultivated crops. According to scientists paddy cultivation probably dates back to the earliest age of man. In China it was cultivated about five thousand years ago. Earliest archaeological evidence of rice from India goes back to 2500 B.C. (Grist, 1975). Excavators at Mahenjdaro found rice grains in eartharn vessels. In Sri Lanka paddy has been grown from times immemorial. Before the establishment of tank irrigation systems in the 5th century B.C., probably rice was cultivated in river valleys of the dry zone of Sri Lanka as a highland crop. History of rice cultivation in Sri Lanka is as long as the history of Sri Lankan civilization. In Sri Lanka it is cultivated at an altitude of 1300 m from the sea level.

Oryza sativa

(A) Panicle with the upper leaf. (B) External view of spikelet. (C) Grain with paleas removed.

EDIBLE PARTS:-

The grain.

FOOD USE:-

Being the staple food of the Sri Lankans, rice is boiled and eaten with curries. Rice flour is used for preparation of various food items as Rotti, Hoppers, String hoppers etc,. In such countries as Japan, Vietnam, Korea and China, beer, wines and the alcohols are manufactured from the grain.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 13.3 g, Energy - 346 Kcal, Proteins - 6.4 , Fats - 0.4 g, Carbohydrates - 79 g, Calcium - 9 mg, Phosphorus - 143 mg, Iron - 4 mg, Thiamine - 210 mcg, Riboflavin - 50 mcg, Niacin -3.8 mg (Perera, et al., 1979).

Starch is the main constituent of the seed. It also contains globulin, albumen, oryzagenin and Vitamin B. The leaves contain alkaloids, hardenine, and the seeds contain alkaloids, stachydrine and trigonelline. Medicinally, a decoction of the root is given for absence of urinary secretion (anuria). Water in which rice has been boiled or cunjee is an excellent demulcent refrigerant drink for febrile and in flanmmatory conditions of the intestines. A poultice of soft rice applied to the chest relieves chronic bronchitis and coughs. Popped rice with other ingredients is recommended for hiccough and vomiting (Jayaweera, 1981).

OTHER VALUES:-

Rice bran is nutritious which is given as poultry feed while straw is used as a cattle feed also used in paper manufacturing.

ENVIRONMENTAL RESPONSE:-

Adapted to a wide range of climatic conditions. Cultivated in tropics, sub tropics and in warm temperate climate. Although it is cultivated in a wide range of soils, heavy soils with a pH of 5.5 - 6.5 are preferable. Rice in adapted to regions of high temperature and prolonged sunshine. Rice varieties can be grouped as sensitive and non-sensitive to the day length. The average temperature required throughout the life ranges from 20 - 38^0.

Rice can be cultivated at different altitudes such as 3500 m in Himalayas and at low altitudes at sea level.

CULTIVATION:-

Area for cultivation - Rice is grown in all districts in Sri Lanka. The smallest acreage is grown in the Nuwara Eliya and Monaragala districts and the highest in the Kurunegala district.

Planting season - It differs in various parts of Sri Lanka. Generally the crop is grown in the *Maha* season in all districts and during the *Yala* in the wet zone or under irrigation in the dry zone. An intermediate season after *Maha* known as the"*meda*" season is recognized in the Kurunegala district.

Land preparation- It can be done either by manual labour or buffaloes. This includes several steps like ploughing, flooding the field, levelling, draining the water, etc. All these are done to get a weed free fine tilth . How a days tractors are been used for the tillage operation.

Planting and space - The common methods of sowing or planting the rice crop are broadcast sowing, row sowing or transplanting. Broadcast is the most popular method of sowing. Transplanting is popular in the up country where skilled labour is available.

Irrigation - It is customary practice in Sri Lanka to flood the paddy fields.

Fertilizer - Traditionally green manure, compost and farmyards manure have been widely used in paddy fields and at present a large amount of mineral fertilizers are used.

Pests and Diseases - Losses of pre harvest and postharvest is considerable.

Time to harvest - When grain is mature and the panicles turn yellow the crop is ready for harvest.

Harvesting - On most small farms the ripe rice is harvested by hand using sickles.

STORAGE:-

Traditionally paddy is stored in traditional silos called "*Bissa*" or "*Atuwa*". Moisture content of grains should be less than 14% which should be kept in bags in dry and hot places.

FAMILY:- POACEAE

BOTANICAL NAME:- ***Panicum miliaceum.***

VERNACULAR NAMES:-

SINHALA	:	*Meneri*
TAMIL	:	*Chamai*
ENGLISH	:	Millet

DESCRIPTION:-

An annual grass with a tufted, erect stem, 30-60 cm high, rather slender, simple or sparingly branched leafy up to near the panicle, internodes 5-10 cm long, nodes glabrous.

LEAVES:- 30-45 cm long, 0.4-0.8 cm broad, erect, narrowly linear, finely acuminate, smooth, glabrous or very sparsely hairy, base narrow, not cordate, margins smooth, sheaths long, eciliate sometimes with a few tubercle-based hairs.

FLOWERS:- Panicle oblong, 5-25 cm long, inclined, rhachis filiform, quite smooth, branches distant, beneath or solitary, spikelets, bisexual, 2.5-3 mm long, dorsally compressed.

GRAIN:- Free but tightly embraced by the hardened glum and palea (Jayaweera, 1981).

DISTRIBUTION:-

Centre of origin is Central Asia (Purseglove, 1972). Millet is cultivated throughout the tropical region of the world including India and Sri Lanka. It is a chena crop in the low-country in Sri Lanka.

EDIBLE PART:-

The grains.

FOOD USE:-

All food preparations made of rice flour can be made with *Meneri* and *Meneri* flour. In the preparation of flour the row grain is first soaked in water for 8 hours and grounded.

Panicum miliaceum

(A) Plant.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 11.9 g, Energy - 341.7 Kcal, Protein - 2.5 g, Fats - 1.1 g, Carbohydrates - 70.04 g, Calcium - 14 mg, Phosphorus - 206 mg, Iron - 5.0 mg, Carotene - 0.0 mcg, Thiamine -200 mcg, Riboflavin 180 mcg, Niacin - 2.3 mg (Perera,et al., 1979).

Medicinally, the grain made into a conjee is given for acidity and biliousness. It is also used for the treatment of snake bite poisoning (Jayaweera, 1981).

OTHER USES:-

Straw is highly nutritions for cattle.

ENVIRONMENTAL RESPONSE:-

Sandy loam soils are preferable. Requires a little rainfall. Even rainfall of 200 - 250 mm is adequate for normal growth.

CULTIVATION:-

Areas for cultivation - The crop is suited to the dry zone chenas.

Planting season - During the *Yala* season.

Planting material- Propagation is by seed, which is broadcast or drilled.

Land preparation - Preparatory tillage is generally limited to one operation. The soil is lightly tilled and prepared for sowing.

Spacing - Rows 22 cm apart,or broadcast.

Seed rate - 8-11 kg/ha.

Irrigation -Usually grown as a rainfed crop, heavier yields are obtained with irrigation.

Fertilizer - Not usually applied.

Pests/Diseases - No pests or diseases harmfull to the crop, but very high rate of bacteria attack the leaves compared to other crops.

Time to harvest - 60-90 days.

Harvest - Yields 225-560 kg/ha in a good season. Harvesting is done either with sickles, or by pulling the plants out whole. The sheaves may be stocked for a week, after which they are threshed by trampling under the feet of bullocks.

FAMILY:- POACEAE

BOTANICAL NAME:- ***Paspalum scrobiculatum***

Syn:- P. commersonnl, P. kora

VERNACULAR NAMES:-

SINHALA	:	*Amu*
TAMIL	:	*Varagu*
ENGLISH	:	Kodo millet

DESCRIPTION:-

Perennial grass with stems 60-90 cm high, tufted, erect or sub-erect rather stout, leafy from the base upwards.

LEAVES:- Bifarious, erect or sub-erect, 15-22.5 cm long, 0.2-0.8 cm broad, flat, finely acuminate, mid-vein slender margins, scaberulous, sheath 10-20 cm long, compressed, loose, mouth hairy, ligule very short, membranous.

FLOWERS:- Spikes 2-6, sessile, usually distant and spreading 2.5-15 cm long, rhachis filiform or broad and concave margins ciliolate. Spikelets closely imbricate in 2-3 series, sessile or shortly pedicelled nearly orbicular to glumes, 3 palea orbicular, tumid, thickly coriceous, strongly inflexed below the middle forming 2 broad, membranous auricles that embrace the grain, stamen 3, hypogynous one at the base of the flowering glum and one opposite each vein of the palea.

FRUITS:- Grain - biconvex, free but tightly enclosed within the hardened glum and palea (Jayaweera, 1981).

DISTRIBUTION:-

Centre of origin is India, and its a minor grain crop throughout India. Grows in the tropics of the world including India, Malaysia and Philippine Islands. It is very abundant in the warmer parts of Sri Lanka up to Nuwara Eliya (Senewiratne and Appadurai, 1966; Purseglove, 1972).

EDIBLE PARTS:-

The grains.

Paspalum scrobiculatum

(A) Whole plant. (B) Flower.

FOOD USE:-

Grains are boiled and eaten as rice and milk-rice.

NUTRITIONAL AND THERAPUTIC VALUE:-

Moisture - 11.6 g, Energy - 280.6 Kcal, Protein - 10.6 g, Carbohydrates - 52.2 g, Fat -4.2 g, Fibre - 10.0 g, Ash - 4.4 g.

It is recommended for diabetic patients, in the same way as *Kurakkan*. This plant is styptic and useful for inflammation and diseases of the liver. The expressed juice of the stem is applied on corneal opacity. The juice of the leaves is given to women at childbirth. The camphor-like substance in the internodes of the stem is used in the treatment of snake-bite poisoning (Jayaweera, 1981).

ENVIRONMENTAL RESPONSE:-

Amu is remarkably drought resistant. It has the capacity to struggle on in spite of a lack of moisture and can be related to the poorer soils.

CULTIVATION:-

Kodo millet is hardy and drought resistant, and is grown on gradually soils. Therefore good for marginal lands.

Areas for cultivation - Kodo millet is a cereal crop of minor importance in Sri Lanka. It is cultivated only in very small extents, as a chena crop in the dry zone and in the Jaffna Peninsula.

Planting season - *Maha* season.

Land preparation - The soils may be prepared as for other minor millets. The seed may be either sown broadcast, or under better culture, drilled in rows.

Seed rate - The seed rate amounts to about 20 kg to the hectare.

Time to harvest - The crop takes 5-6 months to mature. The crop is ready for harvest about 6 months after sowing.

Harvest- The crop is harvested by hand and the grain is threshed by trampling under the bullocks. Grain yield varies from 250-1000 kg.

STORAGE:-

Should be stored at the moisture content of 14% or less.

FAMILY:- POACEAE

BOTANICAL NAME:- ***Saccharum officinarum***

VERNACULAR NAMES:-

SINHALA : *Uk-gas*
TAMIL : *Angarigai*
ENGLISH : Sugarcane

DESCRIPTION:-

A very large perennial herb with a thick, solid, jointed rhizome giving off-root fibers above each joint, stems many, erect 2-4 m high, cylindrical, solid, succulent within, with numerous joints at a distance of 3.5-7.5 cm, internodes shorter at the base, slightly swollen, about 3.7 cm diameter, smooth, shining, polished, yellow, purple or striped, not branched but with a bud at each nod and with numerous scar-like dots arranged in 3 irregular rings above each node.

LEAVES:- Very large numerous distichous, closely placed, deciduous from the lower part of the stem. Sheaths about 30 cm long, rather close, striate smooth or with farinose pubescence which is easily removed, ligule very short, entire leaf blade 90 cm or more long, at first erect, then spreading, 7.5 cm wide acute very finely serrulate on the margin, smooth on both surfaces, ciliate on the back.

FLOWERS:- Spikelets very small, very numerous 1-flowered all hermaphrodite, arranged in pairs, one being sessile, the other stalked, each surrounded by a dense ring of long white, straight, spreading, silky hairs, arising immediately below and coming away with the spikelet, the couples placed rather distantly on alternate sides of the very long , slender, erect or curved, straight or flexuose, smooth branches of greatly elongated narrow panicles, gray inflorescence about 60 cm or more in length, pale yellow, ovary superior (Jayaweera, 1981).

DISTRIBUTION:-

It is probably indigenous to India (Purseglove, 1972). It has been cultivated in dry zone chenas of Sri Lanka as long ago as the 7th century A.D. (Siriweera, 1993). Now it is cultivated throughout the tropics.

EDIBLE PARTS:-

Stem.

Saccharum officinarum

(A) Plant. (B) Part of stem. (C) Flower.

FOOD USE:-

From the earliest time sugarcane is used to chew and sweetening foods. The juice of the stem is the main source of sugar in tropical countries. It is also used for making honey, jaggery and spirits.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The juice of the stem contains sucrose, while the leaf has vitamin C. The root is considered demulcent, emollient, diuretic and stimulant. It has antiperiodic properties and frequently used in chronic malarial affections. A cunjee made out of the pounded leaves is used for coughs due to heat. The fresh juice of the stem with cows milk and king coconut water is given to women in labour.In Cambodia, sugarcane enters into the composition of remedies used for treatment of ulcers in the skin and mucous membranes. A decoction of the stem is given for diarrhoea in children. Sugar in addition to being a food is an antidote against copper and arsenic poisoning. Powdered sugar is used externally as an antiseptic and sprinkled upon ulcers. It is often used for preserving meat and fruits. The treacle is slightly laxative and along with molasses is used for the preparation of rum (Jayaweera, 1981; De Pauda and Pancho, 1989).

OTHER USES:-

Molasas is given to animals.

ENVIRONMENTAL RESPONSE:-

Well drained deep reddish or brown loams are suitable of sugarcane. Being a tropical crop, it requires high temperatures above 26^0 C for optimal growth. A well distributed rainfall of 100-130 cm is necessary.

CULTIVATION :-

Areas for cultivation - In Sri Lanka this can be cultivated throughout the country but due to the low temperature above 2000 m altitude, it grows badly. It is mostly cultivated in areas of the dryzone under irrigation.

Planting season - The best time for planting cane in Sri Lanka is between March to May. Too early a planting results in growing (flowering) of the cane. Too late a planting, on the other hand, retards the growth of the cane during its grand period of growth due to the cloudy weather during *Maha*.

Land preparation - Deep tillage is practiced.

Planting material - The planting material used in sugarcane cultivation is a cutting of the stalk containing one or more buds.

Spacing - Seed sets having 3 eye buds are placed end to end in a furrow and covered lightly with soil.

Seed rates - In furrows 1 meter apart this would require about 22,000 sets per hectare. Weed control during the first few months is essential. After that the cane would close in sufficiently to control weeds automatically. Manual weeding can be expensive. Pre-emergence weedicides have been tried out and are proving successful.

Irrigation - It can be grown under rain-fed conditions though it is cultivated under irrigation.

Fertilizer - It responds well to mineral fertilizer.

Time to harvest - Harvest time should coincide with the dry season to enable a long period for crushing.

Harvesting - In Sri Lanka harvesting is done by hand. The cane is cut down to ground level, trimmed and loaded for transport to the factory.

Yield - About 100 tons millable cane to the hectare.

FAMILY:- POACEAE

BOTANICAL NAME:- ***Setaria italica***

Syn:- Panicum italica, Chaetocholoa italica

VERNACULAR NAMES:-

SINHALA : *Thanahal*
TAMIL : *Thinai*
ENGLISH : Italian millet, Foxtail millet

DESCRIPTION:-

An annual herb with tufted, erect, smooth stem 0.6-1.6 m tall, sometimes decumbent near the base and rooting at the lower joints.

LEAVES:- Flat, linea-lanceolate, long-pointed, 45-60 cm long, 2.5 cm broad, rough, sheaths softly hairy.

FLOWERS:- Spikelets on branches about 2.5 cm long, crowded in a compact, nearly cylindrical, interrupted, nodding panicle 10-25cm long and 1.2.5 cm diameter. Spikelets usually 3, membranous, the lowest small, second and third nearly equal, uppermost sometimes containing a male or rudimentary flower, palea deeply concave containing a bisexual flower.

FRUITS:- Grain-free, enclosed within the hardened glum and palea. (Jayaweera, 1981).

DISTRIBUTION :-

It is a native of East Asia (Purseglove, 1972; Querol, 1992) and is cultivated in most tropical and temperate countries. Now it has become a cereal crop.

EDIBLE PARTS:-

The Grains.

FOOD USE:-

It is boiled and eaten as rice. It can be used in many preparations as rice. In Russia it is used for brewing beer.

Setaria italica

(A) Fruiting panicle. (B) Flowering panicle.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 12.8 g, Energy - 353 Kcal, Protein - 12.95 g, Fats - 2.9 g, Carbohydrates - 68.77 g, Calcium - 37 mg, Phosphorus - 280 mg.

The leaves of this plant contain an alkaloid, a popular remedy to alleviate labour pains. It acts as a diuretic and astringent. It is used externally for rheumatism. In China, the grain is considered an emollient and astringent in diarrhoea and choleraic ailments (Jayaweera, 1981).

OTHER USES:-

It is an important fodder crop in some countries.

ENVIRONMENTAL RESPONSE:-

Italian millet can be grown on a wide range of soils. Well drain, high in organic content loam soils are more suitable. Requires less water. It grows up to 2000 m.

CULTIVATION :-

Areas for cultivation- The crop is suited to areas of low rainfall although it does well even in the higher rainfall areas. It can be cultivated even at high altitudes of about 2,000 m. It is essentially a crop for the dry zone.

Planting season - When grown as a chena crop in the dry zone, it is sown with the first *Maha* rains. In the wet zone it could be planted in both *Yala* and *Maha* seasons, the crop being sown in both cases with the first rains.

Land preparation - Thorough preparation of the soil is essential and this is usually achieved by one or two preparations of the soil with a plough and disc harrow. At least one inter-cultivation is necessary for the purpose of weed control and should be given a fortnight after sowing.

Spacing- Close spacing is advocated as this helps to suppress weeds. The spacing between plants should not be more than 5 cm in a row, with rows 30 cm apart.

Seed rate - The seeds may be either sown broadcast or drilled in rows. When drilled in rows, the three countered seed drills may be used. The seed rate amounts to about 7-10 kg to a hectare.

Fertilizer - It shows application of fertilizer will increase the yield.

Time to harvest - Depending on the variety, it takes 75 -95 days to get matured.

Harvest - When the crop is mature, harvesting is done by cutting off the earheads. The earheads are heaped on the threshing floor for about a week, before being threshed under the feet of bullocks, or by a stone thresher.

STORAGE:-

Seeds can be stored for a long time. Moisture content should be less than 12%.

FAMILY:- POACEAE

BOTANICAL NAME:- ***Zea mays***

VERNACULAR NAMES:-

SINHALA	:	*Bada Iringu, Iringu, Bada Inguru*
TAMIL	:	*Cholam*
ENGLISH	:	Corn, Maize

DESCRIPTION:-

It is an annual crop. The height of the plant varies from more than 15 feet to 3 feet or less. The diameter of the stalks varies from 1.2 - 6.2 cm. The salk is made up of nodes and internodes, usually 10-15 per salk. The longer internodes are found toward the top of the stalks, towards the base the internodes are very short.

LEAVES:- The leaves are similar to those of sugar cane. The leaves are borne alternately. The leaf blades are long, broadly linear.

FLOWERS:- The male and female flowers are borne in different parts of same plants. The male flowers are borne in a cluster (called a tassel) on the top of ends of the stem as terminal panicles while the female flowers are borne inside the young cobs which spring from one of the nodes on the stem.

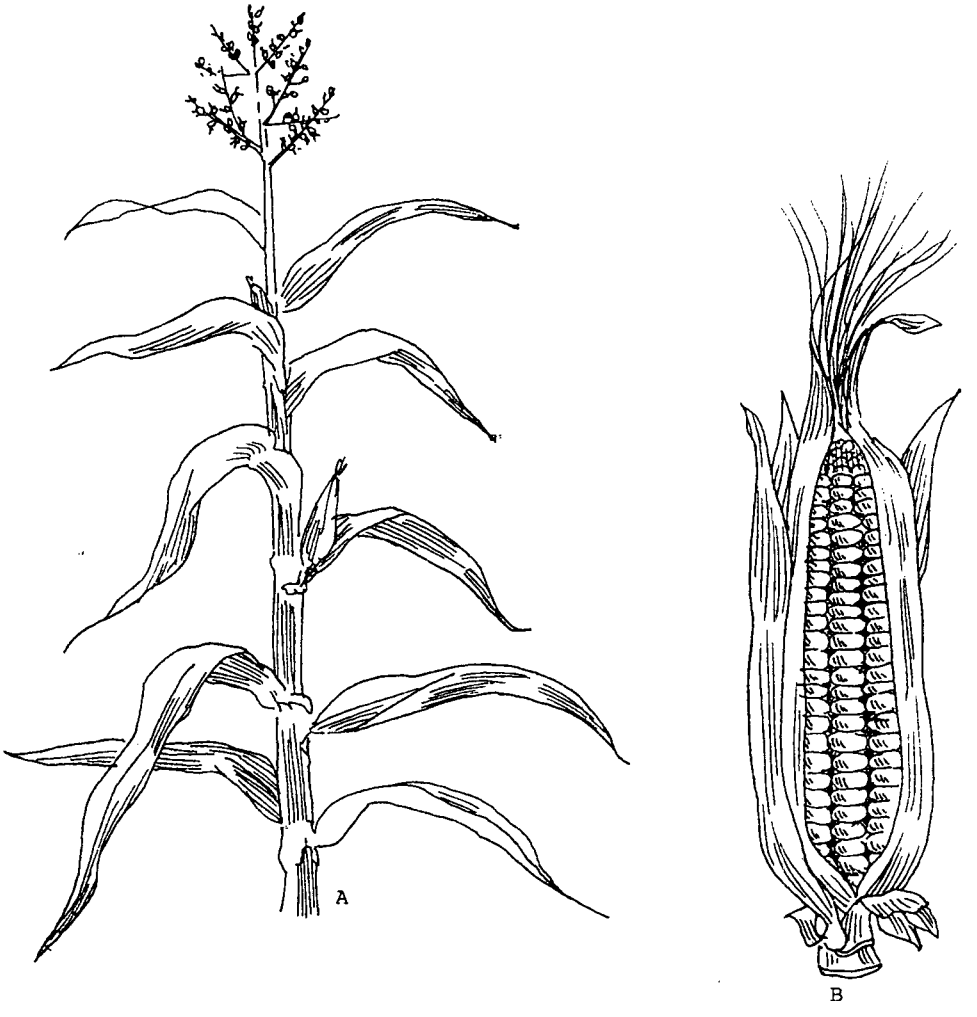
FRUITS:- Grain rounded, flattish and disk-like and are of varying colours such as yellow, red, orange, purple and white.

DISTRIBUTION:--

It originated in South America (Purseglove, 1972) and presently has become a second crop among the cultivating crops. It is cultivated in America, China, Russia, Mexico and Argentina (Ustimenko, 1980). It was introduced to Sri Lanka by the Dutch and cultivated in the dryzone.

EDIBLE PARTS:-

The grains.



Zea mays

(A) Branch. (B) Cob.

FOOD USE:-

It is eaten in many ways. Unripe cobs are boiled and eaten. Unripe seeds are prepared as a curry. Ripe seeds are ground into flour to make *Roti, Pittu* and other preparations. Alcohol, glucose and high quality edible and technical oil are made from the seed. Maize is used for an infant food called "*Triposha*" which is given to low income families in Sri Lanka.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 12.0 g, Energy - 363 Kcal, Protein - 10.0 g, Fats - 4.5 g, Carbohydrates - 71.0 g, Calcium - 12 mg, Iron - 2.5 mg, Carotene - 0 mcg, Thiamine - 350 mg, Riboflavin - 130 mcg, Niacin - 2.0 mg, Vitamin - 0 mg (Perera, et al., 1979).

OTHER USES:-

In many countries *zea mays* is used in rotation as a green manure. Seeds are used as poultry feeds. Green maize is used in making cyledge.

ENVIRONMENTAL RESPONSE:-

Can be grown in a range of soil types while well drained, loam soils with a high organic content and pH of 5.6 - 8.0 are more suitable. Resistant to drought conditions. Optimal temperature is 21 - 26^{0}C.

CULTIVATION:-

Areas for cultivation - In the dryzone of Sri Lanka.

Planting season - In the unirrigable high lands of the dry zone, where maize is grown under rain-fed conditions, planting should be commence with the first *Maha* rains in October.

Land preparation - The first 10 cm of the soil must be worked down to a fine tilth, and pulverized to provide a soil-free large air spaces in which to plant the seeds.

Planting and space - The seeds are usually planted in rows, being either dibbled by hand or drilled using seed drills. The seed is buried to a depth of about 5 cm. The rate amounts to 15 kg per hectare. Spacing when the seed is drilled in rows is 1 m. between rows and 15 - 20 cm within the rows. With dibbled seed, spacing is 50 x 25 cm with one seed per hole.

Irrigation - Under irrigation it can be cultivated even in dry periods.

Fertilizer - Maize responses well to application of fertilizers.

Time to harvest - Depends on the variety. Harvesting is done by snapping the ear from the standing stalk.

Yield - 1000 - 1500 kg/ha.

STORAGE:-

Seeds are removed from the cob and dried. Optimal moisture content for longer storage is below 14%. In the dry zone in Sri Lanka maize is stored in cobs in a dry place as over the burners.

FAMILY:- PUNICACEAE

BOTANICAL NAME:- ***Punica granatum***

VERNACULAR NAMES:-

SINHALA	:	*Delum*
TAMIL	:	*Kalumal*
ENGLISH	:	Pomegranate

DESCRIPTION:-

A large shrub or small tree 3.3-5 tall with slender, somewhat angular branches often with spiny ends, bark pale brownish gray.

LEAVES:- Usually opposite, sometimes alternate, often fascinated on the older branches, shortly stalked, without stipules, 2.5-5 cm long, oblong-ovate or lanceolate, tapering at both ends, entire, rather thick and stiff, smooth and shining, often persistent.

FLOWERS:- Regular, bisexual, large, solitary or 2 or 3 together in the axils of the leaves near the ends of branches, very shortly stalked.

FRUITS:- As large as an orange, 6-7 cm or more diameter, hard depressed globose, bluntly, 5-8 angled, abruptly contracted at the top into a short neck terminated by the thick calyx lobes and containing the withered stamens. Seeds very numerous, entirely filling the fruit attached to the upper chambers on all sides of thick, strong, spongy placentae, seed 1.2 cm long, polygonal, composed of a thick translucent, pink, juicy coating, inner coat hard, white, cotyledons foliaceous, convolute, exalbuminous (Jayaweera, 1982).

DISTRIBUTION:-

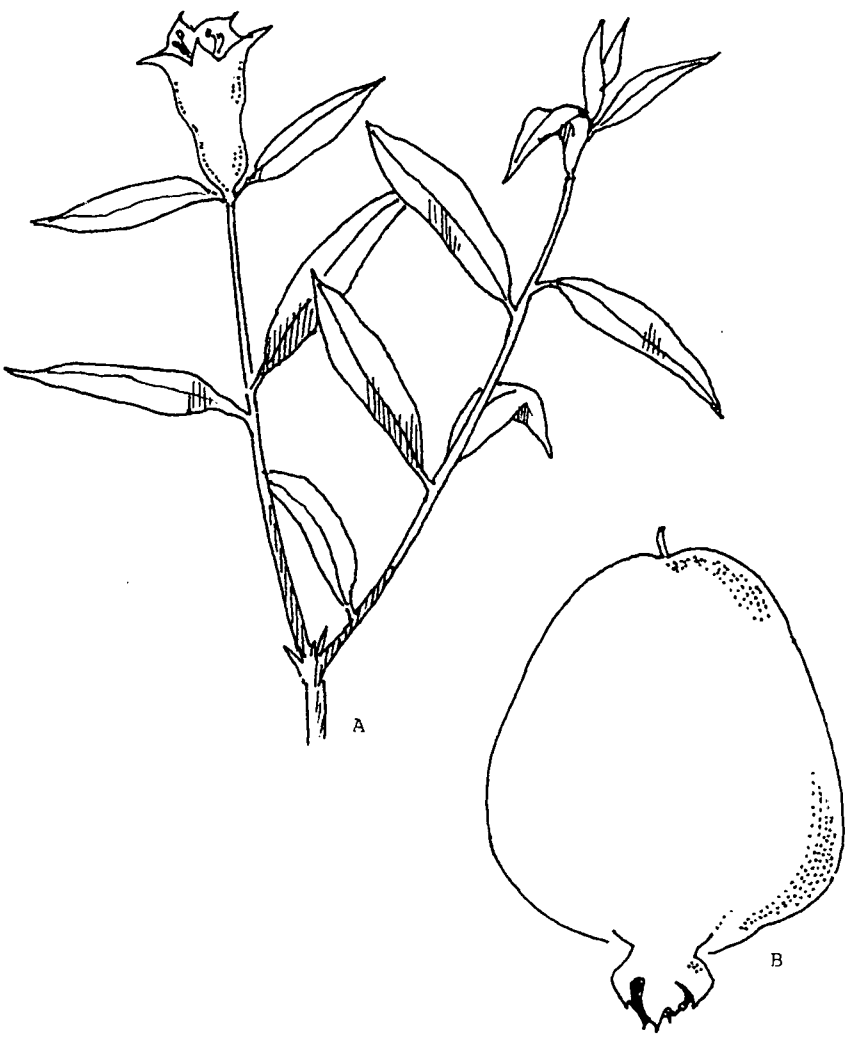
It is a native of Iran (Bose and Mitra, 1985) and is cultivated in most tropical and temperate countries including Africa, India and Sri Lanka (Bose and Mitra, 1985).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Ripe fruit is eaten fresh. Fruit juice extracted from the pulpy cover of seeds is full of vitamins.



Punica granatum

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 78 g, Energy - 65 K.cal, Proteins - 1.6 g, Fats - 0.1 g, Carbohydrates - 14.5 g, Calcium - 10 mg, Phosphorus - 70 mg, Iron - 0.3 mg, Thiamine - 60 mcg, Riboflavin 100 mcg, Niacin - 0.3 mg, Vitamin C - 16 mg (Perera, et al., 1979).

The bark of this plant contains the alkaloids pelletierine, isopelletierine, methyl-pelletierine and pseudopelletierine in addition to tannin, a blucoside, granitic and gallic acids. The fruit contains invert sugar, saccharose, the enzyme invertin and citric and malic acids. It is also rich in vitamin C and is a good source of iron. The root bark is specific for cases of tapeworm, and tuberculous diseases in children. It is also used in diseases of the eye, painful micturition and catarrh. The rind of the fruit is excellent for diarrhoea and dysentery and the bark of this stems a good anthelmintic (Jayaweera 1982; Aluwihare, 1993).

ENVIRONMENTAL RESPONSE:-

A drought tolerant plant. Naturalized easily in semi-arids can be grown in poor soils. Requires a rainfall of 750-1000 mm. Grows in at altitudes below 1000 m.

CULTIVATION:-

Planting material - Usually propergated by hardwood cuttings, of pencil thickness, more than 6 months and less than 2 years of age, taken from sucker at the base of the main stem. Air layering and the use of root suckers are other possible vegetative methods. Cutting should have the leaves removed. They are ready for transplanting after 9 months, but it is common practice to leave them 1-2 years before planting out in the field.

Spacing - Recommendation varies from 4 to 7 m.

Time to harvest - The bushes bear fruits in the 4th year and fruit takes six months to ripe after flowering.

Harvest - Vigorous tree gives 15 - 20 fruits at a time and 70 - 80 fruits per year.

STORAGE :-

If harvested at certain points of ripeness, pomegranate can be stored for 5-6 months, during which it will ripen and improve it is quality. The skin becomes thin and fade, the flesh loses its acidity, and seed pulp becomes softer.

FAMILY :- RHAMNACEAE

BOTANICAL NAME :- ***Zizyphus jujube***

Syn :- Z. jujuba

VERNACULAR NAMES:-

SINHALA	:	*Masan, Debara*
TAMIL	:	*Adidaram, Attiram*
ENGLISH	:	Indian Cherry, Indian Jujube

DESCRIPTION:-

A large shrub or small much branched tree with dark green, longitudinally fissured bark and elongated, flexuase, wooly pubescent branches.

LEAVES:- Simple, alternate, 3 veined with or without stipular spine, 2.5-3.7 cm long, broadly oblong-oval or rotundate, rounded at both ends.

FLOWERS:- Small regular, bisexual, greenish, while on hairy pedicles in small axillary clusters or very shortly pedunculate cymes.

FRUITS:- A globose drape, 1-2 cm long, fleshes smooth, yellow (Jayaweera, 1982).

DISTRIBUTION:-

Tropical India and now grows in tropics (Bose and Mitra, 1985). In Sri Lanka it grows wild or semi wild.

EDIBLE PARTS:

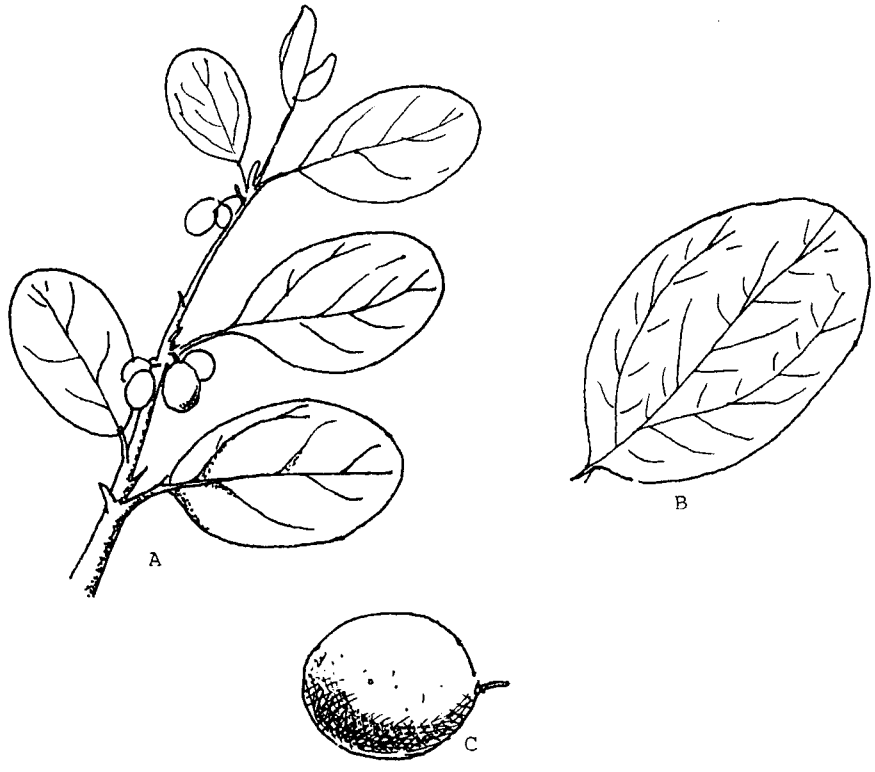
Fruit.

FOOD USE:

Ripe fruits are eaten fresh.

NUTRITIONAL AND THERAPEUTIC VALUE:

Moisture - 75.5 g, Energy - 87 kcal, Protein - 1.6 g, Fat - 0.4 g, Carbohydrates - 21.8 g, Calcium - 32 mg, Phosphorus - 21 mg, Iron 2.2 mg.



Zizyphus jujube

(A) Branch. (B) Leaf. (C) Fruit.

The root and bark of this plant contain tannin, the latter with ziziphic acid in addition. The leaves and bark contain an alkaloid. The fruit is rich in mucilage, sugar and other fruit acids. A decoction of the leaves and bark is used as an effective remedy for dysentery and diarrhoea. The root is a purgative and used for fever. The powdered root is applied to ulcers. The riped fruit purifies the blood and relieves coughs (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:

Resistant to drought and unfavourable soils. Grows in various type of soils, but sandy loam of pH 7 is ideal for *Masan*. Optimal temperature is 22-30^{0}C, requires a rainfall of 150-900 m. Grows in elevations below 1000 m.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Aegle marmelos***

VERNACULAR NAMES:-

SINHALA	:	*Beli*
TAMIL	:	*Aluvigam, Iyalbudi*
ENGLISH	:	Bael Fruit, Bel fruit, Slime Apple.

DESCRIPTION:-

A tree about 10-13 m in height with short, strong, sharp, spiny branches, 2.5 cm or more long in axils of leaves, bark bluish-grey with irregular furrows.

LEAVES:- Alternate, compound with one pair of shortly stalked opposite leaflets and a larger long-petioled terminal one, leaflets 2.5-5 cm long, ovate or oval-ovate, abrupt or tapering at base.

FLOWERS:- Regular, bisexual, pale greenish white 1.8 cm wide, sweet-scented, stalked, solitary or in few flowered, lax, erect, axillary or terminal cymes; (Flowering in May).

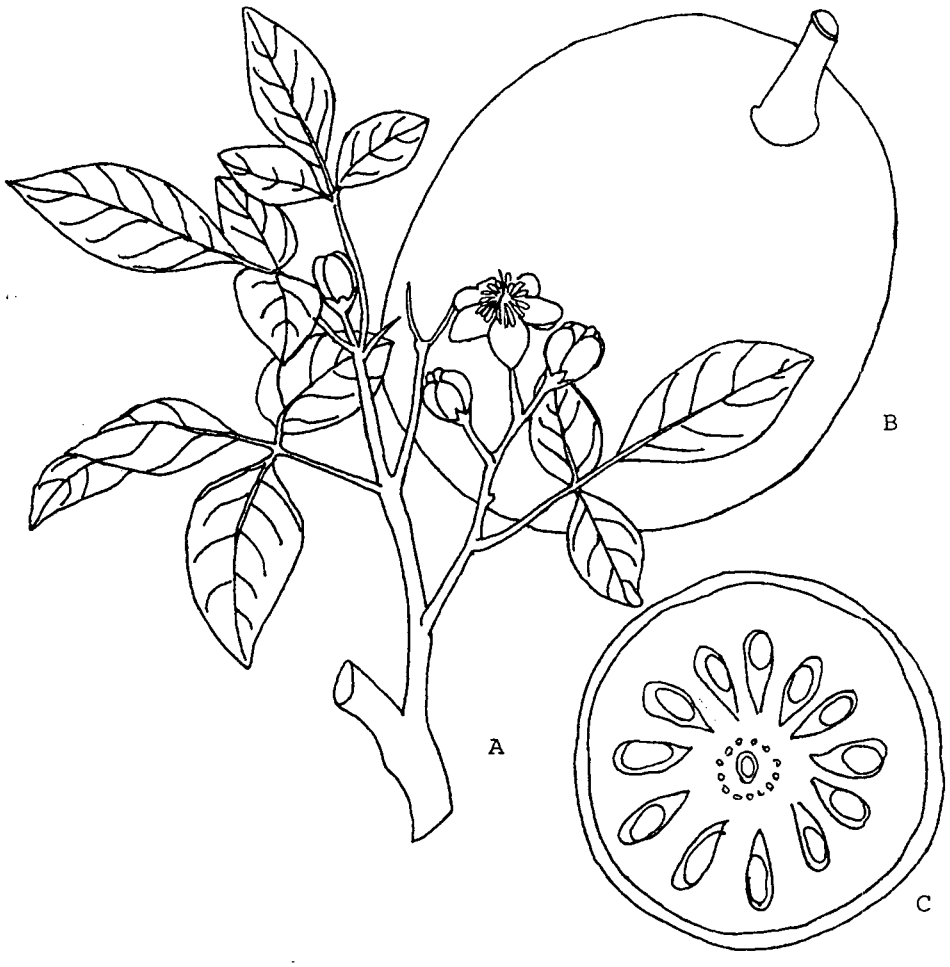
FRUITS:- Globose, 5-12.5cm, diameter, pericarp smooth, greenish-yellow, about 3 mm thick, hard, filled with soft mucilaginous tissue; seeds numerous, compressed, surrounded by slimy, transparent mucous, testa white, covered with woolly hairs, immersed in the mucous, exalbuminous (Jayaweera, 1982).

DISTRIBUTION:-

It is native of India. The leaves of the tree are traditionally used as sacred offering to "Lord Siva" according to Hindu custom (Bose and Mitra, 1990). The centre of origin of *Beli* fruit is Australia. It grows in dry hilly places throughout the warmer parts of India and Burma, and often cultivated in the mid and low-country in Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

The fruit and flowers.



Aegle marmelos

(A) Branch. (B) Mature fruit from outside. (C) Transverse section of fruit.

FOOD USE:-

The flesh of ripe fruits is eaten fresh or a drink is made from it. Jams, cordials are made from the flesh. Immature fruits, shell of the fruit and flowers are boiled with water to make a delicious beverage.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 61.5 g, Energy - 136 Kcal, Protein - 1.8 g, Fat - 0.39 g, Carbohydrates - 31.8 g, Minerals - 1.7 g, Carotene - 55 mg, Thiamine - 0.13 mg, Riboflavin - 1.19 mg, Niacin - 1.1 mg, Vitamin C - 8 mg (Bose and Mitra, 1990).

The leaves of this tree contain the alkaloids, aegelenine, aegelin and skimmianine. The wood contains dictamina and the bark-figurine. The active principle in the fruit pulp is marmelosin. The fresh leaves on distillation yield a faint yellowish green volatile oil with a peculiar aromatic odour and slightly bitter taste. The dried pulp of the unripe fruit is given along with other ingredients for dysentery, piles, dyspepsia, jaundice, scrofula, indigestion and chronic fever. The root bark is used in the form of a decoction for intermittent fever, hypochondria, melancholia and palpitation of the heart. It checks diarrhoea and gastric troubles in children. The fresh juice of the leaves is given for jaundice and anasarca. The ripe fruit is a laxative and prevents the growth of piles (Jayaweera, 1982).

OTHER USES:-

It is a pale aromatic wood and it takes a fine polish. The wood is used in carving. In the villages of Sri Lanka, people make beautiful walking sticks and handles for tools. In Pakistan yellow dye is obtained from the rind of the unripe fruit and is used in calico painting. Boiled pulp of unripe fruits is used as a thick paste to cover the space of the winnower.

ENVIRONMENTAL RESPONSE:-

Grows even in poor dry soils. No damage by a temperature as low as - 7^0C. Grows up to altitudes of 1220 m.

CULTIVATION:-

Area of cultivation - Lowlands of Sri Lanka. Planting Beal is usually propagated by seeds. Seedling are transplanted a year later. It can be propergated through root stocks. It is common in homegardens and is not cultivated in large scale. However, general methods adopted to citrus can be successfully followed.

STORAGE:-

Ripe fruits can be kept for five days. Mature fruits are plucked for prolonged keeping. Sun- dried flowers can be kept for more than one year. Beli cream is canned, and made as juice and cordials.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Citrus aurantifolia***

VERNACULAR NAMES:-

SINHALA	:	*Dehi, Hindehi*
TAMIL	:	*Ambu, Arunam, Thesikkai*
ENGLISH	:	Acid Lime, Sour Lime, Lime

DESCRIPTION:-

A small glabrous tree with stiff sharp spines which are simple by the side of buds.

LEAVES:- Simple, alternate, glandular dotted, elliptic-oblong, 5-7.5 cm long blunt or sometimes rounded at apex, petioles short, narrowly winged, articulated at the top.

FLOWERS:- Regular, bisexual, solitary or mostly clustered in the axils of leaves, usually about 1.2 cm long, white, fragrant throughout.

FRUITS:- Round-oval to oval and small 3.7-6.5 cm diameter; exceedingly sour (Jayaweera, 1982).

DISTRIBUTION:-

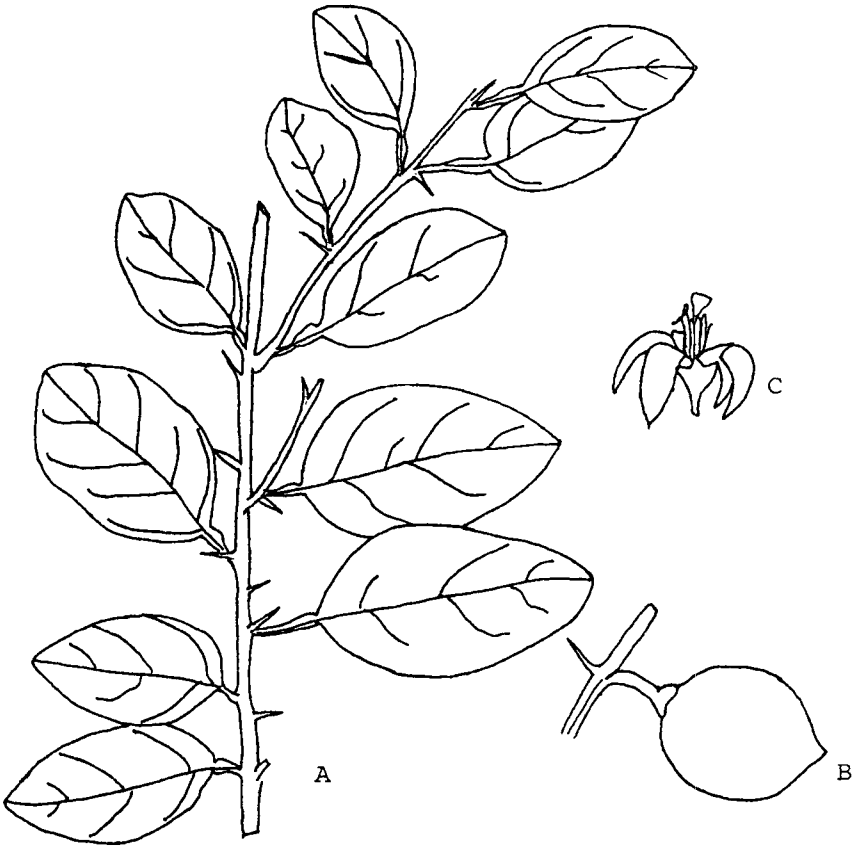
A native of Northern India and it was introduced to the Europe in the 13th century by the Spaniards (Purseglove, 1968). It is widely cultivated in India, Sri Lanka, Malaysia, W.Indies and Florida.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Juice of the fruit is extensively used for flavouring foods. The fruit is often salted, dried in the sun and preserved in its own juice as a pickle. Juice, jelly, james, cordials and marmalades can be made out from this.



Citrus aurantifolia

(A) Twig with leaves and spines. (B) Fruit. (C) Flower lateral view.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 84.6 g, Energy -59 Kcal, Protein - 1.5 g, Fats -1.0 g, Carbohydrates - 10.9 g, Calcium - 90 mg, Phosphorus - 20 mg, Iron - 0,3 mg, Carotene - 15 mcg, Thiamine - 20 mcg, Riboflavin - 30 mcg, Niacin - 0.1 mg, Vitamin C - 63 mg (Perera, et al., 1979).

The juice of the fruit contains citric acid, malic acid and tartaric acids in small quantities and pectin, sugar and traces of other salts. The juice of the lime checks bilious vomiting and is an antiseptic particularly for cleaning wounds and is applied externally for snake bites. In Malaysia, the root of the tree is given in the form of a decoction for the dysentery while the pounded leaves are applied for headaches and the juice of the fruit is given for coughs and stomachache (Jayaweera, 1982).

OTHER USES:-

Boiled fruits are usually used in Sri Lanka as shampoo. It is used as a rootstock for other citrus spieces. Dried leaves are put in traditional grain silos to reduce the insect attack. Lime is used in cleaning of brasswear.

ENVIRONMENTAL RESPONSE:-

It can grow in a range of soil but it thrives well in deep, loose, well drained soils. Ideal pH range is 5.5-7.5 for citrus. Temperature 5^0C and below is considered to be injurious to young trees. It grows at altitudes below 2000 m.

CULTIVATION:-

Area for cultivation - Cultivated in both wet zone and dry zone in Sri Lanka.

Planting season - Seeds should be planted 5-6 months before the rains.

Planting material - Propagation is either by seeds or budding on to rootstock.

Planting and space - Seeds should be obtained from fully matured fruits from adult trees. They are planted at a depth of 2.5 cm and as a spacing of 15-23 cm x 2,5 cm in well drained, shaded and mulched beds. Strong plants with good roots are transplanted from the seed bed to the nursery at a spacing of 1 m x 30 cm, or into plastic bags. Budding takes place about 6 months later. Buddings are ready for planting out 12-18 months after budding, depending on the area. Planting distance depends on the nature and fertility of the soil.

Irrigation - For high yields of good quality fruit in arid and semi-arid regions where rainfall is less than 800 mm, irrigation is essential specially during the dry periods.

Fertilizer - Responds well to fertilizer.

Time to harvest - It reaches full bearing in ten years, but should start producing some fruits 3-5 years from planting.

STORAGE:-

Fresh fruits can be stored in a cool place for a short time. In homes they are kept under sand. Fruits can be salted and dried in the sun and preserved in its own juice for prolonged keeping. Occasionally salted, sundried juice is made for use in offseason.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Citrus aurantium***

VERNACULAR NAMES:-

SINHALA	:	*Embul-Dodan*
TAMIL	:	*Kadarai, Nandam*
ENGLISH	:	Seville, Sour orange

DESCRIPTION:-

A glabrous tree of medium size, 7-10 m high with long but not very sharp spines.

LEAVES:- Medium size, ovate-oblong, 7.5-10 cm long, shortly or bluntly acuminate, sinuate or crenate, petioles broadly winged.

FLOWERS:- Medium size, single or several in the axils of leaves, regular, bisexual, white and very fragrant.

FRUITS:- Globose or slightly flattened endwise, about 7.5 cm in diameter; rough, pulp acid and membranes bitter, core hollow at maturity, segments 10-12 (Jayaweera, 1982)

DISTRIBUTION:-

It originated in Cochin-China (Purseglove, 1968) and cultivated in India, Sri Lanka, Africa and Philippine Islands. It was introduced to Europe in the 11th century (Purseglove, 1968).

EDIBLE PARTS:-

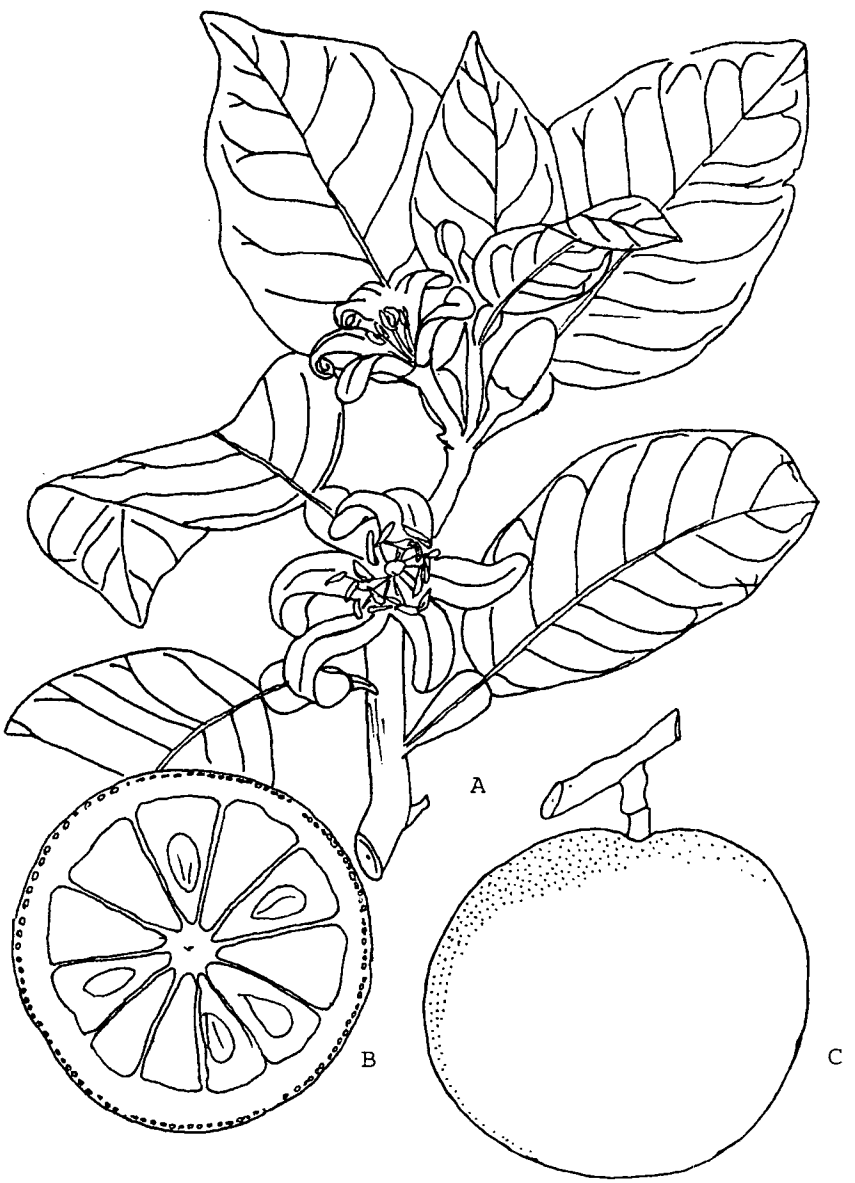
The fruit.

FOOD USE:-

Fruit juice is given as a folk medicine, and used in making of marmalade and in flavouring of liqueurs.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 87.6 g, Energy - 48 Kcal, Proteins - 0.7 g, Fats - 0.2 g, Carbohydrates - 10.9 g, Calcium - 26 mg, Phosphorus - 20 mg, Iron - 0.3 mg, Carotene - 1140 mcg, Vitamin C - 30 mg.



Citrus aurantium

(A) Branch. (B) Transverse section of fruit. (C) External view of fruit.

The oil distilled from the flowers of this tree contains limonene, geraniol and methyl anthranilate. The rind of the fruit yields an olatile oil, a gum-resin, a fixed oils-limonene and three glycosidase hesperidin, isohesperidin, aurantiamarin, pentamenthoxy flavone, auranetin and tannin. The juice of the fruit contains mucilage, sugar, citric acid and inorganic salts, while the leaf has ascorbic acid and l-stachydrine. The mature fruit is used with pepper and rock salt as a throat wash for inflamed glands and tonsils to draw out phlegm. The juice mixed with sugar of *Borassus flabellifer* and sugarcane juice is given for chronic cough.

OTHER USES:-

Hence it is resistant to gummosis, it is used as a rootstock for lemon and sweet orange. Leaves, flowers and fruits yield volatile bigarade oil used in perfume industry.

ENVIRONMENTAL RESPONSE:-

It can grow in a range of soil but it thrives well in deep, loose, well drained soils. Ideal pH range is 5.5-7.5 for citrus. Temperature 5^0C and below is considered to be injurious to young trees. It grows at altitudes below 2000 m.

CULTIVATION:-

Planting season - Seeds should be planted 5-6 months before the rains.

Planting material - Propagation is either by seeds or budding on to rootstock.

Planting and space - Seeds should be obtained from fully mature fruits from adult trees. They are planted at a depth of 2.5 cm at a spacing of 15-23 cm x 2.5 cm in well drained, shaded and mulched beds. Strong plants with good roots are transplanted from the seed bed to the nursery at a spacing of 1 m x 30 cm, or into plastic bags. Budding takes place after 6 months. Buddings are ready for planting out in 12-18 months after budding depending on the area. Planting distance depends on the nature and fertility of the soil.

Irrigation - For high yields of good quality fruit in arid and semi-arid regions where rainfall its less than 800 mm, irrigation is essential, specially during the dry periods.

Fertilizer - Responds well to fertilizer
Time to harvest - It reaches full bearing in ten years, but should start producing some fruits 3-5 years from planting.

Harvesting - Under regular irrigation, or in humid conditions.
Fruiting is seasonal.

STORAGE:-

Fresh fruits can be stored for a few days.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Citrus medica***

VERNACULAR NAMES:-

SINHALA	:	*Lapnaran, Maha-ratadehi, Sideran*
TAMIL	:	*Kogilacham*
ENGLISH	:	Citron

DESCRIPTION:-

A small tree or shrub about 3 m high with irregular, straggling, short, thick branches,bark whitish gray, young shoots purplish to violet coloured.

LEAVES:- Simple, alternate, large, lamina 12.5-15 cm long, broadly oblong or oval-oblong, tapering to the base, bluntly crenateserrate, stiff but not thick, gland-dotted, dark green above, pale beneath, petioles very short.

FLOWERS:- Unisexual, regular, usually in clusters (3-10), pink flowers, buds purplish.

FRUITS:- Very large, oblong, blunt, not mammillate at apex, surface usually lobulated and rugged, pale or dark bright yellow, rind very thick and hard, pulp scanty and pale.

DISTRIBUTION:-

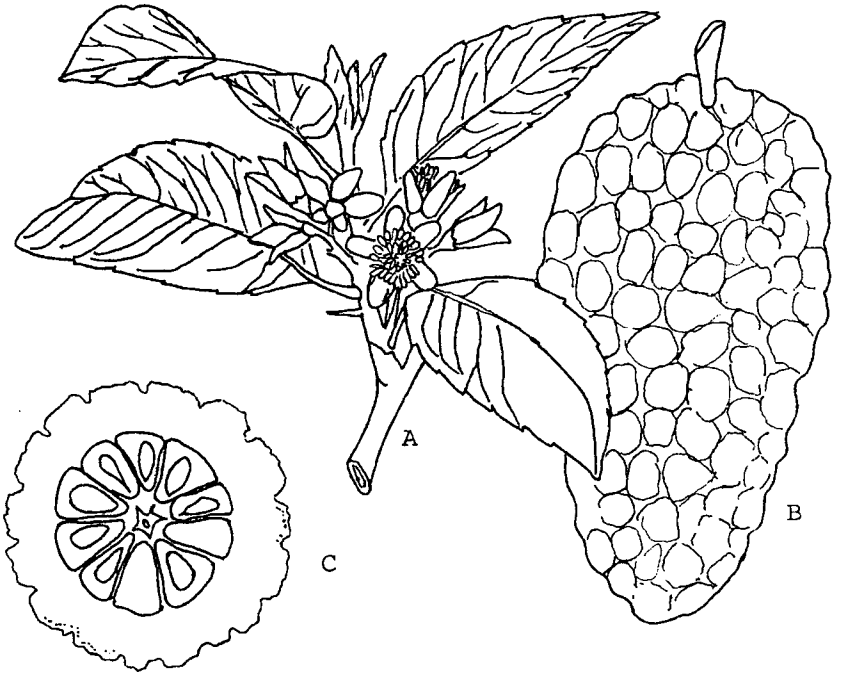
Grows in India along the foot of the Himalayas, Western Ghats, Khasia mountains and Chittagong (Jayaweera, 1982). It was the first citrus to be introduced to Europe. It is cultivated in S.Europe and Mediterranean regions. It is commercially cultivated in Greece, Italy and Corsica (Purseglove, 1968). It grows in the hill country gardens in Sri Lanka.

EDIBLE PARTS:-

The fruits.

FOOD USE:--

Fruits can be eaten fresh. Candied peal is used for flavouring cakes and confectionery.



Citrus medica

(A) Branch. (B) Fruit. (C) Transverse section of a fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The oil extracted from the rind of the fruit contains limonene and citral while the pulp of the fruit contains the glucoside hesperidin. The juice of the fruit with crude potassium carbonate and bee's honey is given for pleurodynia, sciatica, lumbego and pain in the hip, joints, etc. The leaves, bark and fruit in combination with other drugs are prescribed for snake bite. The rind of the fruit is made into a preserve and used for treating dysentery.

CULTIVATION:-

It is commercially cultivated in Greece, Italy and Corsica. In Sri Lanka it grows in homegardens.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Citrus sinensis***

VERNACULAR NAMES:-

SINHALA	:	*Dodan, Peni Dodan*
TAMIL	:	*Narangam, Thodam*
ENGLISH	:	Orange, Sweet Orange

DESCRIPTION:-

A small tree with an upright trunk, much branched above and spreading out to form a spherical head, bark grayish brown.

LEAVES:- Simple, alternate, often with short, solitary, sharp spines in the axils, oval or ovate-oblong, acute, articulated on the petiole.

FLOWERS:- Regular, bisexual, usually solitary, sometimes 2-6 flowered in axillary peduncles shorter than the petioles, white, fragrant. (Flowers in April to May).

FRUITS:- A large rounded berry 9-11 chambered, the loculi packed with soft tissue of large, irregular, fusiform, horizontal, loosely connected cells or vesicles, filled with sweet juice, the dissepiments very thin, membranous, the axis spongy, pericarp thin, spongy, externally smooth, slightly irregular due to the numerous projecting oil cysts below the epidermis.
Seed- Several in each chamber, horizontal, oblong-ovoid, somewhat compressed with a blunt pointed apex and somewhat truncate at the hilum, testa soft, pale yellow, veiny and exalbuminous (Jayaweera, 1982).

DISTRIBUTION:-

A native of China or Cochin-China. It was taken to Europe in the second half of the 15th century. Columbus in 1493, took orange seeds to Haiti from where it spreaded to the West Indies, Mexico and Florida (Purseglove, 1968). It is a common tree in the village gardens in Sri Lanka. It grows best in the dry zone where low atmospheric humidity and a definite dry period aids growth and maturity of fruits. According to the literature, orange has grown in Sri Lankan homegardens from long ago (Siriweera, 1993).

EDIBLE PARTS:-

The fruits.

Citrus sinensis

(A) Branch. (B) Fruit.

FOOD USE:-

Ripe fruits are eaten fresh. The fruit juice is a delicious drink which is rich in Vitamin C. It is used for preparation of jam, cordial and confectioneries.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 87.6 g, Energy - 48 kcal, Protein - 0.7 g, Fats - 0.2 g, Carbohydrates - 10.9 g, Calcium - 26 mg, Phosphorus - 20 mg, Iron - 20 mg, Carotene - 1104 mcg, Vitamin C - 30 (Perera, et al., 1979).

The rind of the fruit contains a volatile oil, a gum resin, a fixed oil which consists of terpene, d-limonene, three glycosidase namely herperid in isoherperidin and aurantiamarin and tannin. The flowers and the fresh rind yield a volatile oil called oil of neroli used in perfumery. The leaves and unripe fruits possess a volatile oil which consists of limonene, nerolol, nerolyl-acetate and geraniol. The juice of the orange contains p-sitosterol, d-glucoside, b-sitosterol, sugar, citric acid, inorganic salts, enzymes and vitamins A, B and C. The juice of the orange is extremely beneficial to invalids suffering from coughs, bronchitis, diabetes and liver and heart ailments. It is a blood purifier and antiscorbutic. The oil extracted from the rind is given internally as a stomachic and applied externally as a liniment on gout and rheumatism. In Ecuador, an extract from the seed is used in the treatment of malaria which brings about a contraction of the enlarged spleen (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:-

It can grow in a range of soils but it thrives well in deep, loose, well drained soils. Ideal pH range is 5.5-7.5 for citrus. Temperature 5^0C and below is considered to be injurious to young trees. It grows at altitudes below 2000 m.

CULTIVATION:-

Planting season - Seeds should be planted 5-6 months before the rains.

Planting material - Propagation is either by seeds or budding on to rootstock.

Planting and space - Seeds should be obtained from fully ripe fruits from adult trees. They are planted at a depth of 2.5 cm and a spacing of 15-23 cm x 2.5 cm in well drained, shaded and mulched beds. Strong plants with good roots are transplanted from the seed bed to the nursery at a spacing of 1 m x 30 cm, or in plastic bags. Budding takes place after 6 months. Buddings are ready for planting out in 12-18 months after budding depending on the area. Planting distance depends on the nature and fertility of the soil.

Irrigation - For high yields of good quality fruit in arid and semi-arid regions where rainfall is less than 800 mm, irrigation is essential, specially during the dry periods.

Fertilizer - Responds well to fertilizer.

Time to harvest - It reaches full bearing in ten years, but should start producing some fruits 3-5 years from planting.

Harvesting - Under regular irrigation, or in humid conditions. Fruiting is seasonal.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Feronia limonia***

VERNACULAR NAMES:-

SINHALA	:	*Divul, Jool*
TAMIL	:	*Velambalam*
ENGLISH	:	Elephant Apple, Wood Apple

DESCRIPTION:-

A small tree with numerous branches, smooth whitish bark and sharp straight ascending spines 1.2-3.7 cm long.

LEAVES:- Compound, alternate, exstipulate, pinnate, 7.5-10 cm long, rachis and petiole flat, very narrowly winged, glabrous, leaflets opposite in 2 or 3 pairs and a terminal one, nearly sessile, 2.5-3.7 cm long oval or obovate.

FLOWERS:- Regular, polygamous, pale green stained with red purple and anthers, dark red. Flowers in February and March.

FRUITS:- Large 5-9 cm diameter, globose, hard, pericarp woody, rough, whitish, l-chambered with many seeds immersed in the pulp. Seeds oblong, compressed (Jayaweera, 1982)

DISTRIBUTION:-

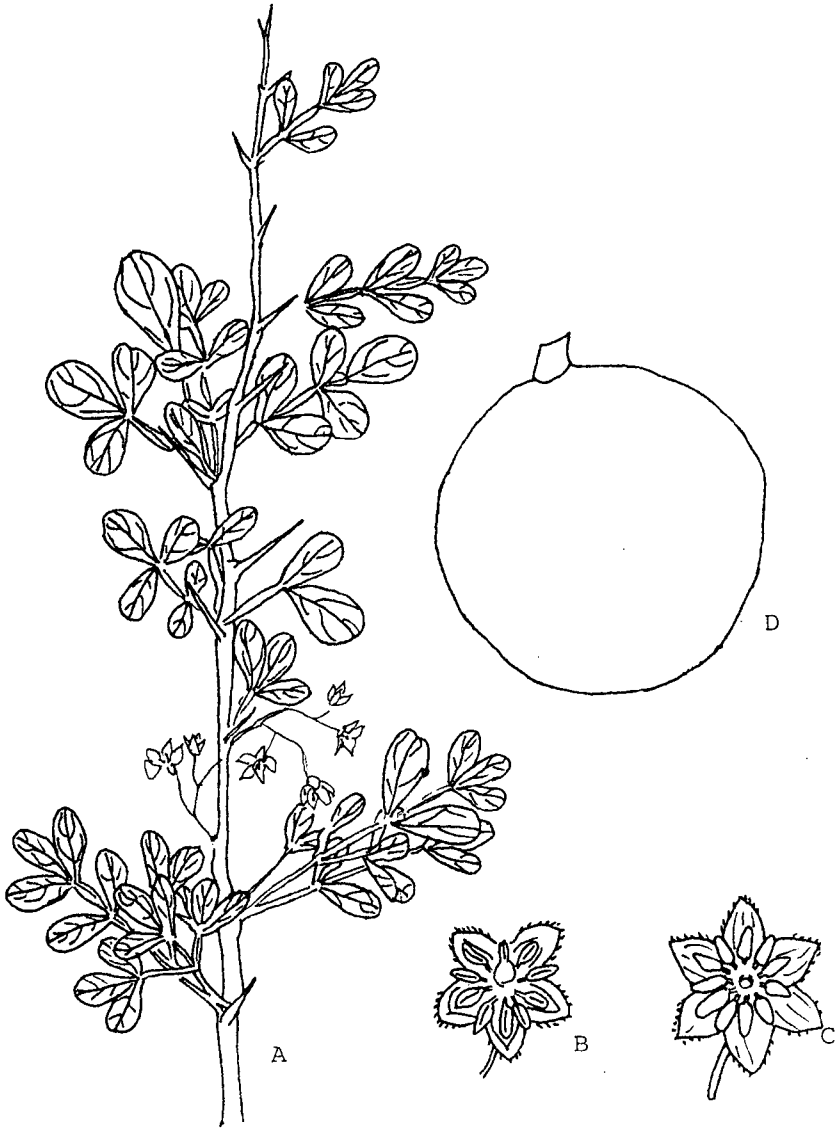
Native of India and Sri Lanka. Now it is cultivated throughout the tropics. Grows naturally and it is very common in the dry zone in Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

The fruit.

FOOD USE:--

Mature and ripe fruit is eaten fresh and a sweet drink is made from the inner portion of ripe fruits mixing with sugar and water. Occasionally, coconut milk which enriches the taste and the nutritious value is also added. It is used to prepare of jams, juices etc. Inner flesh of unripe fruits is made in to salads.



Feronia limonia

(A) Branch. (B) Bisexual flower - dursal view. (C) Male falower - dursal view. (D) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 64.2 g, Energy - 134 kcal, Proteins - 7.1 g, Fats - 3.7 g, Carbohydrates - 18.1 g, Ca-130 mg, Phosphorus - 110 mg, Iron - 0.6 mg, Carotene - 61 mcg, Thiamine - 170 mcg, Niacin - 0.8 mg, Vitamin C -3 mg (Perera, et al., 1979).

The fruit of this tree is an aromatic stimulant and a stomachic. The pulp of the unripe fruit along with other ingredients is used in chronic diarrhoea and dysentery. The ripe fruit is useful in hiccough, ailments of the gums and throat and applied externally on bites of venomous insects. The gummy exudation from the trunk with bees' honey also cures diarrhoea and dysentery (Jayaweera, 1982).

OTHER USES:-

It is used as rootstock in orange budding for its high drought resistance. Wood apple yeilds a gum which is used for mixing of water colours, dyes, varnishes. The wood is used for various purposes. Handycrapts are made from the hard fruit shell.

STORAGE:-

Ripe fruits can be stored for a week.

FAMILY:- RUTACEAE

BOTANICAL NAME:- ***Murraya koenigii***

VERNACULAR NAES:-

SINHALA	:	*Karapincha*
TAMIL	:	*Karuvembu, Karuvepillai*
ENGLISH	:	Curry-Leaf Tree

DESCRIPTION:-

A small tree with dark gray bark and pubescent branchlets

LEAVES:- Compound, alternate, exstipulate, imparipinnate, somewhat crowded, spreading 15-25 cm long, rachis pubescent, leaflets 15 -25, shortly stalked, 2.5-5 cm long, oval or oblong-lanceolate, very oblique at base.

FLOWERS:- Regular, bisexual white, fragrant, about 1.2 cm long on short pedicels and is much branched, flat-topped.

FRUITS:- A globular berry 0.6-1 cm long, apiculate, black, 2- seeded, rough with glands.
(Flowers in December and August) (Jayaweera, 1982).

DISTRIBUTION:-

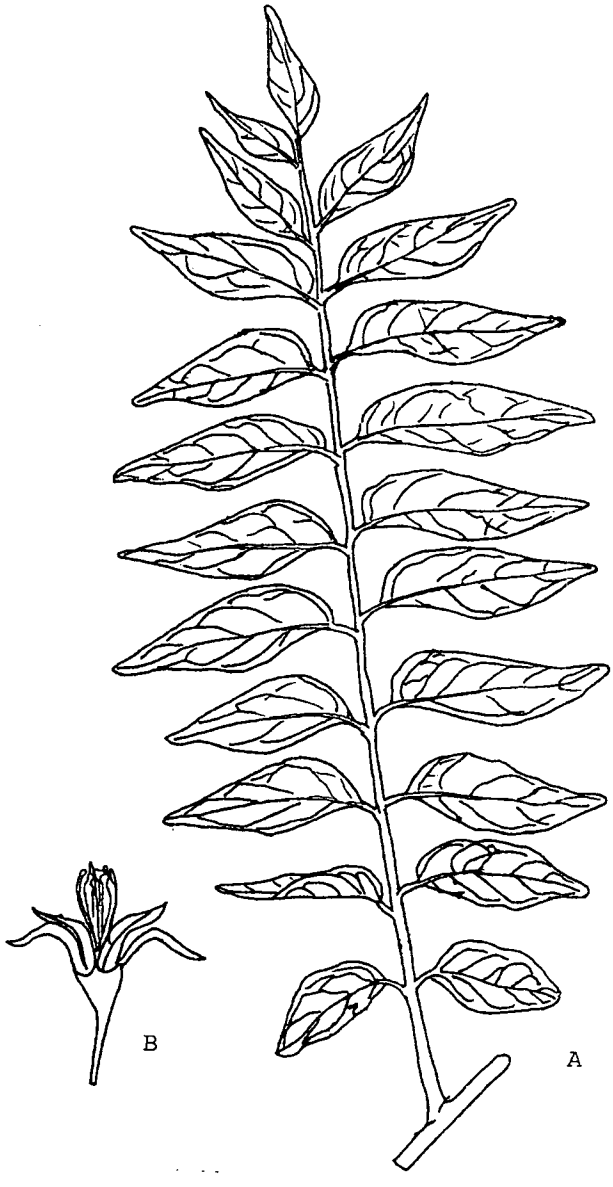
Grows in India and Sri Lanka. It is very common in the low-country dry zone. It is a common plant almost in every homegarden (Jayaweera, 1982).

EDIBLE PARTS:-

Leaves.

FOOD USE:-

The leaves are used in flavouring curries. Leaves are roasted and ground with other spices to make curry powders. Young leaves may be eaten as salads or extract of leaves is added to porridge.



Murraya koenigii

(A) Compound leaf. (B) Flower lateral view.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 63.8 g, Energy - 108 Kcal, Proteins - 6.1 g, Fats - 1.0, Carbohydrates - 830 g, Calcium - 57 mg, Phosphorus - 7 mg, Iron - 7.5 mg, Carotene - 80 mcg, Thiamine - 80 mcg, Riboflavin - 210 mcg, Niacin - 2.3 mg, C - 4 mg. (Perera, et al., 1979).

The fruit of this plant yields an oil and the leaves contain a glucoside called koenigin. The leaves, bark and roots are tonic and stomachic. The leaves with other ingredients are roasted and made into a powder and given for constipation, abdominal colic and diarrhoea. The boiled leaves are given for hiccough and hoarseness. The juice of the fresh leaves are given for diarrhoea and dysentery (Jayaweera, 1982).

STORAGE:-

Under the normal conditions in 4-5 days, young leaves will dry. Fully sun-dried or powdered leaves can be kept for several months in dry containers.

FAMILY: SAPINDACEAE

BOTANICAL NAME:- ***Cardiospermum microcarpum***

VERNACULAR NAMES:-

SINHALA : *Penela, Wel-Penela*
TAMIL : *Kottavan*
ENGLISH : Ballon vine, Leaved heart pea

DESCRIPTION:-

An annual, sub-scandent climber with a slender, strongly furrowed, glabrous stem and puberulous young parts.

LEAVES:- Alternate, exstipulate, biternate, petioles 5-7.5 cm long, spreading or diflexed, furrowed, leaflets sessile or shortly stalked, ovate, tapering at base, acute, deeply incised-serrate, glabrous thin and flaccid.

FLOWERS:- Irregular, polygamo-dioecious, white, very small, 4 mm long on slender pedicels 7.5-17.5 cm long, a very small cyme terminating a stiff, slender, horizontal axillary peduncle 10 cm long, and provided beneath the cyme with 2 opposite reflexed circinate or hooked tendrils.

FRUITS:- An inflated, 3-chambered, membranous, loculicidal capsule on a short, slender stalk, bladder-like, 1.2-1.8 cm wide, depressed pyriform, trigonous, truncate at top, winged at the angles, valves papery, veiny, finely pubescent. Seed 4-6 mm long, globular glabrous, black, the aril heart shaped and white (Jayaweera, 1982).

DISTRIBUTION:-

Grows in India, Malacca and Sri Lanka. In Sri Lanka it grows wild or semi-wild in the mid and low-country (Jayaweera, 1982)

EDIBLE PARTS:-

The leaves and whole plant.

FOOD USE:-

Leaves are eaten as a green vegetable. Extract of the whole plant is added to the porridge.

Cardiospermum microcarpum

(A) Twig with leaves, flowers and fruits. (B) Flower dursal view. (C) Flower lateral view with bud. (D) Dehisced fruit with seeds attached to the axis.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 83.3 g, Energy - 61 kcal, Protein - 4.7 g, Fats - 0.6 g, Carbohydrates - 9.1 g (Perera, et al., 1979).

This plant contains saponin and an alkaloid, a glucoside, resins and tannins. The seeds possess an essential oil. The whole plant is used both internally and externally on cases of rheumatism, nervous diseases, dropsy and orchitis. The juice of the plant is used as ear drops for ear-ache and discharge from the meatus. It is also used for piles, bronchitis and phthisis.

The root is an emetic and laxative and is also considered as an aperient. The leaves are boiled in castor oil and applied externally on rheumatic pains, swellings and tumors. The root is a laxative, demulcent, diuretic and used in nervous diseases (Jayaweera, 1982).

STORAGE:-

Once plucked, the leaves should be used within two days since they will dry in a short time.

FAMILY :- SAPINDACEAE

BOTANICAL NAME :- ***Ephoria Longan***

VERNACULAR NAMES:-

SINHALA : *Mora, Peni Mora*
ENGLISH : Longan, Dragon Eye

DESCRIPTION:-

The longan is a medium to large (10 to 20 m tall) evergreen tree with dense canopy, brittle wood and corky bark which splits and peels.

LEAVES:- The compound leaves are arranged alternately on the branches and are narrow, large (8 to 14 cm long) and dark glossy green on the upper surface and paler green on the lower surface. The young flesh is red brown, changing to light green with maturity.

FLOWERS:- The inflorescence are large (30 to 50 cm long), multi-branched and leafless. Flowers are small, inconspicuous and yellow-brown. Two types of flowers occur in succession on the same branch of a panicle, usually which overlap on branches and panicles on any tree. They are alternately hermaphrodite with an abortive ovary.

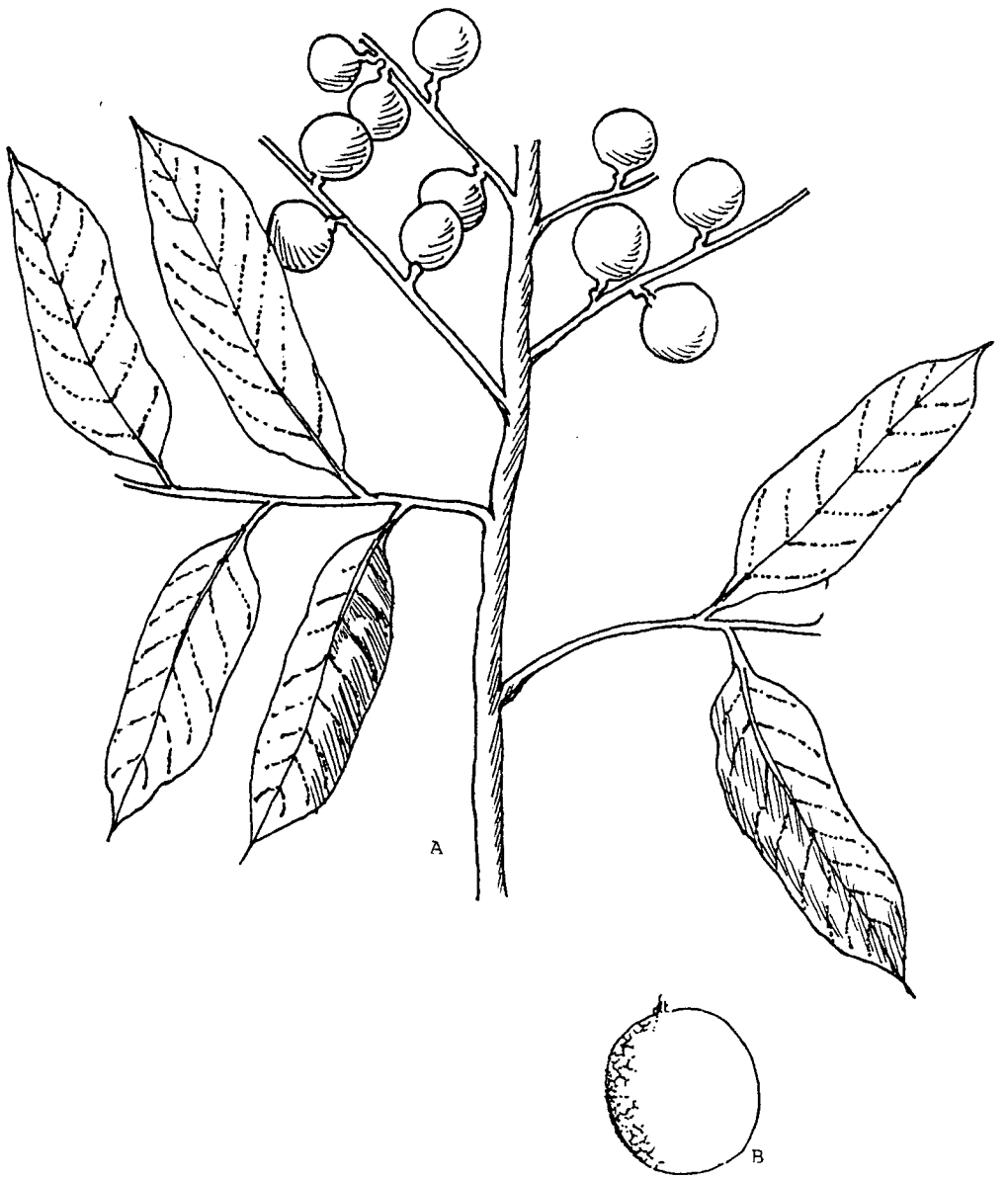
FRUITS:- Fruits are small (about 1.5 to 3.0 cm diameter), globose to round-shaped, sometimes with distinctive shoulders. Fruit appearance is round to obtuse. The fruit skin is thin leathery and changes from green-yellow to yellow-brown with advancing maturity (Manzel et al., 1989).

DISTRIBUTION:-

The longan originated either in Sub-Tropical China (Bose and Mitra, 1985) or in the area between Burma and India (Manzel et al., 1989). Grows wild in the forests in Sri Lanka and Hainan Islands (Zhong, 1983). Commercially cultivated in China, Thailand and Taiwan (Bose and Mitra, 1985).

EDIBLE PARTS:-

Fruit.



Ephoria longan

(A) Branch. (B) Fruit.

FOOD USE:-

Longan can be eaten fresh, dried or quick frozen. Thawed fruit can be used in the same way as freshly picked fruit, without any loss of colour or flavour. Fruit can be peeled, pitted and canned. Juice can be produced without adding sugar since most cultivars are sufficiently sweet.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 72.4 g, Energy - 109 kcal, Protein - 1.0 g, Fat - 0.5 g, Carbohydrates - 25.2 g, Fibre - 0.4 g, Calcium - 2 mg, Phosphorus - 6 mg, Iron - 0.3 mg, Vitamin A - 0.7 mcg Thiamine - 0.04 mg, Riboflavin - 0.07 mg, Niacin - 0.6 mg (Menzel et al., 1989)

ENVIRONMENTAL RESPONSE:-

Longans are adapted to tropical and sub-tropical areas with high rainfall. The best growth and cropping of longan is achieved on deep, well-drained fertile soils with a pH of 5.5 to 6.0 and low salinity.

CULTIVATION:-

Although it is cultivated commercially in some countries like China, Thaiwan and Thailand, in Sri Lanka it grows wild in forests.

FAMILY:- SAPINDACEAE

BOTANICAL NAME:- *Nephelium lappaceum*

VERNACULAR NAMES:-

SINHALA	:	*Rambutan*
TAMIL	:	*Rambutan*
ENGLISH	:	Rambutan, Hairy Litchi

DESCRIPTION:-

This is one of the best known tropical trees. It may grow upto 20 m high with a bushy and open crown.

FLOWERS:- Flowers are greenish yellow arranged in panicles. It flowers in July to September and bear fruits in November to February.

FRUIT:- Fruits are oblong to almost round, covered with hairy soft pericles, yellow, light red or red depending on cultivars. It is flesh is white, juicy, sweet or sour (Bose and Mitra, 1990).

DISTRIBUTION:-

This plant is native to West Malaysia, but now it is cultivated in many tropical areas (Bose and Mitra, 1990; Department of Agriculture, 1993).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

The fruits are eaten fresh or mixed with other fruits in syrups. It can also be used for decorating Cakes and other sweet meats.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 82.0 g, Energy - 64 kcal, Protein - 1.0 g, Fat - 0.1 g, Carbohydrates - 16.5 g, Calcium - 20 mg, Phosphorus - 15 mg, Iron - 1.9 mg, Carotene - 0 mcg, Thiamin - 10 mcg, Riboflavin - 2- mg, Niacin - 0.4 mg, Vitamin C - 53 mg (Perera et al. 1979).

Many parts of this plant are used for medicinal purposes.

Nephelium lappaceum

(A) Branch. (B) Fruit.

OTHER USES:-

Young leaves are used as a dye for silk.

ENVIRONMENTAL RESPONSE:-

Requires a well distributed rainfall; optimal temperate and humidity are 27-30^{0}C and 75%-79% respectively. Grows at altitudes below 450 m.

CULTIVATION:-

Areas of cultivation - In Sri Lanka it is cultivated in the wet zone, especially Colombo and Gampaha districts.

Planting materials - Although it is propagated by seeds, in normal practice seedlings are used.

Spacing - Plants are planted 10 m apart or 100 plants per ha. Young plants should be provided shading and watered in the first 2 or 3 years during the drought season.

Harvesting - Plants bear fruits in 3-4 year after transplanting. But it takes 7-8 years to give a good yield.

STORAGE:-

They can also be processed into jam or even be fermented into wine.

FAMILY:- SAPINDACEAE

BOTANICAL NAME:- ***Schleichera oleosa***

VERNACULAR NAMES:-

SINHALA	:	*Kon*
TAMIL	:	*Kolama, Konji*
ENGLISH	:	Ceylon Oak

DESCRIPTION:-

A large tree with close branches and corrugated rough and cracked bark.

LEAVES:- Alternate, compound, paripinnate, rachis 7.5-18 cm long, bearing 4-6 leaflets, leaflets oblong, 7-18 cm long, 3.5-8 cm broad, opposite, coriaceous, truncate or marginate at apex, dark green and shining on the upper surface, veins prominent beneath, margin curved.

FLOWERS:- Small, green, polygamo-dioecious, pedicellate, in lax, slightly branched, spicate panicles 5-12.5 cm long, from the young shoots below the new leaves.

FRUIT:- Globular, apiculate, corky brown berries 1.7-2.2 cm diameter 1-2 chambered with a single seed in each chamber covered with an orange brown acid aril. Seed exalbuminous, 1.3-1.4 cm long with a brittle brown testa. (Flowers in February) (Jayaweera, 1982)

DISTRIBUTION:-

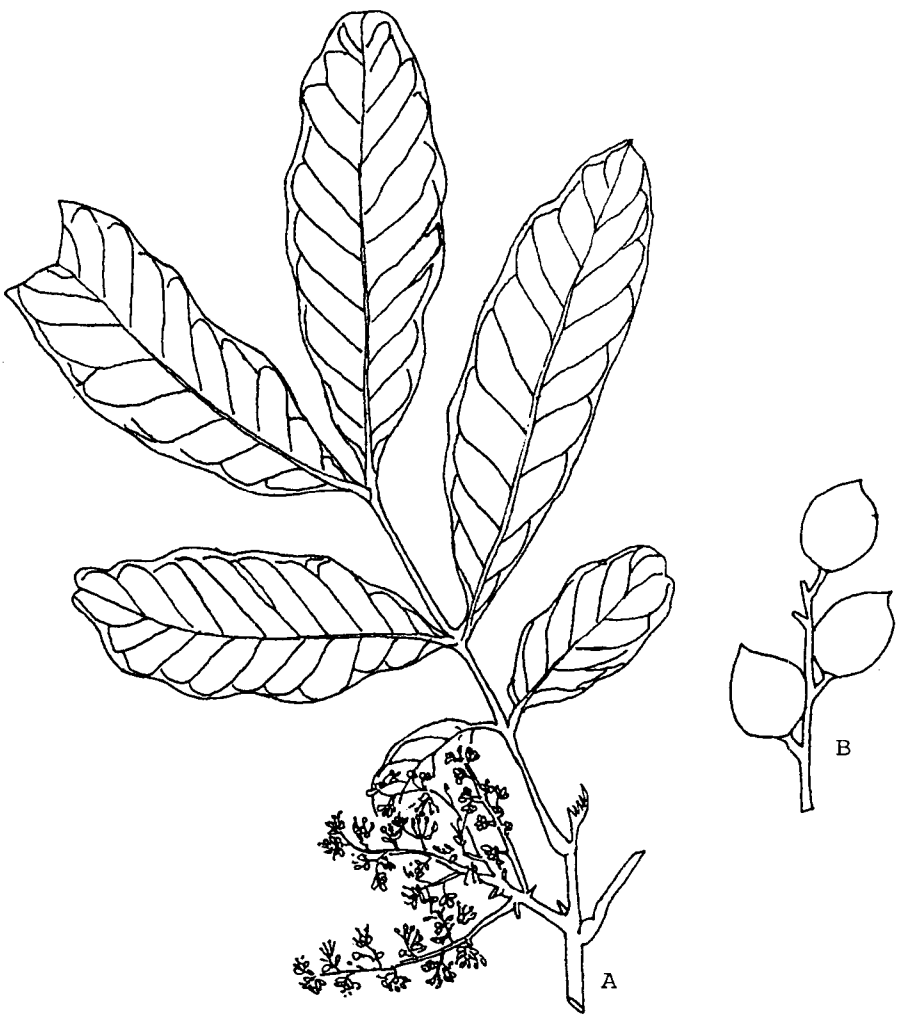
Grows in the dry forests of India, Burma and Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Fruit is eaten as a fruit. A traditional ketch-up called "*Kon-anuga*" is made from acid aril, adding salt and *Kochchi* (small type of chillies). It is boiled till it becomes thick as ketch up.



Schleichera oleasa

(A) Twig with a leaf and inflorescence. (B) Mature fruits.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The bark of the tree is an astringent. The oil extracted from the seed is applied on the head to promote the growth of hair. In different parts of India it is used for different purposes such as a purgative, prophylactic against cholera, rheumatism, headaches and skin diseases (Jayaweera, 1982).

OTHER USES:-

Timber is used in many ways.

CULTIVATION:-

Propagated by seeds. It grows naturally especially in dry zone. The number of trees are reducing at an alarming rate due to the destruction of forests.

STORAGE:-

Undamaged ripe fruits can be stored for 4-5 days. Ketch-up made from *Kon* can be kept for quite a long time in clean containers.

FAMILY:- SAPOTACEAE

BOTANICAL NAME:- ***Chrysophyllum roxburgii***

VERNACULAR NAES:-

SINHALA : *Lawulu*
TAMIL : *Mansal Palam*
ENGLISH : Star Apple

DESCRIPTION:-

Slender erect tree of moderate size. Branches horizontal, bark smooth, grey, young parts with dense fulvais pubescence.

LEAVES:- Numerous, spreading distichously, 3-7 inches, lanceolate-oblong acute and somewhat unequal-sided at base.

FRUIT:- Subglobes, smooth-skinned, 6-10 cm diameter. When unripe the fruit contains a sticky, astringent latex but on ripening a yellow translucent pulp with a sweet and pleasant flavour is formed around dark seeds. Seeds about 2-3 cm about somewhat compressed, brownish yellow, highly polished, very hard (Trimen, 1984).

DISTRIBUTION:-

Indigenous to Central America and West Indies and in Sri Lanka, South India and Assam in North India, Burma and Indonesia. Grows in homegardens (FAO, 1992).

EDIBLE PARTS:-

The fruit.

FOOD USE:-

Ripe fruits are eaten fresh and unripe mature fruits are cooked and eaten. Ripe fruits is used to prepare jams, jelly and syrups.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Energy - 74 kcal, Protein - 0.6 g, Fat - 0.4 g, Calcium - 14 mg, Iron - 1.3 mg, Vitamin a 2000 I.U., (Department of Aurveda).

Chrysophyllum roxburgii

(A) Branch. (B) Fruit.

FAMILY:- SAPOTACEAE

BOTANICAL NAME:- ***Madhuca longifolia***
Syn :- Bassia longifolia

VERNACULAR NAMES:-

SINHALA	:	*Mi, Meek.*
TAMIL	:	*Illuppai, Kuligam*
ENGLISH	:	Honey Tree

DESCRIPTION:-

A very large tree, much branched, bark thick, dark yellowish gray, slightly furrowed, young parts pinkish white, silky pubescent.

LEAVES:- Simple, alternate, stipulate, crowded at end of one year's growth on slender petioles, 8.7-11.2 cm long, linear-lanceolate, tapering to both ends.

FLOWERS:- Regular, bisexual, pale yellow, appearing with the young leaves and below them, solitary in axils of small deciduous bracts, pedicels 5-6.2 cm long, slender, rather thickened at the upper part, glabrous, erect, afterwards drooping.

FRUITS:- Obliquely ovoid, pointed, glabrous. Seed solitary 3.7-4.2 cm long, ovoid, slightly compressed, straight on one edge and curved on the other with a stout curved beak, hilum linear extending the whole length of the straight edge, testa thin, hard, brittle, shining, ocre-yellow. Flowers in February and May (Jayaweera, 1982).

DISTRIBUTION:-

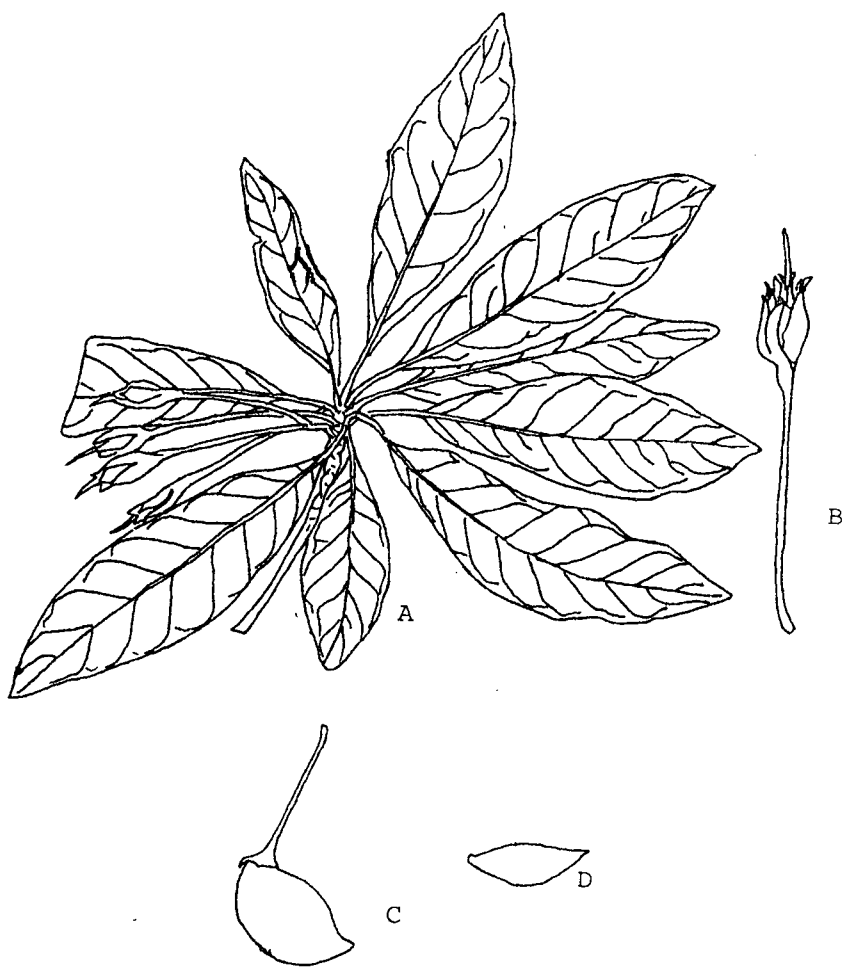
Grows in India and Sri Lanka. It is common in the dry forest region in Sri Lanka, but mostly planted in the moist low-country.

EDIBLE PARTS:-

Seeds, flowers and fruit.

FOOD USE:-

Brown-coloured oil extracted from seeds is highly recognized for food preparation specially in the dry zone of Sri Lanka. Flowers (anthers should be removed) are boiled with water to prepare honey, which according to the dry zone villagers is as good as bee-honey. It is reported that unmature fruits are cut into pieces and prepared as vegetables.



Madhuca longifolia

(A) Twig with leaves and flowers. (B) Flower lateral view. (C) Fruit. (D) Seed.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The seed yields a fixed oil. The bark is a good remedy for itches, swellings, rheumatism and other skin diseases. The heartwood made into a paste is applied on the throat for glandular swellings in the neck and throat (Jayaweera, 1982).

OTHER USES:-

Timber is used in many ways.

STORAGE:-

Seeds and dried flowers can be stored for several months in dry containers.

FAMILY:- SAPOTACEAE

BOTANICAL NAME:- ***Manilkara hexandra***

Syn :- Mimusops hexandra

VERNACULAR NAMES:-

SINHALA	:	*Palu*
TAMIL	:	*Palai, Sivandi, Sukkilam, Paal Palam*

DESCRIPTION:-

A large tree with a non-branched main trunk and a few branches, bark blackish gray deeply furrowed vertically and young parts glabrous.

LEAVES:- Simple, alternate, exstipulate, numerous, small, 3.7-7.5 cm long, broadly obovate, acute at base, truncate, marginate or bilobate at apex, glabrous, sub-coriaceous, venation pellucid, inconspicuous, petioles 1 cm long, channelled above.

FLOWERS:- Small, regular, bisexual, pale yellow, numerous on slender curved rusty pedicels about 1 cm long, 1-3 together in axils of leaves.

FRUITS:- A small ovoid, smooth red berry about 1.2 cm long. Seeds solitary, ovoid, reddish brown and shining. Flowers in February and March (Jayaweera, 1982).

DISTRIBUTION:-

Centre of origin is South and South-East Asia. Grows in India and Sri Lanka. It is very common in the forests of the dry zone in Sri Lanka.

EDIBLE PARTS:-

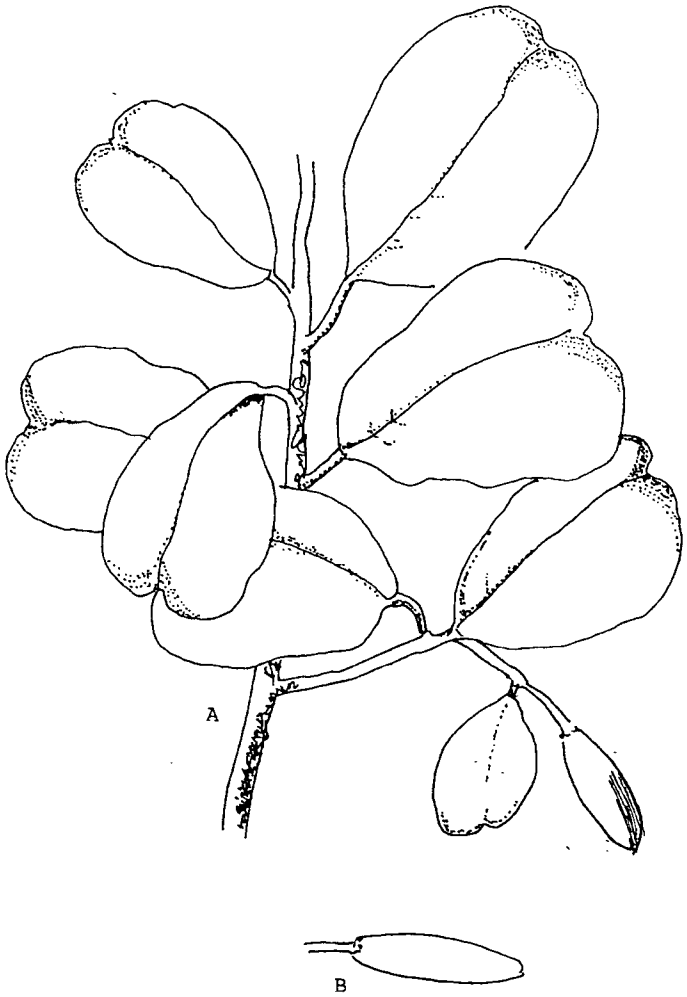
The fruits.

FOOD USE:-

Ripe berries are eaten fresh. Having added some sugar to ripe berries, they are put into a pot. They become black sticky mass after two months and is eaten off-season.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The bark of the tree has astringent properties (Jayaweera, 1982).



Manilkara hexandra

(A) Branch. (B) Fruit.

CULTIVATION:-

Propagated by seeds. It is not cultivated in Sri Lanka, but grows in the dry zone forest.

FAMILY:- SAPOTACEAE

BOTANICAL NAME:- ***Manilkara zapota***

Syn:- Achras zapota

VERNACULAR NAMES:-

SINHALA	:	*Sapodilla*
ENGLISH	:	Sapodilla, Sapot, Neseberry

DESCRIPTION:-

Tree up to 15 m, or rarely more high the foliage usually rather dense and dark green, branchlets and young leaves beneath brownish-pubescent, sap milky.

LEAVES:- Partly arranged in clusters at the branch tips, elliptical, rather broad at the tip and then shortly pointed up to about 13 cm long and 5 cm broad.

FLOWERS:- Solitary in the axils, the calyx rusty-pubescent about 1 cm long, the corolla white a little longer.

FRUITS:- Subglobose, brown, rough-skinned, 5-8 cm diameter, the pulpsweet. Seed rather flat (FAO, 1990).

DISTRIBUTION:-

Sapodilla is a native of Central America (Purseglove, 1968). It is widely cultivated in humid tropics.

EDIBLE PARTS:-

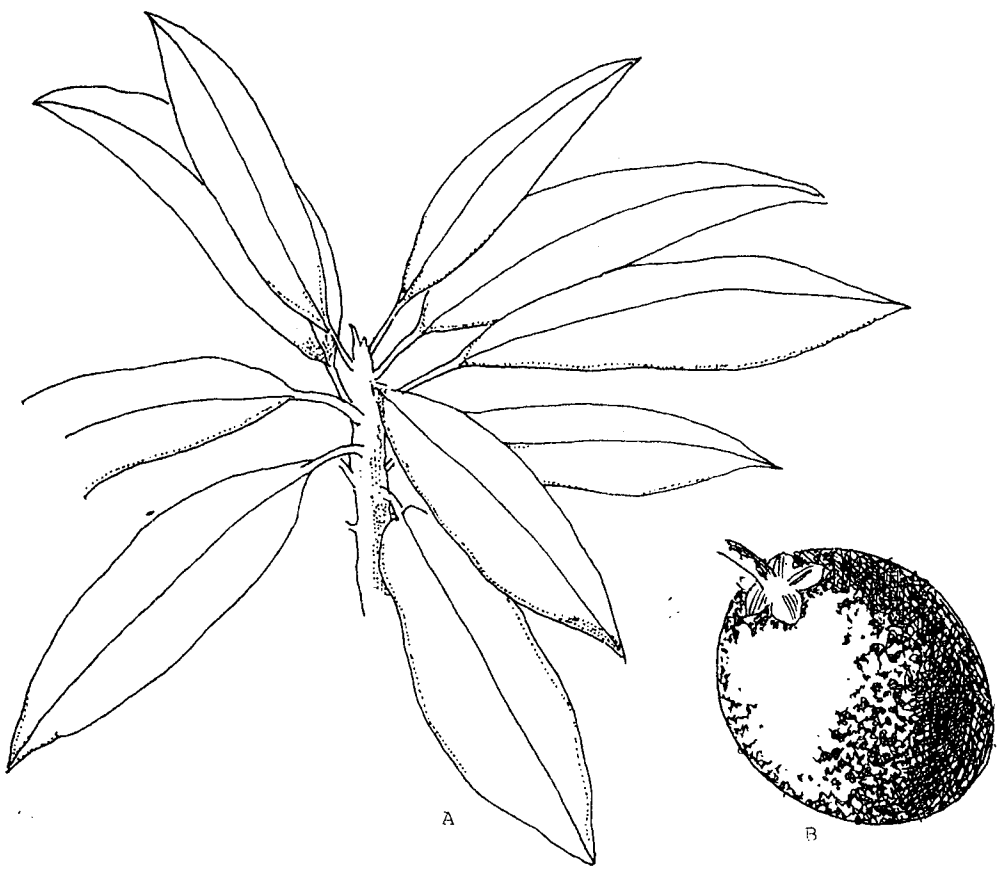
Fruit and young leaves.

FOOD USE:-

Ripe fruits are eaten fresh. Ripe fruits are also used for making jams and jellies. The young leafy shoots can be eaten as a vegetable after steaming.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 73.7 g, Energy - 98 kcal, Fat - 1.1 g, Protein - 0.7 g, Calcium - 28 mg, Iron - 2.0 mg. Thiamine - 0.02 mcg, riboflavin - 0.03 mcg, Niacin -0.2 mg, Vitamin C - 6 mg (Gopalan et al., 1971).



Manilkara zapota

(A) Branch. (B) Fruit.

Decoction of bark is given for diarrhea and fever; also tonic. The astringent fruit is antidysenteric; prevents biliousness and febrile attacks. The seeds are known to be aperient and diuretic (De Pauda et al., 1987).

OTHER USES:-

The unripe fruit and bark yeilds a milky white latex which solifies on exposure to air and this forms the base for making chickle.

FAMILY :- SAPOTACEAE

BOTANICAL NAME:- ***Mimusops elengi***

VERNACULAR NAMES:-

SINHALA	:	*Munamal*
TAMIL	:	*Alagu, Magil, Vegalam*

DESCRIPTION:-

A large tree with an erect trunk and a compact leafy globular head, bark reddish brown, branchlets drooping, young parts silky with fine depressed hairs.

LEAVES:- Simple, alternate, stipulate, numerous, distant, large, 11.2-15 cm long, oval sub-acute at base, acuminate, obtuse at apex, undulate, glabrous, dark green and shining on the upper surface.

FLOWERS:- Small, regular, bisexual, white becoming cream coloured, sweet-scented, in axillary fascicles of 1-4, pedicels 0.6-0.8 cm long, depressed pubescent often deflexed.

FRUIT:- A fleshy berry, over 2.5 cm long, ovate-ovoid, or ovoid apiculate, pubescent when young, afterwards glabrous, orange-yellow, seed solitary, ovoid, compressed, brown and shining (Jayaweera, 1982).

DISTRIBUTION:-

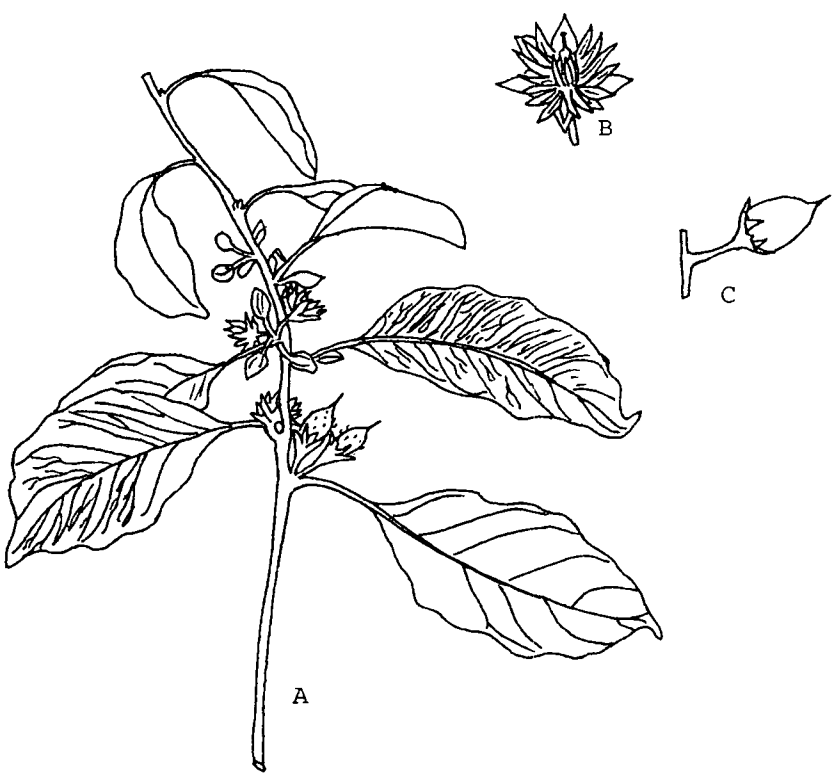
Grows in India, Sri Lanka, Malay Peninsula and Andaman Islands (Jayaweera, 1982). It is rather common in the low-country in Sri Lanka.

EDIBLE PARTS:-

The fruit.

FOOD USE:-

The ripe fruit is made into pickles and preserved.



Mimusops elengi

(A) Branch. (B) Flower front view. (C) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The bark and flowers contain an alkaloid, while the bark has in addition a tannin and saponin. The seed contains a toxic principle and saponin, mimusops-saponin. A decoction of the bark of this tree is used as a gargle for diseases of the gums and teeth and taken internally for discharges of the mucous membranes of the bladder and urethra. It is useful for treating fever and is supposed to increase fertility in women. Along with the flowers, it is given for diarrhoea. The young fruit is used as a gargle for treating sprue and is chewed for strengthening gums. The pulp of the ripe fruit cures chronic dysentery (Jayaweera, 1982).

OTHER USES :-

The flowers serve as a cosmetic owing to their fragrance.

FAMILY:- SOLANACEAE

BOTANICAL NAME:- ***Capsicum annum***

VERNACULAR NAMES:-

SINHALA	:	*Miris, Malu Miris*
TAMIL	:	*Milagai*
ENGLISH	:	Chilly, Capsicum, Red Pepper

DESCRIPTION:-

Annual or short-lived perennial herb, up to 1.5 m in height.

LEAVES:- Alternate, simple, ovate to lancelot margins, entire tip pointed up to 12 cm long, 7.5 cm wide.

FLOWERS:- Single, sepals 5, petals 5 or 6, white-green in colour, up to 15 mm in diameter, anthers 5-6, style with capitate stigma.

FRUITS:- A many seeded berry, 1-15 cm long, 1-4 cm in diameter. Seeds flattened and kidney shaped. 5-5 mm length, pack yellow (Warrier et al., 1993).

DISTRIBUTION:-

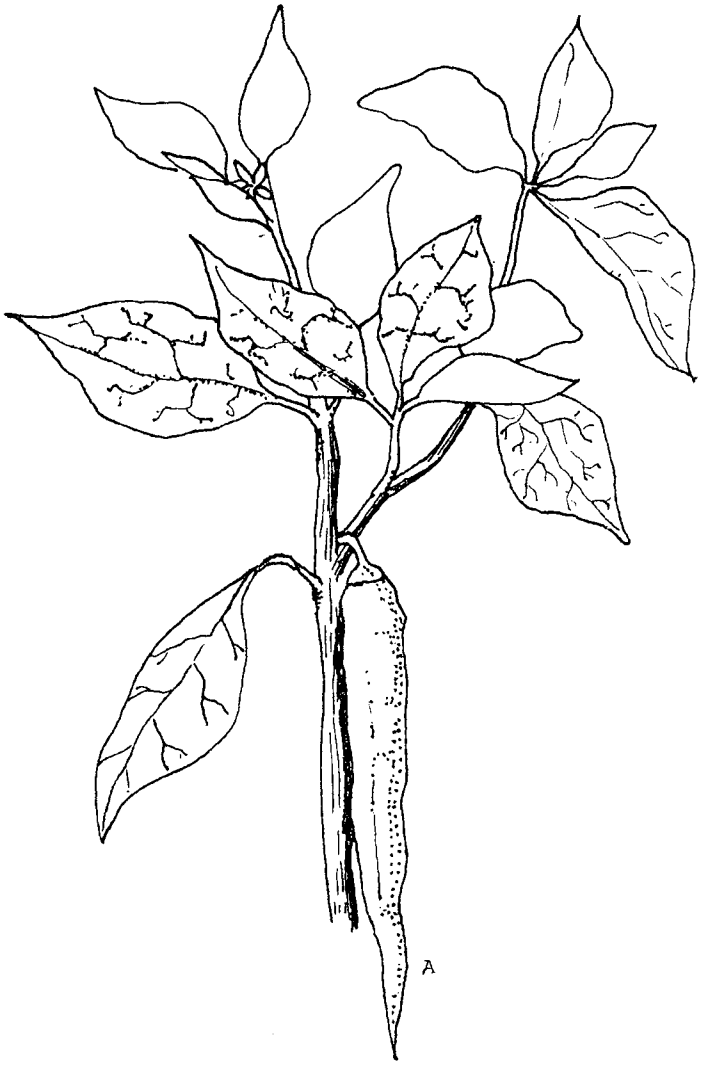
Probably Mexico, widely known in Central and South America prior to the 15th century (Purseglove, 1968; Querol, 1992). It was introduced into Europe in the 15th century (Tindall, 1993). It was brought to Sri Lanka by the Portuguese (Wikramarachchi, 1988). It is now widely cultivated in Tropical Asia, Africa, South America and Caribbean. In Sri Lanka, it is mainly cultivated in the dry zone (Department of Agriculture, 1993).

EDIBLE PARTS:-

Fruits, leaves.

FOOD USE:-

Used in curries, soups and stews or eaten row in salads. Sometimes preserved in brine or vinegar. Sun-dried chillies (var. *acuminatum*) is an important spice in Sri Lankan culinary. Leaves are eaten as a cooked vegetable.



Capsicum annum

(A) Branch with a fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 85.7 g, Energy - 29 kcal, Protein - 2.9 g, Fat - 0.6 g, Carbohydrates - 3.0 g, Calcium - 30 mg, Phosphorus - 80 mg, Iron - 1.2 mg, Carotene - 175 mcg, Thiamine - 190 mcg, Riboflavin - 390 mcg, Niacin - 0.9 mg, Vitamin C - 11 mg.

(Leaves)
Moisture - 82.1 g, Energy - 53 kcal, Protein - 5.8 g, Fat - 1.0 g, Carbohydrates - 8.0 g, Calcium - 8.5 mg, Phosphorus - 246 mg, Iron - 1.4 mg, Carotene - 6210 mcg, Thiamine - 400 mcg, Riboflavin - 330 mcg, Niacin - 1.9 mg, Vitamin C - 68 mg (Perera, et al., 1979).

The fruits are acrid, bitter, thamogenia, digestina carminative, laxative, expectorant, sialagogue, stimulant, cardiotonic. They are useful in cephalalgia gout, arthritis, sciatica, hoarseness, amorexid cough, cardiac debility, malarial and intermittent fevers, dropsy, cholera and indolent ulcers (Warrier, et al., 1992).

ENVIRONMENTAL RESPONSE:-

Fertile loam soils are preferable. Good drainage is important and a pH of 5.5 - 5.6 is ideal for chillies. Tolerant to a wide range of temperatures. Rainfall levels from 600-1200 mm are generally considered adequate, but excessive rainfall affects flowering and fruit set. A water deficit may also result in bud and flower abscission. Grows well in lowlands but up 2000 m altitudes can be grown.

CULTIVATION:-

Areas for cultivation - Both wet and dry zone.

Planting season - *Yala* and *Maha*

Land preparation - In dry zone ploughing the land to a depth of 15-20 cm and followed by two harrowings and a levelling are necessary.

Spacing - 15-40 x 30-40 cm.

Seed rate - 01-1.75 kg/ha depending on the variety.

Irrigation - Frequency of irrigation should be every 5 days, but may be extended to 7 days if sufficient organic matter is incorporated into the soil.

Fertilizer - N-140 kg /ha, P_2O5-175 kg/ha, K_2O - 105 kg/ha.

Yield - In wet zone 6-8 t/ha, while in dry zone - 10-15 t/ha.

Cultivation of C. *annum var acumination*

Area of cultivation- *Capsicum annum* Var. *acuminatum fingeth* are best adapted to the dry zone. Dry chillies are usually grown in the dry zone and green chillies in the wet zone.

Planting season- It is cultivated as a rainfed crop in *Maha* season or as an irrigated crop after heavy *Maha* rains.

Planting materials- Seeds.

Seed rate- 1 kg of seeds to get seedlings to plant in 1 ha land.

Spacing- 30 beds 3 m x 90 cm are required for planting 1 ha.

Land preparation- One ploughing and two harrowings provide good tilth. Planting can be done either on ridges or flat beds. During *Yala* season, the basin system can also be adopted on well-drained soils.

Irrigation- Irrigate at 4-5 days intervals during the first two months, then reduce to one irrigation per week. However irrigation depends on the rainfalls.

Fertilizer- 9-12 kg of decomposed manure per bed. Recommended doses by the Department of Agriculture for chillie cultivation- Ammonium sulphate - 100 kg/ha. TSP - 100 kg/ha, Muriate of potash - 50 kg/ha.

Harvesting- [a] Green chillies are harvested at full size and green.
(b) Dry chillies pods should be red ripe.

Harvesting can start 75-80 days after planting and continue for 2-3 months at 8-10 day intervals.

Yield- Under irrigation 2500-3500 kg of dry chilli can be obtained while rainfed yield would be 1500-2000 kg/ha.

Storage- Sun dried pods can be stored for a long time in dry containers. Green pods can be stored for 4-5 days in normal conditions.

FAMILY:- SOLANACEAE

BOTANICAL NAME:- ***Lycopersicon lycopoersicum***

Syn:- *L. esculantum, solanum lycopersicum*

VERNACULAR NAMES:-

SINHALA	:	*Thakkali*
TAMIL	:	*Takkali*
ENGLISH	:	Tomato

DESCRIPTION:-

A herb, up to .2 m in height. stem solid, hairy rooting at nodes.

LEAVES:- Spirally arranged, 15-20 cm x 10-25 cm; petiole 3-6 cm long, often divided into unevenly shaped pine, mainly oval, irregularly toothed, often with small pinnae between larger leaflets.

FLOWERS:- About 2 cm in diameter. calyx tube short, hairy, sepals persistent, petals usually 6, up to 1 cm in length, yellow, stamens 6, anthers bright yellow.

FRUITS:- A fleshy berry with 2-9 locus, orange, yellow or red when ripe. Usually round, smooth or furrowed, 2-15 cm in diameter. Seed kidney or pear-shaped. Light brown, 3-5 mm x 2-4 mm (Tindall, 1993).

DISTRIBUTION:-

Probably the Peru-Ecuador area (Purseglove, 1968; Querol, 1992)from where it was distributed to many parts of Tropical America. Now it is widely distributed all over the world (Tindall, 1993).

EDIBLE PARTS:

Fruit.

FOOD USE:-
Tomato is used in many ways. Ripe fruits are used fresh or cooked, sauces, ketch-ups, purses, juices are made from ripe fruits. Mature fruits are preserved in brine.

Lycopersicon lycopoersicum

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Tomato green)
Moisture - 93.1 g, Energy - 23 kcal, Protein - 1.9 g, Fat - 0.1 g, Carbohydrates - 3.6 g, Calcium - 20 mg, Phosphorus - 36 mg, Iron - 1.8 mg, Carotene - 192 mcg, Thiamine - 70 mcg, Riboflavin - 10 mcg, Niacin - 0.4 mg, Vitamin C - 31 mg.

(Tomato ripe)
Moisture - 94.0 g, Energy - 20 kcal, Protein - 0.9 g, Fat - 0.2 g, Carbohydrates - 3.6 g, Calcium- 48 mg, Phosphorus - 20 mg, Iron - 0.4 mg, Carotene - 351 mcg, Thiamine - 120 mcg, Riboflavin - 60 mcg, Niacin - 0.4 mg, Vitamin C - 27 mg (Perera, et al., 1979).

Fruits good source of iron, vitamin A & B and excellent source of Vitamin C; useful as mild aperient, intestinal antiseptic; to promote gastric secretion and flow of bile, for bronchitis and asthma; for diarrhea and dysentery; dermatitis and fungal infection (De Pauda and Pancho, 1989).

ENVIRONMENTAL RESPONSE:-

Well drained, fertile soils with a good moisture-retaining capacity and a high level of organic material are preferable although many cultivars are tolerant to a wide range of soils. pH of 5.8 - 6.8 is more suitable for tomato cultivation. Optimal day and night temperatures of 21-27^{0}C and 16-20^{0}C are adequate. Excessive rainfall and high relative humidity can be harmful, due to the proliferation of leaf diseases during humid conditions. Elevations up to 2000 m are suitable for tomato plants. Modern tomato varieties have been selected and bred for daylength neutrality.

CULTIVATION:-

Areas of cultivation - It is grown in low-country, mid-country dry zone and up country intermediate zones.

Time of planting - Establish nurseries in March or August and transplant in April to September.

Land preparation -

i Nursery - Deep ploughing and turning the soil is important.

ii Field - Deep ploughing and two harrowings are recommended to promote extensive root growth. Proper leveling and field drainage are important. Land cropped in the previous season with solanaceous crops should be avoided.

Seed rate - 85-200 g/ha.

Spacing - Monocroping - 80 x 50 cm on fertile soils with 1-2 plants/hill.

Intercropping - When tomato is the main crop it should be spaced at 80 x 50 cm.

Fertilizer - N-135 kg/ha, P_2 05-90 kg/ha, K_2O-90 kg/ha.

Irrigation - Frequent light irrigation is preferable.

Harvesting - Fruits can be harvested when the colour changed from green to yellow. Fruiting can be continue for 125 days in intermediate varieties and about 10-12 picks can be obtained.
Yield - 20-30 t/ha.

STORAGE:-

Pack in ventilated wooden boxes with less ripe fruits in the bottom layer to avoid fruit damage. Fruits can be processed for ketch-up, sauces, juice, jam etc.

FAMILY:- SOLANACEAE:-

BOTANICAL NAME:- ***Solanum indium***

Syn :- S. violaceum

VERNACULAR NAMES:-

SINHALA	:	*Tibbatu*
TAMIL	:	*Kandal, Karimullu*

DESCRIPTION:-

A semi shrub by perennial with stout, much branched, often purple stems with many scattered,large, slightly curved, sharp prickles with long compressed base, covered (including prickles) with a scurry coating of minute white stellate hair, denser on the young parts.

LEAVES:- Simple, alternate, 10-15 cm long, ovate in outline, caudate or rounded, often unequal-sided at base, acute, with a few large, oval-triangular, sub-acute lobes, rough above with stalked stellate hair, white-tomentose beneath with the same veins, with a few large, straight spines on both sides, petioles 1.2-5 cm long armed with prickles.

FLOWERS:- Regular, bisexual, violet or purple, large, numerous, on short stellate-hairy and prickly pedicels, 1.2 cm long, cymes racemose extra-axillary, peduncle short.

FRUITS:- A berry 1 cm long, surrounded at base by the large spreading calyx, smooth but with a few stellate hairs on the summit, dark yellow. Flowers in April and May (Jayaweera, 1982).

DISTRIBUTION:-

Grows in Tropical India, Sri Lanka, Malaysia, China, Philippine Islands and Africa (Jayaweera, 1982).

EDIBLE PARTS:-

The fruit.

Solanum indicum

(A) Twig with leaves, flowers and fruits. (B) Flower lateral view. (C) Fruit.

FOOD USE:-

The half mature berries are cooked and eaten as a vegetable in Sri Lanka and Malaysia.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 74.4 g, Energy - 39 kcal, Proteins - 3.1 g, Fats - 0.8 g, Carbohydrates - 4.8 g, Calcium - 100 mg, Phosphorus - 909 mg, Iron -1.2 mg (Weerakoon, 1993).

The fruit contains solanine and solanidine. The oil extracted from the seeds contains glycerides of lauric, palmitic, stearic, arachidic, oleic, linoleic acids together with phytosterol and carpesterol. The fruit contains carbohydrates which hydrolyze into maltose, melibiose, sucrose, raffinose, etc. This plant is an astringent, resolvent and aphrodisiac. It is used in dysuria, colic, coughs, and asthma. The root is a diuretic and is useful for dropsy, coughs and catarrhal ailments. The vapour of burning seed is a remedy for toothache (Jayaweera, 1982).

FAMILY:- SOLANACEAE

BOTANICAL NAME:- ***Solanum melongena***

Syn :- S. esculantum

VERNACULAR NAMES:-

SINHALA	:	*Vambatu*
TAMIL	:	*Kattarikkai*
ENGLISH	:	Egg Plant, Brinjal, Melongena

DESCRIPTION:-

A short and woody perennial which sometimes grows as an annual, with hairy stem and leaves. It grows to a height of 2 to 4 feet.

LEAVES:- Large and alternate on the stem.

FLOWERS:- The inflorescence is sessile, the outer side of the flowers is bright purplish blue, dark purple inside.

FRUITS:- The fruits vary in shape, size and colour. The seeds are small, flat and light brown (Tindall, 1993).

DISTRIBUTION:-

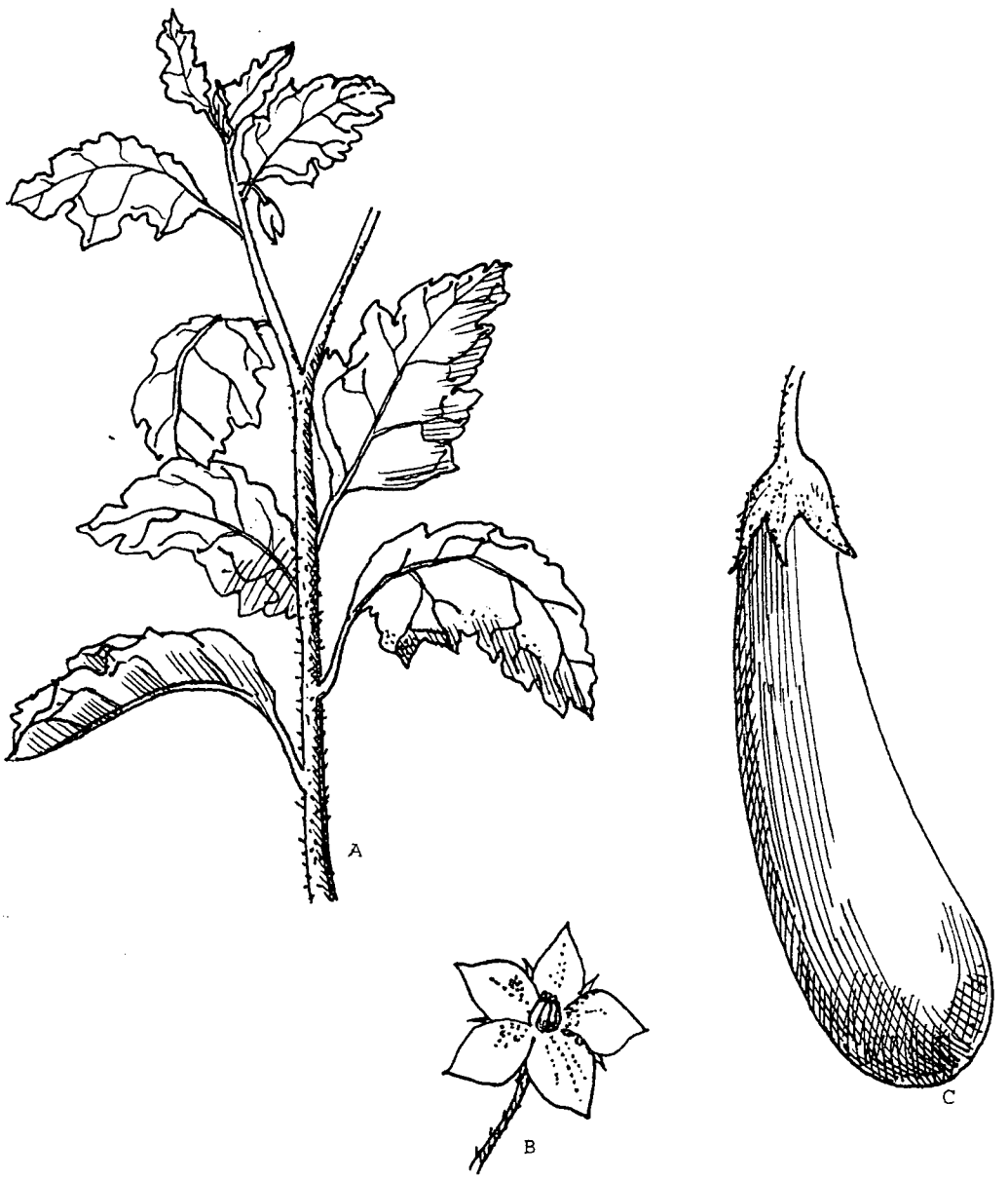
The place of origin of the egg plant is probably India, while the second centre of diversity is China. Later it was introduced to Spain and Persia and to Africa. It is commonly cultivated in the Malaysia, Peninsula Indonesia, Central East-West Africa, South America and Sri Lanka (Tindall, 1993).

EDIBLE PARTS:-

The immature fruits and leaves.

FOOD USE:-

Fruits are used in preparing curry as a vegetable, and making salads and pickles. Leaves can be eaten as a pot herb.



Solanum melongena

(A) Branch. (B) Flower. (C) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 92.7 g, Energy - 24 kcal, Protein - 1.4 g, Fats - 0.3 g, Carbohydrates - 4.0 g, Calcium - 18 mg, P - 47, Iron - 0.9, Carotene - 74 mcg, Thiamine - 40 mcg, Riboflavin 110 mg, Niacin - 0.9 mg, Vitamin C 12 mg (Weerakoon, 1993).

(Leaves)
Moisture - 87.4 g, Energy - 40 kcal, Protein - 3.9 g, Fat - 0.7 g, Carbohydrates - 4.6 g, Calcium - 334 mg, Phosphorus - 52 mg, Iron 5.0 mg.

Decoction or infusion of the leaves is a remedy for throat and stomach troubles; also used as anodyne. The leaves, roots and dried stalk are used in decoction for washing sores. Decoction of roots is taken internally as an anti-asthmatic and as a general stimulant. The fruit is antiphlegmatic, for coughs and loss of appetite; bruised with vinegar, it is used as poultice for abscesses (De Pauda et at., 1987).

ENVIRONMENTAL RESPONSE:-

Sandy, well drained soil with a pH 5.5-6.8 and high water retaining capacity is suitable. Optimal temperature range is 25-30^{0}C. Grows well at altitudes below 1200m.

CULTIVATION:-

Areas of cultivation - It is cultivated both in wet and dry zone lowlands of Sri Lanka.

Planting time - *Maha* season.

Planting materials - Seeds. They are sown in the seed bed and transplanted when 12-15 cm high.

Spacing - 90 x 90 cm.

Irrigation - Is required in first two months of its life.

Fertilizer - NPK fertilizer is applied to soil before planting. At the stage of flowering and fruiting N and K fertilizer is normally applied.

Harvesting - After three months of planting and that is continued for one year.

STORAGE:-

Brinjal can be stored in dark places up to seven days. Sun-dried brinjal slices can be kept for a long period. Pickles and brinjal moju are other ways of prolonged keeping.

FAMILY:- SOLANACEAE

BOTANICAL NAME:- ***Solanum nigrum***

Syn :- S. rubrum

VERNACULAR NAMES:-

SINHALA	:	*Kalukanberiya*
TAMIL	:	*Manattakkali*
ENGLISH	:	Black Nightshade

DESCRIPTION:-

An annual herb, 60-90 cm high, branching and extending to 120 cm. Stem cylindrical glabrous or more or less hispid-pubescence, much diversicately branched.

LEAVES:- Simple alternate, numerous, ovate-lancelot.

FLOWERS:- Regular, bisexual, white, small, petals 5, fused, 9 mm in diameter, calyx 1 mm in length.

FRUITS:- A berry, purple, 1.2-1.8 cm in diameter in clusters of 4-7, falling prematurely when approaching maturity. 20-30 flattened seeds are in a fruit (Jayaweera, 1982).

DISTRIBUTION:-

Centre of origin is probably tropical West Africa (Tindall, 1993). Cultivated in West Africa and tropical Asia when it has become naturalized and is often regarded as a weed.

EDIBLE PARTS:- Leaves, young shoots and half ripe berries.

FOOD USE:-

Leaves and young leaves are eaten as a green vegetables. Berries are cooked and eaten as a vegetable in Sri Lanka.

Solanum nigrum

(A) Branch with fruits.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Leaves)
Moisture - 87.0 g, Energy - 38 kcal, Protein - 4.3 g, Fat - 0.8 g, Carbohydrates - 5.5 g, Calcium - 442 mg, Phosphorus - 75 mg, Iron - 1.0 mg, Carotene - 3660 mcg, Vitamin C - 20 mg (FAO, 1968).

Fruit contains solanine and solanidine. The fruit also contains carbohydrates which hydrolight into maltose, melibiose, sucrose, rafimose etc. The plant is used for dysuria, colia, coughs and asthma. (Jayaweera, 1982).

ENVIRONMENTAL RESPONSE:-

Plants grow well in soils which are high in organic content and thrive during wet seasons. Exposure to full sun is generally beneficial to growth but plants will also tolerate a reasonable level of shading. Elevations up to 2000 m are generally suitable.

FAMILY:- SOLANACEAE

BOTANICAL NAME:- ***Solanum surattense***

Syn:- S. sodomacum

VERNACULAR NAMES:-

SINHALA	:	*Ela-batu*
TAMIL	:	*Vaddu Vattu*

DESCRIPTION:-

A perennial herb, erect, 30-90 cm high with numerous divaricately spreading branches set with scattered straight, compressed, yellow prickles, younger parts covered with dense stellate tomentum.

LEAVES:- Simple, alternate, exstipulate, 6.2-10 cm long, oblong-oval, rounded at base, shallowly pinnately lobed, stellate hairy on both sides, especially beneath with a few straight erect prickles on mid-rib above and beneath, petioles 1.2-1.8 cm long.

FLOWERS:- Regular bisexual, bright mauve purple, large.

FRUITS:- A globose berry, 2.5 cm long, yellow or whitish with green veins, pedicel thickened upwards. Seeds numerous. Flowers all the year round (Jayaweera, 1982).

DISTRIBUTION:-

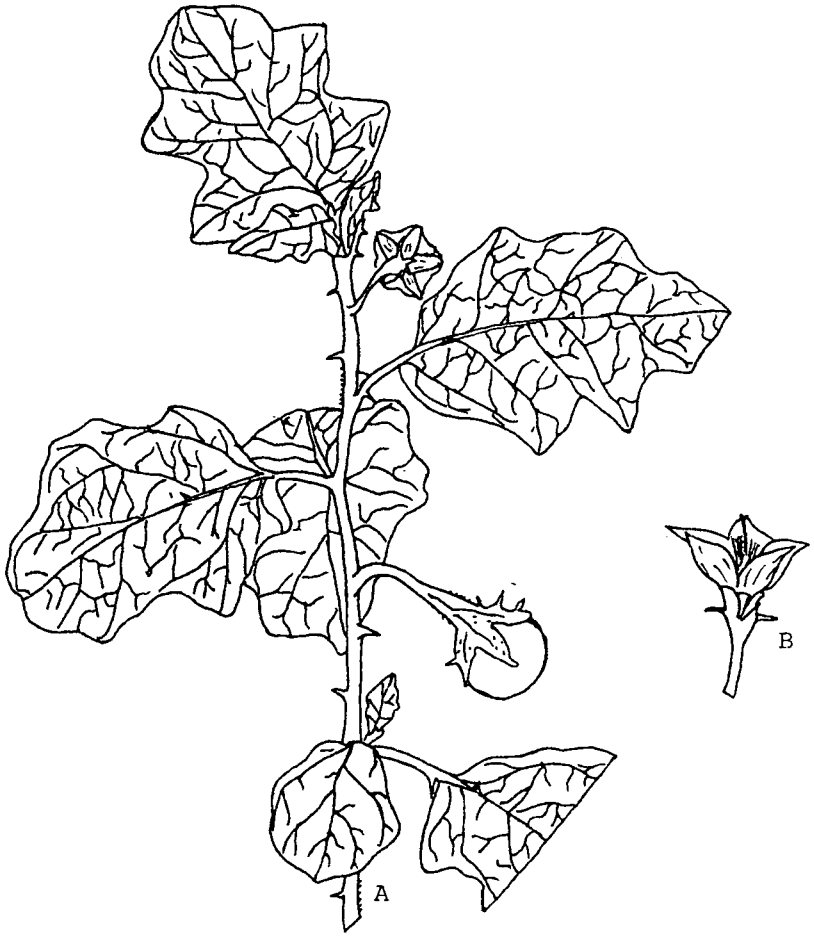
Grows in India, Sri Lanka Tropical Asia, Australia and Polynesian Islands (Jayaweera, 1982). It is a very common roadside weed up to 800 m altitude in Sri Lanka.

EDIBLE PARTS:-

The fruit and young leaves.

FOOD USE:-

The mature fruit is cooked and eaten as a vegetable. Leaves are eaten as green vegetable.



Solanum surattense

(A) Twig with leaves, flower and fruit. (B) Flower, lateral view.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Fruit)
Moisture - 75.5 g, Energy - 39 Kcal, Proteins - 3.1 g, Fats - 0.8 g, Carbohydrates - 4.8 g, Calcium - 100 mg, Phosphorus - 90 mg, Iron - 1.2 mg (Weerakoon, 1993).

The root of this plant is used for various lung ailments, diarrhoea, coughs and rheumatism. The leaves and stems made into a cunjee, is given to convalescing patients (Jayaweera, 1982).

CULTIVATION:-

Areas of cultivation - It is cultivated both in wet and dry zone lowlands of Sri Lanka.

Planting time - *Maha* season.

Planting materials - Seeds. They are sown in the seed bed and transplanted when 12-15 cm high.

Spacing - 90 x 90 cm.

Irrigation - Is required in first two months of its life.

Fertilizer - NPK fertilizer is applied to the soil before planting. At the stage of flowering and fruiting, N and K fertilizer is normally applied.

Harvesting - After three months of planting and that is continued for one year.

STORAGE:-

Brinjal can be stored in dark places up to seven days. Sun-dried brinjals slices can be kept for long periods. Pickles and brinjal moju are other ways of prolonged keeping.

FAMILY:- SOLANACEAE

BOTANICAL NAME:- ***Solanum trilobatum***

VERNACULAR NAMES:-

SINHALA	:	*Wel-tibbatu*
TAMIL	:	*Kudalam, Nittidan*

DESCRIPTION:-

A small sub-scandent under shrub with numerous hooked prickles, stems slender with long divaricate branches with a few stellate hairs on the young shoots, otherwise glabrous.

LEAVES:- Simple, alternate, small, 1.8-3.7 cm long, rotund-ovate in outline, irregularly 3 or 5 lobed, glabrous, petioles as long as leaves and prickly.

FLOWERS:- Regular, bisexual, rich, violet-purple, large on long divaricate or reflexed glabrous pedicels cymes extra-axillary, short racemose, 3-9 flowered, nearly sessile.

FRUITS:- A globose berry, 0.8 cm long smooth and scarlet in colour. (Flowers from December to February) (Jayaweera, 1982).

DISTRIBUTION:-

Grows in India, Sri Lanka and Malay Peninsula. It is very common in waste ground in the dry regions in Sri Lanka (Jayaweera, 1982).

EDIBLE PARTS:-

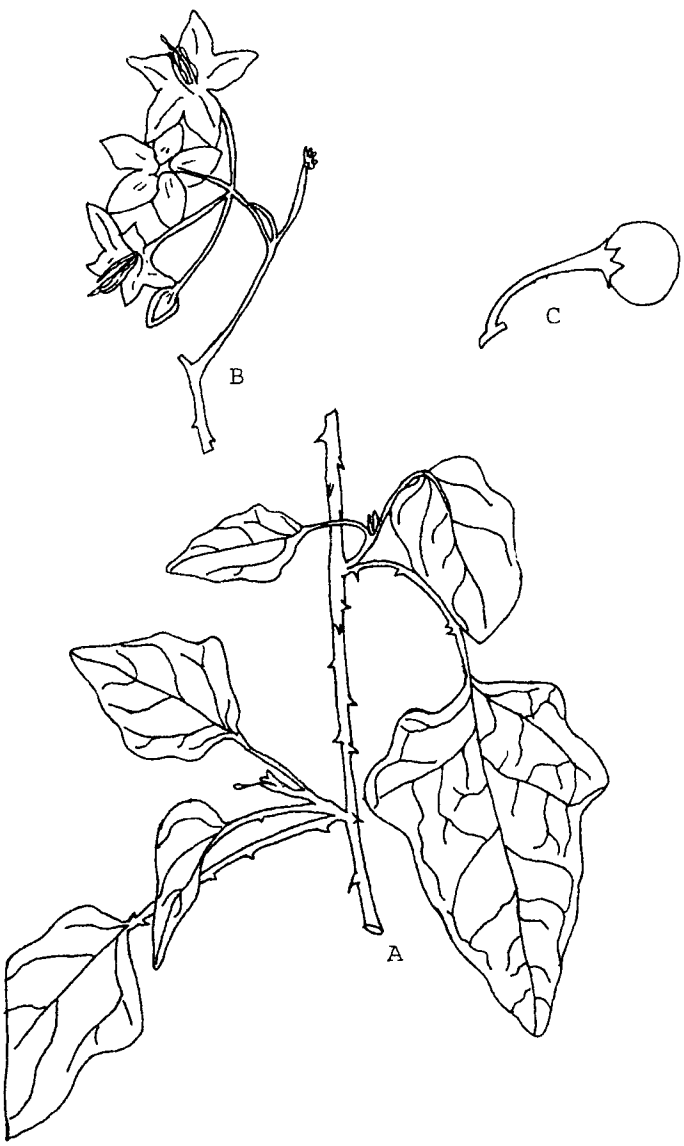
The leaves.

FOOD USE:-

The leaves are a common pot herb given to children suffering from prolonged cough.

NUTRITIONAL AND THERAPEUTIC VALUE:-

The roots and leaves of this plant are given in the form of a decoction to consumptive patients. The berries and flowers are used for coughs (Jayaweera, 1982).



Solanum triblobatum

(A) Branch with leaves and prickles. (B) Inflorescence. (C) Fruit.

FAMILY:- SONNERATIACEAE

BOTANICAL NAME:- ***Sonneratia caseolaris***

VERNACULAR NAMES:-

SINHALA : *Kirala, Kirilla*

DESCRIPTION:-

A shrub or small erect tree with pale bark, reaching 12 m and quadrangular twigs.

LEAVES:- Opposite, from 2 to 3 inches long, nearly round, or oblong- oval, tapered at base, obtuse or apiculate at apex, entire, rather thick. Petiole very short rather stout.

FLOWERS:- Large, about two inches in diameter. Solitary, deep rose pink, placed at ends of branches on thick stalks. Calyx tube smooth, dividing into six narrow acute lobes longer than the tube.

FRUITS:- Broadly ovoid or sub-globose, supported on enlarged calyx which forms a shallow cap, about 6 cm wide, rounded and slightly depressed on top. Flowers in September, probably all the year (Dassanayake and Fosberg, 1981).

DISTRIBUTION:--

A fairly common tree found in mangrove swamps and Western streams around Southern and Western shores. Also it grows in India, Burma and Andaman (Dassanayake and Fosberg, 1981).

EDIBLE PARTS:-

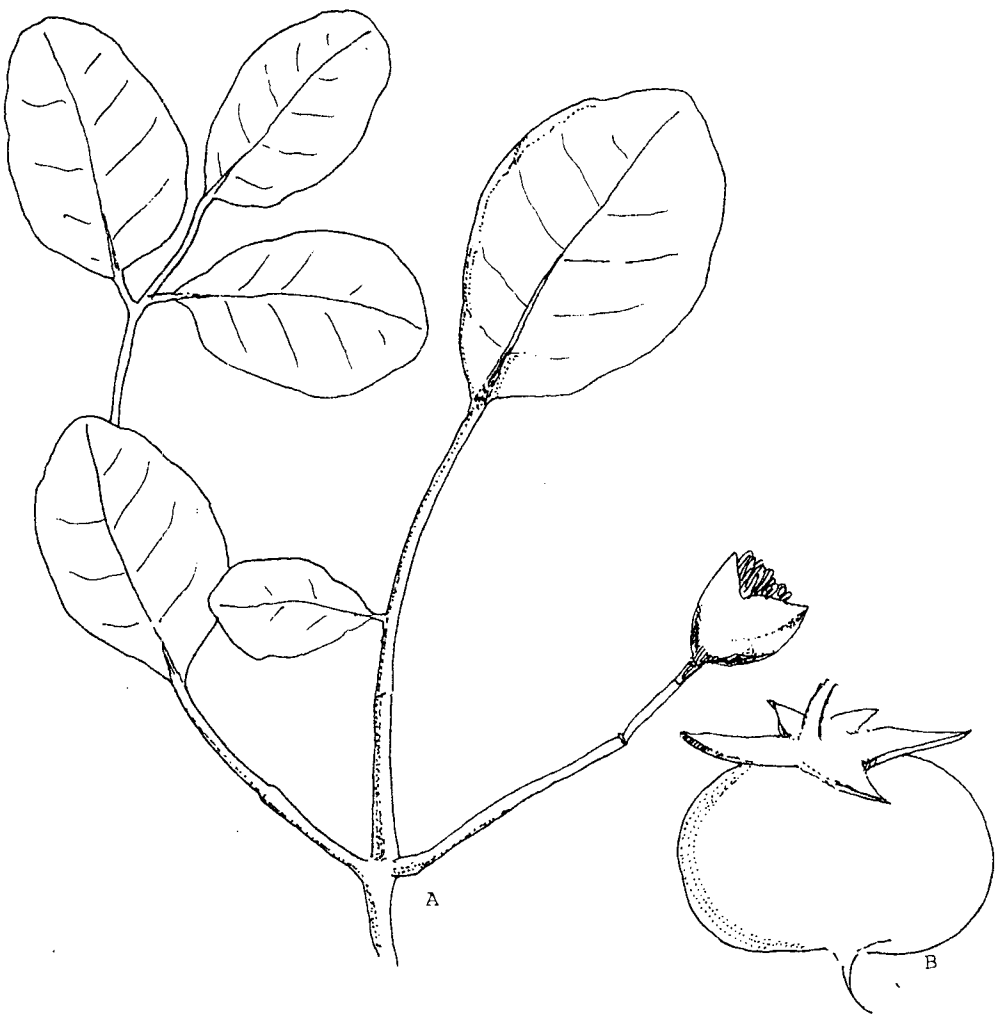
The fruit.

FOOD USE:-

Ripe fruit is eaten fresh. Creamy edible part is eaten with sugar. A drink is also prepared from the fruit.

NUTRITIONAL AND THERAPEUTIC VALUES:-

Fruits are used for bleeding piles.



Sonneratia caseolaris

(A) Branch. (B) Fruit.

OTHER USES:-

It is used as firewood. Aerial root is used as cork.

ENVIRONMENTAL RESPONSE:-

A mangrove plant.

STORAGE:-

Undamaged fruits can be kept for 2-4 days.

FAMILY:- UMBELLIFERAE

BOTANICAL NAME:- ***Centella asiatica***

Syn :- Hydrocotyle asiatica

VERNACULAR NAMES:-

SINHALA	:	*Hin-gotukola*
TAMIL	:	*Babassa, Vallarai*
ENGLISH	:	Indian Pennywort

DESCRIPTION:-

A prostrate perennial herb with a short vertical rootstock and glabrous axillary stems with long internodes.

LEAVES:- Simple, alternate, stipulate, several from the root stock and 1 to 2 from each node of the runners, petioles 7.5-15 cm long, erect, glabrous.

FLOWERS:- Irregular, bisexual, dark pink, nearly sessile, usually three together at ends of short, erect, pubescent peduncles 1-3 from the nodes opposite the leaves, bracts 2, close beneath the umbel, ovate, obtuse.

FRUITS:- About 0.3-0.4 cm long, ovoid, hard. (Flowers from May to October) (Jayaweera, 1982).

DISTRIBUTION:-

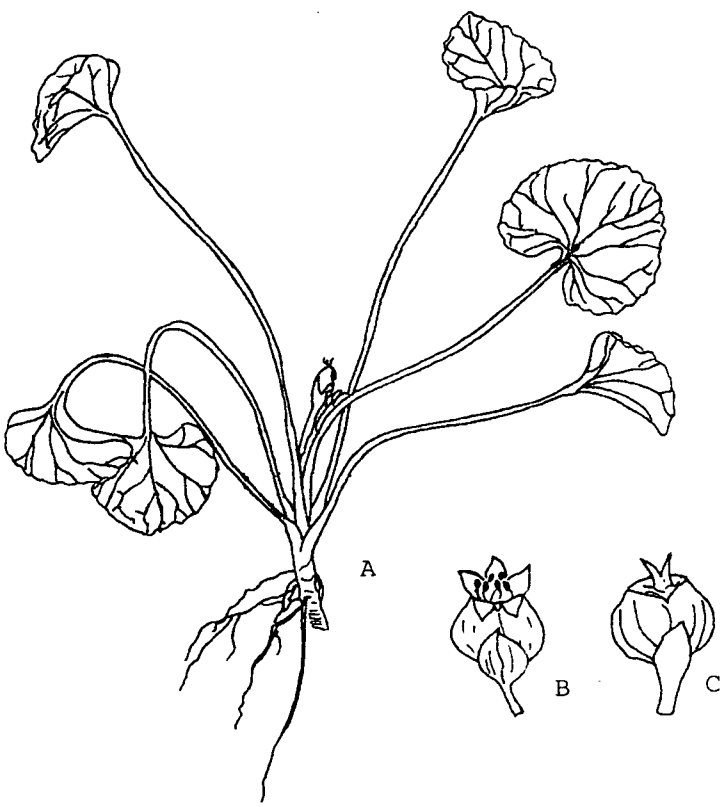
Grows in India, Sri Lanka and other tropical and sub-tropical countries. It is a very common weed in Sri Lanka growing in waste grassy places from sea level to the highest elevations.

EDIBLE PARTS:-

The leaves and young stem.

FOOD USE:-

It is eaten as a green vegetable either cooked or as a salad. It is boiled and drunk as a beverage. Extract of whole plant is used for preparation of porridge.



Centella asiatica

(A) Portion of stem with leaves and fruit. (B) Flower lateral view. (C) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 84.5 g, Energy - 37 kcal, Proteins - 2.1 g, Fats - 0.5 g, Carbohydrates - 6.0 g, Calcium - 224 mg, Phosphorus - 32 mg, Iron - 68,8 mg.

This herb contains the alkaloid, hydrocotyline and a volatile oil vellarine obtained principally from the roots. It is a good source of phosphorus, iron, calcium and other mineral constituents. It has a high percentage of vitamin B. A yellow neutral gum, centelloside is isolated from local material. The herb is said to have a direct action on lowering the blood pressure and is often referred to as a rejuvenating medicament. The leaves are eaten row or finely cut and roasted with scraped coconut. It is believed to purify the blood and cure indigestion, nervousness and dysentery. The plant is useful both in externally and internally for skin diseases, chronic and obstinate eczema, secondary and tertiary syphilis with ulceration, enlargement of gland, leprosy, abscesses and chronic rheumatism. It has a special influence on the urino-genital tract and set up urinary and ovarian irritation (Jayaweera,1982).

CULTIVATION:-

Area for cultivation- It can be grown in all regions of the country.

Planting season - Planting can be done throughout the year. However for good crop establishment, planting during the rainy season is more advisable.

Land preparation - Plough the land to a dept of about 20 cm and bring the soil to a good fertile condition . On a small scale this could be done with a mammoty or a mammoty fork. Use sunken bed to conserve moisture.

Planting and space - Before planting the soil of the seed bed is mixed with organic matter at the rate of 1.5 kg/sq m at planting time and one month later. Depending on the planting type, planting space varies. Bush type 30 cm x 25 cm, 2-3 suckers/hill and creeping type 15 cm x 15 cm.

Irrigation- Adequate soil moisture must be made available for establishment and good growth of the crop.

Fertilizer - Organic fertilizers are used.

Time to harvest - If moisture is not limited the first harvest can be obtained in 90 days. Subsequent harvests can be taken at 60 day intervals. The crop can be harvested over a periods of 2- 3 years.

Harvesting- Leaves are thinned by pulling out or cutting by a sharp knife or sickle at the bottom of leaves.

STORAGE:-

Harvested leaves can be kept for 4-6 days in a shady cool place.

FAMILY:- UMBELLIFERAE

BOTANICAL NAME:- ***Coriandrum sativum***

Syn :- Cuminum cyminum

VERNACULAR NAMES:-

SINHALA	:	*Kottamalli*
TAMIL	:	*Kotamalli*
ENGLISH	:	Coriander

DESCRIPTION:-

A glabrous herb 15-45 cm high emitting a very disagreeable odour when rubbed.

LEAVES:- Pinnately divided, segments of the lower leaves broadly ovate or cuneate, lobed and toothed.

FLOWERS:- Regular, bisexual, small, white in compound umbels, the outer flowers of the umbellets with enlarged ray-like petals.

FRUITS:- Small, ovoid or subglobse, ribbed, less than 5 mm long (Jayaweera, 1982).

DISTRIBUTION:-

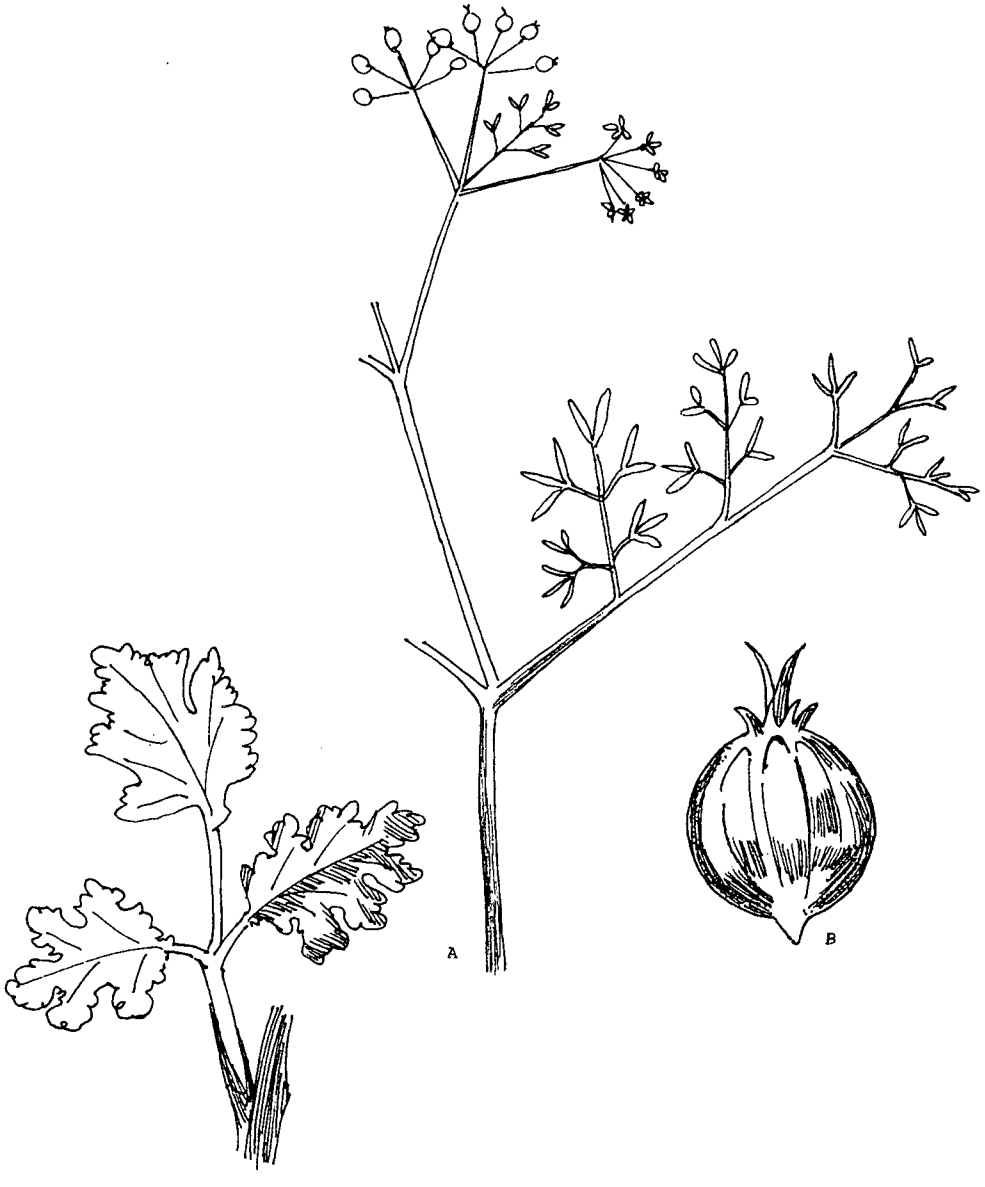
A native of Palestine, Syria, Mesopotamia and Greece, (Querol, 1992) but it is now cultivated throughout India and Sri Lanka. It was known to ancient Israelites and also used in Ayurveda. It was one of the drugs used by Hippocrates (Wikramanayake, 1996). In Sri Lanka it is a popular pot herb

EDIBLE PARTS:-

Seeds and young leaves.

FOOD USE:-

Seeds are used as a spice. Leaves are eaten fresh and added to salads and curries. Seeds are boiled and drunk as a beverage.



Coriandum sativum

(A) Branch. (B) Fruit.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Seeds)
Moisture - 11.2 g, Energy - 288 kcal, Proteins - 14.1 g, Fats - 16.1 g, Carbohydrates - 21.6 g, Calcium - 630 mg, Phosphorus - 393 mg, Iron - 17.9 mg, Carotene - 942 mcg, Thiamine - 220 mcg, Riboflavin - 350, Niacin - 1.1 mg (Perera, et al., 1979).

(Leaves)
Energy - 79 kcal, Protein - 6.7 g, Fats - 1.7 g, Calcium - 440 mg, Iron - 7.0 mg, Carotene - 6780 mcg, Thiamin - 0.06 mcg, Riboflavin - 0.05 mcg, Niacin - 0.8 mg, Vitamin C - 220 mg (Gopalan et al., 1971).

The fresh plant contains a volatile oil which consists of coriandrol, d-ilinalool, licariol, d-d-pinene, p-cymol, trepinene, dipentene, geraniol, l-borneol, b-phellandrene, terpinolene, n-de-cylaldehyde, acetic acid and decyl acid. The fruit contains volatile oil, pentosan, furfural, pectin, vitamin C, fat, protein, starch and potassium malate. The fruit of this herb is universally used with dry ginger as a decoction for colds, influenza, fever etc. It is a flavouring agent for curries in the East. It is a refrigerant, diuretic, tonic and aphrodisiac. An infusion of this fruit is given for dyspepsia, sore throat, catarrh and bilious complaints. The oil is useful for flatulent colic, rheumatism, neuralgia etc (Jayaweera, 1982; Wikramanayake, 1996).

ENVIRONMENTAL RESPONSE:-

Grows well in soils with good moisture retaining capacity. Requires cool temperatures.

CULTIVATION:-

Planting season - *Yala*.

Land preparation - Involves ploughing with the first rains. The land is then repeatedly worked with a blade.

Planting materials - Seeds.

Seed rate - 10-15 kg/ha. Sowing is done either broadcasting or in rows. Space between rows is 25 cm apart.

Fertilizer - 12 t/ha of cattle mannure may be incorporated into the soil when land is prepared.

Harvest - 4 1/2-5 months after sowing.

Yield - 1.8-2.0 T/ha.

STORAGE:-

Dried seeds can be kept for a long time in dry containers.

FAMILY:- UMBELLIFERAE

BOTANICAL NAME:- ***Hydrocotyle javanica***

Syn :- H. hispida

VERNACULAR NAMES:-

SINHALA	:	*Maha-Gotukola*
TAMIL	:	*Vallari*

DESCRIPTION:-

A prostrate perennial herb with very long succulent, slightly pubescent (especially beneath the nodes) stems sending up erect, stout, flexuose branches to about 30 cm high.

LEAVES:- Simple, alternate, stipulate, 7.5 - 10 cm long, orbicular in outline, rather broader than long, very deeply cordate

FLOWERS:- Irregular, bisexual, very small pale green, sessile, 20 or more crowded in globular head on short hairy peduncles 2-6 together from nodes of upright branches. (Flowers from May to October).

FRUITS:- Two separate mericarps attached at summit to slender central axis, indehiscent, much compressed, smooth, mericarps with primary ridges (Jayaweera, 1982).

DISTRIBUTION:-

Grows in India, Sri Lanka, Burma, Malaysia, Sumatra and Tropical Australia. It is common in moist places in the hill-country in Sri Lanka up to 800 m altitude (Jayaweera, 1982).

EDIBLE PARTS:-

The leaves.

FOOD USE:-

It is used as a green vegetable either cooked or as salads. It is boiled and drunk as a beverage. Extract of the whole plant is used for preparation of porridge.

Hydrocotyle javanica

(A) Portion of stem. (B) Flower lateral view. (C) Fruit with persistant styles.

NUTRITIONAL AND THERAPEUTIC VALUE:-

This plant contains an oily non-volatile liquid called vellarin. This herb is an altenative, tonic, diuretic, and local stimulant, especially for the cutaneous system. The leaves are used for indigestion, nervousness and dysentery (Jayaweera, 1982).

CULTIVATION:-

Area for cultivation - It can be grown in all regions of the country.

Planting season - Planting can be done throughout the year. However for good crop establishment plant during the rainy season.

Land preparation - Plough the land to a depth of about 20 cm and bring the soil to a good fertile condition. On a small scale this could be done with a mammoty or a mammoty fork. Use a sunken bed to conserve moisture.

Planting and space - Before planting the soil of the seed bed is mixed with organic matter at the rate of 1.5 kg/sq m at planting time and one month later. Depending on the planing type planting space varies. Bush type 30 cm x 25 cm, 2-3 suckers/hill and creeping type 15 cm x 15 cm.

Irrigation - Adequate soil moisture must be made available for establishment and good growth of the crop.

Fertilizer - Organic fertilizers are used.

Time to harvest - If moisture is not limited the first harvest can be obtained in 90 days. Subsequent harvests can be taken at 60 day intervals. The crop can be harvested over a periods of 2-3 years.

Harvesting - Leaves are thinned by pulling out or cutting by a sharp knife or sickle at the bottom of leaves.

STORAGE:-

Harvested leaves can be kept for 4-6 days in a shady cool place. Sun-dried leaves may be used for preparation of a drink.

FAMILY:- ZINGIBERACEAE

BOTANICAL NAME:- ***Curcuma domestica***

Syn :- C. longa

VERNACULAR NAMES:-

SINHALA	:	*Ath-Kaha, Kaha*
TAMIL	:	*Manjal*
ENGLISH	:	Turmeric

DESCRIPTION:-

A biennial herb, 1-1.5 m tall with a tuberous rootstock provided with tuberiferous root fibers, rootstock and rhizomes orange-yellow, annular, cylindrical, rhizomes distichous, placed fan-wise on rootstock, 3-4 on each side, 5-7.5 cm long, obfuciform each terminating in a bud with several lateral branchlets.

LEAVES:- Large, lamina 28-60 cm long, 9-15 cm broad, oblong, acuminate, aristate, tapering to the petiole, glabrous on both sides bright green on the upper surface, paler below, petioles 11-22 long.

FLOWERS:- Bilaterally symmetrical, bisexual, yellowish-green, 5 cm long, 1.5 cm broad (Jayaweera, 1982).

FRUITS:-

Not seen.

DISTRIBUTION:-

A native of Southern Asia (Jayaweera, 1982; Querol, 1992; Wikramanayake, 1996). and now largely cultivated in India, Sri Lanka, China, Java and other tropical countries. It is grown in the mid and moist low-country in Sri Lanka.

EDIBLE PARTS:-

The rhizome.

Curcuma domestica

(A) Plant. (B) Ryzome.

FOOD USE:-

Turmeric has been used as a spice in South East Asia and Indonesia since early times. Turmeric powder is added to for flovouring and colouring of curries. Turmeric is used for colouring butter, cheese, margerine, liqueres, fruit drinks, confectionery, cakes and jellies. It may be used in alcholic solution.

NUTRITIONAL AND THERAPEUTIC VALUE:-

(Dry root)
Moisture - 13.1 g, Energy - 349 kcal, Protein - 6.3 g, Fats - 51 g, Carbohydrates - 69.4 g, Calcium - 150 mg, Phosphorus - 212 mg, Iron - 14.8, Carotene - 30 mcg, Thiamine - 30 mg, Riboflavin - 0 mg, Niacin - 2.3 mg) Vitamin C - 0 (Perera, et al., 1979).

Turmeric was used in magical rites intended to promote fertility. The major pigment is curcumin (about 8%) which probably accounts for the high anti-oxident activity of turmeric (Wikramanayake, 1996). The dried rhizome is much used as a condiment. The fresh rhizome is crushed and applied externally on bruises, sprains wounds and leech-bites. Internally, it is given as an anthelmintic and in disorders of the blood. It is administered for diarrhoea, dysentery, flatulence, dyspepsia, colic jaundice and amenorrhoea. In Sri Lanka, a paste of it is applied on prurigo, urticaria, boils, sprains and bruises and also given internally for rheumatism, bronchial ailments and snake-bites (Jayaweera, 1982).

Turmeric oil has antiinflammatory, antiarthritic and feeble antiseptic properties. Paste made of the flowers is used in ringworms and other parasitic skin diseases.

OTHER USES:-

Tumeric water made by adding turmeric powder into water is used as a germ killer. Turmeric is said to give a glow to the skin. It is used in cleaning the skin and as a prevention of skin infections. Turmeric water is used as a cosmetic lotion. Turmeric water is rubbed over the body after a bath, or the powder dust over children after bathing.

ENVIRONMENTAL RESPONSE:-

Well drained sandy loam soil is good for turmeric. Requires a high moisture content in the soil and therefore it is normally grown as a mixed crop. Normal rainfall of 2000-2500 mm is required for vigorous growth.

CULTIVATION:-

Areas of cultivation - The mid and low country of Sri Lanka.

Planting season - Around the middle of April.

Land preparation - Required good cultivation and manuring.

Planting materials - Fingers.

Seed rate - 1500 kg/ha of fingers.

Spacing - Fingers are planted in rows 30 cm apart. Space in the rows is 18 cm.

Fertilizer - Cattle manure of 25 t/ha is added at planting.

Shade - Normally shade is provided in turmeric growing. It is normally cultivated under coconut, banana and other perennial crops.

Harvesting time - When the corms ripen and are ready for harvest, the leaves of the plants become yellow and dry up one by one.

STORAGE:-

Boiled and sun-dried fingers can be stored powdered or whole.

FAMILY :- ZINGIBERACEAE

BOTANICAL NAME:- ***Elettaria cardamomum***

Syn :- E. repens

VERNACULAR NAMES:-

SINHALA	:	*Ensal, Karadamungu*
TAMIL	:	*Ella-kai, Yelakkai Alum; Periyayalam*
ENGLISH	:	Cardamom

DESCRIPTION:-

A perennial herb with a fleshy, branching, anmulate rootstock, stem 2-3 m tall. clothed below with spongy sheaths.

LEAVES:- Simple, subsessile, distichous, 30-90 cm long, 7.5-15 cm broad, caudate-acuminate, glabrous or more or less pubescent above.

FLOWERS:- Irregular, bisexual, in short 3-4 flowered racemes.

FRUITS:- Oblong -avoid, 1.2-1.8 cm long, bluntly triangular, pale yellowish-grey. Several seeds in the fruit dark brown closely packed (Jayaweera, 1982).

DISTRIBUTION:-

Cardamom occur wild in everygreen forests of the Western Ghats and in Sri Lanka. Cardamom has a long histrory as a spices. In 1 century A.D Rome imported cardomom. In 180 A.D., cardamom was included the list of spices issues by the Royal Customs House, Alexandria, as biable to payment of duty. Purposeful planting has been done in Sri Lanka since 1800. In Sri Lanka, it is widely cultivated in the hill ranges and slopes of the districts Kandy, Matale and Nuwara Eliya (Wijesekera and Nethsingha, 1975).

EDIBLE PARTS:-

Seeds.

FOOD USE:-

The seeds are used as a spices. Seeds and oil is used in bread, cakes and confectionery. *Cardamom Coffee* is popular in the Middle East. In Indonesia, cardomom is blended with tobacco to prepare ciggerattes.

Elettaria cardamomum

(A) Small racemose portion of a flowering branch. (B) Leaf. (C) Flower. (D) Seed.

NUTRITIONAL AND THERAPEUTIC VALUE:-

It is given internally for diseases of the liver and uterus and applied exterally on tumours of the uterus. The seed is diuretic and used to relieve the retention of urine. It is administered to children to prevent excessive vomiting (Jayaweera, 1982; Wikramanayake, 1996).

OTHER USES:-

Cardamom are used to sweeten the breath. Cardamom oil is used in perfumery and dentistry.

ENVIRONMENTAL RESPONSE:-

Well distributed rainfall of 250-400 cm is required. Well driained, fairly deep, moist, rich lomy soils of pH 5-5.5 are preferable for cardamom. Grown at altitudes from 600-1350 m that is depends on the variety.

CULTIVATION:-

Propagation is by sees of rhizomes of the mature plant. In the first methods, seeds from fully matured fruits, air dried, soaked in water for two hours and sown in nursery beds. The nursery beds must be protected from excessive heat and from direct rain, by a good overhead covering. The last period for sowing is September, October.

The preferred methods is propagation by rhizomes. The rhizomes should be 18 months to 2 years old and should contain at last 2 growing stems.

Planting distance - 2.4-3.6 m under light shade. Pits for rhizomes 60 cm, wide, 30-45 cm deep, 210 cm apart. Rhizomes are buried up to their collars.

Weeding is neccesary during th first two years.

Harvesting - The plant bears in 2 years at lower elevations, in three years at higher elevations. From the 5th years, full crop. Plant must be renewed after 12 years. Fruits mature 3-4 months after flowering at lower elevations and 5 months after flowering at higher elevation. Fruits are harvested before they reach full maturing when still firm and just beginning to turn yellow. They are picked at at 3 weeks intervals. Fruits are cut with a pair of cut with a pair of scissors, without damaging the raceme.

Yield:- 300 kg per hectare.

FAMILY:- ZINGIBERACEAE

BOTANICAL NAME:- ***Zingiber officinale***

Syn :- Amomum zingiber

VERNACULAR NAMES:-

SINHALA	:	*Inguru*
TAMIL	:	*Allan, Sigaram, Inngy*
ENGLISH	:	Ginger

DESCRIPTION:-

A perennial herb with a large, solid, tough, horizontal rhizome, consisting of a series of many persistent roundish joints, pale yellow within, covered with a pale silvery brown skin, ringed with leaf scars, and each marked at the summit by a large, circular, flatsear, much branched, the new joints coming off below the terminal scars, roots numerous, large, cylindrical, fleshy, thick, brittle, semi-transparent, yellow.

LEAVES:- Simple, alternate, distichous, sheaths long, lax, standing away from the stem, terminating in two small, rounded auricles, smooth, pale green, blade absent or nearly so in the lower leaves, in the upper about 20-30 cm long, spreading lanceolate-linear, tapering at both ends often much so at the apex.

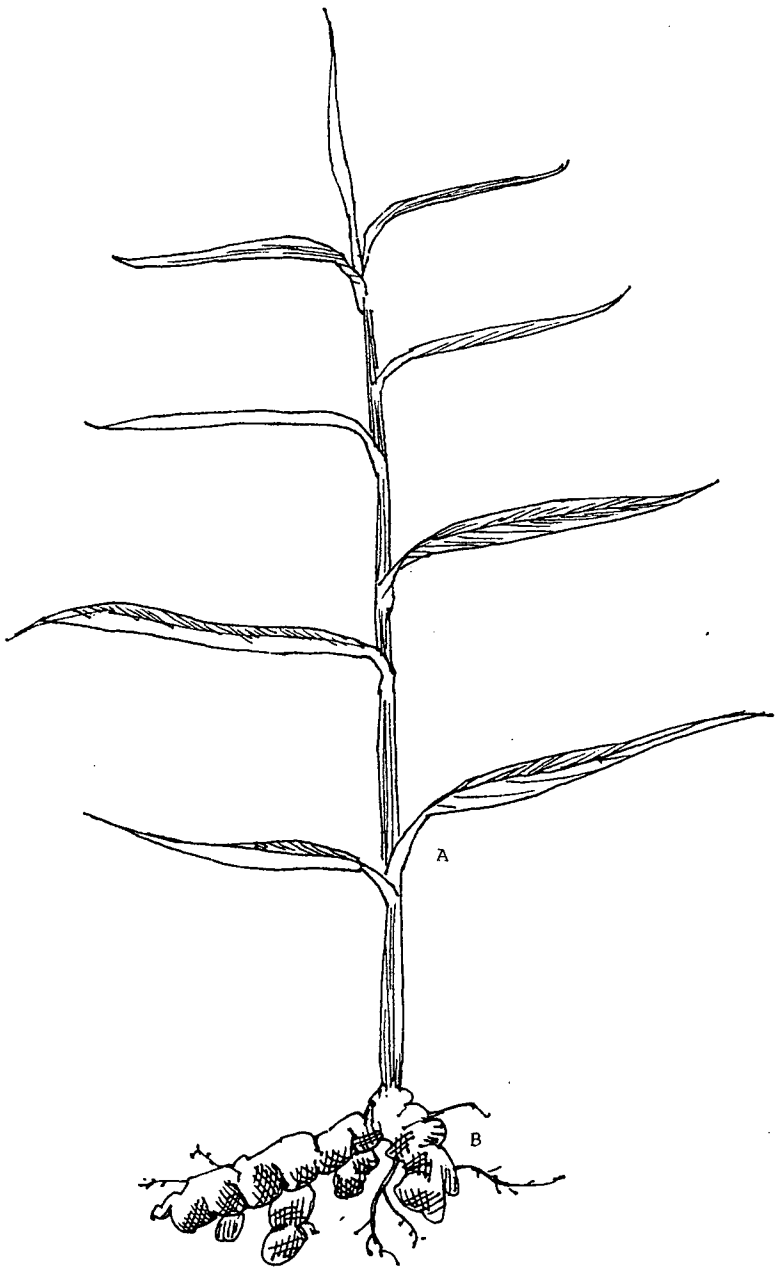
FLOWERS:- Stem shorter than the leafy ones, 15-30 cm high, erect, slender, surrounded with a few loose, blunt leaf sheaths, the upper ones sometimes with a short blade (Jayaweera, 1982).

FRUITS:

Not seen.

DISTRIBUTION:-

Widely cultivated in tropical countries and is probably a native of South East Asia (Querol, 1992) where it has been cultivated from ancient times. Only in the ninth century, the Europeans knew about ginger. It was introduced to East Africa in the 13th century, while the Portuguese had taken it to West Africa. It was probably introduced to the new world in the 16th century (Purseglove, 1972).



Zingiber officinale

(A) plant. (B) Ryzome.

EDIBLE PARTS:-

The rhizome.

FOOD USE:-

Dried rhizomes are added into curries for flavouring and it is a constituent of curry powder. Occasionally it is ground into flour and used in biscuits, ginger beer, cakes and pickles. Crystallized ginger (*Inguru dosi*) is prepared by boiling tender peeled rhizomes with sugar and dried later.

NUTRITIONAL AND THERAPEUTIC VALUE:-

Moisture - 80.9 g, Energy - 67 kcal, Proteins - 2.3 g, Fats - 0.9 g, Carbohydrates - 12.3 g, Calcium - 20 mg, Phosphorus - 60 mg, Iron - 2.6 mg, Carotene - 40 mcg, Thiamine - 60 mcg, Riboflavin - 30 mcg, Niacin - 0.6 mg, Vitamin C -6 mg (Perera, et al., 1979).

The rhizome of this plant contains a pungent principle, mainly zingerone and shogaol, while the aroma is due to a volatile oil containing camphene, phellandrene, zingiberene, cineol and borneol. (Jayaweera, 1982). Ginger is used in medicine as a carminative and aromatic stimulant to the gastro-intestinal tract and as a rebefacient and counter-irritant (Wikramanayake, 1996).

ENVIRONMENTAL RESPONSE :-

Cultivated in a large variety of soils. Good drainage is essential. Acidic soils are more favourable for ginger. Requires a good rainfall of 2500 mm and considerable shade. Grows in elevations of 1500 m.

CULTIVATION :-

Areas for cultivation - Mainly in Central and Western Provinces of Sri Lanka.

Planting season - March-April.

Land preparation - Fine tilth up to depth of 12 cm is necessary. Preparatory tillage commence about two months before planting and the soil turned over at least three times.

Planting materials - Fingers.

Seed rate - 2.5 - 3 t/ha. Cultivated on the beds or the ridges, 25 - 30 cm apart.

Fertilizer - Chemical and organic manure will increase the yield.

Harvesting time - December - January. When leaves are becoming yellow and ultimately drying.

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