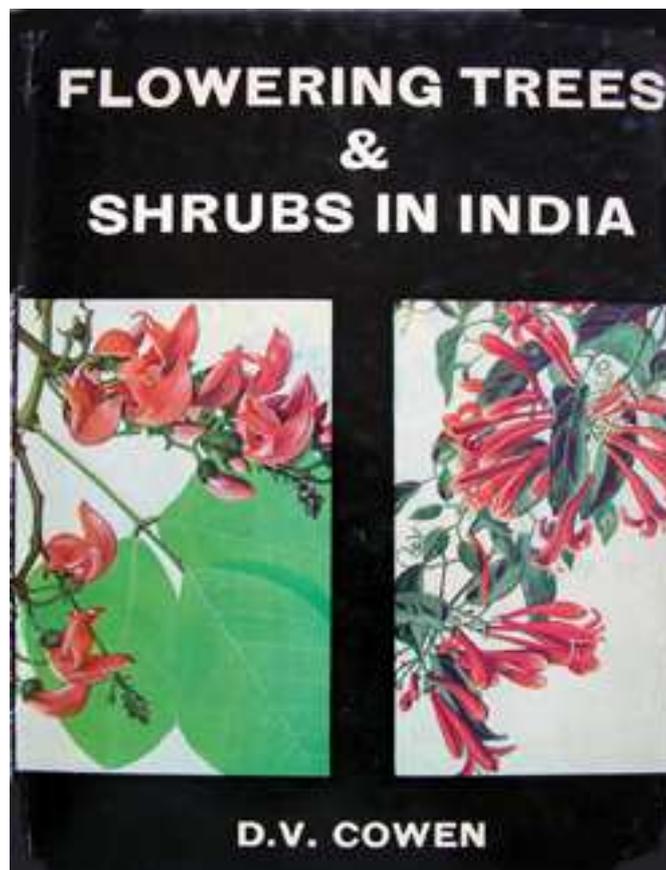


FLOWERING TREES & SHRUBS IN INDIA

by D.V. Cowen



FOREWORD TO SIXTH EDITION

I am flattered at being invited by the publishers to write a foreword for the sixth edition of this beautiful and popular book which has been out of print for several years and much missed and sought after by tree lovers. Not that a fresh foreword is at all necessary or called for after the book has established popularity and usefulness so unmistakably and especially a Foreword by one who is neither a botanist nor an artist but just an interested layman questionably qualified for the task. However, since the author herself has specifically stated that the book is meant for the layman, I feel less reluctant in airing my opinion, more as an appreciation of the artist-author than a foreword for her book. As a fellow birdwatcher I knew Mrs. Cowen intimately enough while she was residing in India to be struck with admiration for her remarkable versatility, boundless energy and unrelenting activity. For besides being a very busy socialite and do-gooder, she was an artist, a writer, an imaginative and successful gardener, a champion golfer and a keen and competent birdwatcher all rolled into one. And she excelled in everything she did. Her attractive plates in this book are all that a layman needs to help him identify the commoner and more showy flowering trees, both indigenous and introduced, he is likely to find in Indian gardens and on the countryside. The text, shorn of frightening botanical jargon, is simply and interestingly written and says just what a layman wants to know. I have myself used the book with much profit and enjoyment over the years and am therefore glad that now others will also have a chance of doing the same with its welcome reappearance in this new edition. — **Dr. Salim Ali**

FOREWORD TO FOURTH EDITION

It had been my intention, before leaving India, to bring out a companion volume to Flowering Trees and Shrubs in India but, mainly because of the difficulty of reaching trees, by no means common in and around Bombay, during their often brief flowering period, I was not able to prepare very many illustrations. Notes on nearly eighty species had been collected so, rather than destroy all these, I suggested to Messrs Thacker & Co, that some of the completed paintings should be used in the new edition to illustrate additional chapters. To this they agreed so, as well as revising and enlarging every chapter, I have described seven new trees and shrubs and added eight new illustrations. The following books have been consulted in addition to those mentioned in the introduction and to their authors I am grateful.

- **Ceylon Trees** by T. B. Worthington,
- **Some Beautiful Indian Climbers and Shrubs** by N. L. Bor and M. B. Raizada,
- **Trees of Calcutta** by A. P. Benthall,
- **Complete Gardening in India** by K. S. Gopaldaswamiengar.

- DVCowen

INTRODUCTION

EVERY year, from March to May, when the air is at its hottest, the ground is parched and cracked and a film of dust covers every leaf and branch, one watches in awe that miracle of nature which brings forth from the branches of so many trees such an extravagant abundance of colourful blossoms and clean, polished foliage. From where, one asks, do these trees get sufficient moisture when no rain has fallen for months. The bright, new leaves, alone, would be a happy sight and one's eyes, tired with the incessant glare of an Indian summer, gladly rest on them, but with blossoms of every hue as well it is impossible to be unaware of the galaxy of colour. It is at this time of the year that so many people feel an urge to learn more about the trees they live amongst.

This book is not concerned with the scientific study of plants or with the botanical forms of flowers and leaves but with those trees and shrubs, which, by the beauty of their appearance or the familiarity of their names, lead visitors and residents to search for further information. It is for those people, residents or visitors — ordinary people with little or no, knowledge of botany but with a love of beauty and an interest in this country — that these pages have been written. The first consideration throughout has been easy identification. A colour key is provided so that, with the knowledge of only a flower, a plant may be identified with a minimum of trouble. The few botanical terms, without which it was impossible to give clear descriptions, are explained or illustrated. There is no doubt that such a book as this will not appeal to the scientific botanist who may say in criticism that the descriptions are not in accordance with scientific works on flora, but it is not for such people that the book is intended. Essentially it is for the layman.

Not being a botanist myself I see trees with the eyes of a layman and as I see them so I have described them. India is so rich in flowers — there are hundreds of trees and shrubs from which I had to make my list — the trouble was what to leave out and not what to put in. So, again, there will no doubt be criticisms of my choice and I can only say that, with due consideration for the size of book required, I chose those which, to me, seemed most prominent.

Since one picture is worth a thousand words, the illustrations were all done with special care and from life, those in colour being painted natural size. A three-inch scale is marked at the bottom of each so that, even when reduced, the actual size of flowers and leaves can readily be determined. In some cases the tree sketches have been simplified so as to give a clearer idea of form and growth. Preparing this book has given me abundant pleasure and it is my hope that those nature-lovers who, by its aid, have found pleasure in identifying the trees and shrubs they have come across, will have had their botanical appetites sufficiently whetted for them to desire a further pursuance of the subject.

Some knowledge of the origin of Indian flora is desirable for a greater appreciation of its teeming growths. Reference to the Encyclopaedia Britannica tells us that the flora of India, Pakistan, Burma and Sri Lanka has no peculiar botanical features, being compounded of those of adjoining countries. Dividing the region roughly into six parts, we have, firstly, the Western Himalayas consisting of parallel snow-clad mountains which show European and Siberian influence, especially at the higher levels. Secondly, the Eastern Himalayas, where tropical forms are more numerous and Chinese plants are in evidence. Next the Indus plain which is arid over the greater part and has a very low rainfall. Here there is only scanty vegetation — mainly herbaceous and drying up in the hot season: low, thorny species are predominant. Fourthly, the Ganges plain which is much more humid and therefore has a greater variety of plants. Then the Malabar area — from Gujarat to Travancore — where the greatest profusion of tropical plants is found — luxuriant and evergreen as in Malaysia. Cane and bamboo are widespread; Teak, Queen's flower and Fig trees grow in number and to fine proportions. Lastly the Eastern area—the belt of dry-evergreen, low jungle along the coast, where Ixoras are common — and the inland region of the Deccan where plants are deciduous and frequently thorny. There, Convolvulus, Bamboo, varieties of Sterculia, the Indian Laburnum, Palmyra and Date palms are common. From this brief survey the reader will get an idea which districts are included or excluded in reference to the distribution of a tree or shrub.

In no country are plants used medicinally to the extent they are here. Few trees or shrubs are not useful in this respect and many offer healing qualities in their flowers, leaves, fruit, bark and roots. A number of the treatments prescribed for centuries by herbalists and medicine men have been proved to be of real benefit to the patient, but others can be classed among "Old Wives' Tales" and if recoveries have been achieved, it has been by good luck and persuasion. Medical authorities have proved that the numerous prescriptions offered as a cure for snake-bite or scorpion sting are, in fact, quite useless.

Selecting names has presented a great difficulty. In the numerous books of reference which I have studied, each, frequently, gives a different English name for the same plant; those which give vernacular names are at great variation in some instances and more recent productions give revised Latin names. So I decided to include all the English names, both Latin names and to select only some of those vernacular names on which different works agreed. It has not been possible for me to make any check on local names except those used in Bombay.

I would like to express full acknowledgment for the information gleaned from the following authorities: Messrs. Watt, Hooker, Brandis, Roxburgh, Blatter and Millard, Talbot, Oliver, Gamble and Parker.

I also owe a debt of gratitude to those who have so kindly helped and encouraged me, especially Mr. Joseph Abraham for correcting the script, Mr. Ahmadi and Mr. Russurricas of the Victoria Gardens, Mr. Castellino of the Willingdon Sports Club and Major E. Holmes, for their kind co-operation.

CONTENTS

List of Illustration (Plates) List of Illustrations (Sketches in Black-and-White)

1. GUL MOHR
2. FLAME OF THE FOREST
3. ASOKA
4. RED SILK COTTON
5. WILD ALMOND
6. JACARANDA
7. JAVA PLUM
8. NIM
9. TEAK TREE
10. TEMPLE TREE
11. BAOBAB
12. MOUNTAIN EBONY
13. CORAL TREE
14. QUEEN'S FLOWER
15. PINK CASSIAS
16. BELLERIC MYRABOLAN
17. MANGO
18. RAIN TREE
19. JACK FRUIT
20. TULIP TREE
21. RIO GRANDE TRUMPET FLOWER
22. TAMARIND
23. CORK TREE
24. PONGAM
25. INDIAN LABURNUM
26. RUSTY SHIELD BEARFR
27. CASUARINA
28. LIGNUM VITAE
29. BABUL
30. BANYAN TREE
31. PEEPUL
32. MADRE
33. DRUMSTICK TREE...
34. BEAD TREE
35. GOLDEN CHAMPA
36. UMBRELLA TREE
37. CANNON-BALL TREE
38. KARNIKAR
39. ALEXANDRIAN LAUREL
40. MOHWA
41. EASTER TREE
42. SCARLET CORDIA
43. INDIAN JUJUBE
44. MAST TREE
45. PAPAYA
46. BANANA TREE
47. COCONUT PALM
48. PALMYRA PALM
49. FISH-TAIL PALM
50. ROYAL PALM
51. WILD DATE PALM
52. ARECA

SHRUBS AND CREEPERS

1. GOLDEN DEWDROP
2. OLEANDER
3. PEACOCK FLOWER
4. PAPER-CHASE TREE
5. BOUGAINVILLEA
6. LANTANA
7. CAMPHIRE
8. IXORA
9. HIBISCUS
10. GARDENIA
11. BRILLIANT GARDENIA
12. GOLDEN CHAMPAK
13. YELLOW OLEANDER
14. RANGOON CREEPER
15. POINSETTIA
16. CORAL CREEPER.
17. MOONBEAM
18. PURPLE WREATH
19. GOLDEN SHOWER
20. REDBELL BUSH
21. TREE OF SORROW
22. YELLOW ELDER
23. RAILWAY CREEPER
24. GLORY LILY
25. HEAVENLY BLUE
26. ALLAMANDA

GUL MOHR

DELONIX REGIA

Syn. Poinciana regia

Fam. Leguminosae. Sub fam. Coesalpineae (which consists almost entirely of trees, shrubs and climbers native to warm countries and contains some of the most beautiful trees in the world). Gul Mohr (Hindi); Rakta chura (Beng) Mayarum (Tam): Alasippu (Mal): Shima sankesula (Tel): mal Mara (Sinh): Boj (Malay): Gul Mohr, Peacock Flower, Flamboyant (Eng)

THE Gul Mohr is one of our most striking ornamental trees and each April one cannot help but wonder how a bare, gaunt tree, standing in dry, hard earth (.in produce such a wealth of glorious bloom. Within a week of the first blossom appearing the whole tree is sparkling with vivid splashes of crimson and orange. In May the pale, rich green of the new foliage unfolds and the tree develops a feathery grace. Bare. grey branches and long ugly, black pods are all hidden and the spreading canopy of green lace and scarlet blossoms is at its loveliest. There is a wealth of variety in the shades of crimson and scarlet, some trees being almost orange and others a deep, deep red. Each has its admirers.



DELONIX REGIA



The large flower-sprays bear numerous, intermingling blooms and roundish nodding buds. Individually each flower will be seen to be about 12.5 cm. across. Five thick crimson sepals curve back to display their lime-green lining and bright yellow rims. From the spaces between them, radiate the five spoon-shaped, wavy and crinkle-edged petals; one of them is larger, its white or yellow centre streaked and splashed with scarlet. Ten long stamens spread and curve from the centre. After the fall of the flowers the soft, green pods make their appearance; soon they become hard and black – long ugly straps hanging amongst the leaves. They remain there throughout the season — even until the flowers of the following year appear.

The long, bipinnate leaves are not unlike those of several other trees — each pinna bearing from twenty to thirty tiny, oblong leaflets, giving a graceful feathery aspect to the tree. Even when the Gul Mohr is flowerless it can easily be recognised by the smooth, grey limbs and the characteristic formation of outward spreading branches and leaves. There is no depth to the foliage; from below there seems to be but one layer of leaves — an umbrella of lace.

Gul Mohrs make excellent light-shade trees, are quick growing up to about 12 m. and are frequently planted in avenues, where, if every tree is about the same height, they form a splendid vista. During the first weeks of flowering such an avenue is a joy to behold, but after some weeks we turn our eyes in relief to the softer pastel shades of the Queens Tree and the Jacaranda. The strident scarlet has begun to pall!

There is some controversy over the meaning of the name of this popular tree. There are those who say the word is Mohr, meaning “peacock”, while Gul is a flower. Others claim that the word is Mohur, a coin. But it is generally agreed that the name Gold Mohur is incorrect. Perhaps the most attractive of its names are those given by the French—*feu de Paradis* and *Flamboyant*. The botanical appellation is in honour of M de Poinci, 17th Century Governor of the Antilles in the West Indies, but the tree is a native of Madagascar, from where trees were taken to Mauritius about 1824. Seeds from these trees were then taken to England and now it is to be found in most tropical countries. It grows readily from seed, although they often take a long time to germinate. As a garden tree its only disadvantages are that the limbs break easily in strong winds and that grass and other plants do not grow well beneath it. Self-sown seedlings can be transplanted easily, even when 2.4 or 3 m. high. In some countries, such as Jamaica and Australia, it has become naturalised and grows well amongst the local flora.

The timber is soft and light and has no other uses than for firewood.

Another species, *Delonix elata*, syn. *Poindana elata*, is sometimes cultivated in India with flowers similar to those of the Gul Mohr but white or cream coloured. There are fine plantations of it in Saurashtra.

Delonix is from the Greek word *delos*, meaning “evident” and *onux*, “a claw” in allusion to the shape of the petals. *Regia* is Latin for “royal”.

FLAME OF THE FOREST

BUTEA MONOSPERMA

Syn. B. frondosa

Fam. Leguminosae. Sub fam. Papilionaceae. Chichra tesu, desuka jhad, dhak, palas, chalcha, kankrei (Hind.); Palashpapra (Urdu); Muthuga (Can.); Palas, polashi (Beng.); Porasum, parasu (Tam.); Muriku, Shamata (Mal); Modugu (Tel.); Khakda (Guj.); Kela (Sinh.); Flame of the Forest, Parrot Tree (Eng.)

THE Flame of the Forest is a medium-sized tree, growing from 6 to 12 m. high, and the trunk is usually crooked and twisted with irregular branches and rough, grey bark. It is seen in all its ugliness in December and January when most of the leaves fall: but from January to March it truly becomes a tree of flame, a lot of orange and vermilion flowers covering the entire crown. These flowers, which are scentless, are massed along the ends of the stalks — dark, velvety green like the cup-shaped calices — and the brilliance of the stiff, bright flowers is shown off to perfection by this deep, contrasting colour. Each flower consists of five petals comprising one standard, two smaller wings and a very curved beak-shaped keel. It is this keel which gives it the name of Parrot Tree. The back-curving petals are covered with fine, silky hair, which, seen at certain angles, change the deep orange to a silvery salmon-pink. The buds and stems, too, have this downy growth, at first dark brown but later acquiring a beautiful mauvish bloom.

The leaves, which appear in April and May, are large and trifoliate. When fresh they are like soft suede; thick, velvety and a beautiful pale, bronze green. Old leaves are as firm and tough as leather, smooth above and hairy below. This silky down gives them a silvery appearance from a distance.

The pods, when young, are pale green, are covered with a dense growth of fine hair and sometimes give the effect of a tree in full leaf. They are pendulous and 7.5 to 10 cm. long. When ripe they become yellow-brown and contain flat, brown seeds.

That the flowers contain much nectar is evidenced by the frequent visits of many species of birds; sunbirds, mynahs and babblers are usually to be seen, hurrying from flower to flower, chattering and twittering. To the lac insect it is a most important tree, providing a plentiful supply of lac. With man, also, the tree is very popular, having numerous uses. From an infusion of the flowers a brilliant colouring matter can be obtained which may be made into water-paint or into a dye. Cotton, prepared with alum, can be dyed a bright yellow or orange.

From the seeds a clear oil is obtained and the gum which exudes from the stems, known as Bengal Kino, is valuable to druggists because of its astringent qualities, and to leather workers because of its tannin. Young roots make a strong fibre which has many uses, the making of rope sandals being one of the most important. The inner bark gives a coarse fibre which is used for caulking boats. The leaves, because of their strength, make a substitute for wrapping paper and are sewn together by poor people to make lates and the bely flowers are popular with all Indian women for adornment of their ir. Buffabes will eat the foliage, but goats, usually so omnivorous, will not touch them.

The wood is dirty white and soft and, being durable under water, is used for well-curbs and water scoops. Good charcoal can be made from it.

The Palas is sacred to the moon and to Brahma and is said to have sprung from the feather of a falcon impregnated with the Soma, the beverage of the Gods, and thus immortalised. It is used in Hindu ceremonies for the blessing of calves to ensure their becoming good milkers. When a Brahmin boy becomes a Sadhu, his head is shaved and he is given a Palas leaf to eat — the trifoliate formatbn representing Vishnu in the middle, Brahma on the left and Shiva on the right. During the thread ceremony he must hold a staff of Palas wood and from the wood also sacred utensils are made. A rare yellow variety of the Flame of the Forest is sometimes found in India.

Butea monosperma is named after the Earl of Bute, a patron on Botany and monosperma, meaning “having one seed”. *Frondosa* means “leafy”. It is a native of India, most common in Central India, and the Western Ghats, but also found in the dry, coal districts of Bengal and Bihar and to some extent in the Uttar Pradesh, the Punjab and east to Burma.



FLAME OF THE FOREST



FLAME OF THE FOREST

ASOKA

SORROWLESS TREE *SARACA INDICA*

Fam. Leguminosae. Sub fam. Coesalpineae. Asok, asoka, vanjulam (Hind), Beng); Asok, ashoka, asogam (Tam.); Diyaratmal (Sinh); Gapis, tengalan (Malay).

THE origin of the name *Saraca indica* is doubtful and it can hardly be claimed to be an improvement on ones a asoka, given by Indian botanists to honour Sir W. Jones “the most enlightened of the sons of men”, who himself expressed the wish that the tree should retain the old Sanskrit name Ashoka.

Indigenous to India, Burma and Malaysia, it is a slow-growing, erect tree, small and evergreen, with a smooth, grey-brown bark. The crown is compact and shapely.

The Ixora-like flowers are usually to be seen throughout the year, but it is from February until May that the profusion of orange and scarlet clusters turns the tree into an object of startling beauty. Pinned closely on to every branch and twig, these clusters consist of numerous, small, long-tubed flowers which open out into four oval lobes, having the appearance of petals but being in fact part of the calyx. Yellow when young, they become orange, then crimson with age and from the effect of the sun’s rays. From a ring at the top of each tube spread several long, half-white, half-crimson, stamens which give a hairy appearance to the flower clusters. These, after sunset, acquire a delicate perfume. In strong contrast to these fiery blooms is the deep-green, shiny foliage. Each of the 30 cm. long leaves has four, five or six pairs of long, wavy-edged leaflets. Young leaves are soft, red and limp and remain pendent even, after attaining full size.

The straight or scimitar shaped pods, stiff, leathery, broad and about 20 cm. are red and fleshy before ripening.

As one would expect from a tree of the country it has many useful medicinal properties. The juice obtained from boiling the bark is a cure for some ailments of women, and a pulp of the blossoms is one of the remedies used for dysentery.

As it is believed that Sakyamuni, the founder of the Buddhist religion and doctrine of Nirvana was bom under an Asoka tree in the 6th Century B.C. the tree is worshipped by all Buddhists. Hindus also revere it because to them it is the symbol of love and dedicated to Kama Deva the god of love, who included an Asoka blossom among the five flowers in his quiver. Sita, wife of Rama, when abducted by the evil Ravana, was kept in a garden among groves of Asoka trees. Both Buddhists and Hindus plant the tree round their temples and the blossoms are among those used for religious offerings.

On Ashok Shasthi day, women from Bengal eat the flower buds, while Hindu ladies believe that by drinking the water in which flowers have lain, they will protect their children from worry and grief.

There is a quaint Indian belief that trees will flower only in places where a woman’s foot has trod and another which asserts that a tree will bloom more vigorously if kicked by a young lady!



SARACA INDICA
(ASOKA)

RED SILK COTTON

BOMBAX MALABARICA

Syn. B. heptaphyllum, Salmalia malabarica

Fam. Malvaceae: Simal, shimal, pagun, semur, kantisemal, ragatsemal (Hind.); Ragtasimal, simal, tula (Beng.); avu, kaddu-olaga, kaddu-parati (Tam); Ilavu (Mal.); Buraga (Tel); Savar (Mar); Katumbu (Sinh); Simur (Malay).

THE Red Silk Cotton, a tall, handsome tree, is found all over India, Sri Lanka, Malaysia and Burma, except in the driest areas, and is particularly common in the Konkan. The straight, ashy trunk is often buttressed to support the heavy crown and the prickly-covered, horizontal branches are usually arranged in twos or threes around the main stem in a whorled formation. When young, the trunk, too, is clothed with stout, conical prickles. Nature's way, probably, of keeping marauding monkeys at bay.

Towards the end of the year, or even as late as the following March in moist localities, the leaves wither and fall, leaving the tree gaunt and naked until, in January or February, small swellings appear on the wrinkled twigs. These quickly develop into strong, heavy buds, pinkish-purple in colour and with a plum-like bloom. The large flowers grow in groups and cling closely to the rugged branchlets. From the short, thick stalk and cup-shaped calyx curl the five broad, fleshy petals, brilliant crimson and glossy. Faint veins etch each petal from base to tip. The conspicuous stamens, more than sixty in number, grow in a wide circle of five unequal bunches and a central bunch of fifteen. They are golden at the base then, merging into red, are tipped with small black anthers. Light scarlet, orange, yellow and even pink flowers are found, all alike in their shining flamboyance. While still fresh the flowers fall to the ground and are often eaten by deer. Village folk too, consider them edible and use the calices in their curries.

No tree attracts birds to quite the extent of the Silk Cotton. There is a constant chatter of bird voices from every tree in bloom. Crows, bulbuls, mynahs, rosy pastors, sunbirds, flower-peckers and many other squabble and jostle for a sip of the delicious nectar. All this activity, of course, means that many flowers are fertilised.

In April, the well-known fruit can be seen, first as big, green fingers pointing in all directions; then later, brown and brittle and split to their base by the bursting, fluffy cotton which, freed from its confinement, floats down to earth, carrying with it the small, black seeds. At this time the tree becomes an odd sight. It appears to be draped with cotton wool and for some distance around the base lie scattered fragments of floss. This is too short, soft and slippery to be spun, but can be made into tinder and is widely used, under the name of Indian Kapok, for stuffing pillows and cushions.

Mocharas, a brown, astringent gum, is obtained from the Silk Cotton and is sold in the bazaars as a tonic. In another form, known as "katira" this gum is used as a substitute for "gum tragacanth" (which is obtained from the genus "astragalus", found in Persia) and is widely used for such purposes as book-binding, thickening ice-cream and cosmetics and also in medicine.

During the monsoon and until the end of the year the Silk Cotton makes a good shade tree, well covered with fresh green, spreading leaves. These are in "hand" formation, each of the three to seven leaflets about 15 cm. in length, oblong, pointed at each end and with the apex point slightly elongated. At this time of the year the tree can be recognised by the horizontal prickly branches and the rather unusual shape of the leaves. The Red Silk Cotton is quite common in West Africa and widely cultivated in tropical countries.

Bombax is from the Greek word Bombax, "a silk-worm" and mafabahca means "from Malabar". The wood, known as Simul, is whitish in colour, soft and light. Not being very durable its main uses are for making packing-cases, coffins and matches. As it has greater durability under water it is also used for dug-out canoes, weil-linings and floats.

A species which is very similar to the Red Silk Cotton and often mistaken for it is *Saimajia instgnis* or *Gossampinus tinstgnts*, also known as Simal or Silk Cotton. The leaflets are narrower and often greater in number and have long, pink stalks and the fruit is larger and angled, the flowers are red, pink or white with petals which are longer and narrower and, most important of all, the stamens are in bundles of fifty or more and completely fill the cup of the corolla. It flowers earlier than the previous tree and is much more common on the line of the Ghats.

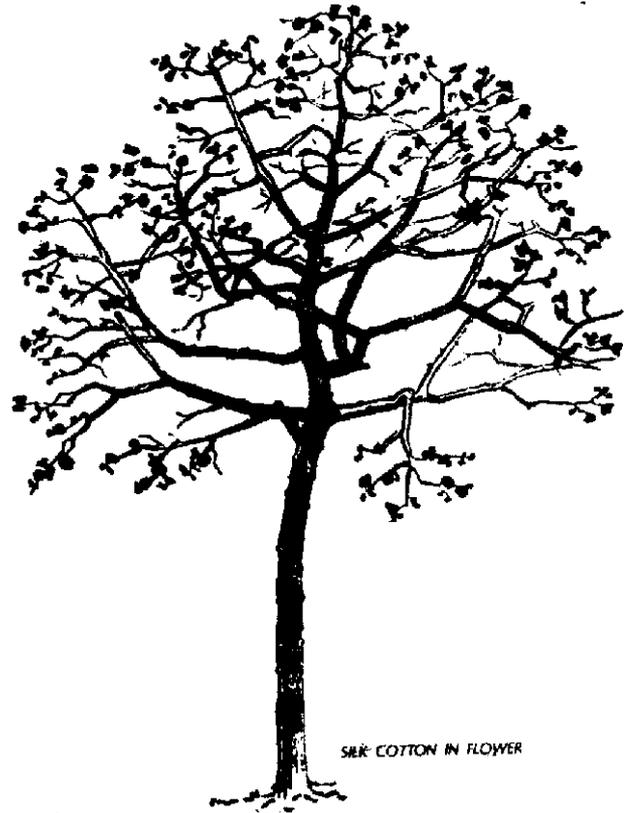
The White Silk Cotton (*Ehodendron anfructuosum* Syn. *Ceiba pentandra*) known as Sated simal and belonging to the same family is similar in leaf and general growth but the flowers, which appear in February, are smaller and a dirty white and hang in clusters. The fruit is filled with masses of wool fibres and is the familiar, commercial Kapok used for pillow and mattress filling. Many lives were saved during the war by the excellent Kapok-filled life-belts provided by all ships. The tree also has many medicinal and economic uses. *Ceiba* is a latinized version of the South American name for Silk Cotton.

The Yellow Silk Cotton or Torchwood Tree (*Cochlospermum gossypium*) and Kumbi in the vernacular, belongs to the Bixaceae family and is entirely distinct from the true Silk Cotton. It is found mostly in dry, hilly districts, thriving in the hottest and stoniest places. It is therefore all the more astonishing that in March, it is able to put forth such a magnificent display of large, polished, yellow blooms. These cluster at the ends of the dark, naked branches — a brilliant contrast! Leaves soon follow flowers and, covering the numerous branches, form a heavy crown. Like the other Silk Cottons, the seeds are

contained in masses of silky floss which, during the May winds, are carried considerable distances. Because of the very inflammable gum, even green and fresh branches burn freely and so are used as torches. *Cochlospermum* is from the Greek *kochlos*, "a snail shell" and *spemia*, "seed", referring to the shape of the seeds.



RED SILK COTTON



RED SILK COTTON IN FLOWER



***LEAVES OF
RED SILK COTTON***

WILD ALMOND

STERCULIA FOETIDA

Fam. Sterculiaceae. Jungli badam (Hind., Beng.); Pinari, illawa (Tam); Pinari (Mal.); Telembu (Sinh.); Kelumpang, kayu lepong (Malay): Wild Almond, Poon Tree, Indian Almond (Eng.)

THERE are many species of *Sterculia*, most of them erect, handsome trees, but having a variety of leaf-shape. The flowers, too, vary; some are large and attractive, others small, even insignificant; some sweet-scented, others strong smelling to the extent of being offensive. With the Silk Cottons, they bloom in the early part of the year, sometimes before the new leaves appear.

The Wild Almond (*Sterculia foetida*) is a tall, straight, noble tree, transcendent in the fresh, full leafage of March and April. It can reach a height of 36 m. a giant among the trees of India. Originally from East Africa to North Australia and countries between, it grows freely down the West of the Peninsula, in Burma and Sri Lanka.

The grey bark is smooth, spotted with brown and faintly ridged. At certain times of the year patches of bark loosen and fall away, which impairs the appearance of the tree. The branches are whorled and usually horizontal, the numerous branchlets gracefully up-curved and crowded at the ends with large, digitate leaves, remind one somewhat of the English Horse-chestnut. The flowers, however, bear no resemblance at all to this tree. Appearing early in February, they form at the knotty ends of the wrinkled old branchlets, immediately beneath the new leaves and spread in drooping sprays as much as 30 cm. in length. The reddish-green stems bear numerous short, branched stalks, each terminating in a crimson-brown flower. The calices, in appearance like petals, of which there are none apparent, are about 2 cm. across, five-sepalled, backcurling and varying in colour from yellow to pale terracotta and to deep crimson and brown. But the main characteristics of these flowers is their incredible stench. Coming across a Wild Almond in bloom one's first thoughts would be that one was near an open sewer and many parts of the tree when bruised or cut emit this rank, unpleasant odour. It is unfortunate as the tree is extremely handsome; tall and straight, its well shaped crown swathed in deep coral, often without a single touch of green, it stands out amongst the surrounding verdure in great beauty and dignity.

The leaves, which spring in groups of about seven from the end of the branchlets, are borne on long stalks and consist of from five to seven 15 cm. leaflets issuing from a central point — a hand-like formation. Young leaves are a rich, pale green, slightly downy and from them a green dye may be obtained.

By March no more flowers are to be seen and the tree is crowned with an abundance of fresh green, drooping leaves. In April the fruit clusters become very conspicuous, looking like odd, dark objects casually thrown into the tree. Each nut is as large as a man's fist, woody and purse-shaped. Usually in pairs, but sometimes four together, they are attached to a pendent stalk and eventually open along a single seam just wide enough for the red seeds to fall out. The colour is green, flushed with red, maturing to a deep, dull red.

Leaves and bark have considerable medicinal value and a gum is obtained from the trunk and branches which resembles "gum tragacanth" and is used for book-binding and similar purposes. Cord is made from the fibre in the bark and the seeds are edible when cooked. The wood is pale, lasting and does not split; it furnishes some of the masts known as "poon spars".

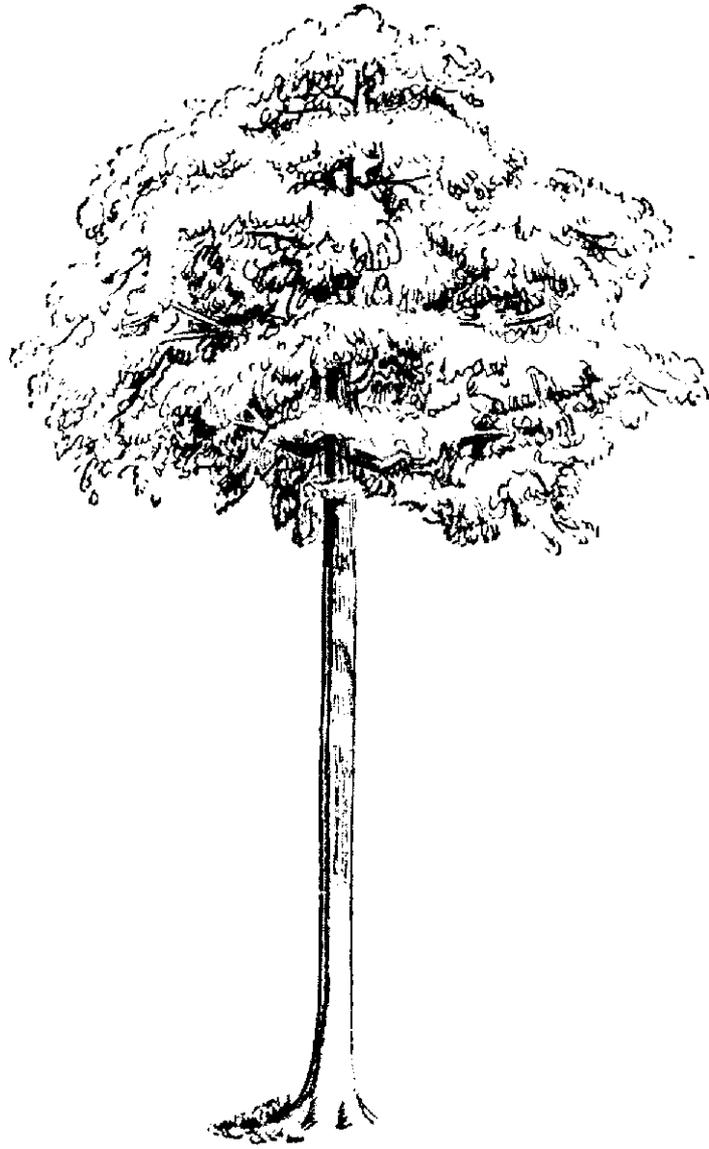
The malodorous nature of the tree is emphasised in its name — *Sterculia* being a word meaning "dung" and *foetida* meaning "stinking"!

S. urens is a fairly common species bearing, in February and March, small greenish-yellow flowers, hirsute and sticky, The leaves are hand-shaped and similar to those of the previous tree, Its vernacular names are Culu (Hind); Kavalam (Tarn.); Jonti (Mal.) and Karai (Mar.)

S. villosa (vilbsa meaning covered in soft hair) flowers at the same time and has long tresses of small, yellow and scarlet blossoms. The fruits are handsome, five or more large, hairy pods at the end of a stem, like a starfish in shape and bright orange-vermilion in colour. The bark is easily stripped and employed in the making of bags and ropes. It makes the common rope used by elephant nutters in the Himalayas and elsewhere. The Hindi name is Udar, Ami and Kavali in Tamil.

Pterygota alata or *Sterculia alata*, is another species, popular for roadside planting and conspicuous when in fruit as the huge, wooden nuts are often more than 15 cm in diameter. The dull green, fragrant flowers appear about March. Its names are Buddha narikella (Beng.) and Anaittondi (Tam, and Mal.)

A fourth species is *Firmiana Colorata* or *Sterculia colorata*, which loses its leaves in the cold season and in March produces on the bare branches numerous, erect or lateral spikes of small, orange-red blossoms and buds. Each flower is only 2.5 cm. long and consists of a rough, serrate-edged tube, from which a long stamen protrudes. The blooms are very popular with birds. The leaves, which appear shortly after, are broadly lobed, each lobe narrowing to a point. The seeds are displayed before ripening as the pink fruit opens out flat — appearing rather like dry leaves. In Tamil it is called Marambarutti and in Malayalam, Maramparatti.



***WILD ALMOND
(JANGLI BADAM)***

JACARANDA

JACARANDA MIMOSAEFOLIA

Syn. *F. ovalifolia*

Fam. Bignoniaceae. jambul merak (Malay); Jacaranda, Palisander, Green Ebony Tree, Tree (Eng.) Fern

IT is difficult to understand why such a beautiful tree as the Jacaranda is not more widely cultivated. It is one of our loveliest garden trees, both the flowers and leaves having a definite charm of their own. In the North-West it has been fairly freely planted as it propagates easily in the sandy-soil, but elsewhere it is all too rare, it is a native of Brazil and its fifty species are widely distributed in the islands of the Caribbean, South America, through to Florida and Mexico. Because of its outstanding beauty it has been introduced into many tropical and sub-tropical countries. It is a handsome tree or medium height — 18m. at the most — with big leaves divided into such tiny segments that the whole has the finely cut appearance of a fern. Each little leaflet is a pointed oblong and, at the end of each pinna is a leaflet slightly larger than the others

The flowering season is from March to May and, unfortunately, does not last very long, but odd trees are often to be found blooming out of season. An avenue of Jacarandas, such as one sees up-country is an unforgettable sight when, from end to end, every tree is swathed in blue. In Bombay the season is extended because one tree will start flowering when its neighbour has finished. Fresh green stems growing from the old wood terminate in large, loose clusters of deep blue-mauve flowers, sometimes as many as ninety in one glorious spray. Each flower is a long, bent, swelling tube, rather the shape of a foxglove flower. It is about 5 cm. long and divides into five unequal! Lobes, two up-curving and smudged with white and the other three large and straight The fruit, which does not appear in anything like the profusion of the flowers, is a round, flat capsule about 5 cm across, bearing numerous seeds.

The Pink Cassias are flowering when the Jacaranda blooms and the two colour side by side make a lovely combination.

In Columbia this tree has medicinal uses, but here it apparently is not sufficiently well established for the herbalists and village doctors to have learnt of its value

The name ovalifolia means “having oval leaves” and mimosaeofolia means ‘having leaves like the Mimosa tree’. The tree described by Mr. Otto Degener in the Journal of The New York Botanical Gardens as *Jacaranda acutefolia* is a different species but similar to our Jacaranda. He says, ‘The acute-leaved Jacaranda has been introduced usually under the wrong scientific name. Even the common name Jacaranda is seldom pronounced correctly. It comes from Brazil, where the literates speak largely Portuguese and in that language the letter “j” is pronounced like the “z” in “azure”, and in this word the last vowel is accented’.

J. obtusifolia var. *rhombifolia*, syn. *J. filicifolia* is another species also round in India. The leaflets are larger and the flowers smaller and they grow in short clusters close to the twigs. As this species will stand a certain amount of damp it will grow where *J. Ovalifolia* would fail to flourish, but it is extremely slow-growing and may take thirty years to, lower, even longer than *ovalifolia*. *Filicifolia* means with leaves like a fern. It is common in the northern countries of South America, in the Caribbean where it is called the Fern Tree.

The wood has a pleasant scent, is often streaked with dull purple and, for carpentry, is considered easy to work and to give a handsome finish. In Egypt it is chiefly used for making pianos.

Propagation is from seed and in the garden the tree looks best planted in small groups and pruned every few years to keep a symmetrical shape. In temperate climates it is often grown in pots for the beauty of the foliage.



JACARANDA

JAVA PLUM

SYZYGIUM CUMINI

Syn. S. jamboiana, Eugenia jambolana

Fam. Myrtaceae. Jaman, jam, kala jam, phalinda, jamni phalani (Hind.); Kalajam, phaunda, paiman, bahojaman (Beng.); Naval (Tam.); Neredu (Tel); Jambhul (Mar.); Madan (Sinh) Jiwat, jambelang, salam (Malay); Java Palm, Indian Allspice (Eng)

THE Java Plum is a tall, handsome tree when grown in suitable localities. Wild, it is found chiefly along river-beds and there it usually has a crooked stem and many branches. It is one of the common evergreen trees of India, Burma, Sri Lanka and Malaysia except in the very arid districts and is grown for its shade and for the astringent fruit which is very palatable in tarts and puddings. In Mahabaleshwar it is common, but there appears like most of the other trees, gnarled and stunted. In South India it grows in all forest districts up to 1800 m.

The bark is rough and light grey, with large patches of darker grey and shallow depressions where bark has peeled off. The elegance of a well-grown tree is provided by the sweeping branches and large, smooth leaves, most of which are pendent.

From March to May the inconspicuous, whitish flowers are to be seen. They grow in open, stemmed clusters from small side stems usually below the leaves, and for this reason are not apparent to a casual observer. Each tiny fragrant flower is like two little caps closed against each other. One is the calyx which remains and the other the petals, which are in one piece instead of divided. The upper "cap" falls, releasing a bunch of stamens which spread out over the edge of the calyx "cap". The little plums are pink and green at first, but purple-black when ripe. There are several varieties varying in size up to 3.8 cm. some being very sweet and pleasant in flavour, others small and astringent. Each contains one seed set in reddish pulp which darkens the lips and tongue.

The leaves grow opposite, on 2.5 cm. stalks. They are oval, terminating in a slight point, very smooth and closely veined. These veins have a characteristic pattern. Running obliquely from the centre rib, most of them join up with a wavy, marginal rib. Leaves, as also the fruit, vary with different trees; the average length of a leaf being 7.5 cm. When new and for some weeks following, the leaves, which form a dense crown, are a fresh, clear green, but older ones are a deeper colour. Crushed, the leaves have a definite smell of turpentine.

The Java Plum is sacred to Krishna and to Ganesh the Elephant God and is therefore often planted near Hindu temples. Buddhists, too, venerate this tree. The wood is sufficiently hard and durable to be used for making carts and implements and also for building. It makes good fuel too. From the juice of ripe fruit a spiritous liquor is distilled and from this vinegar is made. It is one of the trees on which the "tasar" silkworm is fed. The bark has been used in dyeing and tanning and is employed in medicine as a specific for dysentery. From the unripe fruit also, a remedy for this complaint is decocted.

Syzygium is from the Greek *suzugos*, meaning "paired" and *Eugenia* honours Prince Eugene or Savoy who was a patron of Botany in the 17th Century, *jambolana* is from the Portuguese name of the tree.



**JAVA PLUM
JAMUN**

NIM

AZADIRACTATA INDICA, Syn, Me lia azadiracthta

Fam. Meliaceae. Nim, balnimb, nind (Hind.); Nim, nimgach fBeng.J; Bevu (Can.); Vepa (Tel.); Vepe (Mal.); Vepa vempu (Tam); Nimbay (Mar.); Kohomba (Sinh.); Sadu, intaran (Malay); Nim or Margosa Tree (Eng.)

FAMILIAR to most people for its medicinal properties the Nim is recognised by few, in spite of its distinctive leaves and annual profusion of sweet-scented flowers. It is a medium-sized or large tree with a straight trunk, elegant in form and ever-green, a native of India; Malaysia, Burma and Sri Lanka, thriving best in the dry zones.

The flowers, which appear from March to May, are tiny stars borne in great number on long, drooping stems which spring from the axils of the leaves. The five whitish petals surround a yellow funnel which contains the stamens and the style. Bees and other insects are attracted by the pollen and buzzing swarms can usually be seen hovering round the tree all through the flowering season. Later when the fruit is ripe the tree is visited by numerous birds.

The long, pendent leaves, crowded near the ends of the branches, bear up to twenty-nine or thirty-one curiously shaped leaflets. Each about 7.5 cm. long, they are deeply serrated, sharply pointed and curved like a scythe. Their fresh, green colour and shining surface give the tree a delicate and charming appearance and during the monsoon when the flowers have fallen and the tree is in full foliage, the curved, toothed leaves, massed round the branches, have a distinctive appearance easy to recognise. Young leaves are a pale, tender green, tinted with rust. These are eaten on the Hindus' New Year's Day to ward off sickness during the coming year. Hindus, to whom the tree is sacred, also festoon fresh leaves across their houses when there is an epidemic of small-pox, or to keep evil spirits away when there is a birth or death. The so-called Sweet Nim (vern. Mitha-nim) is *Murraya kcenigii*. Its leaves are the flavouring ingredient of Mulligitaway soup and are much used by Indians in chutneys, curries etc. These leaves somewhat resemble those of the Nim, hence the vernacular name, but the plant belongs to a different family. The flowers are borne in broad, erect cluster followed by purplish-black berries about 2.5 cm. long.

Dried leaves (in a bag or envelope for convenience) put in drawers and cupboards keep out moths, cockroaches, etc. Another use for these "magic" leaves is in poultice form when they are employed to heal festered wounds.

From the yellow fruit, the size of a small olive, is obtained the famous Margosa oil which is so effective in the treatment of leprosy and skin diseases. Leaves and fruit are both vermifugal and the latter is used as a purgative. External application of oil from the seeds is believed to cure rheumatism and it also has antiseptic properties. Bark and gum yield valuable medicines, in fact practically every part of this fine tree is of value. There is a legend concerning the powerful medicinal attributes of the Nim. A woman, whose husband was about to set out on a voyage, wished to ensure his early return. She consulted a medical man who told her she must advise her husband to sleep under a Tamarind tree every night of the outward journey and under a Nim tree every night of the homeward journey. This he agreed to do. The Tamarind is reputed to exude unhealthy, acid vapours so, before many days, the unfortunate man found himself too sick to continue his travels. He returned back and the healing power of the Nim trees under which he then slept each night, worked to such effect that by the time he reached home his sickness was cured. Nim timber somewhat resembles mahogany. It is beautifully mottled, hard and heavy and is used for ship-building, cart and Furniture making and has numerous other uses. Wood from old trees is so bitter that no insects will attack it.

Azadirachta is from the Persian name of *Melia azedarach*, to which the Nim is allied, *Indica* means "Indian".



**NIM TREES
MARGOSA**

TEAK TREE

TECTONA GRANDIS

Fam. Verbenaceae. Takku (Sinh.); Kyun (Burmese); Satgun (Hind., Beng.); Tek, teaku-maram (Tam.); Chek (Mal.); Teaku (Sinh.); Jati (Malay.); Teak Tree, Indian Oak (Eng.)

THERE can be few who have not heard of the Teak Tree, but there are many who have no knowledge of its appearance and are unaware of the numerous localities in which it appears.

It is a lofty tree, handsome when in flower, usually found in detached clumps and growing best by the sides of rivers. Many are as much as 45 m. high, but they take sixty to eighty years to reach maturity. The bark is ash coloured and scaly. For the greater part of the year the Teak is ugly as the huge leaves are nearly all eaten by a certain type of insect which leaves only the skeletons and, during the dry season, every leaf falls, forming a crisp carpet on the ground beneath. But from June until September, when every tree in a clump is in fresh, new leaf and crowned with a haze of blossom, they are a really splendid sight.

Large and strong, the leaves grow in pairs, each pair being crosswise to the next. Underneath, they are like soft felt, banded by hard brown cords, above they have the texture of fine sandpaper and, when reduced by insects to skeletons the beautiful net-work of veins can be studied. In young trees the leaves are even larger — sometimes as much as 60-cm. long.

Overtopping the foliage, the huge pyramids of flowers are many times sub-divided and, like the leaves, the branchlets are in pairs and alternate in direction; they bear innumerable, minute, round buds and tiny, white flowers. Each white, scented flower is five or six-petalled and sits in a wee, round calyx, but out of the millions which appear only a few are fertile. Those few, about September, turn into small, green Chinese lanterns which eventually increase in size until they are about 2.5 cm. across. They are papery and crumpled and much too large a covering for the small, furry nut inside. Except for the fact that many of the leaves are getting eaten and torn, the Teak now looks very handsome. The lacy pattern of the numerous flower stalks dotted with bright green balls is extremely decorative. So large are the flower spikes and leaves and so tiny the flowers that no small illustration would be of any help in identifying this tree.

The Teak is a native of India and Burma and is extensively cultivated in the North and also in Sri Lanka, Siam, Malaysia and Indonesia because of its great value as timber, and tends to naturalise in suitable ones yet there are many parts of these countries where the tree will grow but not produce timber of any commercial value. The wood is very heavy, strong and durable, resists white-ants and contains an oil with strong and characteristic scent which preserves the timber and also the nails which are driven into it. It is expensive except where plentiful and is widely used for furniture, houses and ships. It is a tree which needs plenty of space; crowded, it strives upwards towards the light, achieving only height, but, given plenty of space and good drainage, it attains great girth and strength. The blood-red sap of the leaves can be used as a fabric dye. In emergencies the leaves themselves can be plates, umbrellas or thatch. As can be expected from such a widely grown tree, many parts of it have numerous medicinal uses, The wood can be used to alleviate headaches, dyspepsia and stomach complaints. As ashes it is, said to improve the sight. From the bark and also from the flowers a concoction is prepared which relieves bronchitis.

Tectona and Teak are both derived from the Portuguese name teca, which is from the Greek tekton “a carpenter”. Grandis, in Latin, means “large”.



**YOUNG TEAK
IN FLOWER**

TEAK LEAVES

TEMPLE TREE

PLUMERIA KUBRA Syn. *P. incarnate*

Fam. Apocynaceae. Gulachin, gobur champ, chameli, golanchi (Hind.); Khairchampa, sonchampa, gutachin, champa (Bom.); Ilattelari, kallimandarai, perungalli (Tam); Arhataganneru, nuruvarahalu (Tel.); Arali, vellachampakam (Mal.); Avariya (Sinh.); Dalana phul, gorurchampa (Beng.); Chempaka, bungorkubor (Malay); Jasmine Tree, Dead Man's Flower, Life Tree, Frangipani, Crimson Temple Tree, Pagoda Tree (Eng.)

PERHAPS the most familiar and extensively grown of all our trees, the exotic-flowered, many-named Temple Tree is in itself no thing of abundant beauty. It claims affection however for its sweet-scented flowers which, nearly throughout the year, open, bloom and fall to lie immaculate on the earth beneath. To both Buddhists and Mohammedans the tree is an emblem of immortality because of its extraordinary power of producing leaves and flowers after it has been lifted from the soil. For this reason it is frequently planted near temples and in graveyards, where daily the fresh, creamy blooms fall upon the tombs. Hindus make use of the flowers in worship and they are frequently given as votive offerings to the gods.

It is a low, spreading tree, or large bush, seldom attaining more than 6 m. in height. Although rarely without flowers, it is leafless from December until the rains and, beautiful though the flowers may be, they cannot conceal the ugliness of the pale, swollen limbs. Young trees do not lose their leaves and so remain attractive throughout the year. An injury to any part of the tree causes a copious flow of white, latex-like juice and this characteristic has given rise to many local names. The Sanskrit name *Kashira-champa* means "milky champa".

The grey bark is smooth but scaly and the branches hardly taper at all; flower-bearing branchlets even thicken towards their extremity. From the ends of these branchlets polished, rose-tinted stems arise, fleshy but brittle. These divide like spokes and each spoke terminates in a crowded group of buds, the whole forming a flat-topped cluster from which the buds develop, lengthen and open in succession over a period of several weeks. Each funnel-shaped flower is about 5 cm. across, its five overlapping petals broadly oval with one margin curled under. The stamens are not visible being deeply inserted in the corollary tube. The waxy petals are mainly white with a deep yellow throat but the outer sides are tinged with pink. A fairly common variety, illustrated here, has dark crimson buds and petals which are half pink and half white underneath. Above they are pink when newly opened but change to white, the rim only remaining pink. The throat is a very brilliant yellow. This is *P. rubra* var. *tricolor*.

The distinctive leaves, up to 30 cm. in length, grow stiffly in crowded spirals at the ends of the branches. They are smooth and narrow, tapering more at the stem end than at the apex. Parallel, horizontal veins run from the mid-rib to a scalloped border vein and the margins tend to roll under.

There are many uses to which this tree is put. The milky sap is used as a counter irritant for rheumatism and, in conjunction with sandalwood oil and camphor, is a cure for itch. In different parts of the world the bark has different medicinal uses; it relieves fevers, heals sores, in plaster form reduces tumours and is a powerful purgative - dangerous if given in over large doses. The heated leaves relieve swellings and the flower buds, together with betel leaves, make a good febrifuge. The tree is too small to have much timber value but the yellow-brown wood is easily worked and a polish brings up the faint, dull-red markings.

Cuttings up to 60 cm. strike easily if allowed to wilt and dry out for a few days prior to planting. Quite large trees do not resent being transplanted if the work is done during the cold season.

Although some of the local names of the Temple Tree might indicate that it is a Chinese species, *gulachin* for instance meaning "Flower of China", it is, in fact, a native of Jamaica, Mexico and Equador. The 17th Century French botanist and ecclesiastic Charles Plumier gave the tree its generic name and there are literally hundreds of provincial names throughout the tropical areas where it has become so popular.

Plumelia rubra forma *rubra* (syn. *P. r. typica*) shares most of these names but it is also called the Red Frangipani and Red Jasmine. It is a smaller tree than the preceding species with leaves not more than 22.5 cm. long. The predominantly red flowers have glowing yellow centres and rise from downy, red stalks. They also have the typical intoxicating perfume but it is less overpowering.

Plumeria rubra forma *acutifolia* (syn. *P. acuminata*) is the species with yellow-throated white flowers and long, smooth leaves.

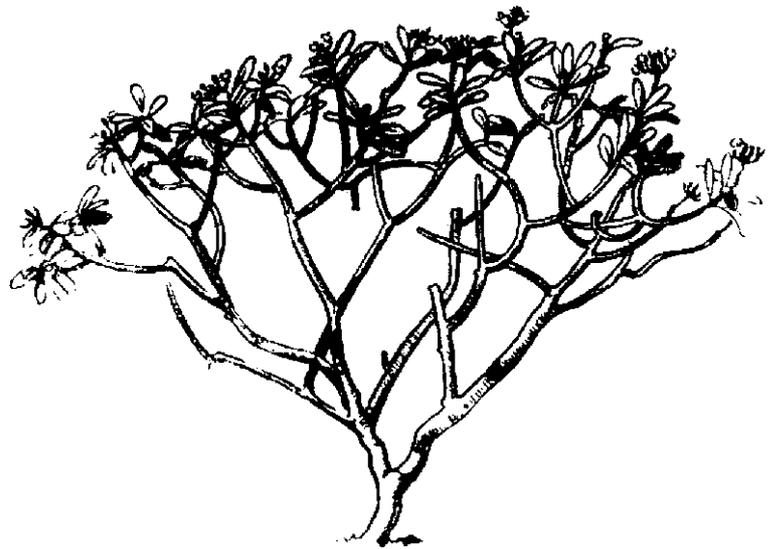
Plumeria alba, a native of the West Indies, has yellow-eyed, white flowers and long leaves which do not have the typical marginal vein. Stems and buds are greenish white with no hint of red.

Plumeria obtusa is an evergreen species with large, dark leaves, blunt ended and with margins tending to roll under. The pure white flowers are much larger than any of the other species described and less funnel-shaped. The more broadly oval petals are not so noticeably overlapping and are gently recurved, forming a handsome, rounded blossom. The clusters can be enormous and crowded with up to twenty flowers. A variety, also with large, white flowers, has narrower petals and a hint of yellow in the throat.

Species of *Plumeria* are notoriously variable in many of their characteristics and as numerous hybrids and varieties have appeared during the years it has been a popular garden tree; separating the botanical species is fraught with difficulties. Hence one finds that while one author may recognise sixty-six species, another reduces them all to seven and claims that the rest are merely varieties and hybrids.

Frangipani is undoubtedly the commonest name for all these trees, being associated with the very distinctive perfume. Four centuries before the discovery of the Western Hemisphere and of the trees growing there an Italian nobleman, by combining a number of volatile oils, produced a heady perfume which became, and remained, a favourite with the noble ladies of Europe. This easily recognisable scent was at once recalled by the early settlers in the Caribbean when they found trees with the same fragrance. So they called them “Frangipani”, the name of the Italian nobleman. But there is a second explanation of the name. The French settlers, finding that a wounded tree produced a flow of milky sap called it “Frangipanier” which means “coagulated milk”.

The meanings of the Latin names are *acutifolia* “with pointed leaves”, *acuminata* “long pointed”, *rubra* “red” and *alba* “white”.



TEMPLE TREE IN FLOWER

BAOBAB

ADANSONIA SUAREZENSIS, Syn. *A. digitate*

Fam. Malvaceae. Gorak amlī, goram lichora (Hind.); Gorak chinch (Guj); Papparapulia, perruka (Tam.); Alihagaha (Sinh.); Baobab, Monkey-Bread Tree (Eng.)

THIS is indeed a most remarkably shaped tree. It is not common in India but the sight of even one cannot fail to arouse interest and curiosity. It is only of medium height but the girth at the base, which is buttressed, is enormous - 33 m. having been recorded. This huge, swollen trunk tapers suddenly and sends out several thick, horizontal tranches. In summer, when in full foliage, it has the appearance of a giant mushroom. A native of Madagascar, it came to us originally from Central Africa and is now naturalised and thrives well in parts of Australia and other dry, desert areas. Not only is it one of the most fantastic looking trees but it is also one of the longest lived — in spite of the fact that it grows quickly. Adanson, the 18th Century French botanist who published a book on the families of plants after whom it was named claims 5,000 years for some he knew in Africa. The name Gora

c chinch is in memory of the monk Corak who is said to have taught his disciples under the shade of one of these trees.

The leaves are large and smooth and described as digitate — five leaflets radiating from a central point. At the beginning of the year they fall, leaving a gaunt, grey skeleton; new leaves sprout in spring just before the buds start making an appearance. These are very large and hang like balls of pale-green suede before the creamy white petals burst open. It is a massive flower; from the back curving petals emerges a white staminal column which opens out into a gold-tipped puff. These handsome blooms appear at midnight during July, wilting by mid-morning.

The white, gourd-like fruit has a spongy, acid pulp, containing many blackish, kidney-shaped seeds, surrounded by tough fibres. This pulp is mealy and edible and from it is made a cooling drink which promotes perspiration and alleviates fevers. Adanson found this fruit a great preservative against epidemic fevers, as it tempers the heat of the blood. From it also are made preparations for soothing irritation, curing scurvy and relieving stomach complaints. Gujarat fishermen use the gourds as floats for their nets and monks dry the shells to serve as water pots. The leaves are eaten and from the bark an extremely strong rope is made. Negroes have many uses for the baobab, including the rather gruesome one of burying their dead in the hollow trunks of old trees and the remarkable fact is that the bodies become dry without the process of embalming. Up to 450 litres of water has been found in the hollowed-out trunk of an ageing tree. This capacity of storing water is no doubt the reason why the tree can survive drought.

The timber is useless except for raft making as the wood is spongy. Poor people sometimes excavate the trunks of living trees to form homes for themselves.

Its rapid growth, valuable fruit and fibres, should make its extensive cultivation profitable, but so far this has not been done successfully.



BAOBAB
GORAKH CHINCH

MOUNTAIN EBONY

BAUHINIA VARIEGATA

Fam. Leguminosae. Sub fam. Coesalpinieae. Kachnar, kolar, padrian, gurial, gwiar, kurai, kandan (Hind.); Kanchan, rakta kamhar (Beng.); Segapu-manchori, manthari (Tam.); Kanchivala (Can.); Kovidaram (Mal.); Mandari (Tel.); Petan (Sinh.); Akbar tapak kerbau, kupu-kupu (Malay); Mountain Ebony, Variegated Bauhinia, Orchid Tree (Eng.)

DURING the time of writing this book I returned to England by plane and took the opportunity of the break in the journey at Cairo to visit the well-known Gazirah Club Edging the golf course of the club was a glorious sweep of glowing purple. Even before I was near enough to identify the trees, the rich, heady perfume which filled the air told me they were Bauhinias. The sight left me breathless and it was then I realised how difficult was the attempt I was making to describe in mere words the trees. I know better how to paint.

There are many species of Bauhinia, several indigenous to India, but the commonest are *B. variegata*, *B. purpurea*, *B. tomentosa*, *B. racemosa*, *B. monandra* and *B. acuminata*. They all have two points in common. One is the splash of colour on one or more of the petals and the other is the united, twin-kidney formation of the leaves. The name Bauhinia was given as this formation suggested the 16th Century herbalists Jan and Caspar Bauhin who were twin-brothers. The Mountain Ebony in my opinion is one of the loveliest of Indian trees. It is a medium-sized tree in this country, reaching a height of 9 to 10 m. but in many other tropical countries where it is cultivated it is considered to be mature at 3.5 or 4.5 m. The bark is dark brown and fairly smooth. The leaves fall during the cold season and at the same time the large, sweetly-scented flowers appear. Some trees have been noted which retain their leaves on a few of the branches but on such trees the flower sprays are borne only on the leafless branches.

The large flowers grow in short sprays bearing two or three blooms, either from the ends of the branches or from the axils of the leaves. Their curved petals emerge from brown, ribbed calices which split and bend as the pointed bud protrudes. These, as also the buds and stems, are covered with a fine, silver down. Five long, arched stamens, terminating in large anthers, are surrounded by long, pointed petals, narrowing at the base. Each petal is delicately veined and one or two are smudged at the base with a deeper colour. The flowers may be magenta, mauve, pink or white, the former three having crimson markings, the latter a striking yellow splash on one or more of the petals. The long, narrow pods are often as much as 30 cm. in length and contain ten to fifteen seeds. These ripen in May and June after the flowering season is over. When dry the unequal contraction of the curved edges causes the pod to burst and scatter the seeds with a considerable force. Young pods, also leaves and buds, are utilised as vegetables and the buds are pickled.

The leaves are from 7.5 to 15 cm. long and as broad, are cleft at the apex, forming two rounded lobes and grow alternately along the twigs on 2.5 cm. stalks. From the base, the veins spread out fan-wise and the leaf is more or less folded along the centre rib. The tree yields a useful gum and from the seeds an oil is obtained. The wrappings of bidis are made from the leaves and the bark is used for tanning and dyeing, also as fibres. The timber is good, reddish-brown, heavy and very hard, hence the name Mountain Ebony. The heart-wood has a fine texture and takes a good polish, yet it is rarely used for anything but agricultural implements and firewood This is one of the species found in China.

The Purple Bauhinia, Geranium Tree or Butterfly Tree (*B. purpurea* Syn. *B. triandrus*) is similar in appearance to the Mountain Ebony but the flowers are mauve, lilac and deep rose or whitish in appearance. The leaves of this tree also fall during the cold season, but briefly so that the tree is almost evergreen. The flowers do not appear, until September and by December the long, greenish-purple pods can be seen like french beans among the foliage. Later, when the leaves are either withered or fallen, the hanging pods give the tree a drooping, dejected appearance. The flowers are five petalled, clawed or pointed, smaller and narrower than those of the Mountain Ebony not overlapping and streaked with a brighter colour. Sometimes the base of one petal is white. The buds are more winged than ribbed, dark green or brown and downy, and when the flower opens, the calyx splits into two sections, one, having two wings and the other three. The underground roots of the Purple Bauhinia have been found to be extremely poisonous, but the bark of the stems is used as a cure for diarrhoea. Both are sometimes used for tanning and dyeing and making fibre. The leaves are given to cattle as fodder. This tree, a native of the Himalayan foot-hills, is more often seen growing wild than the Variegated Bauhinia which is usually seen in gardens. The vernacular names are Cairal, Katiar, Kachnar (Hind.); Koiral, Rakta kanchan, Deva kamhan (Beng). Kanchanam (Tel); Mandari (Tam.).

The Yellow Bauhinia, Bell Bauhinia or St. Thomas's Tree (*B. tomentosa*) from Sri Lanka and tropical Africa and now naturalised in the West Indies grows only to 3 m. and bears showy, yellow flowers blotched with dull maroon at the base. As they fade the colour changes to a more coppery yellow. This tree is often found near Hindu temples and on Dassera Day it is worshipped, the leaves are stripped and, after incantations have been repeated over them, they are distributed as tokens for gold. Its names are Tiruivatti (Tam.); Kanchini (Tel.); Sona (Mar.); Kahapetan (Sinh).

B. racemosa, Apta in Bombay, Archi, atti (Tam.) and Are (Tel.) is also quite common. It is more bush-like with drooping branches, leaves that are broader than long and small yellow flowers in loose racemes. It can also be found in the Malay Peninsula. The leaves are used as wrappers for bidis. *B. monandra*, the Butterfly Flower or Jerusalem Date grows to 6 m. and has one stamened, pale pink flowers marked with purple in terminal racemes. It is quite common and blooms practically throughout the year. It grows in Burma, China and the Malaysia Peninsula and has become naturalised in tropical parts of America.

B. acuminata, known as the Dwarf White Bauhinia is a 3 m. shrub with leaves lobed less than half way. The 10 cm. flowers have broad, white petals. Other varieties are also small shrubs, still others extensive climbers; some have tiny, cup-shaped flowers; some bear long, narrow leaves, some broad some short but the flowers are always perfumed and the leaves always cleft in the characteristic Bauhinia manner.



***VARIEGATED BAUHINIA AND
PURPLE BAUHINIA***

CORAL TREE

ERYTHRINA INDICA,

Syn. E. variegata

Fam. Leguminosae. Sub fam. Papilionaceae. Mandara, panjira, dholdhak, pangri, pharad, dadap (Hind.); Haluvana (Can.); Kalyana murungai, maruka, mulu murungu (Tam.); Palita mundar, rakta madar (Beng.); Mandaram, murikku, nimbataru (Mal.); Katueramadu, erabadu (Sinh.); Dedap (Malay).

THE Coral Tree shown here is one of several varieties of *Erythrina*, more than one of which are referred to as the Coral Tree; but this is the tree so familiar to us from January to March when the thick, angular spikes of rich, red blooms make their striking appearance amongst the naked branches. It is one of India's own trees, growing wild along the coasts and in some inland districts of deciduous forests, but elsewhere it has escaped from widespread cultivation and grows self-sown. It is a large tree, elegant in form and handsome throughout the year, even during its leafless period. In some parts of India this *Erythrina* never grows more than 7.5 m. but elsewhere 18 m. is often attained and because it flowers when only 3 or 4 m. high it is deservedly popular as a garden or park plant.

The Silk Cotton Tree (*Bombax malabarica*) blooms at the same time as the Coral Tree and usually in the same localities and the two are often confused by casual observers. However, a few points of difference serve to distinguish the two without much difficulty. Both bear red flowers on bare branches but those of the Coral are a deeper colour and in stemmed, diminishing spikes, as against the large bright red or pinkish blooms of the Silk Cotton which grow solitary, directly from the branchlets. Both trees are armed with conical prickles on trunk and branches but the bark of the Coral is smooth and curiously streaked with vertical lines of green, buff, grey and white. The last and most important point of distinction is in the branch formation; the branches of the Coral rise obliquely from the trunk while those of the Silk Cotton grow in whorls and are almost at right angles to the main stem. With these few points in mind it should be possible to differentiate between the two trees at any distance.

The branchlets of the Coral Tree are grey, gnarled and rugged, but the flower stems which radiate from their ends are, in contrast, glossily smooth and a deep red in colour. The numerous whorls of flowers and buds encircle a good 22 or 25 cm. of the stem, and are of an unusual formation. A brownish sheath enfolds the unopened flower allowing the points of two of its five segments to extend like comical "ears"; the sheath then splits down the back and the five red petals emerge. One is an erect "standard", oblong and pointed and narrowing at the base; two are small "wings" and the remaining two are similar in size but a deep crimson in colour and known as "keel" petals. These four small petals are partially enfolded by the base of the "standard". A long bunch of red stamens protrudes from between the "keels". The flowers have no scent, but that makes them no less popular among birds. A Coral Tree in full bloom is always like an aviary. Crows, mynahs, rosy-pastors, babblers and parakeets, as well as numerous bees and wasps swarm round the tree in noisy eagerness. By their love of the nectar the flowers become fertilised.

Very soon after flowering the big pods begin to form. They are green at first, later turning black; their 15 to 30 cm. of length may contain up to a dozen smooth, brown, red or purple egg-shaped seeds. Between each seed the pod is constricted and the whole is curved and pointed.

Some.- Coral Trees, particularly young ones, do not lose all their leaves before flowering; others attain a new leaf growth whilst the tree is still in flower. The leaves are large and composed of three broad leaflets, each on a short stem, the end one being the largest.

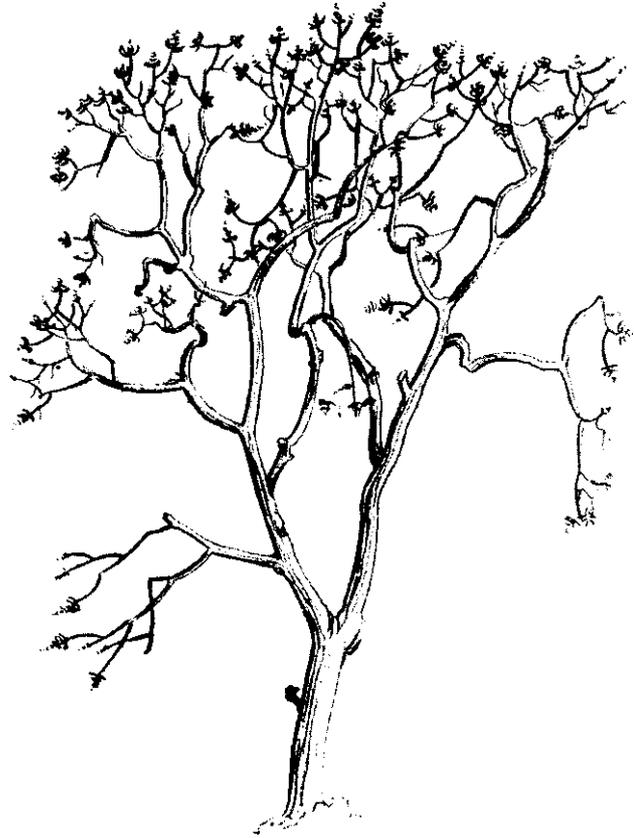
The country people of India have turned to their own account Nature's forethought in arming this tree against the depredations of cattle and other animals and plant it as a hedge around cultivated gardens. Cuttings stuck in the ground where they are to remain root quickly, so a hedge can be very easily grown. It is also widely used as a support of peppers and grape vines, its qualifications for this position being in its quick growth and suitable bark. More important is the fact that, during the hottest months, the crowded foliage gives deep shade to the vines and keeps them moist; when the days become cool all the leaves fall and the vines receive the sun they need.

New leaves are eaten in curries and mature leaves make good cattle fodder. The wood is light and soft but quite durable and neither splits nor warps so is useful for purposes where heavy woods would be unsuitable, such as small, carved articles. A red dye can be obtained from the flowers.

The Coral Tree comes into Indian legends and it is supposed to have been grown in Indra's garden, from where Krishna stole the flowers. Then Rukhmini and Satyabhama quarrelled for the possession of the precious blooms.

There are a large number of species of *Erythrina* most of them remarkable for their brilliant red flowers, borne during the leafless period of the tree. The common species on the Ghats is *E. stricta*, which is very similar to *E. variegata* but for small differences in the calyx. In the hills of South India *E. subumbrans*, *Syn. E. lithosperma*, known as Dadap is widely used as a shade tree on tea estates. It is thornless, almost evergreen and a very rapid grower, 15 m. and the large quantity of foliage it produces are used for mulching and green-manuring. The leaves are similar to those of *E. variegata*, being composed

of three broad leaflets on a long stem, but the flowers appearing with the foliage, in red, scarlet or orange, are smaller and less showy and the buds, although also in whorls, protrude from the stem at various angles. Buds from different whorls may open at the same time and the two-lipped calyces are velvety in texture. The 10 to 12 cm. fruits are sterile in the lower part but carry two black seeds in the upper part It r also found in Java and the Philippines. The name Erythros, meaning “red”, refers to tricolour of the blooms. Of *Erythrina variegata* there are also several varieties including a white one - actually the flowers are a dirty, translucent white and not at all attractive but the “standard”, wing and keel” formation of the flowers of all the species makes identification reasonably easy.



CORAL TREE IN FLOWER

QUEEN'S FLOWER

LAGERSTROMIA SPECIOSA

Syn. L. flos-reginae

Fam. Lythraceae. Arjuna, jarul (Hind.); Jarul (Beng.); Kadali, pumarathu (Tam.); Atampu, chemmaruta, katalpu (Mal.); Lendi (Mar.); Murutu (Sinh.); Taman (Vern.); Bongor raya, sekokok (Malay.); Queen's Crepe Myrtle, Pride of India (Eng.)

THE period of leaf-fall when, among the blackened nuts and ragged dusty leaves are revealed the short knotty bole and big twisted branches is worth enduring for the beautiful sight of the Queen's Flower in bloom. Flowers and new leaves appear in April, mantling the tree with a rich cloak of clean, delicate colours. Blooming right through the hot season until July, it is deservedly popular in gardens and villages. In many other countries it is cultivated, mostly for its beauty as a garden tree. In North Australia, South China, the Philippine Islands, Central and South America and in the many islands of the Caribbean it can be found, growing in a wide variety of soils and conditions. But the true home of this fine tree is in the damp jungles of Assam and Burma, of Sri Lanka and Travancore, in swamps and along the river banks. Here it grows tall and straight, a handsome tree, providing excellent and valuable timber. In full bloom the pale greens and variegated clusters of flowers stand out in sharp relief against the dense darkness of the jungle.

The smooth bark is grey, patched with buff and cream. The tree is deciduous but leaf-fall is gradual so that it is rarely quite bare. In the hot season the big upstanding pyramids of flowers appear; they vary on different trees, some being purple, some mauve, some a lovely pinky-mauve, others a definite pink. There is also a white variety. New flowers are a deep tone, old ones fade almost to white and the various shades interspersed along the sprays give them a delightful appearance. The buds at the end are a soft bluey-green, often tinged with pink and the ridged sepals make them look like velvet urns. Inside, the six or seven sepals are a very pale green and are revealed between the narrow bases of the petals. These petals are very crumpled and wrinkled, giving the tree its alternative name of Crepe Flower. There are either six or seven petals and the whole flower measures some 6.3 cm. across. Yellow dotted stamens and a long style radiate from the centre. At the end of the flowering season the numerous fruits form, sitting like little green crab apples in the withered calices. Later they turn black and often remain on the tree for a long time, even through the next flowering and fruiting season.

The leaves grow alternately or sometimes nearly in pairs and in all directions the branches. They are bright green, paler below and heavily veined on the underside. Each is a smooth, pointed oval from 12.5 to 20 cm. long and grows from a short stalk. Before they fall in the cold season they sometimes turn an attractive coppery shade and if not already disfigured by the ravages of insects, lend the tree a temporary charm.

Second only in importance to the Teak, the timber of Queen's Flower is of great value. Tough and strong it can resist the effects of salt water and sea air for many years and so it is used for wharf posts, boats, casks, etc. And because of the fine polish it will take the timber is exported and used for panelling and furniture. Among the country people it has many medicinal uses. The roots are astringent, the seeds narcotic, the bark and leaves a purgative. But it is chiefly for decoration that this handsome tree is planted so widely.

Lagerstroemia indica (Indian Lilac or Crepe Myrtle), originally from China, is a large shrub, or small tree in suitable climates. It is very ornamental from May to August with its sprays of delicate fringed flowers each about 5 cm. across, which may be pink, rose, mauve or white. It is a deciduous shrub and has leaves about 5 cm. long. In very warm climates as of Malaysia regular pruning will ensure free flowering. A hybrid called *Lancasteri* is an extremely beautiful shrub with large flowers in a charming shade of lilac. The tree was named by Linnaeus in the 18th century for his friend the Swedish merchant Mannus von Lagerstrom.



QUEEN'S FLOWER

PINK CASSIAS

CASSIA GRANDIS

Fam. Leguminosae, Sub fam. Caesalpineae, Pu vakai (Tam); Konna (Mal.), Wesak gas (Sinh.); Horse Cassia, Pink Shower (Eng.)

IN delicate contrast to the vivid hues of our other spring flowering trees, the Pink Cassias, with their lovely cool shades of pinks, greens and white, are a beautiful and restful sight. No one could fail to be moved by the glory of a Cassia in full bloom when its long, sweeping branches are laden with blossom. Each of the five varieties has its own individual, almost indescribable charm. At a glance it is difficult to distinguish one from another but a little study reveals numerous characteristics. Few are indigenous to India but have been introduced from various tropical countries. There seems to be some doubt concerning the actual places of origin of the Cassias, but they quickly became popular and are now common in gardens and on roadsides. Few of them have names in any vernacular.

The first to bloom is the Horse Cassia which rises to about 15 m. In the winter all the leaves fall and in February-March, from the axils of the old leaves rise fine sprays of rose-pink flowers, shading to pale peach and coral according to the amount of sunlight received. The flower branchlets spring rather stiffly from either side of the main stem giving a different appearance to the softly drooping sprays of the other Cassias. There are no bracts to be seen at the bases of the flower stalks as they fall before the flowers open.

The leaves are pinnate and bear from fourteen to forty narrow oval leaflets, rounded at the ends and about 3.8 cm. long. When young they are soft and downy and the end leaflets have a distinctive wash of bronze. The fruit is a thick coarse pod from 22 to 30 cm. long, curved and slightly flattened containing transverse seeds in an unpleasantly smelling pulp.

The Red Cassia (*C roxburghii*, Syn. *C marginata*) is smaller and less robust than the other varieties, but is extremely beautiful at all times of the year. The name refers to the thickened margins of the leaves. Vernacular names are Vakai and Kirudam (Tam.); Kottakona (Mal.); Samareta (Tel.) and Rata wa (Sinh.). In June-July, the upper surfaces of the downward sweeping, hairy branches are laden with copious, short clusters of dull pink flowers. The tree appears almost overweighted with the profusion of blossoms. The flowers are quite small, little more than 2.5 cm. across, with five petals, two of which are often slightly larger. The calyx is pink and the nine stamens are in three groups; three are very long and curved, the next four are less than half that length and all bear red anthers. The remaining two are very short and have yellow anthers. The flowers are more of a terra-cotta than the other Cassias and each petal is delicately veined with green, the pink becoming deeper as the flower ages. The bracts at the bases of the flower stalks are pale green and the calices pink. Leaves and leaflets are much smaller than those of other Cassias. Each leaf bears from ten to fifteen pairs of leaflets, oblong and blunt ended, narrower at the base and unequal sided. The pods are slender 25 cm. cylinders.

The Burmese Pink Cassia (*C renigera*) is thus named because of the kidney-shaped appendages from which spring the leaf stalks. It is a small tree - not more than 6 m. but in April when the large, showy flowers and tender, green leaves appear, it presents a strikingly beautiful picture enhanced by the varied tones of salmony pink in each dense cluster. These clusters rise on short stems from the scars of the old leaves. At the base of each flower stalk is a bract like a small leaf and these numerous bracts crowded together form a long clump from which spring the downy, red stalks. Outside, the calyx is dull red, inside, the palest green. The scented flowers, each about 5 cm. across, are a deep pink inside, paler outside and fading slightly with age. The smallest buds are white but those about to open are a rich pink. The ten yellow stamens are in groups of three, four and three, crowned with delicate green anthers. The longest three are curled like the letter "S" and have a curious balloon-like swelling in the middle. The leaves, which fall in December, leaving the tree adorned only by the long blackened, cylindrical pods, are up to 30 cm. in length. Each bears from eight to twenty pairs of downy oblong leaflets, narrow and rounded at the tips.

Cassia nodosa, the Pink and White Shower or Joint-wood Tree can reach 15 m, in height. It has a short, gnarled trunk and a fine, spreading crown. From March until well into July the flowers appear in groups along the downy branches, each cluster borne on a short stalk. The flower stems are red and grow in whorls. The buds and flowers are deep pink, fading nearly to white and each petal is narrow and somewhat pointed at each end. The calyx is green and velvety and the bracts narrow ovals. There are ten yellow stamens, the longest three having a round swelling in the middle. The pods grow to 45 cm. or more and are an unattractive feature of the tree. A leaf may be from 15 to 30 cm. long and comprise up to twelve pairs of leaflets. These are pointed at the apex, leathery and slightly glossy. This Cassia is a native of Malaysia, Burma and parts of northern India. In Malaysia it is known as Sebusofc hutan and Tutup burnt.

The Java. Cassia or Apple Blossom Cassia (*C. javanica*) is very similar to the last species, but the few distinguishing features can be observed with little trouble. It is slightly taller, has the same spreading crown, long drooping branches and numerous feathery leaves, but the flowering season is much more brief - through April and early May only. The flowers are quite similar, but the sepals are smooth, green inside and deep red underneath. The petals are more rounded and the bracts heart-shaped and pink tinged. Similar, too, are the stamens and the brown cylindrical pods, but the latter attain a greater length. The clusters of flowers grow more often on short, leafless branches than at the ends of leafy twigs like *C. nodosa*. In

the number of leaflets they are alike, but these leaflets are a little shorter. They are rounded ovals with no gloss, smooth and silky to the touch. The tree is native to Java and Sumatra and is now found in most tropical countries. Its Malay names are Sebusok and Dulang.

The originals of these Cassias were identified by differences of growth, leaves and seed-pods, but cross pollination by insects has played such havoc with subsequent generations that confusing hybrids have arisen. A *C. nodosa* with bright pink flowers and one with nearly white flowers can now be seen. Cassia is a Creek name for the genus of leguminous plants which provide the senna leaves and pods so important in pharmacy.



JAVA CASSIA



BURMESE PINK CASSIA IN FLOWER

BELLIRIC MYRABOLAN

TERMINALIA BELLIRICA

Fam. Combrefaceae. Sabera (Hind., Beng.) ; Tani, tanti (Tam.); Tanni (Mal, Tel.); Beheda (Mar.); Mus-bulu and eta-bulu (two varieties) (Sinh.) ; Jilawai, mentalun (Malay).

THE Belliric Myrabolan belongs to a very large family of important forest trees and because of its handsome appearance and fine proportions it is often planted by roadsides. It is found throughout the forests of India, Burma and Sri Lanka and the Malay peninsula, below elevations of about 900 m. but not in the very arid regions. It is deciduous, losing its leaves between November and April in dry places and only during February-March in damper situations. It grows well on poor soil and in the best conditions will reach a height of 36 m. or more. In some places the timber is not popular being subject to insect attack and the tree is often left standing, tall and conspicuous amongst the new sapling growths. In others it is considered worth the cutting to make into planking, packing cases, etc., but in the south Deccan it is left untouched because of a superstition that it is inhabited by demons.

The bark is dark grey and fissured by numerous, longitudinal cracks and the straight, buttressed trunk, which can achieve a very large girth, bears many horizontal branches.

From March to June the tiny flowers appear, filling the air around with their strong honey scent. There are many who find the scent objectionable, but to me it is so exactly like honey that even at close quarters I find it delightful. Springing from amongst the leaves at the ends of the branches, like long, creamy tassels, the flower sprays bear numerous, globular buds and tiny, cup-like flowers. Each of these rests on a stout, short stem and divides into five lobes from which rise ten stamens.

The leaves, fresh and shining, which appear with the flowers, are large and closely packed round the ends of the branches and a lovely copper colour when new. They grow on stems from 2.5 to 10 cm. long and are wedge-shaped at the base, terminating bluntly, like a Jackfruit leaf. They are very tough and have a strong, broad centre rib.

The fruit is a grey velvet ball about 2.5 cm. across and is the most important part of the tree. It is used commercially as a medicine and when unripe, as an inferior dyeing and tanning material; also for making ink. The kernels yield an oil which is used on the hair and are also eaten, although an excess is said to produce intoxication. Monkeys, deer, squirrels, pigs, goats and other animals greatly favour this fruit and few are allowed to remain long on the ground.

The name Terminalia is from a Latin word meaning "terminal" and is given because in many of the species, including this one, the leaves cluster at the ends of the branches. Bellarica is a corrupted and Latinised form of the Arabic name of the fruit. The fruit is known as Myrabolan and this name is also used for the fruits of *Phyllanthus emblica* and *Terminalia chebula*, the three making the tonic known as Trefala churan.

Another well-known member of the family is the Indian Almond or Malabar Almond (*T. catappa*) known in Tamil as Nat vadam, in Sinhalese as Kottamba, in Hindi as Badam, in Bengali as Desh; badam and often incorrectly called lungli badam in Hindi. lungli badam is the Wild Almond or Poon Tree (*Sterculia fetida*). The Indian Almond is a tall tree easily recognised at any stage of its growth by its whorled horizontal branches and dense layers of foliage. Also by its large, rough leaves, much wider at the end than at the base, which, twice a year, in February and September, turn bright red and give the tree a handsome and striking appearance. While still red they fall and soon after, the new, brilliant green leaves appear. The tree is cultivated widely in tropical areas and is popular for garden and avenue planting, also for its oily, edible seeds. In Florida it is popular as a street tree. The unripe fruit of the Indian Almond also is a source of tannin

The Arjun (*T. arjuna*) is another handsome member of the family. It is tall and evergreen with buttressed trunk and horizontal branches and may be recognised by its very smooth and thick bark which flakes in pink and grey patches. It is native to Sri Lanka and India where it is found along the river banks of dry zones and also in villages where it is often planted. The oval leaves grow in nearly opposite pairs on very short stalks and sometimes end in a short point. Before falling they turn to shades of orange and red.

From the ends of the leafy twigs spring the clusters of flowering spikes, each bearing a profusion of creamy blossoms, scented, as are the other Terminalias, but much less pleasantly. The fruits, as hard and angular as the flowers are soft and fluffy, are brown tinged with olive or rusty-red and have five broad, flat wings with wavy edges. They each contain one seed.

The wood is hard and heavy, grained in shades of brown, but is not considered a very useful timber because of its inability to withstand changes of temperature and humidity. It is used for bridges, houses, carts and furniture.

The bark of this tree is also used for tanning and dyeing and has many medicinal uses. Its vernacular names are Kumbuk (Sinh.), Maratu, kuta-maruthu and vella-marda (Tam.) ; Yermaddi (Tel); Arjune, kawa, koha, and jamba (Hind.) and in English it is often called the White Murdah.

T. Tomenfoid Syn, *T. crvnulata* known as Saj, Maddi and Ain, is like Arjun in many ways but can be distinguished by its very dark grey, cracked and fissured bark and the veins on the wings of the nuts. These run at right angles to the nut. It is a common forest tree but is rarely seen outside forest areas. It yields an excellent, hard timber.

T. chebula is called the Ink Nut or Chebulic Myrabolan (Haritaki in Bengali, Har or harara in Hindi) and is a deciduous forest tree with spreading, drooping branches. Its evil-smelling whitish flowers are borne on catkins at the ends of the branches and are followed by hairless, pear-shaped fruit, which are exported in large quantities for tanning. The kernels are made into ink and a black dye. After the fruits have fallen the earth around becomes darkened by their tannin.



ARJUN



BELLARIC MYRABOLAN

MANGO

MANGIFERA INDICA

Fam. Anacardiaceae. Am (Hind, Beng.); Mangas, ma (Tam.); Mahu (Mal.); Mamid, mamada (Tel.); Amba (Sinh.); Mangga, mempeam (Malay).

ALTHOUGH the Mango is probably the best known fruit in India there are many people who would not recognise the tree unless it was bearing large, ripe fruit. Leaves, bark and shape, however, are sufficiently distinctive to make recognition easy even if there are no flowers. Rounded banks of dark green foliage and deep shadows enfold the stout, black limbs; these and the short trunk are clothed in thick, corky bark which cracks and comes off. Retaining its leaves all through the year and frequently having a spread greatly in excess of its height the Mango makes an excellent shade-tree and is frequently planted in avenues and groves. These are usually the wild

Mango, grown from seed whose raw fruit are good enough only for monkeys. The smoothness of the leaves reflects the heat, their position gives maximum shade and their strong, springy stalks are not easily broken by the wind. Thus there is rarely any glint of sunlight to be seen in the cool shadows of a Mango tree.

From January to March the long, upstanding pyramids of flowers appear beyond the leaves. Thick, green, ridged and tapering stems bear numerous, diminishing side stems. On each of these are borne a large number of tiny, stalked flowers, white and greenish-yellow in colour, four or five-petalled with each petal orange-striped. There are varieties with both the flower stalks and flowers dull red. When the trees first bloom the flowers are pleasantly fragrant, but later turn quite disagreeable. Of the thousands of flowers which bloom only a few are capable of producing fruit. These are perfect ones, the rest being only one-sexed.

Two and a half to three months later the fruits ripen. These vary tremendously. The best fruits are from grafted tree which are smaller than and not so long-lived as those grown from seed. But they are the ones which produce the famous Alphonso variety, between which and ordinary seedling fruit there is as much difference as between the best eating apple and a crab apple. Weighing anything from 170gms. to 1.4 kg; this fruit par excellence of India has a tough, thin skin, green or yellow and red; juicy flesh, creamy white, yellow or deep salmon in colour and a large stone, sometimes fibrous, sometimes smooth. As well as being eaten raw the fruit is included in curries, pickles and preserves it is also tinned and exported. To the

aboriginal tribes the fruit and kernels of the wild Mango are an important part of their diet being rich in vitamins A and C. They boil quantities of them and drink the resultant juices.

The leaves are large and leathery, oval in shape and borne on longish stalks with a thickening at the base. They crowd round the ends of the branches in all directions. New leaves are copper-tinted and drooping—Nature's way of reducing the effect of heat and light. The normal fruiting period of Mangoes is from May to July, but one can obtain fruit nearly every month of the year. Some varieties produce fruit twice and even three times in every twelve months.

It is known that the Mango has been established for many, many years. Gautama Buddha was presented with a grove of Mangoes, beneath which he could find repose. He told some monks a tale of his earlier life as a monkey. With his clan he lived in a Mango tree and all were very careful never to let the fruit fall to the ground where it might be found by a man, tasted and desired. But one fell into the river and was carried to Benares where the King, who was bathing, found and ate it. Delighted with the taste, he and his soldiers set out to search for the tree. When they eventually located it he ordered all the monkeys to be shot. The Buddha, in saving the others by making a bridge of bamboos from over the river, himself lost his life. So, to Buddhists, it is a sacred tree. To the Hindu religion, too, it is of great importance. To Hindus, it is a transformation of the God Prajapati, the Lord of all creatures, and so, on holy days, the twigs must be used as tooth-brushes and the leaves as spoons for the pouring of libations. Rooms in which marriage ceremonies are held are festooned with Mango leaves and the wood is sacred because it is included in funeral pyres. The flowers are dedicated to the moon, to whom they are offered on the second day of Magh, and to Madan the Indian equivalent of Cupid. The tree is considered to be a native of India, but now it is found in all tropical countries. It will grow and fruit from sea-level to about 1500 m. and endure temperatures ranging from -5° to 50° Centigrade and in a wide variety of soils. It is erratic in fruiting seasons and most varieties do not bear fruit every year.

The Mango, being so valued for its fruit, is rarely used for other purposes. The timber is soft and not durable but admirable for planking, packing-cases and tea-boxes. The bark gives a gum used in medicine. The unripe fruit is used to treat ophthalmia and from the ripe fruit a tonic is prepared which is claimed to be good for the liver. Various parts of the tree are used to stop bleeding and also prescribed in cases of snake-bite and scorpion-sting.



MANGO

RAIN TREE

SAMANEA SAMAN

Syn. Enterolobium saman, Pithecollobium saman

Fam. Leguminosae, Sub fam. Mimoseae. Enal-vakai (Tam.); Belaiti siris (Hind., Beng.); Amaivagai (Tam.); Plavu (Mal.); Peni mara (Sinh.); Hujan-huan (Malay.); Saman Tree, Monkey Pod, Cow Tamarind (Eng.)

LARGE, handsome and spreading, the Saman Tree is easily recognised by its canopy of evergreen, feathery foliage and puffs of pink flowers. It is frequently planted in groups or as an avenue because of its ability to keep its symmetrical conformation in spite of prevailing winds. It is a tree of rapid growth, brought originally from Central America to Sri Lanka and forwarded from there because it was considered to be a tree of great value for railway fuel. It often reaches a height of 27 m. and the strong, spreading branches may be nearly as long. The bark is dark grey, often bearing horizontal weals and the trunk frequently branches quite low down. It is a suitable tree to be grown as host for ornamental epiphytes.

From March to May and again towards the end of the year the green canopy is dotted all over with pink and white. During the rest of the year, too, there are usually quite a few flowers to be seen. The flowers appear like round, silken tufts, but actually each flower stalk bears one central and a surrounding circle of florets, up to twenty in number. Each has a tube-shaped calyx and a tiny, yellow-lobed, crimson trumpet; bunches of long stamens, half pink and half white, protrude from each. The long, heavy leaves are twice pinnate and each pinna, of which there are four to eight pairs, bears from three to seven pairs of leaflets. These are oval and have no stalks, becoming larger and more curved towards the end. They have the remarkable power of changing their position in accordance with atmospheric conditions. In full sunshine they are horizontally spread, allowing no single beam of light to penetrate the dense crown; but at night, in dull weather, or during rain, the pairs of leaflets fold together, the leaf stalks droop and each pinna swivels on its thickened base so that the leaves all lie sideways. In Malaysia this drooping of the leaves is considered to portend rain and is the explanation of the name Rain Tree, Hujan-hujan meaning "rain", but in India it is believed that the name was given because of a curious habit possessed by the tree of intermittently spraying the ground beneath with moisture. Later it was discovered that this was caused by multitudinous minute insects. The fruit is a fleshy pod, sweet to the taste and much relished by squirrels, horses and cattle. The leaves are used as fodder and the pods eaten in times of scarcity, but the wood is soft, light and inferior, not even good enough for fuel.

A close relation of the Rain Tree and also of the Babul and somewhat alike the former in its general appearance is the Frywood Tree, *Albizzia lebbek* (or *Acacia lebbek*) known in Hindi as Siris, Sirsa, Carso or Tantia, in Sinhalese as Mara and in Tamil as Vakai. It has a flecked, grey bark and long, spreading branches. This bears, in April, innumerable heads of fuzzy, green and white scented flowers. The leaves, bi-pinnate and bearing small, long and oblique leaflets, fall during the hot season and the tree is naked except for the large, flat, papery, yellow pods which are very conspicuous and clatter in the wind. Because of this constant noise the tree has, rather ungallantly, been given the name "Woman's Tongue". It is common in forests all over India and is often planted in avenues. The wood is very tough and durable and exported under the name "East Indian Walnut". In medicine, too, the tree is valuable. A concoction made from the bark is used to cure skin diseases, toothache and bronchitis, the astringent roots make a remedy for eye troubles and many parts are given as antidotes for venomous bites. Shallow rooted like the Rain Tree, it is easily blown down by gales and is also susceptible to a form of rot which affects the roots and base and causes the tree to crash down without warning. *Pithecollobium* is from two Greek words meaning monkey and ear-ring. The Brazilian name flincos de Sahoy also means 'monkey ear-ring'. *Albizzia* honours F. de Albizzia, a Florentine nobleman of the 18th century.



SAMAN TREE / RAIN TREE



JACK FRUIT TREE

ARTOCARPUS HETEROPHYLLA

Fam. Moraceae. Chakki, panos, kanthal, (Hind.); Katkal (Beng.); Pila, pilavu (Tam., Mal.); Panasa (Tel.); Phanas (Mar.); Kos (Sinh.); Nangka, tajaka (Malay.)

THIS large, evergreen tree, with its dense crown of dark green leaves bears the largest edible fruit in the world. Hanging from branches, trunk and even on the roots of older trees they look like huge, ugly parasites. But it is one of the most important fruit trees of India, only slightly less valued than the mango and the plantain.

The Jackfruit is native to the forests of the Western Ghats, where it is also cultivated extensively; elsewhere, throughout the warmer regions of India, Burma and Sri Lanka, it is cultivated or has run wild. Fast-growing, it varies in size and conformation according to the type of soil; in sandy soil it becomes tall and spreading; in stony soil short and thick and if the roots remain in contact with water the tree will not bear fruit. The bark is dark grey-brown, rough and warty.

The leaves grow alternately in close bunches at the ends of the branchlets. They are large, thick and leathery, oblong in shape with a blunt end and tapered towards the short stalk. They are usually entire but sometimes lobed in very young trees. Above, they are deep green and glossy; below, paler and stiffly hirsute.

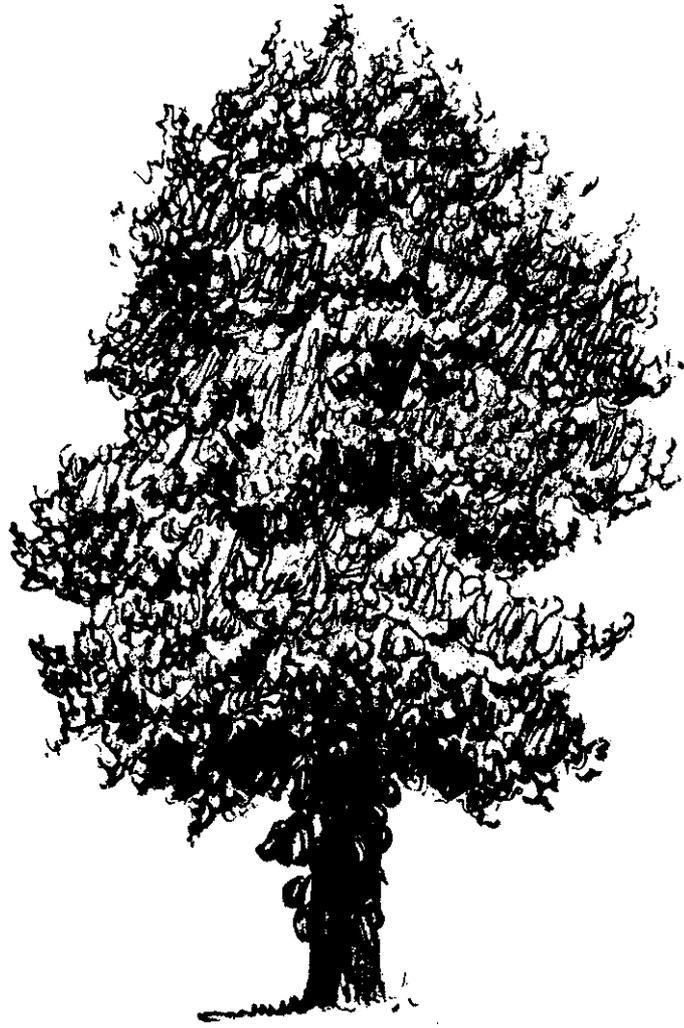
The flowers are unusual. Male and female flowers are separate but grow on the same tree, although young trees bear only male flower heads. Innumerable flowers, all of the same sex and each minute in size, cover a small cylindrical appendage and the whole is enclosed in two green sheaths. Male appendages grow at the end of short leaf-bearing twigs and are inconspicuous amongst the leaves when in bud. The falling sheaths reveal them as dense, yellow catkins. Female flowers are grouped together in large prickly heads directly on the trunk or limbs. February and March is the usual time for flowers to appear.

The enormous fruits, sometimes as much as 45 kg. in weight, are irregularly oblong or round. Their rough skin is covered with numberless, conical studs. When immature they are green, later becoming more yellowish and eventually brown. Inside, many small cavities, each containing one seed, are surrounded by a soft, yellowish pulp.

On young trees, fruits are found only on the branches, but on older trees they grow in great clusters down the trunk. Very old trees even bear fruit on the exposed roots. They are eaten in tremendous quantities by the people of the East but Europeans usually find their odour sufficiently unpleasant to discourage further acquaintance. Ripe fruits are nutritive but laxative; large quantities can be indigestible and apt to produce diarrhoea. Unripe fruits are astringent, but are cooked and eaten as vegetables. There are several varieties of Jackfruit of which the honey-jack is considered the sweetest and best. Fruits are eaten raw, boiled or fried in curries and in pickles, also dried like figs; the mature seeds are roasted if not discarded. If the pulp is boiled in milk, strained and iced, it forms a palatable dessert like blanc-mange.

The numerous economic uses to which this tree is put makes it of considerable value. A sticky, white latex is obtained from young shoots which makes a good birdlime, and the fruit juice gives a kind of caoutchouc or rubber. A diet of Jackfruit leaves is said to be fattening to cattle and goats. Medicinally it has uses, too; the leaves make a fomentation to apply to wounds and their juice relieves swellings of the glands. The timber, known as Jackwood, is used for furniture; at first it is pale yellow, but later turns almost as dark as mahogany and takes a fine polish. Being termite-proof it is greatly valued for furniture and building. From the heart wood, usually by the process of boiling sawdust, is obtained a strong, yellow dye which is used in Burma to dye the robes of phoongies or Buddhist priests. The Nambudri Brahmins of Malabar produce sacred fire by the friction of dry Jackfruit branches. The tree is a native of the Western Ghats, South India and Malaysia, but for long it has been cultivated throughout the Eastern Tropics. *Integra* means "entire" and *integrifolia* means "with entire leaves". The name Jackfruit is from the Sanskrit *tchackka*.

There are many species of *Artocarpus*, the Bread-fruit being one of them and it is to this one that the name refers. It is from the Greek *artos*, "bread" and *karpos* "fruit". *A. altit.*, Syn. *A. incisa* is a native of the South Sea Islands and now naturalised in parts of Sri Lanka, Western India, the Malay Peninsula and cultivated in Tropical America. It is a handsome and quick growing evergreen tree, reaching 18 m. at maturity. The large, pinnately lobed, ovate leaves are dark green, shining, thick and leathery. The large, oval fruits appear rather similar to those of the Jackfruit, but, inside, the pulp is like soft bread and is much enjoyed as a vegetable. In Tamil it is known as Seemai-pala and Era-pala and in Sinhalese as Rata-del.



JACK FRUIT TREE WITH FRUITS



JACK FRUIT TREE WITH MALE RECEPTACLE

TULIP TREE

SPATHODEA CAMPANULATA

Fam. Bignoniaceae. Patadi (Tarn.); Kudaella gaha, kudulu (Sinh.); Rugtoora (Hind.); Neerukayi mara (Can.); Panchut-panchut (Malay.); Tulip Tree, Scarlet Bell Tree, Fountain Tree, Flame of the Forest (Eng.)

THERE are several species of Spathodea but the Tulip Tree is quite the most striking and also the most common. Originally from Tropical Africa it was introduced into India in 1873 and is now widely planted up to altitudes of 1200 m. both as decoration and for shade. In Sri Lanka, Malaysia, the Philippines, the Caribbean, Tropical America and Mexico it has also become a great favourite. But in those places where it has to stand up to the buffeting of monsoon winds it does not attain the fine proportions and erect dignity of those trees more happily placed.

It is a large tree, deciduous in drier places during the hot weather, but never quite bare in other places. The main branches grow rather upright and, as the lateral branches are short, the tree is narrow and slender rather than spreading and can reach a height of 27 m. The bark is light grey, fibrous and warty. The leaves fall during February, then in March and April new ones appear in profusion, together with magnificent clusters of orange and crimson flowers. These are borne on the ends of the branchlets and are first heavy compact masses of dark olive-green, velvety buds, in up-turning whorls. The buds in the lower circle then bend out and burst into fiery bloom - large crumpled bells, crimson and orange in colour. Four brown anthered stamens rise from the centre. The tree is now aglow, dozens of scarlet torches stand out in brilliant contrast to the deep green of the foliage. By the end of April all the flowers have fallen, but at several times during the rest of the year odd clusters will appear and there is quite a definite flowering period between October and December.

The leaves, which mass towards the ends of the branches, are large and smooth. They consist of from four to nine pairs of 5 cm. leaflets and a terminal one. These are oval in shape and fairly deeply veined. Very young leaves are downy underneath.

The pods appear like the fingers of a hand, pointing upwards and outwards above the foliage. Each one is some 15 or 20 cm. long, green and brown in colour and smooth. When ripe they split and discharge white, papery, winged seeds. Trees in Bombay rarely bear fruit.

The name Fountain Tree and many of the African vernacular names originated because the soft buds often contain a quantity of liquid and small boys discovered that by squeezing them they could be made to emit a jet like water squirt.

It is said that African hunters make use of the nuts by boiling the centres and thus obtaining a poisonous liquid.

Tulip Tree wood is difficult to burn and makes poor fire-wood but because of this property it is ideal for constructing the sides of blacksmith's bellows.

Spathodea is a Greek word meaning "spathe" - referring to the ladle-like shape of the calices and campanulata describes the bell-shape of the flowers. In America there is a yellow flowered form.



TULIP TREE IN FLOWER

RIO GRANDE TRUMPET FLOWER

BIGNONIA MEGAPOTAMICA

Fam. Bignoniaceae

OUR attention is first drawn to this charming little tree by the scattering of delicate, pinkish flowers around its base. In fact there always appear to be more flowers on the ground than on the tree. Among the foliage, in small clusters of three blooms at the most, their pastel tints get lost against the patches of sky; but carpeting the grass below, their frail, fresh charm demands a closer inspection.

The tree is a native of Brazil, rising to 7.5 to 10.5 m. with ash-grey furrowed bark. It is deciduous with graceful sweeping branches and numerous small branchlets. The leaves, which never form a very compact crown, are compound, consisting of one or two pairs and one terminal leaflet. These are a bright olive-green, smooth, inconspicuously veined and oblong with blunt tips. They are about 10 cm. long.

The scentless flowers appear throughout the year but never in great profusion. In small groups at the ends of the branchlets, they spend their short lives hidden among the foliage and fall while still fresh. They are trumpet-shaped and of the palest lilac pink with five trilled and crinkled lobes. The bright yellow tube is painted inside with orange or purple streaks and the whole flower has an appearance of ephemeral fragility, in great contrast to many of the bold blooms of the East. As a rule the tree does not fruit in profusion, but some years show quite a considerable sprinkling of pendent green pods. They are cylindrical and about 15 cm. long.

The tree is fairly common in India and the flowers, being easily acquired, are often used by women to decorate their hair. Propagation is by seeds. In the South of India, a white flowered species, *B. crispa*, Syn. *Dolichadrone*. known as *Padiri* in Tamil, is very common. The flowers are somewhat similar in formation but the leaves are brighter and distinctly veined. Hindus use the fragrant flowers in their temples as an offering to the Gods.



RIO GRANDE TRUMPET FLOWER

TAMARIND

TAMARINDUS INDICA

Fam. Leguminosae. Sub fam. Caesalpinieae. Tamrulhindi, ambili, imli, (Hind.); Tintil, nuli, taetul (Beng.); Puli (Tam., Mal.); Chinta (Tel.); Am (Mar.); Siyambala (Sinh) jawa (Malay.); Tamarind, Indian Date (Eng.)

IN spite of the fact that the flowers of the Tamarind are inconspicuous, it is quite one of our most handsome trees. It grows to a large size and great age and at all times of the year is a beautiful sight with its fine, spreading limbs and canopy of billowing foliage. Native to tropical Africa, it is now cultivated or naturalised all over India, Burma and Sri Lanka, Malaysia and the warmer parts of the Florida, where it is much esteemed as an avenue, park or garden tree, for its useful fruit and for its highly prized timber.

The Tamarind has a short, strong trunk, sometimes slightly buttressed to bear the weight of the wide, spreading crown. The thick bark is almost black and covered with longitudinal fissures and horizontal cracks. It can reach a great age, 200 years has been recorded, and a height of 27 m.

In May and June the small, scented flowers appear in loose, terminal and lateral sprays. Inconspicuous amongst the mass of foliage, they are found, on close examination to have an unexpected beauty. Each flower is rather more than 2.5 cm across and the four creamy or yellow sepals spread to the full width appearing more like petals. The actual petals are three in number, one being smaller. They, also, are creamy or yellow but are covered with a fine net-work of deep red veining; the edges are closely pleated. Three green stamens and one long pistil curve from the centre. Before starting to open. the buds are enclosed in two sheaths, often crimson in colour and these make a pretty variation on the flower sprays. The pods, which are usually fairly numerous, vary considerably in size and shape on the same tree. Many are sickle-shaped, some like long, thick beans and others nearly as short as their breadth. They are at first green, but a dun, felt-like film over the green makes them appear brownish. When ripe they are buff and brittle. The seeds, from one to ten, are contained in a fibrous pulp and the pod is more or less constricted between these seeds. In some varieties of Tamarind the pulp is brown and acid, in others it is sweet but the best is considered to be the one with reddish pulp.

The tree is never quite leafless but at times it is bare enough for many of the branches and twigs to be seen. Then the leaves are dark green and dull: But at the beginning of the year and sometimes in September, too, new, fresh leaves appear. The Transformation is striking. One week there is a tired, dusty tree; the next, a billowing cloak of brilliant green covers it from top to bottom and there is barely a glimpse of branch or twig.

The leaves are compound, dividing into ten to twelve pairs of leaflets. These are quite small, becoming even smaller at the end; they are oblong, smooth and grow obliquely.

There are many uses to which the fruit is put. The pulp is a popular ingredient tin curries and preserves. Sometimes it is pressed, preserved and sold by weight in the bazaars. It also makes a good sherbet. Medicinally it is used as a laxative. The seeds ground to powder and boiled to a paste with gum, make a strong cement; from them, too, is obtained a substitute for wheat or other flour, used by jungle people to make chapattis. The husks of the seeds have even been employed for road surfacing. It was also discovered that from the seeds could be made a cheap, efficient substitute for cereal starch which is used for sizing cotton yarn, jute fabrics and woollens.

Leaves and flowers, too, are useful as they are both edible and the leaves make a good poultice for boils; also an infusion from them makes a fine yellow dye which is used to give a green colour to silks previously dyed with indigo.

The wood is highly prized, though hard and difficult to work and it is unfortunate that the heart wood is so small. However it is widely used for making wheels, mallets, furniture, oil and sugar mills, etc.

Country people have a prejudice against sleeping under Tamarinds because they say the trees exude unhealthy vapours. This is no doubt correct to a degree as the cloth of tents pitched under Tamarinds in wet weather becomes discoloured and rotten after a time; many plants will not grow beneath them but it is a mistake to suppose that this applies to all herbs and shrubs. In the description of the Nim Tree is a legend concerning these acid exhalations.

The name Tamarind is from the Persian Tamar-i-Hindi which means "Indian date".



TAMARIND

CORK TREE

MILLINGTONIA HORTENSIS

Fam. Bignoniaceae. Akas nim, nim chameli, betati nim (Hind.); Akas nim, mini-chambeli (Beng.); Karkku, kat malli (Tam.); Kavuki (Tel.); Katesam (Mal.); Cork Tree, Tree Jasmine (Eng)

THE Cork tree is cultivated in most parts of India, both in gardens and avenues. Tall and straight, with comparatively few branches, its claim to popularity lies in its ornamental value rather than any shade-giving properties. It is a fine tree, fast growing, but with brittle wood, liable to be damaged by storms. In favourable positions it can reach 24 m. in height.

The ashy bark is cracked and furrowed and the numerous fissures make removal of the cork an easy matter. It is used as an inferior substitute for true cork. From April until the rains and again in November and December, a profusion of silvery-white, delightfully fragrant flowers crown the foliage. Upright open clusters with arching blooms terminate every branchlet. Each flower is a tiny bell-shaped calyx, a long slender tube of palest green dividing into four waxy, white petals and several conspicuous yellow anthered stamens. One petal is longer and cleft. Many flowers are delicately tinted with rose. As they fall very soon after opening, the flower sprays consist largely of long whitish buds, while the ground below is spangled with innumerable little stars.

Between January and March the leaves are shed and renewed during April and May, although the tree is never quite naked. The long leaves bear two or three widely spaced pinnae, each with five or seven smooth leaflets, oval, pointed and slightly round-toothed. Each is from 2.5 to 7.5 cm. long. Sometimes the lower pinnae, are again divided and bear one pair of three leaved pinnae, one or two pairs of leaflets and one leaflet at the end.

The fruit is very long and narrow, pointed at both ends and contains thin flat seeds. Trees do not seed very easily in India.

The name Millingtonia honours Thomas Millington, an English botanist of the 18th Century, and hortensis means "grown in gardens". The tree is indigenous to Burma and the Malay Archipelago, but now grows wild in most parts of India, as well as being extensively cultivated in suitable climates. It is easily propagated from the numerous root suckers and is a very fast grower but should not be planted where its shallow roots and numerous suckers would interfere with other plants.

The wood is rather soft and a light buff colour and can be used for ornamental work.



CORK TREE



PONGAM

PONGAMIA PINNATA Syn. *P. glabra*

Fam. Leguminosae. Sub fam. Papilionaceae. Ponga, dalkaramcha, pongam, punku (Tam.); Kona, karanda (Sinh.); Honge (Can.); Karanj, papar, kanji (Hind., Beng.); Unne (Mal.); Pungu (Tel.); Malapari, pan-pan (Malay.); Karum Tree, Poonga Oil Tree (Eng.)

IN March and April when every other tree is taking on a new cloak of rich green leaves, the richest and brightest of them all is the Pongam. For a few days or a week at the most, when the buds develop into limp, new leaves, the whole tree is tinted crimson, but as the leaves grow, they acquire a lovely vivid lime-green colour, each teat clean and shining and the whole tree one of the freshest sights one could wish to see against the drab dustiness of roads and fields.

Recently the Pongam has been planted in numerous gardens and along countless roads and is becoming one of our most popular City trees. In the coastal forests all round India and by streams and rivers it grows wild. It can be found, too, in other parts of tropical Asia and in Australia. In Southern U.S. it is grown as an ornamental tree. It is of medium size and fast-growing with rough, grey-brown bark.

Almost immediately after the new leaves have developed the flowers bloom in great numbers. They could not be described as striking but the profusion of the short, pinkish sprays half hidden amongst the leaves gives to the already lovely tree an added charm. The 1.3 cm. blooms are crowded along the ends of long stems which rise from the axils of the leaves. Each flower has a short stalk, a loose, brown, cup-shaped calyx and five white petals, tinged with pink or mauve. The largest petal - the standard - is hooded over the other four which are all folded together. The flowers fall before they wither and cover the ground with myriads of little white balls.

The fruit is a woody pod about 5 cm. long, mottled buff or dark grey, and ripens just before the next lot of new leaves appear, but does not open to release the red kernel within until the walls of the pods decay. As the tree frequently grows along river banks it will be appreciated that nature has ensured the distribution of the species. Each seed is encased in a sturdy raft shaped like a rubber dinghy. The ground below is always covered with a crackling carpet.

The leaves are between 15 cm. and 30 cm. long and have five, seven or nine oval leaflets with pointed tips; each leaflet is short stalked and the leaf stems - as also the flower stems - are swollen at their base. To ensure a good, straight bole the Pongam is usually lopped and these loppings are either given to cattle or - more often - ploughed into rice-fields as manure. Gardeners use the well-decomposed flowers for forcing plants which require rich feeding. The seeds give a red oil which bums well and is also used as an embrocation for skin diseases. The juice of the roots is applied to sores and is used for cleaning the teeth as it has antiseptic qualities. The wood is yellowish white, fairly hard and coarse. It is not easy to work but is used for making cartwheels and posts and for fuel.

Pongamia is from the Tamil name, Pinnata refers to the pinnate leaves and glabra means "smooth and hairless".



PONGAM

INDIAN LABURNUM

CASSIA FISTULA

Fam. Leguminosae. Sub fam. Cceslapinieae. Kakke (Can.); Sarak-konne, konnai, tiru kontai (Tam.); Amaltas, bandarlathi (Hind.); Sonda (Beng.); Khtamalam, svamnakam (Mal.); Rela (Tel.); Bhava (Mar.); Eheta (Sinh.); Rajah kayu, bereksa, teneguli (Malay.); Golden Shower, Purging Fistula, Pudding Pipe Tree, Golden Rain (Eng.)

THIS is without doubt one of our loveliest flowering trees. Similar in many ways to the English Laburnum, it is infinitely more beautiful. Each in its season becomes "rich in streaming gold", but the drooping flower clusters of our trees are many times longer and the individual blooms many times larger than those of their English cousin. One of the most widespread of Indian trees, it is popular all over the country, every vernacular providing a name. Many of these names refer to the long stick-like pods which appear in profusion during March and May. The Hindi name means "Monkey-stick" and the Dutch call it "Pudding Pipe Tree"; but they have an alternative to that unromantic name in "Golden Shower", the Latin word fistula also means "pipe". Several countries in equatorial regions claim the Indian Laburnum as indigenous and ancient records of Greece and Egypt support those claims, but it is generally accorded that India has the greatest claim. It is propagated so easily from seed or suckers that it is now common in Sri Lanka, Malaysia, the West Indies and South America from Brazil to Mexico where it thrives best in the drier forests.

It is a moderate-sized, deciduous tree, growing well at any height up to 1200 m. but not gregarious except in districts well-populated by monkeys. This is because, most of the seeds are eaten by insects before leaving the pod. Animals, particularly monkeys, are partial to the sweet pulp in which the seeds lie. They break open the pods, and the seeds, thus liberated, fall to the ground and have a chance of germination.

The bark is greenish-grey and smooth on young trees, but with age it becomes brown and rough. Between February and May the leaves get dull and ragged and many of them fall. New leaves are a lovely, tender green sometimes tinged with pink, or a rich copper colour, clothed beneath with a soft down. Until fully grown they remain pendulous and folded. The leaves are large and compound, consisting of three to eight pairs of oval 12.5 cm. leaflets on short stems. These large leaves and also the stiff, erect branches, make the Laburnum distinct from all other Cassias which have feathery leaves and long arched branches.

During the hot season when the long, drooping sprays of clear, yellow flowers clothe the tree in a mantle of gold, it is indeed a glorious sight. Each spray is more than 30 cm. in length and bears on long, slim stalks, numerous, large, deliciously fragrant flowers and rounded buds. Each consists of a delicate green calyx, five sepals; five spoon-shaped petals of unequal size and ten yellow stamens. Three of these are long and curve gracefully upwards. The next four curve the opposite way and are less than half the length, while the remaining three are short and straight. All are crowned with large, brown anthers. The style is long and green, curved amongst the major stamens. There are two distinct varieties - one has large leaflets and bright flowers, the other smaller leaflets and paler flowers. There are also variations in the shade of yellow and in the size of the flowers. A new variety with nearly white flowers is extremely attractive.

At the beginning of the year the Laburnum is by no means an attractive sight. The long, cylindrical pods appear in profusion and hang like so many pipes among the nearly leafless branches. They sometimes become as much as 90 cm. in length and contain large numbers of shiny, brown seeds. At first the pods are green and soft; later they turn brown and eventually become black and very hard. The pulp of these pods is used in India to flavour tobacco. Taken in large doses the pulp is a strong purgative, yet bears and monkeys eat it with apparent impunity. The Santals eat both flowers and leaves, although cattle or goats will not touch them. The bark is used to a small extent for tanning and dyeing and the wood makes an excellent fuel and gives good charcoal. There are many medicinal uses for all parts of the plant, including the cure of ringworm, the relief of rheumatism and chilblains, cooling of the blood and as an emetic.

The timber is very hard and durable and employed for such things as fence posts and agricultural implements. Although it takes a good finish it is not economical to export as large cuts are not available.

There is another Cassia with bright yellow flowers and, although the individual flowers are very similar, it would be impossible to confuse the two. At the end of the year the Siamese Cassia or Kassod Tree (*Cassia siamea* or *C. florida*) a native of India, Burma and Malaysia and now naturalised in tropical America produces amongst its thick, dark green, evergreen foliage numerous, large spires of yellow blooms, which are followed, in a couple of months, by a crown of red-brown pods. The smoothish grey bark is marked with longitudinal fissures. The leaves are pinnate and the many leaflets larger than those of the Pink Cassias. It is possible to confuse the Siamese Cassia with the Rusty Shield Bearer as the latter also bears conspicuous spires of yellow blossoms and may frequently be found in flower at the end of the year. These flowers, it will be noticed, are more of a golden-yellow, the Cassia more lemon-coloured, while the leaflets of the latter are considerably larger. The vernacular names of the Siamese Cassia are Beati; and Vakai in Tamil, Wa in Sinhalese and Kassod in Marathi and Hindi. In Malaysia it

is called }aha, sebusok or guah hitam. The wood of this Cassia is also very hard and durable, the heart-wood being a rich, dark red streaked with lighter shades and is used for the best cabinet work. It is easily propagated from seed and is a quick grower. A third yellow-flowered Cassia is the recently imported Cassia multijuga which comes from Brazil and Guyana and is now naturalised in the West Indies. The leaflets are bright green above and pale below and the flowers, borne in profusion during August and September, are typical Cassia flowers.



INDIAN LABURNUM IN FLOWER

RUSTY SHIELD BEARER

PELTOPHORUM PTEROCARPUM Syn. *P. inerme*, *P. ferruginium*

Fam. Leguminosae. Sub fam. Ccesalpineae. Iya vakai (Sinh.); Iya vakai, iyalvagi (Jam.); Kondachinta (Tel.); Batai, jemerelang soga (Malay); Rusty Shield Bearer, Copper Pod, Yellow Poinciana (Eng.)

FROM my flat I look down on to an avenue of Rusty Shield Bearers and in April, when most of them are in full bloom, it is a veritable road of "The Cloth of Gold". As each brilliant dome sends up its heady, Eastern perfume, they are truly a delight to the senses.

The flowering period is long and variable; one tree will be in full bloom while its neighbour has got no farther than the bud stage. I have seen one half of a tree flower for some weeks before the other half commenced; then, when the second half was covered in gold, the first was bearing fruit. From September until the end of the year there is another, lesser flowering period and all through the year occasional trees bear a few odd blooms. It is a tall tree, often 24 m. high, with a smooth, grey bark and a fairly spreading crown, dense and dark when in full leaf.

By the end of February the tiers of erect, pyramidal flower sprays are in bud. The several branchlets, green and brown in colour, are clustered with velvety, rust-red balls, each on a short stem. Two or three buds at the base of each branchlet then open into five petalled flowers, clear yellow, crumpled and twisted, the copper-red sepals curling back from the narrow, rust bases of the petals. The protruding stamens bear bright orange anthers. These lovely fragrant blossoms each last but a short time, falling from their calices while still fresh and daily carpeting the ground with gold.

The large copper pods develop in profusion and are nearly as conspicuous as the flowers, especially during December-January, when most of the leaves fall. They remain on the trees more or less until the next spring, by which time they are black and brittle.

Just before the new, bright leaves sprout, the trees are all practically bare and the transformation—in the space of a few days—is one of the annual pleasures of all tree-lovers. A week or two later the fresh, tender green has changed to a much deeper colour. The large, fern-like leaves are bipinnate, the twenty to thirty close-growing leaflets of each pinna being oval, leathery and set nearly at right angles.

I know of no uses made of this tree except that the wood, although too light to be very enduring, is employed for furniture-making.

The name *Peltophorum* is from a Greek word meaning "shield bearing" in allusion to the shape of the pods, and *ferrugineum* describes their rusty colour. The name *inerme* is much less descriptive, meaning "unarmed". In fact, during the last 140 years the name has been changed six times causing considerable and unnecessary confusion. It is native to the Philippines, Sri Lanka, Malaysia and North Australia and is now widely planted in India, the Caribbean and other tropical areas. Easily grown from seed it makes a fine avenue tree and is excellent in gardens as grass will grow beneath it.



**RUSTY SHIELD BEARER
OR COPPER POD**

CASUARINA

CASUARINA EQUISETIFOLIA Syn. *C muricata*

Fam. Casuaranaceae. jungli saru, vilayati saw, jungli jhao (Hind.); Sarve. (Can.); Belati jhao (Beng.); Chouk sabuku (Tam.); Katodi (Mal); Serva (Tel); Kasa (Sinh.); Chevaka (Vern.); Ru, aru, chemara laut (Malay).

Casuanna, She-Oak, Australian Oak, Beef-Wood Horsetail Tree, South Sea Ironwood (Eng.)

THE Casuarina has the general appearance of a conifer with its cord-like leaves, small cones and tall, straight stem. It is fairly quick-growing, long-lived and hardy, particularly in the sea-coast areas where the loose sandy-soil is most suited to its requirements. Many plantations have been made in South India for reclaiming sandy sea shores and in those parts, the tree has now become naturalised. There also, in North Kanara and along the Coromandel coast in particular, it is extensively grown for fuel. Closely planted and kept low, it can be made into a good, dense hedge. In inland regions and in the coastal districts it is often used as a roadside or garden tree, being an extremely decorative as well as useful tree. In fact gardeners in temperate countries grow it as a hot-house plant for decorative purposes only. The wind whispering and sighing through the branches of a Casuarina can be likened to the distant murmur of waves on the shore—a soothing and restful sound.

The original homes of the Casuarina are Australia where it is called the “Beet-wood Tree” because of the rusty, meat-like hue of the inner wood, Malaysia and islands of the Pacific. It is also found in South Florida and Mexico. The name Casuarina arises from the resemblance of the fine leaves to the feathers of the Australian bird the Cassowary whose scientific name is Casuarius. Equisetifolia suggests that the bunches of the leaves are like a horse’s mane or tail. Muricafa means “covered with short, sharp points.”

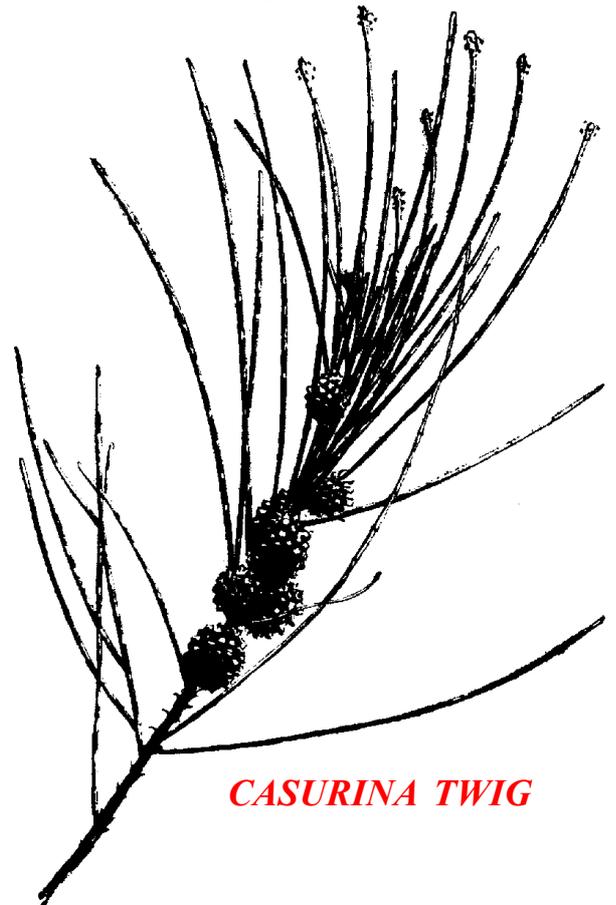
The strong, branched trunk is clothed with rough bark which cracks and comes away in long strips. The waving feathery foliage consists of many slender, drooping, jointed branchlets, arising from rough, woody branches; these branchlets are green, fulfil the functions of leaves and are partly deciduous. They fall throughout the year, forming a spongy carpet beneath the tree, such as one finds in pine woods.

Some authorities claim that a tree will bear flowers of one sex only and it is the exception to find both male and female flowers on one tree; others state that it is two-sexed and the one-sexed tree is the exception. In the illustration of a twig, both male and female flowers can be seen. The flowers appear twice a year, from February to April, and again six months later. They are unisexual, the staminate, or male being in cylindrical terminal spikes, the pistillate, or female, in dense heads which lie in the axils of the branchlets. These heads, which are usually seen in the groups, are like small buds covered with curly, dark red fur. The “bud” swells to become a cone and the red hairs fall. The cones are about 2.5 cm across, round or oblong and comprised of numerous pointed segments which are not overlapping as in a fir cone.

The wood is hard and, because of the uncertainty of the grain, is almost unworkable by Indian carpenters. It also cracks and splits easily and so is more suitable for beams or posts than planks, but does not last long underground. The chief use is as fuel for which a tree may be cut when 10 to 12 years old, although it is better left until about 20. The bark is astringent and used for tanning and dyeing fishermen’s nets. It is also employed in the treatment of stomach complaints and as a tonic.



YOUNG CASURINA



CASURINA TWIG

LIGNUM VITAE

GUAICUM OFFICINALE

Fam, Zygophyllaceae. Lignam Vitae, Gum Guaicum, Wood of Life (Eng.)

THIS is another of- our trees which attracts attention by its cool, quiet colours, in sharp contrast to the predominant yellows and reds. The dark, rounded crown of small, dull leaves frames the bunches of small, blue flowers with the restraint of an English rather than an Eastern tree.

It is a slow growing tree, reaching 9 to 12 m. when mature, usually with a crooked trunk and knotty branches. The bark of the trunk is smooth and variegated in shades of grey and beige, while that of the branches is furrowed and uniformly ashy. From these angular branches spring many branchlets, all bearing numerous, dark green leaves. These consist of two or three pairs of smooth, stemless leaflets, roundish, about 2.5 cm. long, but varying considerably in size and shape. Usually the end pair is the largest. At the base, each leaf has a tiny spot of orange.

At the beginning of the hot season the whole crown becomes swathed in silvery blue and throughout the monsoon many of the flower clusters remain. During the end of the year some of the trees have a second, but lesser flowering period.

As buds and newly opened flowers are quite a deep blue and old flowers fade to palest silver, the clusters present a charmingly shaded effect. Each small flower has five spreading petals surrounding ten erect, yellow-tipped stamens.

In August the little, round berries stud the tree with gold. They appear in small clusters, first green, then ripening to bright yellow and orange. Irregular in shape, they are compressed to form varying numbers of rounded wings.

A translucent green resin exudes from this tree either naturally from the trunk or through incisions. Sometimes it is obtained by cutting the tree in sections and heating the wood. Melted, this gum produces a very pleasant odour. The hard, olive-brown wood is also aromatic but this is acid and not so pleasant. The wood is extremely hard and heavy and will not float in water. In fact it is the heaviest of all commercial woods and it is so amazingly iron-like that in the old days it was found that the iron tools used to fell the tree broke before the trunk could be severed; but for such uses as part of the propellor shafts of steamships there is still no natural substitute for Lignum Vitae heartwood. Bowling balls, mallets, bearings, etc., are also made from it.

Wood, gum, bark and fruit all have medicinal qualities which makes the fact that there are no local names for the tree even more surprising. In Jamaica in the early 18th Century a pioneering naturalist and doctor by profession discovered that the tree had almost magical properties in treating a score of maladies, after which the market price rose astronomically.

The Latin name is derived from the Mexican name of the plant and from a word meaning “recognised in pharmacy and medicine”. Lignum vitae is the name of the timber, which is also known as Brazil wood and means “Tree of Life”. In fact the tree has many names in different parts of the world, yet our vernacular would appear to provide none at all. It is indigenous to the tropical and subtropical areas of South America and the West Indies, mostly in the drier districts and near the coast being resistant to salt spray.



LIGNUM VITAE

BABUL

ACACIA ARABICA

Syn. Mimosa arabica, acacia nilotica var. tomentosa

Fam. Leguminosae. Sub fam. Mimoseae. Babul, kikar (Hind.); Babla (Beng.); Karu-velam (Tam. Mal.); Natta tuma (Tel.); Babul, Indian Gum Arabic (Eng.)

AMONGST other trees the Babul is not particularly conspicuous, but in the inland, drier regions it is one of the few trees able to find sufficient nourishment to attain average height and, having established itself by arming its branch, it acquires protection from grazing animals, to which it affords good shade. Older trees and branches beyond the reach of animals are not thus armed. The ability of the pairs of tiny leaflets to fold flat, not only at night, but during excessive heat also endows it with a greater chance of survival as, too, does its capacity for doctoring injuries to its branches by exuding a gum which coagulates rapidly and heals the wound.

It is a small or medium tree, rarely rising beyond 12 m. with straight, fine, grey-downy branchlets. The small, golden-yellow balls appear in fragrant groups during July and November - throughout the year in some localities - and consists of numerous, tiny blossoms resting in minute calices and having distinct stamens. Half-way down the flower stalks are broad bracts or irregularly developed leaves. The narrow, stiff, leathery pods, densely lined with fine down, are from 7.5 to 15 cm. in length and enclose about a dozen seeds, between each of which the pod is more or less constricted.

The leaves are bipinnate and the many pinnae, each bearing numerous tiny leaflets, give the tree a delicate, feathery appearance. At the base of each leaf stalk is a long, white, ascending thorn.

Pods, seeds and young branches are used as fodder for cattle, camel and goats when grass is scarce. Most parts of the tree have medicinal uses. The bark contains a powerful, astringent acid and is used for tanning and dyeing. The gum it exudes during March-April is procured by making an incision in the bark and when the sap runs out it hardens in lumps of various sizes and may then be easily removed; it is used as a substitute for Gum Arabic and, mixed with seeds of sesamum, is eaten by the village people. A decoction of the bark makes a soap substitute and is of healing value. The thorns are popular in offices, where they are used to pin sheets of paper together. The wood is hard, heavy and durable and is put to many uses such as making wheels, oil and sugar presses and agricultural implements.

The Babul is common in the forests of the Punjab, Bihar and Western India, West Pakistan, Sri Lanka and Burma; makes excellent fuel and is of rapid growth, despite the fact that it needs little water. The name is derived from the Greek 'akis' meaning a sharp point.



BABUL

BANYAN TREE

FICUS BENGHALENSIS Syn. *F. indtca*

Fam. Moraceae. Bargad, bor, ber (Hind.); Ala (Tam.); Petal (Mal.); Mart, pedda-mari (Tel.); War (Mar.); Nuga (Sinh.); Indian Fig Tree (Eng.)

WALKING in the country one day I came across a venerable old Banyan tree, its pillared arms extending an offer of cool shade away from the heat and glare of the Indian sun. I wandered among the arcades and marvelled at the vast area which this one tree covered and recalled the descriptive lines —

Branching so broad and long that in the ground
The bending twigs take root and daughters grow
About the mother tree, a pillared shade —
High over-arched with echoing walks between

Then I remembered a picture once seen of a whole village settled beneath the canopy of a Banyan tree. Other memories came - legend of folklore which told of ghosts and dark spirits inhabiting old Banyan trees, but I passed those over as nonsense. Later in the day, however, I again came that way. The sun was well below the horizon and this time I saw an evil old giant, his snake-like arms extended, waiting to crush some helpless victim. A sinister atmosphere surrounded the place - no need then to recall the tales of ghosts and devils!

There are those for whom this tree with its ability to support its growing weight by an ever-widening circle of root-like branches represents eternal life. By them it is worshipped and special prayers are offered to it on Vat-Savitri day.

The Banyan is an outstanding example of epiphytic growth. A seed, ejected by some bird, may come to rest among the leaves of a palm, or other tree. Here it germinates; long roots appear which soon thicken and strengthen and eventually strangle their host. To the Hindus this is a Holy Union - to others, probably, another story of Beauty and the Beast!

The bark is grey and smooth - usually variegated because it flakes off easily, and the trunk in mature trees is never cylindrical but composed of several amalgamated aerial roots. From every branch hang clumps of brown 'rope'; these eventually unite and on reaching the ground take root and grow into separate trunks and so the tree widens and covers an ever-increasing area. One famous specimen was reputed to have a circumference of 600 m. - so great that 20,000 people could shelter within its columned shade.

The leaves are large and leathery, mostly elliptical in shape and dark, glossy green, conspicuously pale-veined. Like nearly all fig-trees, the Banyan has two large scales which cover the leaf bud. As the leaf develops the scales fall, leaving a ring round the stem at the base of the leaf stalk. Young leaves have an attractive reddish tinge.

The tree appears to bear no flowers, only fruit. Actually the flowers are concealed in the fleshy receptacle commonly referred to as the fig. These figs are stalkless and grow in pairs like red cherries in the leaf axils. They contain numerous, tiny blossoms of Both sexes and also a host of small insects. These are the 'fig insects' without which the tree could not produce seed, each species of fig having a species of wasp attached to it. The insect enters through a hole in the top and lays eggs which hatch out and mature. These new insects, on leaving their home, become dusted with pollen from the male flowers. They then make their way into another fig, thus ensuring fertilisation. The figs ripen between February and May, when they become bright red and are then much sought after by birds and bats.

The name Banyan, according to one authority, was given to a tree growing in the Persian Gulf, under which some banyas or Hindu traders had built a pagoda. To Hindus it is sacred and they object to felling it, causing great difficulty to forest officers in search of labour. Often a seed will germinate in a cracked wall and so firm is the embrace of the roots that it is almost impossible to extricate it.



Banyan timber is porous and not sufficiently durable to be in great demand; the aerial roots, though, provide stronger timber and are used for tent-poles and cart-yokes. From the bark and young hanging roots a coarse fibre is obtained which is used for rope-making. Bird-lime is made from the sticky, milky sap, which also has medicinal qualities and the leaves are used as plates. From the leaves a poultice is made which brings relief to abscesses. The original home of the Banyan is South and West India and among the sub-Himalayan tracts but it is now found all over the country.



PEEPUL

FICUS RELIGIOSA

Fam. Moraceae. Pipal (Hind); Asvattha (Beng.); Drasi avasi (Tam.); Aruli-mara (Can.); Avasai, arasu (Mal); Ravi, ragi rai (Tel.); Bo (Sinh.); Bodi (Malay.); Peepul, Bo Tree, Sacred Ficus (Eng.)

FOR antiquity and veneration the Peepul is unrivalled throughout the world. No other tree is claimed to have such long life; part of one in Sri Lanka said to have been planted in the year 288 B.C., still lives and flourishes. The Prince Siddhartha is known to have sat in meditation under a Bo tree and there found enlightenment from which time he became known as the Buddha. So, from then on the tree was sacred to Buddhists. Hindus associate the tree with the three gods Brahma, Vishnu and Shiva, Vishnu being reputed to have been born under a Peepul, which is therefore Vishnu himself in the form of a tree. In his washing ceremony the Brahmin goes to a Peepul tree and, facing east, offers prayers. Sometimes the tree is invested like a Brahmin with the triple cord, the very same ceremony being performed. And sometimes it is solemnly married, the Nim or Banana being frequently chosen as the bride. So one may sometimes see a Peepul and a Nim planted side by side on little mounds. They also relate the legend of the Hindu boy who died during his thread ceremony and became a ghost to haunt the tree for ever after. In such veneration it is held that it is forbidden for any devotee to fell it, harm it or utilise a part of it in any manner. Even if found growing in a dangerous position or to have sprouted in some unsuitable place, which it does very frequently, the task of removing it is given to some person of another religion. Thus, by shifting the responsibility to the shoulders of others, the faithful can witness the destruction of the sacred tree with equanimity!

As light and airy as the Banyan is dark and enveloping, the Peepul bears long-stalked, fluttering leaves, heart-shaped and terminating in a long, tapering point. In all some 15 to 17.5 cm. long, these shining Poplar-like leaves, paler beneath than above, cannot fail to be identified. Like the Poplar too, these pendent leaves on their long stalks flutter and dance in the slightest breeze and the gentle tapping of their tails against neighbouring leaves simulates the pattering of rain. Especially charming is this sight in April when the new leaves, dark-red and shining, are scattered about the branches.

The smooth, pale-grey bark frequently peels off in patches and the erect trunk, rounded in young trees, becomes ridged and irregular as the tree ages. There is a fine specimen of the tree in the Victoria Gardens, Bombay; its strong, buttressed trunk and widely spreading branches make it indeed a noble sight.

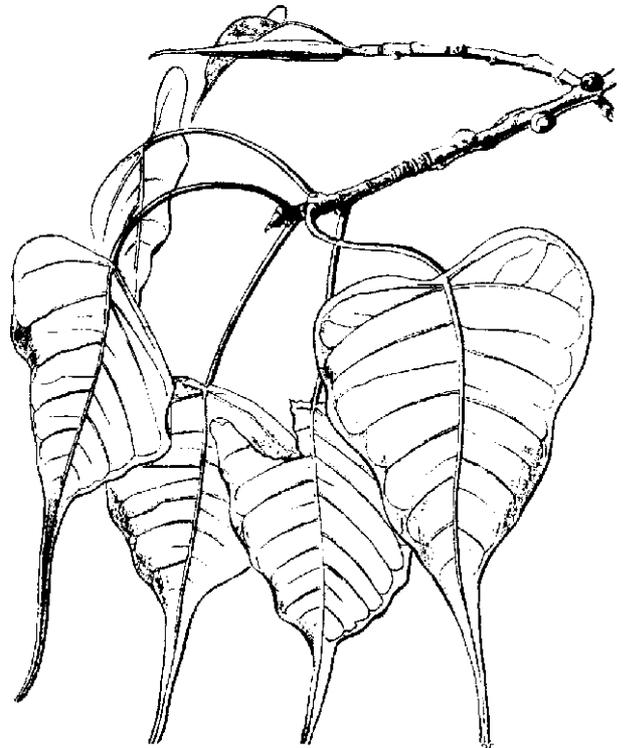
Figs, the fruit of the tree, grow in pairs, concealing the flowers, as do those of the Banyan and other species of ficus and are purple-blade when ripe and much liked by birds. The seeds, as in the case of the Banyan, are carried by birds and, lodging in a tree, germinate and grow. The host tree, which at first supports the intruder, eventually succumbs to the pressure of the enveloping roots. This does not mean, though, that the Peepul and Banyan are parasites. They take no nourishment from the host tree, relying on air and rain until their roots reach the ground.

Because it is so universally worshipped the Peepul has few medicinal or economic uses. The juice of the bark is sometimes made into a mouthwash to alleviate toothache or strengthen the gums and also made into bird-lime, and the wood is used to make packing-cases. It is common from India to South East Asia and ubiquitous in most tropical countries.

There are several hundred species of Ficus and in India alone about eighty. *F. racemosa*, Syn. *F. glomerata* is the wild fig. Unlike the Peepul it is not epiphytic when young, but is to be seen in the same areas. The red, downy and edible fruit which, although always full of crawling insects and dangerous to eat, is much relished by the country people. In Bengali, it is known as lagdumar and in Hindi as Umar or Gular.

F. carica, the common Fig known as Anjir, bears the cultivated fig which from time immemorial has been one of the most valued of fruits. Its goodness is mentioned in the Old Testament and the "Odyssey"; but it is agreed that those grown in India do not compare with the richly flavoured figs from Italy. It is usually more of a shrub than a tree and is grown in the Mediterranean regions and South America as well as in Asia.

F. elastica, an improved form of which is called the Rubber Plant when grown as a house plant in temperate climates, is the India-rubber tree, (Attah bor in Bengali) thus named when it was discovered that the latex has the property of erasing pencil marks. Its distinguishing marks are the close, parallel, straight nerves of the leaves and the huge, leaf-like appendages at the base of their stems. It is widely cultivated in the tropics and common in Nepal, Assam and Burma.



LEAVES & FIGS OF PEEPUL TREE

MADRE

GLIRICIDIA SEPIUM Syn. *C. maculate*

Fam. Leguminosae. Sub. fam. Papilionaceae. Kona maram (Tam. a name for any Cassia-like tree); Maikonagaha (Sinh); Madre, madura (Vern.); Madre, Spotted Gliricidia, Madre de Cacao, Nicaraguan Cocoa Shade (Eng.)

THIS is a charming tree, its long sprays of pale pink flowers rather reminiscent of the Cassias. As recently as 1916 the first specimen was brought to India from Sri Lanka where it was introduced in 1899. Its native country is South America, but now it is quite common in Indian gardens.

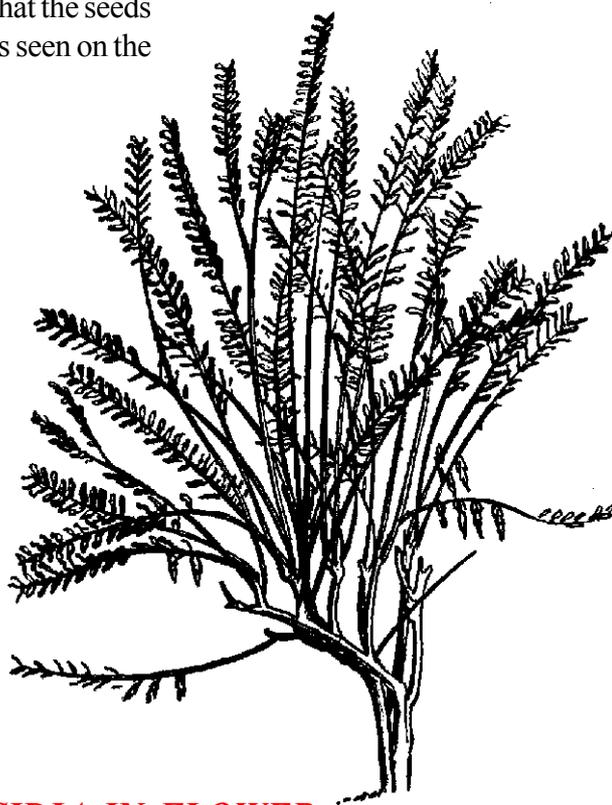
Left unpruned the Madre develops into a fine spreading tree, its long grey branches sweeping out and downwards in graceful arches. But these branches, unfortunately, bear such a profusion of leaves that they are often broken by the weight if the tree stands in a spot unsheltered from the wind. So it is that most garden trees are pollarded. This changes the form of the tree entirely. An unpruned tree will bear from its main branches numerous flower-bearing branchlets, upstanding 7.5 to 10 cm. each clothed with a dozen or so flower sprays. From the scars of the pruned tree rear several, very long branches which, for nearly their entire length, will be swathed in clumps of pink bloom. The flowering season is January-February, and before that most of the leaves fall, enough, however, remaining to show off the delicate paleness of the blossoms. To be seen at its best a Madre should really have a dark background - an evergreen for instance.

Plants sometimes flower when only about a metre high and are very quick growing and easy to propagate. In fact gardeners have to avoid using a Madre branch as a supporting stake because there is every chance of the stake taking root and becoming larger than the plant it supports. The 15 cm. flower sprays are tightly covered with pale purple-pink blossoms with the "keel and wing" formation of several flowers described here. One petal is large and back-curving, and within the two sickle-shaped wing petals is an incurved keel petal. The upper petal is smudged with yellow. The fruit is a long flat "bean" and in March, when the whole tree is draped with these pendent green pods, the effect is quite charming.

The leaves are about 30 cm. long and divided into eight pairs and one terminal leaflet, pale green, soft and furnished above with fine down. When fallen and withered they smell like new-mown hay.

The tree has no economic or medicinal uses in India, not having been sufficiently long established, but it is often planted for its beauty and because it makes an excellent shade tree for nine months of the year. The loppings are used as a green manure. In Central America Red Indians planted Madres at short intervals among the cocoa crops (*Theobroma cacao*) and claimed that the crops would not thrive without their "cacao mama". This was probably true, not because they gave shade and exercised some special charm, but because they enrich the soil with an abundance of humus-forming leaf mulches and because the tree is rich in nitrogen. The Spanish conquerors appreciated its benefits and called it Madre de Cacao - "cocoa mama". Today it also serves as a "coffee mama". It is now extensively planted in tropical countries as shade for coffee and cocoa plants but care has to be exercised in its handling as leaves, bark and seeds are all poisonous.

A white variety, *C. alba*, has recently been introduced. My opinion of the only one I have seen - a flowering sapling - is that, as the blooms are a pure white and are borne in as great a profusion as those of its pink relative, the tree is very charming. The name *Gliricidia* means "rat destroying" and it is claimed that the seeds have this power. *Maculata* means "spotted" and refers to the small glands seen on the undersides of the leaves.



SPOTTED GLIRICIDIA IN FLOWER

DRUMSTICK TREE

MORINGA PTERYGOSPERMA Syn. *M. oleifera*

Fam. Moringaceae. Munga, sondna, segva (Hind.); Nugge (Can.); Soanjna, suhujna (Hind., Beng.); Morunga flam., Sinh); Muringa (Mal); Munga (Tel.); Shakta (Mal.); Merunggai, sajina (Malay.); Drumstick Tree, Horse Radish Tree, Ben Tree (Eng.)

THIS is a pretty tree, the delicate tracery of its much-divided leaves giving it an airy, graceful appearance. It is very common in towns and village gardens where it is grown as a boundary fence and for its many edible uses. Cuttings 1 to 1.5 m. long, put down in their permanent positions strike easily and grow quickly. In the Western Himalayas and Oudh it grows wild and has become naturalised in equatorial lands around the globe.

The thick, grey bark is furrowed and comes off in corky flakes. The main flowering season is from February to April but many trees will be seen in bloom from September onwards. The creamy white flowers appear in large, loose clusters, sometimes covering the whole tree in a white froth. Each individual flower is small; the stem bends sharply at the tip and nine of the ten long petals fold back around it. Six unequal stamens bear bright orange anthers. Old flowers turn rather yellow and, together with the new white flowers and the pale green and white buds, the whole spray is a picture of delicate beauty, its sweet honey-scent an added attraction. The fruit starts as a pinkish, twisted tube and takes about three months to attain its full length of anything up to 50-cm. when it is bright green and ridged and contains many winged seeds. This extraordinary pod gives the tree its name of Drumstick; both pod and seeds are a popular ingredient of curries (the drumstick curry of Madras; Boiled it is said to have the flavour of asparagus, and is often pickled.

The distinctive leaves are divided and sub-divided, the ultimate segments being only 1.3 to 2 cm. long. They are oval, borne on tiny stalks and a clear green colour. Each leaf is as much as 60 or 90 cm. long but the pinnae and leaflets are rather widely spaced and the whole does not form a compact and symmetrical leaf. It is like the leaf of the Persian Lilac on a small scale. Pinnae, secondary pinnae and leaflets are all opposite.

As well as having an edible fruit the Moringa is useful in many other ways. The scraped root is an excellent substitute for horse-radish; the twigs and leaves are lopped for camel fodder and the flowers and leaves, rich in vitamins, are cooked in curries. Medicinally the tree has many uses; the roots contain a pungent oil rather like mustard oil and is used to make plasters where a counter-irritant is needed; the root itself is popular as cure for sore throats and the bruised leaves are believed, incorrectly, to be a remedy for the bites of snakes, monkeys, etc.; from the wood exudes a gum which is at first white but later turns yellow and then dark brown. It is used in native medicine. The seed: yield an oil very similar to the ben oil of watch-makers. Actually ben oil is the produce of another species, *M. aptera* of Africa. The oil of our tree is used in India for fine machinery and by perfumers as it holds odours which are inclined to be fugitive, but it is not exported and is not as largely used as it might be.

From the bark is obtained a coarse fibre, useful for making mats, paper and cordage.

The name Moringa is from the Tamil and oleifera, means "oil-bearing". Pterygosperma is from the Greek and means, "with winged seeds".



FLOWERS & FRUITS OF THE DRUMSTICK TREE

BEAD TREE

MELIA AZEDARACH Syn. *M. australis*

Fam. Meliaceae. Deikna, bakarja, drek, bakain, malla nim (Hind.); Mahanim, gora-nim (Beng); Mallay vembu, puvempu (Tam.); Vaymbu (Mal.); Taraka vepa (Tel.); Pejri (Mar) Mat kohomba (Sinh.); Mindi kichil (Malay); Bead Tree, Persian Lilac, Pride of India, Chinaberry, Japanese Bead Tree (Eng.)

THE lovely Bead Tree is somewhat similar to the Nim in appearance and takes the place of that tree in the Northern parts of India. Both have compound leaves with narrow, serrate-edged leaflets terminating in long points, but those of the Bead Tree are smaller, lack the scythe-like curve and are sub-divided at the base into several pinnae bearing five or seven leaflets. It is a medium-sized tree, fast-growing and attaining up to 12 m. in height in a few years, but its beauty is short-lived; at the age of about 20 years it commences to die off. The bark is dark grey-brown cracked vertically by long furrows.

In the winter the leaves fall and the tree is naked except for the masses of cherry-like fruits which, when ripe and lusciously golden, attract bulbuls and other birds in large numbers. By March the spring foliage appears, followed immediately by the beautiful sprays of tiny, lilac blooms. Growing high up on the tree, they draw attention to their presence by their delightful fragrance - powerful yet delicate. One looks up to see a multitude of little nodding blossoms loosely clustered on long-stemmed sprays. Each flower has five or six narrow mauve or white petals which, on opening, reveal a deep purple tube; this is actually a cohesion of the stamens. Recently I came across a flowering Bead Tree which bore from the trunk - only a foot or two from the ground - several new leaves and quite large clusters of flowers; but this is most unusual.

After the monsoon the fruits form and those which are not eaten by birds eventually become very wrinkled. Each fruit contains five seeds which, having a natural perforation through the centre, make ideal beads when the pulp has been boiled off. Because of this characteristic the tree has become a popular exotic in Southern Europe where the beads are made into rosaries by the monks in the monasteries. Although principally an ornamental tree it has several uses. The fruit has narcotic qualities and large quantities are poisonous, but, combined with the leaves they have a certain value as poultices in cases of headache, or neuralgia. Over a century ago it was found that an inflammable and odourless gas which burnt with a clear light could be obtained from these berries. A valuable oil is also procured from the roots, and the timber, though not often used, is handsomely marked and easy to work. It is employed mostly for sheds, beams and small furniture.

The Bead Tree is believed to be indigenous in North India and Burma, but for countless years it has been held as sacred in Persia and Malaysia as well as in India and can now be found in tropical America, the Philippines, the Hawaiian Islands, Cuba and China. In some of these places it is a persistent nuisance - in others garlands of the flowers are placed on temple altars as offerings. It is not fussy as to soil and position and grows readily from seed or cutting.

Melia is the Greek name of the Ash, but is not very appropriate as there is only superficial resemblance between the Bead Tree and the Ash. Azcdarach is from the Persian azad darakht.



BEAD TREE

GOLDEN CAMPA

MICHELIA CHAMPACA Syn. *M. aurantiaca*

Fam. Magnoliaceae. Champa, champaka (Beng., Hind.); Chembuga, chambugam (Tam.); Champaka (Tel.); Champakam (Mal.); Sampige (Can.); Sapu (Sinh.); Chempaka, chempa (Malay.); Golden Champa, Yellow Champa, Fragrant Champaca (Eng.)

TREES with flowers as highly scented as the Yellow Champa are usually popular with Hindu ladies who love to adorn their hair with the blossoms and this tree is no exception. They are used for Puja too so the tree is commonly found around temples as well as in gardens. Derivations of the Sanskrit name Champaka are heard not only in India but in the languages of Malaysia, Indonesia and the Philippines and in all of these places it is a popular tree. In suitable conditions, plains or low hills with adequate rainfall, it may reach 30 m. in height.

The leaves, which do not all fall at one time, are slightly like Mango leaves, long and wavy-edged and have a silky bloom before opening out. The air for many yards around the tree is filled with the scent of the flowers during May and October and an inspection of these golden-yellow stars shows that sepals and petals are the same colour and appear like twelve to fifteen narrow, pointed petals. They grow in the axils of the leaves on 2.5 cm. curved stems and are hooded by a pinkish-yellow sheath when in bud. There are varieties with white and creamy-white flowers which can be grown only as a graft on the golden-flowered variety and one with golden-orange flowers which can be grown from seed and is probably the most favoured variety being even more highly scented.

Seeds of the common Champa are produced in abundance; in fact the tree can exhaust itself with the prodigality of its output and may take two to three years to gather enough strength to flower again. Gardeners would be wise to remove many of the fruit clusters before they develop. These seeds are coral-red in colour and two or more are contained in each green, dotted carpel.

The yellow-brown timber is of great value and where the tree is grown extensively is used for almost anything from cabinet-making to firewood. Medicinally, too, the tree has a wide variety of uses. Concoctions from the bark make a good tonic and a cure for toughs and rheumatism is prepared from the flowers. The scented oil from them is considered to relieve eye troubles and gout.

A Florentine botanist, P. A. Micheli, was honoured when the Champa was named and the old name *aurantiaca* means “orange-yellow”



GOLDEN CAMPA

UMBRELLA TREE

THESPESIA POPULNEA var. *ACUTIFOLIA*

Syn. *T. dcutiloha*, *Hybisius Populnrus*

Fam. Malvaceae. Bhendi, gajahanda, parsippu (Hind.); Poresh, paras pipal, gajashundi (Beng.); Portung, puvarassu, pursa (Tam.); Chandamaram, chilanti, pupparutti, puvarusu (Mal.); Huvarsi (Can.); Gangareni (Tel.); Suriya (Sinh.); Baru, buah keras laul (Malay); Umbrella Tree, Portia Tree, Indian Tulip Tree (Eng.)

THE compact, clean-cut crown and straight bolt of the Umbrella Tree often give it the appearance of a child's model tree, conventionally carved and painted. This neatness makes it most suitable for formal park planting, but because of the close-growing foliage it is often used as a shade tree, too. Common along the tropical shores of Asia, it does not thrive so well at any great distance from the sea. In that the flowers are large and cup-shaped they resemble the tulip, but the crinkled, fragile quality of the petals and their ephemeral life bear no resemblance to that plant at all. Appearing all through the year, singly or in pairs they are a bright, lemon-yellow with patches of blood-red at the base of each of the five petals. The whole flower has the appearance of having been so crushed and twisted in the bud that it was impossible for the petals to smooth themselves out again. From the pistil, rising like a wick in the centre, sprout numerous white stamens, conspicuous because of their deep-yellow anthers.

Although evergreen, many of the leaves fall in February. Withering leaves acquire the same lemon-yellow tint as the flowers and at first glance one gets the impression the tree is in full bloom. The leaves are heart-shaped and pointed, with conspicuous pale nerves radiating from the base. They are from 5 to 12.5 cm. long and nearly as broad, borne on brown and green stalks a couple of inches in length.

The fruit, when young, sits loosely in the enlarged calyx, but, later, swells into a small green apple which eventually turns black.

It is an extremely useful tree; from the inner bark is obtained a tough fibre which is made into cordage; bark and wood contain tannin and yield a red dye, and the wood, retaining its qualities in water, is ideal for boats, vehicles and house-building.

From the flowers and fruit a yellow dye is obtained and the fruit juice, applied externally, is a cure for scabies and other cutaneous diseases. Migraines can be cured by applying the crushed capsules to the forehead and a tonic is concocted from the roots.

Thespesia is derived from the word Thespesios meaning "divine" and the tree is named thus because it is frequently planted near churches and temples. Populnea means "having leaves like a poplar" and acutifolia means "with pointed leaves".



UMBRELLA TREE

CANNON-BALL TREE

COUROUPITA GUIANENSIS

Fam. Lecythidaceae. Nagalingam (Beng., Tam.); Shivalingam (Hind.)

BEFORE the Cannon-Ball Tree has started to flower it is very ordinary and commonplace with its stout, straight trunk, rough, grey-brown bark and long, dark green leaves; but mature and bearing flowers or fruit it at once attracts attention. From the base of the trunk upwards hang a tangle of long woody branches quite distinct from the leaf-bearing branches and from the wood of the tree. These branches, up to 90 cm, long bear the long fleshy flowers and globular green buds. Remarkable, not only from their habit of crowding the base of the tree instead of the top, but for the curious and unusual grouping of stamens and style, these scented flowers are quite 7.5 cm. across and a beautiful mixture of pale yellow, white and shades of deep pink. The six thick petals are concave and within them lies a circle of barren stamens without pollen grouped around the ovary. To one side a ladle-like appendage juts out and on it are ranged the fertile, or pollen-bearing stamens, curving protectively over the ovary and style. This odd arrangement ensures that if pollination by an insect from another flower is not achieved then self-pollination will take place, because as the flower starts to wither the appendage of pollen-bearing stamens closes over the style which is thus pollinated.

The fruits are also extraordinary, hard brown spheres which attain the size of a coconut and make it very obvious why the tree was given the common name of Cannon-ball Tree. They take eight to nine months to ripen and contain a mass of very sour-smelling, pale yellow pulp.

The tree has been described as evergreen and also as deciduous. In actual fact the old leaves do fall together but the new ones appear so soon and so quickly that the tree is never bare for more than about a week. For a brief time the new leaves are a rich, bright green but soon become dark. They are clustered mostly at the ends of the branchlets and are each about 12.5 cm, long and narrow in proportion, pointed and tapering gradually to their short stalks.

Propagation can be from seeds or by suckers which are produced in quantity and the tree thrives best in moist, low-country districts. Its original home is in the Guianas of South America and it was recorded as being an inhabitant of their dense forests over 130 years ago. It has since been introduced into several tropical countries, but being an object of curiosity rather than beauty, never in large numbers.

The Cannon-ball Tree is of little commercial importance as a timber product since the wood is of inferior quality and there is little or no heart wood. But it is used by the South American natives for a variety of rudimentary purposes.



**TRUNK OF
CANNON BALL TREE**



CANNON BALL TREE

KARNIKAR

PTEROSPERMUM ACERIFOLIUM

Fam. Sterculiaceae. Kanak champa (Beng., Mar.); Kanak champa, kaniar, katha champa (Hind.); Bayun (general for the genus) (Malay)

IN northern India, Assam and Burma which are its home the Karnikar becomes a tall, slender tree, but further south it achieves no great height. It is evergreen and striking because of the large size of both flowers and leaves. The latter, being pale grey underneath, are most conspicuous when the wind turns and twists them on their long stalks. The bark is smooth and grey but the twigs are downy and a rusty-brown in colour. Young leaves also have this downy covering which drops on as the leaf develops. A full-grown leaf can be as much as 35 cm. long and only a little less in width, with margins that are waved or lobed, the lobes sometimes terminating in a point. They are tough and leathery, dark green above but silvery below because of the dense clothing of down. The flower calices are also downy but an ochre or khaki shade. These are seen first as long, rough buds which eventually split into five slender sepals, curving gracefully back to release the creamy-white petals which twist and bend around the cluster of white and gold stamens. The delicate fragrance of these flowers, which open from February to May, remains long after they have fallen and become dry.

The fruit is a hard capsule, sometimes 15 cm. long. It is covered in rough, brown hair and divided into five sections and, after ripening for about a year, these sections split open and release a large number of winged seeds. The Karnikar is a valuable tree to Indians. The large, round leaves make fine plates or can be used as a wrapping. Laid on roof battens under the thatch they make a strong 'felt' and the down from the under-surface is used to stop bleeding. Flowers, too, have their medicinal uses, a good tonic being prepared from them, also a cure for inflammation, ulcers and tumours. Kept among clothes they impart a pleasant perfume and keep away insects. Hindus use them for religious purposes. The tree can be found in countries from India to Java.

The timber is not very hard but is durable and rather like teak and is used for planking, boxes, spars, etc.

Propagation is from seed. Pterospermum is from two Creek words, pteron and sperma meaning "winged seed".



KARNIKAR

ALEXANDRIAN LAUREL

CALOPHYLLUM INOPHYLLUM

Fam. Guttiferaceae. Kath champa, sultana champa, punnag (Beng.); Sultana champa, surpan, undi, surpunka (Hind.); Undi, udi, pumag (Mar.); Pinnai, punnagam (Tam.); Domba (Sinh.); Pinna, dherupunna (Mal.); Surabinne (Can.); Penaga laut, pudek, bentangor bunga (Malay); Alexandrian Laurel Dilo Oil Tree (Eng.)

THIS noble tree with its evergreen canopy of rich green foliage is found on most coastal districts of the Indian and Pacific oceans from East Africa to Tahiti. When Georgetown, on Penang island, was laid out groves were planted at a place called Tanjong Penaga which presented a magnificent spectacle for many years and in India it is a popular tree for roadside and avenue planting although very slow-growing. It will reach 21 m. and spreads its whorled branches from low on the trunk. The smooth bark is dark grey and brown in colour.

Reminiscent of the Magnolia, the thick, oval leaves are smooth and polished with a conspicuous pale mid-rib and parallel veins so fine and close that they are barely visible from above. In contrast to this rich, dark green the clusters of scented, white flowers stand out strikingly. They are four-petalled, with numerous yellow stamens grouped in four bundles. The anthers change from deep yellow through khaki to brown. Both male and hermaphrodite flowers grow together but only the hermaphrodite flower has an ovary, a bright pink ball which is left at the end of the white stem when the petals drop. The flowers appear during May-June and sometimes again in November and are followed by the spherical fruit, greenish yellow in colour and smooth-skinned. These are frequently to be seen floating in the sea or on the shore. From them is extracted an oil used in the past as an illuminant. This is known as pinnai or dilo oil, is dark green and highly scented and employed as a remedy for rheumatism, ulcers and skin diseases.

Being close-grained and durable, the wood is used for boat-building, railway sleepers and plywood and being of a rich reddish-brown is excellent for cabinet making.

Callophyllum in Greek means “beautiful-leaved” and inophyllum means “having leaves with pronounced veins”, referring to the undersides of the leaves.

The tree is usually raised from seed.



ALEXANDRIAN LAUREL

MOHWA

MADHUCA LATIFOLIA Syn. *Bassia latifolia*

Fam. Sapotaceae. Mohwa, mahula, banmahuva, maul (Beng.); Mohwa, mahua, jangli-mona, maul (Hind.); Mohwa (Mar.); Kat-illipi, illupai (Tam.); Illupa (Mal.); Ippa (Tel.); Mi (Sinh.); Mohwa, Indian Butter Tree (Eng.)

THE Mohwa is one of the most important of Indian forest trees, not because it may possess valuable timber - and it is hardly ever cut for this purpose - but because of its delicious and nutritive flowers. It is a tree of abundant growth and, to the people of Central India, it provides their most important article of food as the flowers can be stored almost indefinitely. Not a tree of coastal districts, it prefers the dry, rocky hill-regions and there, where it is so much cultivated, it also comes up self-sown.

The tree was named after Fernando Bassia, one-time curator of the Botanical Gardens at Bologna. It is large and deciduous with a thick, grey bark, vertically cracked and wrinkled. Most of the leaves fall from February to April, and during that time the musky-scented flowers appear. They hang in close bunches of a dozen or so from the end of the gnarled, grey branchlets. Actually the word 'hang' is incorrect because, when a bunch is inverted, the flower stalks are sufficiently rigid to maintain their position. These stalks are green or pink and furry, about 5 cm. long. The plum-coloured calyx is also furry and divides into four or five lobes; within them lies the globular corolla, thick, juicy and creamy white. Through small eyelet holes at the top, the yellow anthers can be seen. The stamens are very short and adhere to the inner surface of the corolla; the pistil is a long, protruding green tongue. It is at night that the tree blooms and at dawn each short-lived flower falls to the ground.

A couple of months after the flowering period the fruit opens. They are fleshy, green berries, quite large and containing from one to four shiny, brown seeds. While there are stili flowers on the tree the new leaves sprout; rising in close whorls from the tips of the branches, above the flowers, they are lovely shades of rust and crimson. The tree at this time is extremely decorative. Tiny leaves are furnished with soft down, but they soon become smooth and polished-looking and later turn dark green.

The gathering of the edible Mohwa flowers is an important business to the country people. Below the tree the ground is cleared and swept and at dawn the families, who have been camping near by, sweep up the blooms and put them out to dry on hard, flattened earth, near their shelters. The average yearly yield of a tree is 2.5-maunds (1 maund = 37 kgs.). Properly prepared the flowers are very tasty - something like pressed figs; they are often mixed with other food, with sal seeds or leaves of other plants, or they can be made into puddings and sweetmeats. Sugar can be made from them too, or they can be fermented and distilled into a spirituous liquor. This is an extremely strong drink, rather like gin to taste but spoilt by its powerful and unpleasant odour.

The fruits too, both ripe and unripe, are valuable, all parts being used. The outer coat is eaten as a vegetable and the inner one dried and ground into meal. A thick oil is expressed from the kernels, which, being yellowish, gives the name of Butter Tree. It is largely used by the jungle tribes for cooking or else sold for making soap and candles. The residue makes a good manure and is widely used on lawns as a worm eradicator.

Animals, particularly deer and bears, love the fallen flowers and will come for miles on the chance of getting past the vigilant night guards and making a meal. Birds, too, enjoy them and peafowl can often be seen around the trees at sunset and dawn. Many a beast has lost its life by a bullet, through its passion for Mohwa flowers.

Cut flowers, stems and branchlets exude a thick, milky sap which is extremely sticky and astringent. It is used for curing rheumatism. Many plants with a milky secretion are poisonous, but that is certainly not the case with the Mohwa. The wood is hard and heavy, works easily and is occasionally used for furniture making. Medicinally the tree is very valuable. The bark is used to cure leprosy and to heal wounds, the flowers are prepared to relieve coughs, biliousness and heart-trouble while the fruit is given in cases of consumption and blood diseases.

In South India and Sri Lanka the Mohwa is largely replaced by a similar specie with narrower leaves, *M. longifolia*.



MOHWA

EASTER TREE

HOLARRHENA ANTIDYSENTERICA Syn. *Nerium antidysentencia*

Fam. Apocynaceae. Hat, kureya, karva-indarjau, dhudi, kura, kurchi (Hind.); Dhudi, kurchi tita-indarjau (Beng.); Dowla, indrajau (Bom.); Vepali (Tam.); Kuttukappula (Mal.); Pala, kodaga (Tel.); Easter Tree, Conessi Bark, Ivory Tree (Eng.)

THE Easter Tree is not widely grown as a garden plant but can be seen in abundance in any of India's and Burma's forests and can be found throughout the Malay peninsular. Personally, I think it makes a charming garden tree, being of small or medium height, having attractive, rich green foliage and decorating itself with hundreds of little, white blooms for a couple of months every year after it reaches only 2 to 3 m. in height. In Bengal the variety *H. a. pubescence* is planted in gardens and is considered far superior to the type.

The bark is pale grey mottled with brown, rough and cracked.

The oval leaves are quite large - between 15 to 30 cm. - pointed at the tip and wedge-shaped at the base. They grow opposite on short stalks and are marked with long, arched veins.

The full clusters of lightly scented flowers appear from about March to May and are usually blooming well at Easter, when they are plucked for church decoration. Each waxy, white flower stands on a pale, slim stalk. From a tiny, deeply-cleft calyx emerges a slender, narrowing tube, often tinged with red; this opens into five smooth petals, round-ended and overlapping slightly to the left, the whole measuring about 2.5 cm across. The stamens are not visible. The fruit is about 30 cm. long, narrow and slim, and contains cinnamon-brown seeds, each with a tuft of silky hair at the upper end. These seeds are bitter and have an unpleasant odour.

The Easter Tree is one of our most important forest trees, being the last to disappear in denuded tracts and the first to come up on waste land. This is probably because it bears flowers and seeds abundantly and when quite young, and also coppices well, sending up strong shoots even from burnt land. So it is useful for paving the way for more tender and slow-growing trees.

The bark, known as Kurchi, has tonic and astringent properties, but its reputation is principally as a cure for dysentery. Remedies for fevers, piles, dysentery and worms are made from the seeds. These are known as Indarjau, and for several centuries have been employed pharmaceutically. Decoctions from the roots are also used as a cure for dysentery - the name *antidysenterica* meaning this.

In Assam, where the tree grows to a greater height, the pale wood is used for making furniture; elsewhere it is used for small carved articles, for turnery and beads.

In the past there was some confusion between the Easter Tree and another species called *Wrightia tinctoria*, which has much less active medicinal qualities, as a result of which the genuinely curative Easter Tree fell into disrepute. In general appearance, bark and leaf of the two are similar but, except for the fact that the flowers are small and white, they have little in common. Apparently the country people mixed them up, too, as many vernacular names are common to both. One of these names is Dhudi, meaning milk-like, and it is applied to *Wrightia* because of the interesting preservative property of the sap. If a few drops of the sap are added to milk the milk will remain fresh without the necessity of keeping it on ice, the taste remaining unaltered.



EASTER TREE

SCARLET CORDIA

CORDIA SEBESTENA

Fam. Boraginaceae. Bhokar, bohari (Hind.); Virigi (Tel.); Scarlet Cordia, Aloe Wood, Ginger Tree (Eng.)

WE have many indigenous Cordias in India, but the loveliest of them has its home in the Caribbean Islands and the northern coast of South America, and was imported to this country and to Sri Lanka and the Philippines many years ago because of its ornamental value. The derivation of the name sebestena is rather involved. It means having fruit like Sebestens, which word is derived from the Persian Sapistan and is the name of an allied species grown round the town of Sebesta. The name Cordia honours Euricius Cordus and his son Valerius, a German botanist of the 16th Century.

Here we find the Scarlet Cordia as a small tree or garden shrub, but in its native haunts, in the sandy, sun-baked conditions it loves, it can reach 12 m. and there grows almost like a weed. Small or tall, it always has a short crooked trunk, wide in comparison with the height. The bark is brown and ridged.

Practically throughout the year the clusters of brilliant, bell-like flowers, scattered amongst the deep foliage, gladden our eyes with their rich hue - a clear, true scarlet. Each blossom is about 2.8 cm. across. A finely pleated tube is inserted neatly into a long olive-brown, felt calyx. The tube opens out into six rounded petals, deeply crinkled and pleated. Up to a dozen blooms may be found in one close cluster.

The fruit is distinctive - a pure white, five-lobed berry, enclosed in the remains of the calyx. The flesh has an odour reminiscent of bananas.

Both to look at and to touch, the leaves are unusual. They are large ovals, blunt at the apex and very deeply indented by the veins which, on the underside, form hard ridges. The colour is dark green, especially dark in older leaves and the texture as harsh as sandpaper. Even young leaves, although limp, are rough.

C. myxa, Lasora and Bhokar in Hindi, is the best known of our native Cordias and produces attractively fragrant, white flowers in March and April. This is the flower which was formerly known among medical writers as the Sebesten, whose famous fruit was used as a cure for lung ailments in ancient times. It is a fair-sized, deciduous tree with rough, grey or brown bark, and harsh, leathery, oval leaves. The flowers lie in a cup-shaped calyx and have fine curling, white petals, revealing the long stamens. The fruit is like a pale cherry and develops in stalked clusters. The nut is edible and tastes like a filbert, and the pulp, which has a disagreeable smell, is transparent and viscid and employed as bird-lime. Both parts of the fruit have medicinal qualities. The wood, despite its softness, is strong and durable and is said to be one of the timbers used to make Egyptian Mummy cases. It is also one of the better woods for the purpose of procuring fire by friction.

The tree is propagated by seed which germinate and grow quickly. Cuttings are difficult to strike.



SCARLET CORDIA

INDIAN JUJUBE

ZIZIPHUS JUIUBA Syn. *Z. Vulgahs*

Fam. Rhamnaceae. Ber (Hind); Bor, kulgachh, bogri (Beng.); Ellandi, ilantai, (Tam., Mal); Rengha (Tel.); Debera (Sinh.); Sedara (Malay.); Indian Jujube, Indian Plum, Indian Cherry, Chinese Date (Eng.)

THE *Ziziphus* group is somewhat difficult to describe as it varies so much - not only in the size but in the colour of the leaf and in the size and shape of the fruit. Sometimes the spines at the base of the leaf stalks are in pairs, sometimes single and frequently absent altogether. But once the leaf has been examined and the angular, twiggy formation of the branches observed, recognition in any of its forms becomes quite easy.

The Indian Jujube is described as a small to medium tree, but one has been recorded which reached a height of 24 m. At the other extreme it is often met with as a scrubby, prickly growth straggling along roadsides or in waste land alongside the common *Lantana*.

The thick bark is very dark grey with irregular cracks. In well-grown trees the branches sweep gracefully downwards and, being almost evergreen, the tree is always attractive. The small, scattered leaves do not form a very close crown, so the Jujube does not include shade among its many uses.

Two short spines usually appear at the base of the leaf-stalks, especially on the flower branches; one is straight and the other curved. In cultivated trees these are sometimes absent. The leaves are from 2.5 to 7.5 cm. in length, oval and with three long veins running from the base. Above, the colour is darkish green; underneath either tawny, buff, cream or silvery-white and like suede to the touch. Occasionally, particularly on cultivated trees, the underside of the leaf is pale green, but the characteristic vein pattern and the way the leaves grow alternately from zigzag twigs establish their identity without much doubt.

The flowers clustering on slim stems round the leaf stalks are very tiny. From wee, globular buds five triangular petals open, forming a multitude of pale green stars. In most flowers, when the stamens are the same number as the petals, they grow beside the middle of each petal, but in the Jujube the stamens lie between the petals and often below each stamen, is a small ladle-like appendage. Some varieties bear very long flowering branches each with numerous side branches and myriads of clustered florets. Flowers appear around April, earlier on some trees and are considered by many people to have a most offensive odour. They are followed by the ovoid fruits which, within a tough, thin skin contain a dryish pulp and a hard stone. Like other parts of the tree these fruits vary considerably. They are edible; the pulp is used in seasoning food or eaten cooked with sugar when it is very pleasant and the kernel is eaten raw. The entire acid fruits are also preserved in oil or a sugar syrup. The wild fruit, green and round when unripe, is, when ripe, mostly used for making sherbet and is widely sold in the market - a favourite with all Indian students. The cultivated fruit is more oval and like a plum. The kernels are eaten, too, and in times of scarcity a floury meal can be prepared from the dried, ripe fruit.

The Jujube is an important tree in the dry regions as it grows readily and quickly on poor ground, furnishes good timber, excellent fuel, material for fencing in its branches, fodder for camels and goats and fruit for man. The bark is employed for tanning; many parts have medicinal uses and the plant is one of those on which the eri and tasar silk-worms feed. It is one of the best trees in the Punjab for the lac insect. The work of these insects makes a fascinating study. They live on the tender branches of certain trees, sucking the juice and forming a continuous incrustation of an orange-red, resinous substance. These insects occur naturally, but, of course, are extensively cultivated because of the value of their secretion. Previously lac was used for dyes but since the discovery of aniline dyes it has been of much less value. Now the resin is used. Purified, it becomes shellac which comes in various grades, the lowest making sealing wax and varnishes; the higher, gramophone records, polishes, lithographic-inks up to fine lacquer work. Other trees on which the lac insect feeds are Flame of the Forest, Peepul, Rain Tree and Mango.

The word jujuba is a Latinised form of the vernacular name and *Ziziphus* is from the Arabic. The tree is also found in Sri Lanka, Burma and Malaysia and in much of Australasia.

INDIAN JUJUBE OR BOR



MAST TREE

POLYALTHIA LONGIFOLIA

Fam. Anonaceae. Devdar, ashoka, debdaru, asok (Hind.); Debdaru (Beng.); Assothi, mara illupai (Tam.); Choruna (Mal); Owila (Sinh.)

THE Mast Tree is usually noticed as a lofty column, infinitely graceful with its downward-sweeping branchlets and shining, green foliage. This is the weeping variety, *P. longifolia* var. *pendula*, but in the species wide-spreading slender branches issue from the trunk and form a compact symmetrical crown.

The bark is smooth and dark greyish-brown. Flowers appear during March and April, but adjacent trees do not all flower at the same time. For a short period - two or three weeks only - the tree is covered with a profusion of delicate, star-like flowers, which, being palest-green in colour, give the tree a peculiar hazy appearance. They grow in clusters from small protuberances all along the dark branchlets. Each flower, borne on a slim, green stem, has a tiny calyx and six long, narrow, wavy petals arranged in two sets of three. The stamens are packed tightly together in a small, pale-green dome. Every flower produces several egg-shaped fruits, each on a short stalk and containing one seed. Bats and flying foxes love these fruits and clamorous, squealing throngs will cover a tree during the evening, leaving in the morning the nut-strewn ground as evidence of their orgy.

The leaves are somewhat unusual in form. Up to 22.5 cm. in length they are lance-shaped, bright, shining-green and wavy-edged. The tree is at its most attractive when the new leaves are appearing; the contrast between the deep-green of the old leaves, the yellow-green of the half-grown leaves and the rusty tinge of the limp new ones being particularly striking. It is held in great esteem by Hindus who plant it near their temples. Having light and flexible wood, the tall straight trunks were ideally suited to making of masts in the days of sailing ships. It is straw-coloured and also used for making small articles such as pencils, boxes etc. A febrifuge is prepared from the bark and the inner bark yields a useful fibre.

Festoons of leaves are often used to make arches or are strung across doorways during religious ceremonies and leaves, in conjunction with various flowers, are frequently seen as a decoration. The tree is a native of Sri Lanka. There and in India the spreading form is planted in all the hot areas, usually as a roadside shade tree. The pendulous variety is more often seen in large gardens, sometimes close together as a high screen.

Polyalthia is from two Greek words *polys* and *altheo* meaning "much" and "to cure" and refers to supposed medicinal qualities. *Longifolia*, in Latin, means long-leaved.



MAST TREE



PAPAYA

CARICA PAPAYA

Fam. *Cariaceae*. Papaya, papita (Hind., Beng.); Pappali (Tam.); Omakka (Mal.); Pepol (Sinh.); Betak, kepaya (Malay); Papaya, Papaw, Tree Melon (Eng.)

ERRONEOUSLY referred to by many people as a palm, the Papaya should really be described as a giant herbaceous plant. It is short-lived and of exceedingly speedy growth, bearing fruit within a year of planting and continuing to bear them in such abundance that thinning is frequently necessary.

The Papaya is a native of tropical America but is now common in most parts of the East. A small, soft-wooded tree, it bears huge, palmate leaves on long, hollow stems, forming a palm-like tuft at the top. The bark is smooth, but marked by the conspicuous scars of fallen leaves. Male and female flowers grow on different trees and it is advisable to have trees of both sexes for the female to bear fruit. Hermaphrodite Papayas have been known producing both male and female flowers and bearing good fruit, and it has been recorded that trees have changed their sex passing through an hermaphrodite stage. It has now been proved that the pollen of hermaphrodite flowers will fertilise female flowers. The colour of the flowers is pale yellow, male ones growing in tight clusters of tiny, scented blossoms pinned closely on to long, drooping stems. A flowering male Papaya is a lovely sight, dozens of creamy sprays cascading from amongst the leaf stalks. Female and hermaphrodite flowers are larger and grow singly close against the main stem.

The fruit is generally like a melon. Within a smooth, thin, green skin which later turns orange-yellow, is a mass of succulent, salmon-pink flesh. This encloses a large, sometimes five-angled cavity, to the walls of which are attached numerous round, wrinkled, black seeds, the size of a small pea, enclosed in a sac of fluid - the best fruit being bland and sweet. They should be plucked as soon as the skin begins to turn yellow or it will be found that monkeys, squirrels or birds have got there first! Some people relish the seeds, too; they are hot and pungent. Unripe fruit are cooked like pumpkins and make a good vegetable.

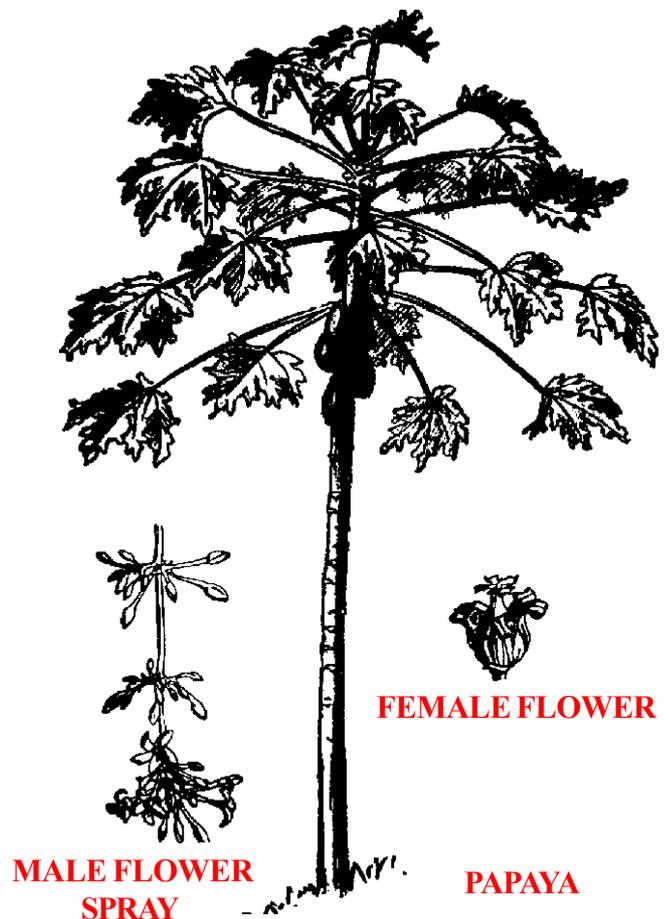
The large, smooth 30 to 60 cm. leaves are divided into eight crowded segments, oblong and pointed, some being subdivided and all very deeply lobed.

From unripe fruit is obtained a milky latex which has several medicinal uses and is considered one of the best vermifuges. Papain is made from the latex and this is used as an ingredient in the manufacture of chewing-gum.

It has been claimed that this milky juice has the extraordinary property of hastening the decay of muscular fibres. Tough meat steeped in water with a little of the milk added will become tender with in a few minutes and in 10 minutes will drop to pieces. All parts of the tree are supposed to have this property and old pigs or poultry, fed on the leaves and fruit will be found to have tender and succulent meat, but if left, this meat will quickly putrefy. Even the vapours of the tree are claimed to separate muscular fibres in this way, and joints hung amongst the leaves for a few hours will become tender. Meat wrapped in a leaf and roasted will be greatly improved. My own experiments suggest that these statements are somewhat exaggerated. It is undoubtedly true that meat steeped in water and papaya juice becomes tender, but I did not find that it falls to pieces. The ripe fruit is considered to be good for digestive troubles and skin diseases. The seeds are used as a vermifuge.

The unripe fruit is used in curries and also preserved and pickled.

The people of the West Indies, where the tree is indigenous, used to wash their clothes with Papaya leaves instead of soap. This soap-like quality is not exclusive to the Papaya but is possessed by several trees, the Soapnut being perhaps the best known. Propagation is by seed or cuttings.



BANANA TREE

MUSA SAPIENTUM PARADISIACA, Syn. *M. sapientum*

Fam. Musaceae. Kela, amrit (Hind.); Kala and Champa, chinee-champa, dhakkai (varieties) (Beng.); Baja purl, sonekale, raikale (varieties) (Bom.); Valai (Tam.); Vala (Mal.); Kehel (Sinh.); Pisang (Malay)

THIS extensively cultivated plant has been common in all tropical countries for many, many years. Different forms and cultivars can be found throughout the Malay archipelago to New Guinea, Australia, Samoa, East Africa and the Philippines. It was certainly known in ancient times, as the name Pala given in one description is identical with the Malayalam and Bengali names Vala and Kala. It is not a tree, but a huge, herbaceous plant, which means that it does not form a woody stem. There are about 300 species of *Musa*, all growing best in hot, damp atmospheres. In early accounts of the West Indies the banana was clearly distinguished from the plantain, and in the present time, except in India, banana always refers to the variety which is eaten raw and plantain to those which must first be cooked. In India the word is used for both varieties. Originally, all plants must have been like the wild varieties found now on rocky hillsides and in scrub jungle, whose fruit has practically no pulp, but is only an outer shell filled with large seeds.

Both bananas and plantains are cultivated varieties of *Musa sapientum*. The *Musa sapientum, paradisiaca*, is of the greatest importance as an article of food and is very widely planted. The many types grown vary greatly in size, colour and shape of the fruit, but all are popular with the people of India as vegetables for cooking.

The manner of growth of banana plants is interesting. They do not spring from seeds, but are propagated by young plants which "bud" from the old bulb. This bud at first gets its food from the parent plant, but soon forms its own roots and leaves. When the life of the parent plant is over, that is, when the fruit has all been cut, food left in the stem and leaves passes down to nourish the young suckers. At 6 or 8 months these can be cut away and transplanted, or, when the old plant is dug out one may be left. Growth is very rapid, the plant is a gross feeder and the stem quickly reaches about 6 m. in height. This stem consists of concentric layers, each traceable to a leaf. These gracefully arched leaves are very long and oblong, bright green and, except when quite new, split from the edge to the centre in many places. Old leaves become papery-edged, ragged and unattractive; new ones are a brilliant, translucent green, beautiful in the sunlight, with close parallel nerves at right angles to the main rib which, like the stalk, is often pink-tinged. Very young leaves are so rolled round on themselves that no drop of rain can penetrate to the heart of the plant. The last leaf to appear before the flower stalk emerges from the centre is often much smaller than the others and hangs over to protect the flowers from the sun. It is when the plant is about 12 to 15 months old that the flower stalk appears. This is the true stem of the plant and rises from the bulb, through the tube of leaf sheaths. The strong, thick stalk droops under the weight of what appears to be a huge, purple or claret-coloured pod. This is in fact a series of bracts in the axils of which cluster the inconspicuous, yellow-white flowers. At the base of the stalk are the female flowers, covered in groups by bracts. These swing open in turn and the flowers rapidly develop into rows of fruit. Beyond these female flowers are a group of hermaphrodite or neuter flowers which form useless fingers of fruit. At the extreme end are the male flowers in tight groups beneath hinged bracts which open in turn to reveal the flowers. These are visited by insects for their honey and pollen. That bract then falls, soon followed by the flowers, and the next one rises up. By the time a large cluster of bananas has developed there is a naked length of stalk between the fruit and the knob of male flowers. The plantain, or cooking variety, differs in that the sterile flowers do not drop off so that the stalk, which is also shorter is fairly covered for its whole length. The fruits are larger, less saccharine and are plucked before they are ripe. They are known as Kachkela in Bengali and Kachkula in Hindi.

Of the desert bananas there are many different varieties grown, some quite tiny, other larger; some yellow; some red. The consistency and flavour of the pulp also differs widely. There is a dwarf form *M. cavendishii*, growing not more than 1.8 m. high and bearing up to two hundred and fifty 10 cm. fruits in each bunch.

The banana being an emblem of plenty and fertility, the plant is invariably used in Indian festivals. During marriage ceremonies stems, laden with their branches of fruit, are placed at the entrance to the house, and the leaves together with brightly coloured materials, are often seen decorating temporary erections at festival time.

Practically every part of the plant is put to some economic or medicinal use. The skin of the fruit is used in dyeing, the sap contains tannin and makes a fairly permanent, almost black stain on cloth and so can be used as marking ink. The flowers, the central portion of the stem, shoots and buds of young plants are all eaten, usually cooked as vegetables. The leaves are used as plates and wrapping material or for making mats or as protection from the rain. Fibres from dried leaf stalks make a sound kind of twine and are used for tying fences, etc. Numerous ailments are treated with concoctions made from roots, stem, flowers, leaves and ashes from the burnt plant. In fact it seems that there is only one other plant which can compete with the banana in usefulness and that is the coconut. The Banana can be found throughout India and will even grow at 1500 m. but will not stand frost, being an essentially tropical plant. It thrives best in warm, moist regions but may be grown in more arid districts if well irrigated.



BANANA

Theophrastus in his writings alludes to a fruit, supposed to have been the plantain, which served as food for the wise men of India. Thus the banana received its name *sapientum* *musa* could be from the Arabic “mouz” or “moz” or it could have been named to honour Antonius Musa, physician to the first Roman emperor.

Both *Musa sapientum* and *M. sapientum* *van paradisiaca* are now called *Musa sapidisiaca*.

PALMS

PALMS! What pictures does the word conjure in the mind! Warm, tropical nights; slender coconuts gently waving their plumed heads against the stars; perhaps a moon, large and brilliant, gleaming coldly on each bending frond, obscuring in contrast the dense, nut-laden hearts. That is the popular conception of a tropical coast and one of the few conceptions justified by fact. So soothing, almost so intoxicating is the restful, moonlit beauty of a palm-grove by a gentle sea that one has difficulty in differentiating one's sense of beauty from sentiment. Thinking beyond moonlight, to what do our minds turn? Coconuts? Dates? Toddy? Betel-nuts? All from palms, but each palm so different and each with such a wealth of interesting information. To the country people of India there are no more useful plants - every part has its value. Fruits are edible or give an oil valuable in the making of soap and candles - a profitable export; leaves are used to make baskets, thatch and books; the wood is used for building and from a large number of palms is obtained the sweet juice which makes toddy, arrack and sugar. In addition to furnishing food, shelter, clothing, timber, fuel, fibre, paper, starch, sugar, oil, wax, wine, tannin and dyes, there are hosts of minor products.

Nearly all Palms are unbranched - a slender, cylindrical trunk, circled by the bases of fallen leaves - terminated by a tuft of divided leaves. Flowers are male and female, rising in sheaths from the axils of the leaves.

Five of the commonest Palms are here described - the Coconut, the Palmyra, the Date, the Betel-nut, the Fish-tail, and one more recently introduced species, the Royal Palm, has been included because of its popularity as a City garden plant.

COCONUT PALM

COCOS NUCIFERA

Fam. Palmae. Narial (Hind., Mar.); Narikel (Beng.); Jennai-maram (Tam.); Nari kadam, kobari, tenkai (Tel.); Tenga, thengu (MaL); Pol (Sinh.); Kelapa (Malay)

ORIGINALLY from the Cocos Islands, the Coconut Palm is now cultivated in all the damp, hot regions of Asia, especially in low, sandy situations near the sea. It is frequently self-sown and the rounded nuts can not only bowl along the ground for some distance with the help of sloping terrain or strong wind but can float buoyantly and be carried by the tides to other shores. So, throughout the years this Palm has found its way to all the tropical countries of the world which have a sea coast. One of Nature's most valuable gifts to the poor, its uses nearly equal those of the ubiquitous bamboo, and as a commercial proposition, it is of greater value than most other plants.

It is a tall, unbranched tree with thickened base and terminal plume of large, pinnate leaves. Soft-wooded, it is capable of bending to a considerable degree and is usually found leaning into the prevailing wind. All the way up the trunk can be seen the ring-like scars of fallen leaves - a characteristic of all palms. The leaves are from 4 to 6 m. in length and borne on stout, stiff stalks. The leathery, sword-shaped leaflets, each from 60 to 90 cm. long, are arranged flat, like a feather. Clustered round and twisted among the leaf bases is a quantity of substance like elastic matting. On one side it is smooth, the threads lying close together and on the other ridged by cross-woven threads.

Male and female flowers grow on the same plant, the male being smaller. Both appear clustered on many branched stems, sheathed in "spathes" which spring from the axils of the outer leaves of the crown. They are yellowish and like stiff catkins.

The well-known fruit is large and ovoid, the size of a man's head with a hard, green outer covering, which becomes brown when ripe. Inside is a thick brown fibre surrounding a hard shell with three basal pores. Within this is the albumen - the sweet and pleasant edible matter familiar to all - and the milk, which can be extracted by puncturing two of the pores. The embryo lies opposite one of the pores.

Little care is needed in the cultivation of this most useful plant providing that the nursery seedling has been planted in a large, well-manured hole. New fronds appear at the rate of one a month and in their third year of growth begin to fall. The plant is full-grown and at the height of its vigour between its 25th and 30th year when it has about twenty-eight fronds and has reached anything up to 24 m. There are usually about twelve branches of nuts, some bearing dry nuts, others ripe nuts. Most of the young fruits fall off when they are the size of golf balls, only a few achieving ripeness, but, even so, a single tree may produce up to one hundred nuts a year.

From the nut an oil is obtained. Freshly prepared, it is straw-coloured and practically inodorous, but later the oil becomes somewhat rancid both in smell and taste. It is made into shampoos and applied to the scalp to enrich the hair or encourage its growth after fevers. Refined, it is taken as a substitute for cod-liver oil. It is almost indispensable to the native for culinary purposes, in lamps and as a liniment, while large quantities are shipped abroad for use in the manufacture of soap and candles.

Commercial copra is obtained by cutting the nut open and drying the white "meat". This is used extensively in confectionary, the making of soap, margarine, etc., and forms the "desiccated coconut" so popular in the West.

The Copra residue is the dried kernels after the oil has been expressed and is used as a fattening food for fowls and cattle, also as manure for young palms.

Coir is the thick, fibrous rind of the nut and has many uses. It is equally adequate as a stuffing for mattresses and saddles, for making carpets and mats and for the construction of strong ropes, durable in salt water. When the husk is cut across and the inner nut removed a hard brush is formed which is used for polishing and scrubbing.

No curry or pillau is complete without the albumen and the "milk". For cooling the palate when eating a "hot" curry nothing is more effective! Black paint is obtained by burning the shell; the downy substance at the bottom of the fronds makes a good styptic for wounds and the web-like substance growing where the flower branches expand, is employed in the making of bags and coverings, also for the straining of toddy. The leaves are used for thatching, the trunk for rafters, bridges and small boats. The wood is known as "porcupine wood" and has a pretty, mottled appearance. Dried and polished, the hard cases of the nuts make useful cups and vessels.

Perhaps the most interesting of all the varied products of this tree is Toddy. Most visitors to the tropics have seen the toddy drawer - the Sanar - nimbly ascending the tall trunks seemingly in complete security. Actually, a considerable amount of practice is needed and it often takes as long as a year before a man is regarded as efficient. On reaching the top he selects a spathe which is ready for tapping; this must be about 60 cm. long and 5 cm. thick. He cuts the point transversely and fixes it in a curved position so that, when he has crushed the exposed flowers at the end, the juice may flow freely. This

is repeated daily, a thin layer being shaved off on each occasion. In a week or two the tree is ready to yield toddy - as the Sanar knows by his observation of the crowding insects, the visiting birds and the dropping of the juice. The cut end of the spathe is then fixed to a vessel so that the drops fall into it, from which time it is no longer necessary to hammer and crush the flowers. A tree yields toddy for six months in the year and one man may have to attend to thirty or forty trees, ascending each, morning and evening.

From this toddy, sugar or jaggery can be obtained by slow boiling, 45 litres yielding about 4.5 kg. After fermenting it becomes Arrack, one of the intoxicating drinks of the country. Jaggery mixed with lime, or chunam, forms a strong, heat-resisting cement and takes a good polish.

Native doctors recommend toddy in cases of consumption and it is generally agreed that a drink each morning is beneficial to the health. Prisoners of war in the Far East during the last war, suffering from deficiency of vitamins, were cured with Toddy, which contains Vitamin B.

The name Cocos is from a Portuguese word meaning "monkey" and alludes to appearance of the nut without its outer covering of coir, which was said to be like a monkey's head. Nudifera means "bearing nuts".



COCONUT PALM

PALMYRA PALM

Borassus Flabellifer

Fam. Palme, Tal, talgachh, tarkajhar (Hind., Beng.); Pannei (Tam); Karimpana; (Mal) Lulu, tacli (Tel); Tadi (Mar), Tal (Sinh) Bultar, male; phultar, female (Vern) Lontar, tah (Malay) Palmyra Palm, fan Palm, Brab Tree, Toddy Palm, Tala Palm (Eng)

THE Palmyra is a tall, erect palm, easy to recognise by its large, fan-shaped leaves which are quite unlike the pinnate leaves of other palms mentioned in this book. Its usual height is from 12 to 18 m. but 30 m. with a diameter of 60-cm. is sometimes reached. The black, cylindrical stem is ridged by the semi-circular scars of fallen leaves and, in young trees, at the top by the dry bases of the leaf stalks which remain woven in a "plaited" manner. Old trees show a slight thickening above the middle and the base is always swollen by a dense network of root fibres.

The huge leaves, which spring in a clump from the summit, are borne on extremely tough, thick stalks, which leave that segment of the stem which they enclose like green gutters, protectively spiked at the edges. The leaves are palmate and as much as 5 m. across. The crowded segments, sixty to eighty in number, are connected for a part of their length, then spread out like stiff, shining lances, folded along the mid-ribs.

Male and female flowers are borne by different trees. Both are enclosed in leathery branched sheaths. The male flowers, which are the smaller of the two, lie in dense overlapping bracts which appear to be sunk in the cavities of the branch. The female flower sheath bears only a few scattered flowers. During March-April and again later in the year flowers may be seen. These are followed by the green globular fruits which grow in drooping clusters at the base of the leaves, each fruit containing three nuts within the soft, fleshy pulp.

The Palmyra is one of the most valuable and important of Indian trees. It is not indigenous to this country but is now extensively cultivated, and because it readily propagates itself in regions where it is abundant, it is also found growing wild. The uses to which various parts of the tree are put are innumerable. The hard outer wood is universally employed for posts, rafters and domestic purposes, but it is of no great strength and iron nails rust rapidly in it. The hollowed-out stem makes an ideal water pipe, or, split in half, an open channel. Fans, mats, baskets, buckets, hats, umbrellas and sandals are made from the leaves, which also provide good thatch. The jelly like pulp of the fruit and the soft kernels of young fruit are pleasant to eat, while the germinated nuts, with their enlarged, fleshy embryos are cooked and eaten as vegetables. The mid-ribs of the leaves and the fibres from their stalks are used in brush-making and the web-like substance at the base of young leaf stalks is used for straining the Toddy and for making into torches. The chief product of the Palmyra, however is Arrack or Toddy the intoxicating drink of the country. Before fermentation it is a saccharine juice which, when freshly-drawn before sunrise, makes a tasty and health giving drink and, taken in large morning doses, has a laxative effect. The method of obtaining this sweet sap is as follows — the flowering branches, both male or female, are first beaten and crushed, then a thin slice is cut from each spathe. After several days, when more thin slices have been cut, the spathe begins to exude a thick liquid. This is caught by earthenware pots or bamboos previously fixed in position. The collected sap, if not immediately drunk, is made into a sugar called "jaggery", or is distilled or fermented into Toddy. Both male and

female trees will give a spring and winter crop but only the female continues to yield its sap throughout the monsoon. Thus the amount given by a female tree is about 12 times that of a male.

The medicinal uses credited to this palm are innumerable. Fresh Toddy, mixed with rice flour and gently heated until it ferments, makes a valuable stimulant poultice. The fruit is popular as an aperient and the ash obtained from burning the flowers is used in prescriptions for biliousness.

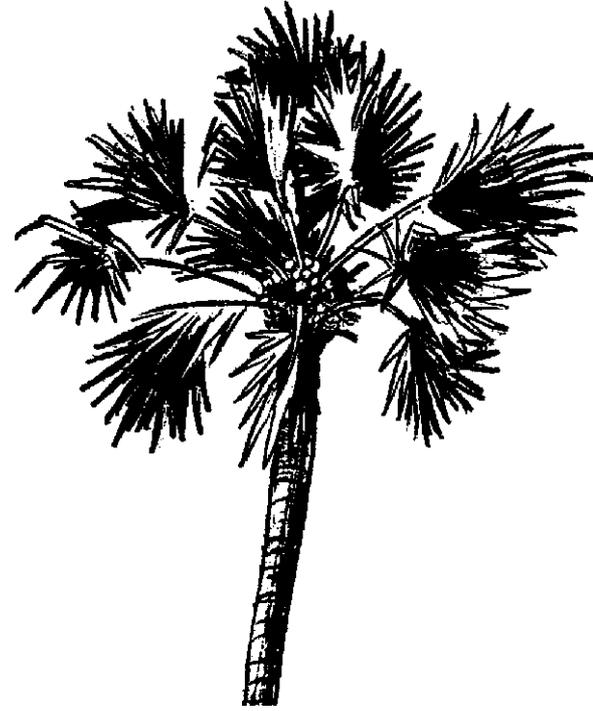
The timber of the Palmyra Palm varies considerably according to age and sex. Soft when young, it gradually hardens although the heart-wood remains less hard. The female tree produces wood which is much superior to that of the male and its uses include house and veranda posts, water gutters when halved and hollowed out and small fancy articles in Europe. So it will be realised that like the Coconut and Bamboo, the Palmyra is of inestimable value to the people of India.

Hindus and Buddhists both venerate this tree because sacred writings were inscribed on its leaves in olden times. They use the leaves and fruits on ceremonial occasions, hanging them on doorways and on marriage shamianas.

Several species of birds and animals enjoy the protection of Palmyra Palms and, in fact, the little Palm Swift, could almost be said to be parasitic on the tree, gluing its tiny nest to a furrow in the bent-over underside of the leaf and never leaving the locality of its home. The Palm Civet, too, may live and find much of its food in this tree.

The Palmyra is found in the drier areas of Burma, Sri Lanka, India and most tropical countries.

Borassus is from a Greek word describing the leathery covering of the fruit Flabellifer means "fan-bearer."



PALMYRA PALM

FISH-TAIL PALM

CARYOTA URENS

Fam. Palmae. Man (Hind.); Sopari (Beng.); Thippali, konda panna, kundal panai (Tam); Kala-pana, iram-panai, choondappana (Mal.); Mhar, jiluga, man, kondaijivalaggu (Tel.); Birli(Mar); Kitu(Sinh); Fish-Tail Palm, Toddy Palm, Kitul Palm, Jaggery Palm, Wine Palm, Sago Palm (Eng.)

THIS fine palm, is extremely handsome and differs in many ways from the other palms described in this book, being remarkable for its much divided leaves and triangular leaflets.

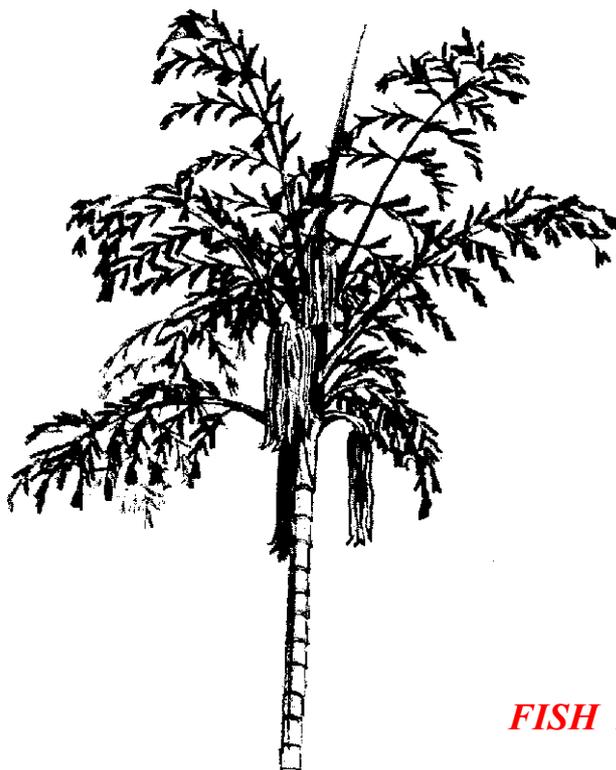
It is widespread over India, Burma- Sri Lanka and Malaysia, is much planted in gardens and makes an attractive pot plant when young. It is not a tall palm, 15 m being about the highest it ever reaches and 6 m. being more common. The stem is smooth, grey and cylindrical. From the top issues a tuft of leaves, few in number but huge in size, but they do not all develop from the crown, many rising from the trunk at intervals below the summit. They are bipinnate, the pinnae leaving the main stalk is at right angles and dividing into numerous triangular leaflets which grow obliquely. The terminal leaflet is lobed, giving the outer edge a ragged look.

The flowers, emulating the leaves in oddity, are in addition quite attractive. On long, stout, pendulous cords, covered by large, grey sheaths, they develop in threes, the upper one, a male, opening first. It is reddish in colour, the two female ones being greenish. The tree's oddity lies in the fact that it flowers only once during the course of its existence and continues in flowers for several years. The first branch appears at the top of the tree and is very long, hanging straight down the trunk. When this has finished flowering others issue from the axils of lower leaves, or former leaves, until there is a thick level-ended "horse's tail" of branches. This downward development of flower sheaths continues until the very last one - the death-knell of the plant - shows itself at the foot of the trunk. The reddish berries which, developing from the flower also hang down in a thick "tail" are the size of a nutmeg with a thin, acrid skin. The pulp is bitter and stings the hands when touched. Within are one or two seeds.

The wood is much stronger and more durable than that of other palms and is employed for many domestic purposes.

Toddy is obtained by tapping when the tree is between 15 to 20 years old and commences to flower. The annual yield is about 8100 litres. Mohammedans use the seeds as beads. From the interior of the stem is obtained a sago-like starch which is made into bread or boiled into gruel; the terminal bud, or cabbage, is edible as in other palms and, cooked, makes a good vegetable, but removing it kills the tree. The most important product of the tree is Kitul fibre which is made from the sheaths of the leaf stalks. This is very strong and is made into ropes, brushes, baskets, fishing lines and other articles, many of which are shipped abroad.

Caryota is from the Greek word Cayotos meaning "nut-like" in reference to the fruit; urens means "burning" or "stinging" and refers to the acrid quality of the juice, or possibly to the tiny hairs on the fruit, which cause an unpleasant itch when handled.



FISH TAIL PALM

ROYAL PALM

OREODOXA REGIA Syn. *R. Ventricosa*, *Oreodoxa regia*

Royal Palm, Mountain Glory, Bottle Palm (Eng.)

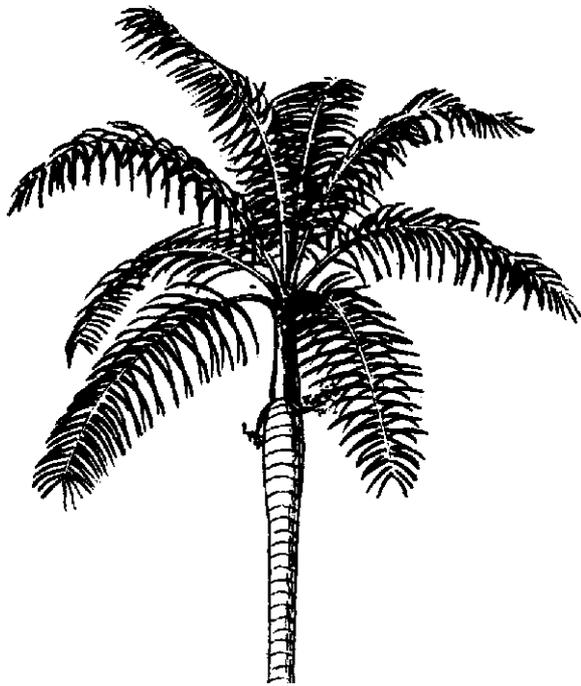
THIS elegant palm has only recently been imported into India from the West Indies where it is very common. It is an extensively cultivated tree; all parts of it are used there and in Cuba. It is now much planted in parks and gardens where it reaches a height of about 20 m. and is very decorative, particularly when planted in avenues.

A major asset is that it is resistant to wind and salt spray. The erect, unbranched stem very often has a distinct thickening towards the top, but this is not invariable and cannot be described as a definite characteristic of the tree, being seen mostly in young trees. The bark is of palest grey, smooth and evenly ringed; sharply divided from this grey bole rises a polished, green column formed by the leaf sheaths and swollen at its base, and from the summit emerges a tuft of numerous, long, arched leaves. These are crowded with 75 cm. narrow leaflets alternately inserted in contrary ways, which means that they lie in two planes. Towards the tip they are almost in one plane like a coconut leaf; new leaves are also like this. Many of the leaflets are curved or folded and the whole presents an attractively shaggy appearance.

The flower sprays spring from the top of the trunk, below the green column and are enclosed in sheaths. Before opening, the spathes are erect, then they lie horizontal and the much-branched sprays burst forth. Male and female flowers are on the same trees, but the former are larger and open first. Both are a straw yellow and appear during the hot weather and rains. The fruits are small and rounded, light purple when ripe and form in clusters.

This palm has not been grown long enough in India to have the extensive uses of our own palms, but the tender top portion is cooked and eaten as a vegetable and the leaf-sheaths are flattened out and used as sleeping mats.

The name *Oreodoxa* is from two Greek words meaning "mountain" and "glory"; *regia* means "regal."



ROYAL PALM

WILD DATE PALM

PHOENIX SYLVESTRIS

Fam. Palmae. Sendhi, salma, khaji, khajur (Hind.); Khajur (Beng.); Itcham-pannai, tncu (Tam); Kattinta (Mal.); Pedda-ita (Tel.); ShJnda (Mar); Indi (Sinh.j; Wild Date Palm, Toddy Palm, Sugar Palm (Eng.)

HERE is another of our extremely valuable palms. Its origin is unknown, probably the Malay peninsula, but the common wild Date Palm is one of the most conspicuous trees in India, in some regions being the only tree visible. Sun is not a necessity for it as it will thrive in shade. In some districts it forms gregarious forest growths and covers considerable areas. Many of these forests are "Reserved" and belong to the government; the rights of Toddy tapping are allowed to certain individuals and the Toddy obtained yields them a considerable income.

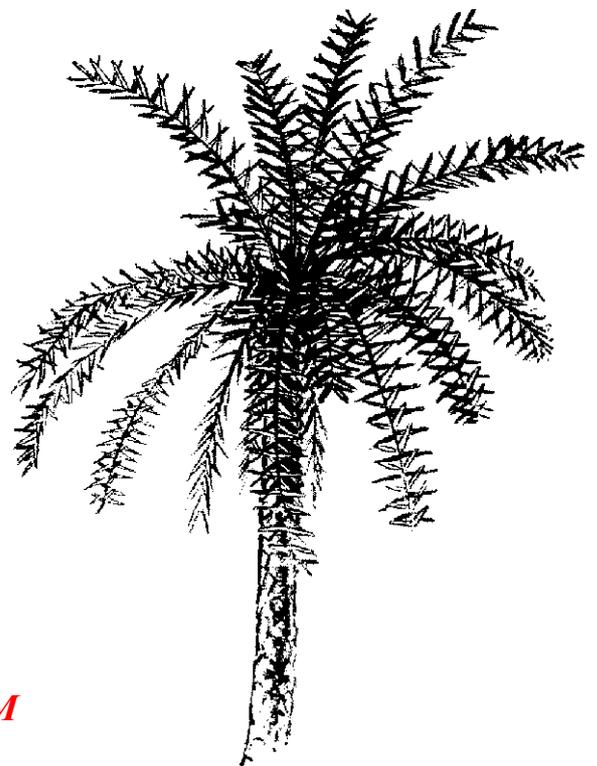
Comparatively speaking, it is a small palm — 9 or 12 m. being the usual height. The thick stem is densely covered with the bases of fallen leaves and, lower down, by the remaining scars. From the summit emerges a tuft of leaves and more leaves issue from the sides, forming a thick, round crown. The long, arched leaves divided into numerous, rigid leaflets, each tipped with a sharp spine. These leaflets are sword-shaped and a greyish-green in colour. Unlike the leaves of the Coconut and Areca Palms the leaflets on each side do not lie parallel; they grow alternately out and up - that is, in two planes - giving a criss-cross, spiky effect to the whole leaf.

Male and female flowers are borne by different trees, as in many other palms. Appearing in the hot season, they are sheathed in a long, stout spathe which bursts to disclose many thickly crowded branchlets. Male flowers are small, waxy and white, on short stalks, while the female flowers are greenish and develop in clusters of three. Both are scented and appear during March. The fruits, of course, are much more important than the flowers and much more conspicuous. They form on long pendulous stems nearly a metre in length, from which issue numerous bunches. The clustered fruits are round or oblong and, at first, hard and green, becoming orange-yellow and brown when mature. Jellies and jams are made from them or they are preserved whole, or powdered into a paste with locusts. A good palm will develop dozens of clumps of fruit.

Date Palms give an excellent yield of palm-wine but, as can be expected, the fruits of a freely tapped tree are inferior to those of one which is allowed to retain its sap. Extraction also spoils the appearance of a tree as the cutting makes the stem grow in a curiously zigzag fashion and the terminal tuft becomes lop-sided. Tapping is done thus: after the rains the lowest side leaves are cut away for half the circumference; this bare part is at first white but turns brown and appears like coarse matting. After a few days this surface is cut in a large V and a triangle is removed from the pith; the sap runs out and is conducted down a channel, made from bamboo, or a Palmyra leaf rib, into a container. The wound is renewed twice at intervals by paring a thin slice from the notch and then the tree is allowed to rest. The flow from the first cutting is the biggest and best. It is either drunk fresh or boiled down to a brown viscid matter and sold to sugar refineries, or distilled into a potent spirit known on the Coromandel coast as Paha-arak, Sap is extracted when the plant is seven to ten years old and only about 1.2 m high. November to February is the tapping period and an average yield will be about 100 litres; this if boiled down to sugar produces about 3.5 kg. It is generally considered to be inferior to cane-sugar.

Other parts of the tree have their uses. Sleeping mats are woven from the leaves and baskets from the leaf-stalks; these are also twisted into ropes used, among other things, for drawing water from wells. In some places the fruit is chewed with betel-leaf and chunam like areca.

There are eight species of wild date palm in India in addition to the cultivated date (*P. dactylifera*) which is considered to be the parent stock of all cultivated varieties. Phoenix is from the Greek and means "purple." Sylvestris means "wild" in Latin.



DATE PALM

ARECA

ARECA CATECHU

Fam. Palmae. Supari (Hind., Beng.); Kamugu, paku (fruit) (Tam.); Kavugu, adakka-maram (Mal.); Pokavakka (Tel.); Puwak (Sink); Pinang (Malay); Areca, Betel-Nut Palm, Supari Palm, Pinang Palm (Eng.)

PROBABLY originating in Malaysia the Betel-Nut Palm is now cultivated- over all the hot, damp coastal regions of Asia and has a wide distribution in India. In Malabar, Kanara and round the hills of South India, in Sri Lanka, Burma and Assam it is very common, its elegant and graceful beauty an asset to any district where it flourishes. Rising to 18 or even 30 m. with a girth of only 45 cm. it bears at the summit of its slender, unbranched stem a crown of long, feathery leaves surrounding lovely, drooping clusters of shining red fruit. These palms are often seen in clumps of a couple of dozen plants, together with the few small leaves of numerous new growths.

The flowers, which appear early in the year are at first enclosed in smooth, double sheaths the bases of which partially enfold the trunk. Bursting from their sheaths the much branched sprays reveal both male and female flowers, the latter being solitary at the axils and bases of the branches and the former in great number above them. The appearance is of numerous stiff, creamy catkins.

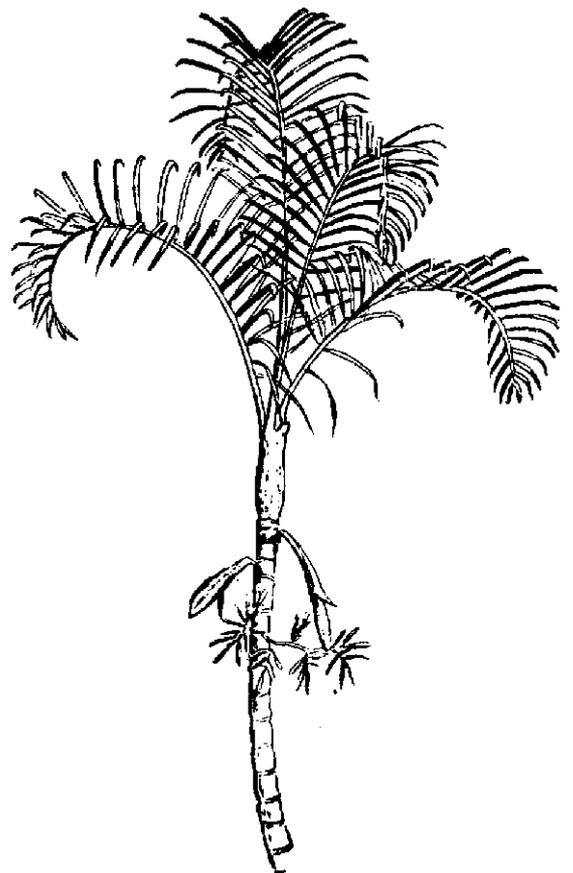
The slender grey stem is ridged with the scars of fallen leaves and topped by a polished area of green or orange, from which rises the tuft of graceful, arched leaves. These bear on each side a large number of dark green leaflets, long, narrow and pointed and lying in one plane like coconut leaflets. But they differ from those by being less rigid and are often seen with the tips bending downwards. The centre rib is so strong that, when dry and expanded, it forms an excellent ready-made splint.

The name Betel is applied to two different plants which are closely associated in the purpose to which they are applied. Betel leaf is from the betel-vine (*Piper betel*), known as pan and allied to the plant which produces our table pepper; betel-nut is the fruit of the Areca palm so universally chewed by the people of Asia. This innocent but somewhat unattractive habit of chewing is indulged in by many millions of people, who are estimated to chew over 50,000 tonnes of palm seeds yearly. Mastication is considered to sweeten the breath, strengthen the gums and tone the digestion; it also has a mildly narcotic effect and produces a copious flow of brick-red saliva which stains the teeth and gums. Methods of preparing the cud vary, but the common way is to take a pan leaf and smear it with quicklime and cutch and to place thereon slices of betel-nut. Sometimes flavourings such as clove, tamarind or tobacco are added, the whole is then wrapped up and placed in the mouth. This gum known as cutch is an extract from the red-heart-wood of the *Acacia catechu* tree and is extremely astringent. Another form, known as kath, is a pale, biscuit-like substance obtained from white heart-wood of the same tree. It is carefully prepared and fetches comparatively high prices.

The betel-nuts, each the size of an Indian hen's egg, hang in generous clusters from below the bases of the leaves. Within a smooth, orange or scarlet outer covering lies a fibrous ring which encases the seed. A tree begins to bear fruit after its fifth year if grown in the open, but amongst other trees taking much longer, and a good specimen will produce annually as many as three hundred nuts and continue to do so for about 25 years.

As well as being widely employed for chewing, there are other uses for these prolific nuts. Burnt to charcoal and powdered they make a good dentifrice, and a preparation made from them in powder form checks dysentery arising from debility. They are used in turning for necklaces, the knobs of walking-sticks and other small articles.

The wood makes bows and spear handles and the trunk forms a good scaffolding pole. The sheaths enfolding the young leaves are used as wrapping like brown paper, also as writing-paper, and as the covering of Burma cheroots. This Areca is not often found in gardens, but other species are very ornamental and are frequently grown as pot-plants. Areca is a variant of the Tamil word which means "a cluster of nuts". Catechu; is a Malayan word.



BETEL NUT PALM

SHRUBS AND CREEPERS

GOLDEN DEWDROP

DURANTA PLUMIERI Syn. *O. plumieri*

Fam. Verbenaceae. Golden Dewdrop, Sky Flower, Pigeon Berry (Eng.)

THIS charming little evergreen shrub is a native of the West Indies, but is now popular in India as a garden plant, particularly as a hedge. Unpruned, it spreads and rises to 2 m. or more in height, with stiff brown branches and long, gracefully arched flower sprays. When trimmed it grows strongly and compactly but should not be regularly clipped, as are some hedges, because the charm of the plant would be lost if its lovely, cool flowers were not allowed to make their appearance. The clustered masses of tiny, mauve flowers stand out conspicuously from the close darkness of the leaves. Every cluster bears numerous, trumpet shaped flowers—each less than 1.3 cm across. These consist of a close, green calyx, a short, yellow-centred tube and two lips, the upper one divided into three curved lobes and the lower into two, each of the latter having a central purple streak. The principal flowering period is January-February, but a few flowers may usually be seen on one plant or another throughout the dry season. Soon after flowering the fruits appear. These are most unexpected and it is difficult to believe they belong to the same plant, although flowers and fruits are always seen side by side. The fruits appear in as great profusion as the flowers and each spray droops with the weight of the round, orange berries; these are glossy and soft, contrasting vividly with the delicate flowers and deep foliage.

The leaves are small, pointed ovals, dark green as in most evergreens and grow closely along every branch and branchlet. They vary in size, sometimes have serrate edges and are often twisted or curled. The underside is paler and slightly downy.

This plant is not widely used medicinally or economically but the berries steeped in 'liquid are claimed to be lethal to gnats and mosquitoes.

There is a species, *D. ellisii*, which has white flowers and another variety with thorns and white centred, mauve flowers. *D. grand*

flora has, as its name implies, larger flowers, up to 2 cm. *D. Plumieri* var. *Lady Stanley* bears bright mauve flowers and there is a variety with variegated foliage which has gold edges and markings. All are easily propagated from the seed or by cuttings.

Durante was named for Castore Durante, the Papal physician and botanist who worked in Rome in the 16th C.



GOLDEN DEWDROPS

OLEANDER

NERIUM ODORUM Syn. *N. indicum*

Fam. Apocynaceae. Kaner, kunel, karubi (Hind.); Ganigalu (Can.); Karabi (Beng.); Arali (Tam); Arayila (Sinh.); Bunga jepun (Malay.); Rose Laurel Rose Bay (Eng).

THE original home of this handsome shrub is in the Mediterranean region where it is sometimes thought to be the “willow of the brook” of Scriptures. Now it is common in many parts of India and in numerous tropical and sub-tropical regions, growing wild in rocky stream-beds in the Lower Himalayas, fringing roads and rivers and adorning hundreds of gardens from the Channel Islands to Japan where the climate precludes growing it outdoors it is very popular as a greenhouse plant. It is a strong shrub, not as a rule more than 25 cm. high, with upright branches and evergreen foliage. Its several varieties have all become very popular as cultivated shrubs because of their fragrant, showy blooms and in spite of the poisonous quality of the sap. They flower throughout the year, but are at their best during the rains. Deep rose, pink and white flowers are all common in both their single and double forms. They grow in large sprays and in the double varieties the flowers are massed so closely as to be indistinguishable as individuals. Each bloom rises on a short stalk, lies in a small five-cleft calyx, is salver-shaped and about 5 cm. across. The single variety has five broad petals opening from a short tube to the inside of which bands of stamens adhere and divide into several ragged segments. The fruit is a narrow 20cm. pod and contains brown, silky seeds.

The leaves are very distinctive and although somewhat similar to the leaves of the Yellow Oleander, (*Thevetia nerifolia*) could not be mistaken for any others once they have been studied. They are unusually narrow and tapering and grow in whorls of three on very short stalks. A little over 2.5cm. in width their length may be 20 or 21 cm. in colour they are a dark, dusty green above and paler below. The veining on the underside barely shows on the upper surface.

All parts of the plant are dangerously poisonous and in common with other plants which have this characteristic, exude a milky sap from cut stems and young shoots. The shrub is always left untouched by cattle, goats and other domestic animals who appear to be aware of the fatal results a meal of Oleander leaves would have.

This poison, however, is put to use by medical men; a paste made from the bark of the roots is a remedy for ringworm while leprosy and boils are treated with preparations containing the poison. The leaves, boiled in oil, are also claimed to be efficacious in the curing of skin diseases. Women in India driven to suicide by jealousy, misery or sickness have been known to eat Oleander roots.

The flowers are among those chosen by Hindus to offer to the God Shiva. Hookah tubes are sometimes made from the stalks. A rare, yellow variety is known.

The shrub is easily propagated by cuttings or by layering and can be kept bushy and handsome by regular pruning after the flowering season is over. *Nerium* is a classical Greek name.



OLEANDER

PEACOCK FLOWER

CAESALPINIA PULCHERRIMA, Syn. *Poinciana pulcherrima*

Fam. Leguminosae. Sub fam. Caesalpineae. Kunish churin (Hind.); Krishna chura (red), radha chura (yellow) (Beng); Komri (Tam); Monera mat (Sinh); Gul-i-turah (Vern.); Chana, jambul merak (Malay); Peacock Flower, Barbados Pride, Dwarf Poinciana (Eng)

VILLAGE people, if asked for information about the red flowering variety of this shrub, will often tell you that it is a Gul Mohr; others, granting that there is a Difference in size if nothing else, will call it the Gul Mohr bush; and indeed there is considerable similarity between both leaves and flowers, but a brief observation will reveal that the form and growth of the shrub are quite unlike the tree and the flowers, as well as being smaller, are grouped differently.

Its native country is unknown but it was introduced into Holland about 1670 and ten years later it was recorded as growing in the gardens of India and now it is popular in all tropical and sub-tropical countries. The pure yellow and bright orange-red types are equally popular and few gardens of any size are without one or two. Villagers, too, like their bright, exciting colours. It is the showiest of the forty odd species of *Caesalpinia*.

Rising to about 25 cm. and branching low to form an open, spreading bush, it has clear green, feathery foliage topped practically throughout the year with broad spires of blossoms. The bark is pale and smooth, often marked with blackish spots and armed with stout prickles rising from round protuberances. Young branches are smooth and green. The big, long-stemmed bi-pinnate leaves grow opposite at wide intervals. Each of the twelve to eighteen pinnae bears from twenty to forty small, oblong leaflets with very slightly lobed ends. They are smooth and dull, the underside being considerably paler.

The larger sprays of flowers appear at the ends of the branches and are often sub-divided into smaller sprays. Egg-shaped buds and open flowers are all borne on long, slim stems. In the red variety, the flowers are first vermilion edged and streaked with deep yellow. Later they become entirely red.

Of the five spoon-shaped petals, one is smaller and shaped differently, but all have crinkly edges. The red and orange calyx has five long lobes which are spread to show between the petals. Ten very long stamens, red from the red flowers and yellow from the yellow variety, give the sprays a whiskery appearance; on opening these flowers are curiously curled and twisted.

The pods are straight, narrow and thin about 7.5 cm. long.

Legends connect the Peacock Flower with God Shiva, so to all Hindus it is sacred. All parts have medicinal uses and to women in particular are administered concoctions from which they derive benefit. Taken as a substitute for senna the leaves are an efficient purgative; as a fomentation they are claimed to heal wounds. The roots are considered by some to be poisonous, but, like many poisons, a tonic if taken in suitably small quantities. Ink is made from the charred wood.

The Peacock Flower produces seeds in abundance and self-sown seedlings are frequently found. It may flower when only eight months old and is remarkably drought-resisting. Regular pruning after flowering prevents it from becoming straggly.

The name *Caesalpinia* honours Andrea Caesalpini, a 16th C. botanist and philosopher, who was also physician to Pope Clement VIII. *Pulcherrima* means "most beautiful".



PEACOCK FLOWER

PAPER-CHASE TREE

MUSSANDA CLABRATA Syn. *M. frondosa* var. *glabrata*

Fam. Rubiaceae. Lanchut, sarvad (Hind) Bebana (Bom.); Vellaiyilai (Tam.); Vellila (Mal); Bhutkesh (Mar.); Wal-but-sardad (Sinh.); Balek adap (Malay); Paper-Chase Tree, Dhoby Tree (Eng.)

THERE are several kinds of Mussaenda, all easily recognised by the curious enlargement of one or two of the flower sepals in every spray. This growth is usually white, sometimes light yellow and at first glance looks as if it might be the pale underside of a leaf, or, as the name suggests, one might get the impression that someone had been scattering paper among the leaves.

It is an erect shrub or small tree with a tendency to climb and is very common all over India, being indigenous to this country, Assam, Burma and Sri Lanka. The bark is grey and smooth, but the branches are covered with a coarse, brown down. The oval pointed leaves are usually smooth above but downy underneath. They are a fairly deep green in colour. Stems and veins are red and so indented are the leaves by these veins that they have a quilted appearance. The bush blooms from July to October, bearing on stout, hairy stalks, clusters of small, orange flowers. From the calyx of narrow sepals protrudes the long, green corolla tube. This swells at the end and opens into five triangular petals, like orange velvet. Beneath, these are pale green and the centre of the flower is yellow. On a few of the flowers one sepal of the calyx is prolonged into an oval bract, dead white in colour and very distinctive. In Bombay these white leaves are eaten as a vegetable and, as can be expected with a shrub as common as this, various parts of it have medicinal uses. The root is bitter and has an alterative and demulcent action. It is used in the treatment of white leprosy and eye trouble. A weak decoction of dried shoots is often given to children as a cure for coughs. The wood is used for turning, and in the villages ladles, spoons and other domestic articles are made from it as they are said to avert the evil eye. For the same reason milch cattle are tied to pegs made from this wood.

M. erythrophylla is a variety introduced from Singapore with crimson bracts and yellow flowers. It is now grown in tropical West Africa.

M. luteola is a smaller shrub, attaining only 1.2 m in height. The flowers are yellow and the bracts the same colour but of a much paler shade.

M. corymbosa has pale orange flowers and white bracts.

M. frondosa means "the leafy Mussenda" and Mussaenda is the latinization of a Sinhalese vernacular name Mussenda. Propagation is by layering or cuttings and to ensure a good shape it is advisable to prune after the leaves have fallen.



PAPER CHASE TREE

BOUGAINVILLEA

Fam. Nactaginaceae. Kadadasi kodi (Tarn.); Kadadasi vel (Sinh.); Bunga kertas (Malay). Paper Flower (Eng).

BOUGAINVILLEAS from one of the most conspicuous and colourful features of Eastern gardens. They make admirable boundary hedges and fences; pruned to suitable dimensions they make perfect pot plants; over an arch or pergola they are a beautiful sight, while left to ramble through a straggling tree they give their host the appearance of being in constant bloom. The colours vary from magenta and purple to crimson, brick-red and pale pink, salmon and yellow. A white variety has now been reported in India. The tones of the magenta varieties being rather strident they are apt to clash with other flowers and are at their best against a background of green, or even better against a clear blue sky. In the west a small private greenhouse nurtures a potted Bougainvillea while the large tropical greenhouses of famous parks and gardens have them trained up the sides and under the glass roof.

In their homes in South America the various species are found as climbing shrubs and many are of the opinion that they will always look their best thus, rambling unchecked in the wilder corners of the garden. The first specimens were collected in Brazil by L. A. de Bougainville on his voyage round the world towards the end of the 18th Century and it is in his honour that the genus has been named.

What appear to be the flowers are really trios of bright coloured bracts which surround the true flowers. These flowers, usually in threes, are small and tubular, each partly adhering to the base of a bract. The long, ridged calyx tube is greenish or cream-coloured, often tinged with the colour of the bracts, and opens at the end into a tiny, frilled flower, either white or yellow.

The stems are armed with spines which assist the plant in its climbing and rambling and the leaves are simple and alternate.

There are innumerable varieties of Bougainvillea and a host of hybrids, all of which it would be impossible to describe. On several occasions a variety has been introduced into gardens in different parts of India under different names. From each of these hybrids have been produced and the result has been considerable confusion, resulting in many valid varieties having three or four names.

All the known varieties are derived from four species and are either smooth or hairy leaved ; *B. spectabilis*, *B. glabra*, *B. peruviana* and *B. buttiana*.

B. spectabilis is more vigorous and has purple or rose-purple bracts each about 3.8 cm. long. The flower heads are grouped at the ends or sprout from the sides of the branches, each borne on a short stalk. The leaves grow alternately. They have a short stem, are oval in shape, sometimes with a slightly pointed tip and are somewhat hirsute. Cultivars of this species include lateritia which has brick-red bracts, fading to Brazil red and Rosa catalina, the familiar Pink Bougainvillea, which has bracts of a pale-red or bright rose. Other varieties have cerise, scarlet or deep pink bracts.

B. glabra has magenta bracts but the leaves are smooth, oblong and bright green. The whole plant is less hairy than *B. spectabilis* and is more popular than that species as it flowers almost continuously throughout the year in some districts. There are several varieties of this species differing only slightly in the shade of the bracts and in the size of the flower panicles.

B. peruviana has smaller, mauve-pink bracts, yellowish flowers and large, smooth leaves. Ecuadorean Pink, Lady Hudson and Princess Margaret Rose are names given to a deep pink variety. It is to be seen from Colombia to Peru but rarely in the United States.

The hybrid *B. buttiana* is considered to be a cross between *B. glabra* and *B. peruviana*. It has cerise bracts or coppery orange turning to crimson-purple and dark green, broad, rather hairy leaves. It is a beautiful plant with its close branches of flowers and deservedly popular. Concerning its origin there has been some confusion but Mr. Holttum of Malaysia has clarified matters considerably by collecting much useful data on the subject. Mrs. Butt of Trinidad is recorded as having taken cuttings from Cartagena at the beginning of this century and propagating the species in Trinidad. A few years later a similar plant was introduced into Florida from British Guiana. When it appeared in Europe it was known both as Mrs. Butt, and Crimson Lake. Still later a Bougainvillea with only a slight difference in the flowers came to India from the West Indies. This was named Scarlet Queen. Sports of these Bougainvilleas appeared in different parts of the world with orange or coppery orange instead of crimson bracts. Those¹ were named Louis Walthen, Mrs. McLean and Brilliant and although these two have a slight difference it seems obvious that they have a common origin. With age they fade to a pretty salmon pink, tinged with mauve.

B. formosa has solid clusters of pale magenta-pink flowers, which continue to bloom through the rains, but become rather untidy as many flowers remain in the cluster after they have become¹ dead and dry. There are two kinds with variegated leaves, green marked with cream.

The Bougainvillea grows easily in any soil and thrives with little attention. But with judicious pruning and watering, the form of the plant and quantity of bloom can be controlled. It is perhaps at its best in India at altitudes between 600 and 1200m. but grows splendidly in many sub-tropical countries.



BOUGAINVILLEA GLABRA

LANTANA

LANTANA ACULEATA

Fam. Verbenaceae. (Hind.); Kanguni (Mar.); Uni cheddy (Tam.); Arippu (Mal.) Chaneri, tantani (Mar.); Katu hinguru (Sinh); Bunga tahi ayam, bunga pagar (Malay).

ONE of the commonest and most troublesome weeds in India, the Lantana, in its cultivated forms, is a charming garden plant. *Lantana aculeata* a cultivar of *C. camara* occasionally considered to be useful in giving shelter to young sandalwood trees, but because of its growth and the amazing speed at which it can spread, it has become a serious menace and costs the country many rupees in damage. Along the river banks of Bengal it is especially prolific.

It is a rambling, prickly shrub, a native of tropical America, said to have been brought to India from Australia by a planter. It has a strong smell of black-currants, which is more apparent when the plant is touched or disturbed. The square branches are pale green and either hairy or armed with recurved prickles. The leaves, too, are hirsute but in this case the hairs are invisible. An attempt to stroke one "against the pile", however, will immediately reveal the strength and density of the tiny prickles. Of a bright clear green, the leaves grow in pairs, each pair roughly crosswise to the next. They reach about 7.5 cm. length, are oval in shape with pointed tips. They have a round-toothed edge and are often wavy; underneath the many veins are predominant and, above these give a wrinkled effect.

The flowers, which may be found throughout the year, grow on slim stalks from the axils of the leaves and are therefore also in pairs. Twenty or thirty tiny, unevenly-petalled flowers with long tubes form a compact head about 2.5 cm across and many have the charm of being multi-coloured. In the commonest variety, the inner blooms are deep crimson and the outer circles are bright orange, all with orange centres. Another common one has an outer ring of orange centred, pink flowers, surrounding a group of pale yellow ones with dark yellow centres. A third is all orange. Cut short and massed in a small trough vase, these flowers make an attractive table decoration and may be obtained when no other flowers are available.

The fruit is a berry, green or blue-black and is very popular with birds who spread the seeds widely and are largely responsible for the weed becoming such a menace. Nearly fifty varieties have been developed; all retain the black currant smell and the hairy leaf formation, but the flower heads are in many lovely shades of mauves, pinks, yellows and oranges.

L. Cloth of Gold is all a brilliant yellow, *L. delicatissima* has a pale yellow heart marked with deeper yellow and surrounded by a circle of palest pink. *L. alba* and *L. nivea* are both white and *L. Sanguinea* is a deep red. *L. Selloviana* from Uruguay anci now known as *L. montevidensis* is a trailing dwarf with mauve heads of flowers and is more suitable tot hanging baskets and rockeries. *L. camara*, common in the West Indies and southern States of America, is similar to *L. aculeata* but rarely has any prickles.



LANTANA

CAMPHIRE

LAWSONIA INERME Syn. *L alba*

Fam, Lythraceae Mehndi (Hindi); Medhi(Beng.); Marudani, mahthondi (Tam.); Mayilanchi(Mal); Gonnta(Tel.) Coranti (Can.);Khenna (Egypt); Al khanna (Arabic); Jamaica mignonette (W. Indies); Inai, hinna (Malay); Camphire, Hennah, Egyptian Privet Tree Mignonette (Eng.)

THIS very common Indian shrub, known in so many parts of the world, has a history which dates back to thousands of year B.C. In the Song of Solomon we read : “My beloved is unto me as a cluster of camphire in the vineyards of Engedi.” Mrs. Temple in her Flowers & Gardens tells us : “This camphire or hennah, is Pliny’s ‘Cypress of Egypt’,” and the women of Egypt and other Eastern countries stain not only the palms of their hands and the soles of their feet with a paste of hennah leaves but also the tips of their fingers, the nails and knuckles, from which custom probably arises the designation of Aurora as “rosy” or “rosy fingered.” Mummies have been found with hennahed nails and up to the present time Egyptian women consider it almost indecent to be seen without their nails dyed. The powdered leaves are beaten up with catechu paste and the dye will endure for three or four weeks. It is a popular form of embellishment among Indian women and many men from the North like to give their hair and beards a copper tint and even gharry horses, particularly grey ones, are adorned with flamboyant, red manes and tails; or worse—large spots like a rocking horse. Skins and leather, too, can be dyed with hennah, but as the plant contains no tannin the colour is not permanent.

When young the Camphire is a smooth, twiggy bush with straight branches and numerous branchlets. When grown on poor soil or under unsuitable conditions it acquires a multitude of prickles and thorns which are often concealed in small, leafy side shoots. Well cut back and constantly pruned, it makes an ideal hedge, being an almost impenetrable barrier.

The long spires of pale creamy flowers have a heavy, clinging fragrance and are well suited for cutting. They bloom throughout the year, but most profusely during the hot weather and the rains, the tiny, glossy buds opening into tiny stars. Numerous protruding, yellow-tipped stamens give the sprays a soft, fluffy effect. There is a variety with dull, pale red flowers and another a clear pink. The fruit is a small pea containing many seeds and are borne in such profusion that the branches are bent down with the weight of the clusters. Green and shining at first, they later become brown, dry and hard. The numberless, 2.5 cm. leaves grow on short stalks from the red-brown branches, the branchlets and every little side twig.

From the flowers, leaves and young shoots an extract is obtained which is used in the treatment of leprosy and from the flowers perfumes are concocted. The leaves are used as a remedy for skin diseases and ulcers and are made into an astringent gargle.

The hard, close-grained wood is employed for making such small articles as tent pegs and tools.

The name Lawsonia honours John Lawson, the traveller. Inemne means “unarmed, in other words “thornless.” The English name Tree Mignonette was given because of a resemblance to the creamy, scented flowers of the popular garden plant Mignonette.



CAMPHIRE

IXORA

Fam. Rubiaceae. Kangan (Hind, Beng.); Thetti, chethi (Mal); Rookmini (Vern.); Pecha periok (Malay.)

THERE are so many species and varieties of *Ixora* that it is sometimes difficult, with so many colours and sizes, to realise that the different varieties belong to the same genus. They grow as shrubs or small trees with rough, grey branches and glossy, dark red stems.

The smooth leaves, which appear in pairs-occasionally in threes-are dark and shining, paler underneath with definite veins. New leaves are a clear, translucent lime green.

Each flower is a long, slender tube dividing into four spreading petals from the bases of which spring four stamens. The flowers are massed in heads of various sizes, sometimes immense, round, full trusses, other times merely a group of a dozen or so. All shades and colours are found except blues and purples. As the flowers remain fresh for a long time after plucking they are well suited for indoor decoration.

A native of tropical Asia and Africa, the *Ixora* is now common in all Eastern countries, both in its wild state and as a cultivated garden shrub. It flowers throughout the year but is at its best during the rains.

The country people find many medicinal uses for the various parts of the plant. The roots are made into a medicine to alleviate stomach troubles and cure dysentery, although it is admitted that it is not so effective as *Ipecacuanha*.

Perhaps the commonest is *Ixora coccinea* known as the Scarlet *Ixora* or Flame of the Woods, Jungle Flame and Jungle Geranium, Bakora in Marathi, Vedchi in Tamil and as Rat mat in Sinhalese. The word *coccinea* means "scarlet." This is one of the smaller varieties and reaches little more than 150 cm. in height. The brilliant flowers grow in large, compact heads which are particularly attractive during the monsoon. It is frequently found growing wild in scrubby undergrowth, but in such circumstances the flower heads are much smaller. The fruit is black and about the size of cherry and supposed to be favoured by peacocks. A decoction from the flowers or bark is claimed to relieve bloodshot eyes and to cure sores and ulcers. The bush is held sacred to Shiva and Vishnu and the flowers are offered to the God *Ixora*, a local Malabar deity.

I. rosea, meaning "the Pink *Ixora*," is an untidy, straggling bush, rarely reaching 120 cm, but it bears large, round heads of flowers which contrast attractively with the dark green leaves. The pink is inclined to darken as the flower ages.

I. parviflora means "the Small-flowered *Ixora*" and it is known as the Torch Tree. It is a small tree with many branches and fragrant whitish flowers but is not particularly attractive. In Madras it is very common and branches from it are used as torches by letter carriers. Its local names are Koto gandal (Hind.), Kurat (Bom.), Shulundu, korivi (Tarn.), Kori, gorivi (Tel.) and Lokandi (Mar.)

I. barbata is called the Bearded *Ixora* because of the woolly appearance of the mouth of the flower. It is a large shrub with many branches starting almost from the ground. The flower stalks are dull purple and the long-tubed white flowers bear spreading, yellow-anthered stamens.

I. griffithsii is considered by many to be the best of the *Ixoras*. It grows to about 120 or 150 cm. and bears huge orange trusses, sometimes as much as 23 cm. across. A young bush only 60cm high may produce as many as twenty flower heads. It is *I. chinensis* is orange-flowered; *I. undulata*, the Wavy-Leafed *Ixora*, *Paiaka jui* in Bengali, has white flowers; *I. fulgens* is a very ornamental shrub with large, long-tubed, scarlet flowers; *I. lutea* is another attractive shrub, rather like *I. coccinea*, but with yellow flowers and *I. singaporensis* has very large and showy heads of flowers of a rich terra-cotta colour. *I. bracheata*, the commonest and most abundant *Ixora* around Bombay is a small rather ugly tree, growing up to 6 m. *Ixoras* are usually grown from layers and to keep their compact and rounded shape the garden hybrids should be pruned fairly closely after flowering.

The name *Ixora* is derived from a Sanskrit word "ikvana" which is the name of a Malaysian deity, or possibly from the name "Iswara", a Malabar deity to whom flowers were offered. A third claim is that it is from the Portuguese rendering of the Sanskrit word "Iswara" meaning "Lord", referring to the God Siva.



SCARLET IXORA

HIBISCUS

Fam. Malvaceae lashand (Hind., Mar.); loba (Beng.); Dasavala (Can.); Sembaruthi, sappartu pu (Tarm.); Chemparathi (Mal.); Wada mul (Sinh.); Gurhul, jaswand, jaba, juva (Vern.)

THERE are more than two hundred species of herbs, shrubs and small trees sharing the name Hibiscus, nearly all tropical. Of the herbs perhaps the best known are *H. esculentus*

entus, which is the well-known vegetable Ladies Fingers and *H. sabdarifta*, the Rozelle from which jellies are made. Among the shrubs and small trees there are numerous species and varieties and crosses, some salver, some trumpet-shaped, some single and some double, the latter being like huge, full-blown roses. Flowers appear all through the year and are very popular with sunbirds and tailor-birds who insert their beaks between the petals at the back of the flower to reach the nectar. With few exceptions all varieties are scentless and the flowers open in the morning and die after about twelve hours. The plant belongs to the mallow family and was once thought to be allied to the hollyhock because of the similarity in arrangement of the flowers. They are sun-loving plants and must be pruned regularly to prevent them becoming straggly and to produce the maximum number of blossoms.

The four main types are *H. mutabilis*, *H. rosa sinensis*, *H. syriacus* and *H. schizopetalus*. The first is known as the Changeable Rose, *mutabilis* meaning "changeable," or Persian Rose or Rose Mallow and in parts of America as the Cotton Rose or Confederate Rose. The vernacular names are Gul-i-ujajib, Sthalpaddo and Oru, Botan in Malay and Bettada tavare in Canarese. It is, of course, not a rose at all, but the names have no doubt been given because of the appearance of the double varieties. It blooms in September-October and is a large shrub or small tree, inclined to be straggly and with distinctive leaves. If heavily pruned after this flowering period the shrub will produce another flush of flowers in the cold season and again later. Leaves are large and heart-shaped, almost as broad as they are long and with five veins radiating to the point of each, rather indefinite lobe. The edge is serrate and the whole leaf and stem is covered with a fine down. The large flowers, single or double and 7.5 to 10 cm. across, are, in the typical variety, pure white in the morning and gradually turn through pale pink to deep rose in the evening. Other varieties remain white, change from pale to dark pink or remain pink. By night they are dead, but both life and colour can be retained for some hours by plucking them during the morning and keeping them in a refrigerator. The fruit is a small, hairy capsule. All other Hibiscus flowers, except the scarlet ones, lose their red colouring matter during the day.

H. rosa sinensis, a large evergreen shrub, called the Shoe Plant, Blacking Plant or China Rose as it was introduced from that country, is known in India as Jasud or Juva, in Malaysia as Bunga raya. It is perhaps the commonest and most beautiful of them all, known in all tropical and sub-tropical countries under many fancy names, its large, single bell-shaped flowers being a lovely shade of rich Chinese red. It forms a fine ornamental hedge. There are now double varieties and many new colours, including white, yellow, pink, orange, terra-cotta, cerise, have been introduced. The leaves are bright green ovals, pointed at the apex and coarsely toothed except round the base. They grow alternately on a short stalk, at the bottom of which is a narrow bract. Amongst the leaves, the lovely flowers with their long bunches of stamens hang like open bells. The calyx is rather unusual. Circling the five sepals is what appears to be a secondary calyx comprised of several narrow pointed leaves

Exhilarating reds and scarlets are always popular in the East and the China Rose is no exception. It is used on festive occasions, as a hair decoration and often, too, in sepulchral rites. The blooms last only one day, but like the Changeable Rose, their life can be prolonged by keeping them in the refrigerator. At some time it was discovered that a crushed flower, rubbed on black shoes with the hand, gave a fine polish and now it is a common method of shoe-polishing.

H. syriacus or *Althea frutex*, Swet joba in Bengali, was named by Linnaeus because he contended that the plant was a native of Syria. The lovely name Rose of Sharon was no doubt given for the same reason, but it is now considered more probable that it originally came from China. Shrubby *Althea* is another name by which it is known in some places. Thriving best in the hills it produces lovely white, blue or mauve flowers, either single or double and grows to about 2.7 m. Like hollyhocks they spring from the axils of the leaves. Like other species of Hibiscus it has been widely planted, even as far north as Ontario and given many descriptive names.

H. schizopetalus, known as the Coral Hibiscus, Japanese Hibiscus or Japanese Lantern was imported from Africa. From April to September it bears red or orange-red flowers, drooping and fuschia-like with deeply fringed petals. The staminal tube is exceptionally long, up to 15cm. in length and this feature is retained in flowers which have been crossed with other varieties

H. micranthus is a strong, shrubby plant often seen in hedges in the hotter parts of India. The leaves are deeply serrate and the flowers solitary, small and pink. Like the other types there are many varieties and innumerable hybrids continue to be introduced.

In the west Hibiscus plants are very popular in heated greenhouses and as house plants.

Pacific Island women wear Hibiscus flowers in their hair to indicate they are free from commitments to the opposite sex.

The word Hibiscus is a Greek word for mallow.



CORAL HIBISCUS

GARDENIA

GARDENIA IASMINOIDES Syn. *C. Honda*, *C. radicans*,

Fam, Rubiaceae Gandharaj (Hind., Beng.); Gunda-raj (Bomb.); Ananth (Mar.); Bunga china (Malay);
Gardenia, Cape Jasmine (Eng.)

THE Gardenia is one of the most popular of garden shrubs, growing well in tropical and sub-tropical conditions and under glass in temperate climates. It is a native of China and Japan and forms a dense, evergreen shrub when kept in shape, always attractive with its dark glossy foliage and large white flowers which cease to appear only in the cold season.

The crowded leaves grow in opposite pairs and whorls, a rich, pale green when young, changing to a deep, dark colour as they mature. They are long and narrow, tapering to a very short stalk and having deep, pale-coloured nerves. The polished appearance of the new leaves is due to a resinous substance contained in them.

This cultivated Gardenia usually bears double flowers up to 7.5 cm. across. They appear on short stalks, solitary near the ends of the twigs and are showy and fragrant. Unfortunately the pure white of the fresh flowers changes to a dull ochre before the blooms fall. The calyx is a long, green and ridged tube which opens into five or six spikes or teeth.

The fruit is a ribbed, orange berry containing orange-coloured pulp and numerous seeds, but the bush does not often bear ripe fruit. Propagation is usually by cuttings or layers. There are varieties with larger, double flowers.

The Chinese perfume their tea with the flowers and dye their food with the fruit. In Malaysia the bush has been cultivated for a long time principally for the dye and for medicinal purposes. It is recorded that the people of the Konkan relieve headaches with a paste made from the roots and take it internally in cases of hysteria.

The name Gardenia honours the botanist of South Carolina Dr. Alexandra Garden. Florida in Latin means "flowering richly", lasminoides means "resembling Jasmine" and Radicans means "resting".

BRILLIANT GARDENIA

GARDENIA LUCIDA Syn. *C. resinifera*

Fam. Rubiaciae. Dikmala (Hind.); Dikamala (Mar.); Kambil, kumbai (Tam); Yern bikki, karinguva, terra manga (Tel.); Bunga china (Malay); Bikke, dikkamalli (Can.); Brilliant Gardenia, White Emetic Nut (Eng.)



BRILLIANT GARDENIA

THIS is the Gardenia which grows wild in India. It is found in all dry districts and deciduous forests in the South-West and from Madras up through the Decan to Chittagong and into Burma. It is a handsome shrub, sometimes a small tree, lighter in both form and colour than the garden Gardenia. The flaking bark is paler, greenish-grey in colour and the leaves are a bright, clear green. They, also, exude a substance which gives them a varnished look.

The single flowers are a little smaller but equally strongly scented. They grow singly in the axils of the terminal leaves on short stalks and have five oval petals rising from a long tube clothed in soft hairs. These flowers also turn yellowish before falling. The woody fruit is a smooth, 2.5 cm. ball etched with lines circling the surface from the calyx. A clear, malodorous gum exudes from the tips of young shoots and buds. This substance, known as Dikamali or Cumbi-gum is also produced from another species of Gardenia and it is sold in the bazaars either as drops or resin still adhering to the severed branch tips or in glutinous masses. When freed from impurities it becomes transparent and bright yellow and is used to assist teething in children. Dissolved in spirits it is effective for cleaning ulcers and sores, melted in oil and applied to the forehead it provides a relief to sufferers from headaches.

The hard, close-grained wood is yellowish-white and is used for making small turned articles.

GOLDEN CHAMPAK

OCHNA SQUARROSA

Fam. Ochnaceae. Yerra juvee (Bom.); Ramdhan champa (Hind.); Chilanti (Tam.); Sunari (Tel.)

A charming characteristic of this handsome shrub is its willingness to display all its attractive qualities at one time. The new leaves, before turning green, are subtle shades of russet, brown and lime and it is during this time that the bright yellow, scented flowers appear. When the petals have fallen the maroon fruit develops and the calices turn from pale green to crimson. And in contrast to this gay display are the dark brown stems.

The flowers appear in clusters on 2.5 cm. stems and have a variable number of petals. These open flat or bend back showing the close bunch of yellow stamens, each tipped with a long, deeper yellow anther. The fruits, about 5 cm in length, are first green but ripen to maroon and black and develop singly or in clusters up to ten in number. They perch on a red boss surrounded by the crimson, curled sepals.

In the cold weather the leaves fall and the new ones appear in February-March. They are long and pointed with edges that are wavy and also finely notched. In June, when this illustration was painted, there is a second flush of flowers and more-red and brown leaves appear.

The roots of the Golden Champak are curiously long, swollen and twisted. The Santals make from them an antidote to snake-bites. From the bark a tonic is concocted, taken as a cure for digestive troubles and poultices are prepared from the leaves and applied to wounds.

The wood is quite hard and with a pretty red-brown grain, but is not widely used because of its tendency to warp.

In the garden this is a handsome shrub reaching about 2.5 m. in height and is grown from cuttings or seeds. Wild, it is found in Assam, Burma and Sri Lanka as well as in India where it is common in the Deccan and Karnatic regions in dampish places. It is now planted in many gardens of the tropics and is popular in California and Florida.

The name Ochna is from the Greek word for the wild pear as the leaves of some members of this genus are similar. Obtusata means blunted and Squarrosa in Latin means "rough" or "scurfy."



GOLDEN CHAMPAK

YELLOW OLEANDER

THEVETIA PERUVIANA Syn. *T. nerifolia*

Fam. Apocynaceae. Zard kunel, pita kaner (Hind.); Kolkaphul (Beng.); Kunairu (Sinh.); Yellow Oleander, Exile Tree, Lucky Nut (Eng.)

THIS large, attractive shrub is easily recognised by its narrow, pointed leaves and scattered, yellow flowers. It is now very common throughout India and all tropical countries, thriving especially well in the drier regions. Every part of the bush is extremely poisonous, especially the milky sap which exudes from stems and shoots, when cut. Its popularity may be due in part to this fact, as goats and cattle will not graze from it, and it is allowed to grow in symmetrical formation, bearing leaves almost to the ground.

The waxy, yellow flowers up to 5 cm. across, are slightly fragrant but short-lived. However, blossoms continue to appear throughout the year and, although they never bloom in profusion, it is but rarely one comes across a bush with not a single flower. They spring from the ends of the branchlets and from small side shoots and are bell-shaped with five overlapping petals. Pale buff and cream-coloured flowers are sometimes seen.

The fruit is an odd-shaped berry, changing from green to brownish when ripe. Inside is a woody stone containing from two to four seeds. These are known as Lucky Seeds or Lucky Beans and are made into pendants or charms, or kept in the pocket “for luck.”

Leaves are always present in great number, shining, green lances pointing in every direction. Underneath they are pale and dull. The shining bark is thin and greyish brown in colour and the branches, slender and spreading. It should be pruned lightly from time to time.

The seeds give a bright yellow oil which bums well and is also used in medicine.

“Thevetin,” a strong poison, is obtained from the bark and made into a powerful febrifuge, but should be employed with great caution. The seeds are sometimes used to poison wild animals. In the U.S.A. large quantities of nuts are used to make a medicine, valuable in certain heart ailments. Grown in plantations for the sake of the nuts — and it is easily propagated by cuttings or seeds — the Exile tree would be a source of considerable profit if medical men in this country made as full a use of it as they do in the States. It is a favourite with Hindus who like to plant it beside temples and offer the flowers to the God Shiva.

The name Thevetia was given in honour of M. Andre Thevet, a French monk of the 16th Century and nerifolia means “having leaves like the Nerium or Oleander” These two shrubs belong to the same family but there is no close relation, the Oleander being from the Mediterranean and the Exile Tree from South America and the West Indies.



YELLOW OLEANDER

RANGOON CREEPER

QUISQUALIS INDICA

Fam. Combretaceae Iranganmalli (Tam.); Huchki (Vern.); Akar dani(Malay).

THE name Quisqualis, meaning “which ? what ?” was given to this plant by a Dutch botanist called Rumphius to express his astonishment at the odd behaviour of the species. A new plant grows for the first six months as an erect shrub, then it ends out a runner from the roots which soon becomes stouter and stronger than the original stem. This runner, by means of tenacious spines, which have developed from the stalks of fallen leaves, climbs neighbouring trees sometimes to a considerable height and becomes a large, woody creeper. It does not twine or cling by means of tendrils as do many creepers. Apart from this peculiarity in its early growth the life of the Rangoon Creeper is quite normal. It is a charming plant, a native of Burma and Malaysian Archipelago, and thrives well in most parts of India, being frequently cultivated in gardens. Fresh green leaves set off the clusters of pendent pink and white blossoms and the attractive appearance is enhanced by the delicious perfume.

The oblong, pointed leaves are opposite and from 2.5 to 10 cm. long, deeply veined and slightly downy.

When tiny the pink buds grow erect, but as the slim, lime-green stalks extend to several inches, the buds droop and open. These long stalks are actually the calices which are in the form of slim tubes dividing into five segments, between which are inserted the five oval petals, forming a pink star. On first opening the flowers are white or part white and part pink, but later they become completely pink and darken considerably before withering. They appear from March until May and again after the rains. In some parts of India it is constantly in bloom. There is an all-white variety. The plant is easily raised from layers, cuttings or root divisions and should not be given very rich soil or it could become almost unmanageable. It is wise to cut it back sometimes in the dry season.

The black fruit is smooth and pointed, dry and five-winged and about 2.5 cm. in length. A bitter liquid is produced from pulped, unripe fruit and used as a vermifuge. When ripe, the fruit can be eaten, but only in moderation as an excess quickly causes nausea and hiccupping. The leaves, too, are edible and have a warm, pungent taste like radishes.



RANGOON CREEPER

POINSETTIA

EUPHORBIA PULCHERRIMA Syn. *Poinsettia Pulchenima*

Fam. Euphorbiaceae. Lal pate (Hind.); [Poinsettia, Christmas Plant painted leaf, Lobster Plant, Mexican Flame Leaf (Eng.)

AS there are few flowers to brighten our gardens around Christmas time, the flamboyant Poinsettia, with its bright red bracts, is deservedly popular. It came originally from Mexico and was named after Ambassador Poinsett of South Carolina, who brought the first plants from there in the middle of the 19th Century. Now it is found in most parts of the world, in greenhouses in the colder climes and out-of-doors in tropical and sub-tropical countries. There are many varieties all with the same peculiarity — extreme degeneration of the flowers. The coloured leaves are not part of the flowers but just bracts, brightly coloured to attract insects as in the Bougainvilleas and other plants. The rounded, bud-like formations, with up-standing stamens and peculiar lateral protuberances are not flowers at all but clusters of degenerated flowers. Each “stamen” is all that exists of a male flower, and the bulky “pistil” is all there is of a whole female flower. Some of the varieties are very far removed from our gay garden plant, being nothing but roadside weeds. Others are like miniatures with only a small area of scarlet, others have no scarlet at all but an ugly greenish-yellow instead. Horticulturists have introduced still more varieties, so now we have double forms, forms where the red is replaced by pink or yellow or white and some with variegated leaves. But I do not think any of these is an improvement on the original crimson.

The Poinsettia has a short, thick trunk and rough, brown bark. The branches are slender and green and spread into an open bush formation, bearing most of their leaves towards the end. New leaves are soft, bronze and downy, later becoming green and then hard and leathery, deeply scored by the veins. Each branchlet ends with a circle of bracts surrounding a small cluster of “flowers.” The bracts are about 12.5 cm. long and half that in width. A characteristic of many poisonous plants, it should be noted, is a milky-white sap which exudes from a part or all of the plant when cut. Poinsettia is no exception and one should exercise great care in handling cut branches. Both leaves and bracts droop very quickly after cutting; so if the sprays are required for indoor decoration, the cut ends should be immediately plunged into boiling water to the depth of 5 cm. This will preserve their freshness for a considerable time.

The Poinsettia requires full sun and good drainage and should be cut down to about 30cm. after flowering. This is essential if large, compact shrubs, 2.5 to 3m. high, are expected the following season. Cuttings root readily.



POINSETTIA

CORAL CREEPER

ANTIGONON LEPTOPUS

Fam. Polygonaceae. Bunga bonet, bunga berteh (Malay); Coral Creeper, Sandwich Island Creeper, Honolulu Creeper, Confederate Vine, Mountain Rose, Queen's Jewels, Chain of Love (Eng.)

THIS pretty little creeper is deservedly popular for its lovely sprays of delicate pink flowers. Its original home was South America, but for many years now it has been planted in gardens all over the East where it has established itself as a hardy perennial well suited for covering fences, wall or pergolas — an asset to any garden. From the very large number of English names recorded it is clearly a widely planted and well loved climber.

It is a deciduous plant, the leaves falling in February and for the next few months it presents a very bedraggled appearance unless trimmed and tidied up. But, to make up for this, the two flowering periods are each quite long — all through the rains and for several weeks during the cold season. Then, the fresh green leaves and tangled clumps of globular, pink flowers make a pleasing picture.

The long, curled flower sprays bear numerous side stems, many of them springing from the axils of leaves. Along one side of these stems cluster numerous 1.5 cm. round flowers diminishing in size to tiny pale pin-heads towards the end. Beyond them the stem often divides into three segments like hooks, by means of which the spray attaches itself to neighbouring stems. When fully open the flower is a deep cup, displaying the orange anthers within. The coloured parts of the flowers are called “perianth segments,” which means that there is no difference between petals and sepals in colour or structure, and there is only one series.

The leaves are heart-shaped or triangular, pointed and up to 7.5 cm. in length. Rising from the stalk on short, pink stems, they bend and fold in every direction. The surface is furrowed by the deep indentations of the veins and the edges are slightly wavy. They are a bright green in colour, paler beneath.

The fruit is a small nut, sheathed by five heart-shaped “leaves” which form wings. These are green at first, later becoming brown and brittle. They develop in clusters similar to the flowers. There are several varieties. *A. leptopus alba* has white flowers, and *A. amabilis* deep, rose-coloured flowers. *Amabilis* means “lovely.” *A. insigne* — meaning “the remarkable *Antigonon*” — is grown less extensively but is more attractive with its slightly larger flowers and deeper shades of pink. They all thrive in deep well-drained but not too rich and can be propagated by cuttings, layering or seeds. anti, “against” and

The word *Antigonon* itself is derived from two Latin words *gonum*, an “angle.”



CORAL CREEPER

MOONBEAM

TABERNAEMONTANA CORONARIA Syn. *Ervatama coronaria*

Fam. Apocynaceae Firki tagar (single), bara tagar (double) (Hind., Beng.); Nandia vetta (Tam); Nandiavattum (Mal.); Wattesudu (Sinh.); Chandnee, tagan, tagai nandet (Vern.); Nandi battalu (Can.); Susun kelapa, susok ayam (Malay); Moonbeam, Ceylon Jasmine, Wax Flower, Broad-Leaved Rosebay, Crepe Gardenia (Eng.)

YOU have only to look at this shrub on a moonlit night, the growing whiteness of the flowers standing out against the dark, shining leaves to understand why it is called Chandnee or Moonbeam. Its Latin name comes from a 16th Century Botanist called Tabernaemontanus and a word meaning “used for garlands” The country of origin is unknown but for years it has been a popular garden shrub in India and is also round growing wild. It is evergreen, grows to a height of 1.8 m. or so and bears scattered clumps of dazzling, white flowers more abundant on those bushes which get plenty of sunlight. Branches and twigs are ashy and wrinkled, marked by the bases of past leaf shoots. These shoots are green, polished and branched and terminate in pairs of leaves growing crosswise to each other. Young leaves are a rich, glossy green, becoming darker and even more glossy with age. Growing to 10 cm in length they are pointed ovals, narrowing down to the short stalk and indented by the veins.

In the wild state the flowers are single, but cultivated forms are usually double, a pale yellow tube rising from a small, yellowish calyx and spreading out into around, overlapping, wavy-edged petals, the whole forming an exquisite gardenia-like bloom nearly 3.8 cm. across. Their delicate fragrance increases towards evening, and cut sprays make a charming table decoration. Deccan women use them as buttons and all Indian women like to wear them in their hair.

The three-ribbed fruits, each from 2.5 to 7.5 cm. in length, are spreading, like a pair of horns, and contain red, fleshy seeds which, when pulped, make a good red dye. Propagation is by layers or cuttings.

It is quite a useful shrub, as a good resin is contained in the milky juice which exudes from cut branches. The roots, also, are valuable either as a vermicide or, mixed with lime-juice, as a cure for certain eye diseases. The juice from the leaves also has this latter property and is a remedy for ophthalmia. Perfumes are manufactured from the delightfully fragrant wood and it is burnt as incense, in frost-free areas of the United States it is planted as an ornamental shrub.

Divaricaeae means “spreading” or “growing in a straggling manner”



MOONBEAM OR CHANDNI

PURPLE WREATH

PETREA VOLUBILIS

Fam. Verbenaceae. Kudirai valuppu (Tam) Queen's Wreath (Eng.)

SUCH a sharp contrast between the soot, delicate flowers and the harsh crisp leaves of the Purple Wreath is most unexpected. Even the new leaves are stiff and papery.

The Purple Wreath was introduced from tropical America many years ago and has always been popular as a garden shrub, usually as a climber, but sometime^ over a support where it is encouraged to twine around its own branches. It is described as a woody vine and has a grey bark. A strong climber, it will attain great height and cover a considerable area if left unpruned; but it can, if desired, be trained as a standard. Over a porch or along a veranda it makes a glorious show in the spring when the innumerable, long, mauve flower sprays appear. There is also a lesser flowering season towards the end of the year. The tapering clusters bear many pale, blue-mauve stars, becoming deeper in colour towards the end. They grow nearly in pairs, on a short stem and usually turn so that each flower faces the light. But what we take to be the flowers are actually the calices which remain after the flowers have fallen. The true flower is a small, five-petalled affair of deep purple velvet which may be seen resting in two or three of the end calices. One purple petal has a white splash in the middle. These flower sprays spring from the axils of the leaves and are usually drooping and gracefully arched. The plant does not bear fruit in India.

The oval leaves are quite large—up to 12.4 or 15 cm. and deeply veined. Stiff and rough, they are a dull-green above and brighter underneath. New leaves are a fresher green but also stiff—never soft and limp like the young leaves of most plants.

This is a charming flower to cut for the house but it will be found that, if the woody stem is cut, the blooms will rapidly droop and die. If, however, the flower-sprays only are cut and arranged in a shallow bowl, they will remain fresh for several days. The plant usually sends up several suckers which can be removed to form new plants, or a branch can be bent down and anchored to the ground where it will quickly root. In the West Indies, Mexico and Central America it is popular and in the colder climate it is given the protection of a greenhouse. A cultivar albiflora with white flowers is now obtainable.

The name Petrea was given to commemorate the name of Lord Petre, who, in the 18th Century, became famous for his wonderful collection of exotic plants. Volubilis means “twining”.



***PETREA VOLUBILIS OR
PURPLE WREATH***

GOLDEN SHOWER

PYROSTEGIA Syn. *Bignonia Venusta* Bigne.

Fam: Bignoniaceae. Tanga pu (Tam); Golden Shower, Orange Bignonia, Flame Vine Flaming Trumpet (Eng)

There are many Bignonias, generally known as Trumpet Flowers, and the name of this one, a native of Brazil, and Paraguay means “charming” or “beautiful”. It is an extensive climber and, during February, clumps of its brilliant orange flowers may be seen even as high as the tops of tall trees. The green stems are strong and angled, bearing, on longish stalks, pairs of leaflets up to 6.3 cm. in length. Actually the normal growth of the plant produces three leaflets, but the centre one either never develops or is transformed into a long tendril divided at the end into three tiny hooks. This contracts spirally after laying hold of some object and, having a certain elasticity, is considerably stronger than its frail appearance would lead one to imagine. The tips of the tendrils, after attachment, often turn into small discs. The leaves are bright, dark green, shiny above and rather hairy beneath.

The calyx is tiny and loose fitting, a round cup minutely toothed at the rim. From it emerges the rich, shining, orange tube of the flower, expanding at the mouth and dividing into five, white-edged lobes, the two lower ones of which are partly united. These flowers appear in dense, drooping clusters between February and April and, although without perfume and with a very short flowering season, the plant is an ornament in any garden, perhaps the most striking and gorgeous climber in the world, framed along a garden fence, up a Palm or over an old tree stump, it remains effective throughout the year. Densely evergreen, the plant never becomes straggly or untidy and during its brief flowering season the splendid beauty of the honeysuckle-like blooms are a joy to see. The plant thrives well in any good, fibrous loam to which a little manure¹ has been added. Propagation is by cuttings of the old wood set in sand under glass.

Another handsome creeper of the same genus is the Purple Bignonia (*Rignorua purpurva*), now called *Clystotona binatum*, with dark green, glossy leaves and thick clusters of lovely purple trumpet flowers. These are produced several times a year and are sweetly scented

Saritaca magnifica {*Bignonia magnifica*) is a heavier climber, equally vigorous and bearing large, purple-mauve trumpet flowers in great profusion.

Macfadyenci unguis-cati: (*Bignonia unguis-cati*) Cat’s claws, is another extensive climber bearing masses of pendent, yellow flowers, also trumpet-shaped.

Pyrostegia is from the Greek word “pyr” meaning “fire” and *stegē*, “a roof” referring to the colour and form of the upper lip of the flower. The name *Bignonia* was given to honour Abbe Jean Paul Bignon, librarian to Louis 14th while *venusta* means handsome or charming.



GOLDEN SHOWER

RED BELL BUSH

WOODFORDIA FRUTICOSA

Fam. Lythraceae. Dawa, Santha (Hind); Dhauri (Bom.); Phulsatti, dhaiti (Mar); Malitta (Sinh.); Seduwayah (Malay)

THE Red Bell Bush is a spreading, leafy shrub, small in size but very conspicuous on dry, rocky hillsides from December to May, when the masses of little fiery bells give a bright touch of colour to the drab terrain. It is common in Sri Lanka, South Konkan and on the Ghats and ascends the Himalayas to 1500 m. but is more rare in South India. It grows in Madagascar and Southern Asia and is cultivated in Florida.

It is a deciduous shrub, usually with a much-fluted stem. The grey bark is exceedingly thin and peels off in flakes. When in flower the bush appears twiggy and formless but entirely swathed in red. This is because the small flowers grow singly or in groups all the way along the branches and side twigs, and it is at this time that the leaves fall. Each flower, borne on a tiny stem, is a slender tube, slightly curved, the greenish base of which is the calyx. Swelling slightly, the tube divides into narrow, pointed lobes and from within emerges a bunch of long stamens. The whole length, including the stamens, is not more than 2 cm. The fruit is a small, oblong capsule, covered by the withered calyx.

The narrow, pointed leaves grow straight from the branches, either opposite or in whorls of three. They are harsh and dull, dark green in colour, but paler underneath. Sometimes they are dotted beneath with small, black glands.

From the flowers, which contain much tannin, a red dye is obtained which is used to dye silks. The leaves also contain a large proportion of tannin and make the commonest tan in India.



RED BELL BUSH

TREE OF SORROW

NYCTANTHES ARBOR-TRISTIS

Fam. Verbenaceae. Harsinghar (Hind.); Sephalika, seoli (Beng.); Paghala, pavala malligai, parijata (Tam.); Parijathakam (Mal.); Parjate (Can.); Kharsati, parajit (Mar.); Siri gading (Malay). Night lasmine, Tree of Sadness (Eng.)

THIS is a very common wild shrub, usually seen as a thick, tangly bush, but becoming a small tree if cut back every year and allowed to grow freely. The small, creamy-white flowers have a surprisingly powerful scent and, as they open in the evening and fall early in the morning, they permeate the night air with a most delicious fragrance. They cluster at the ends and along the sides of branchlets which spring from the axils, of the leaves. Seven slim petals, unequally lobed and somewhat rolled and twisted, surround a brilliant orange tube little more than a 0.6 cm. in length. Each little flower sits in pale green, stalkless cup, sheathed by a wee leaflet, up to five flowers forming a head. Night flowering plants such as this are obviously intended to be cross-pollinated by night flying insects.

The fruit is quite large in comparison with the flowers. Round and flat, it is compressed round the edges revealing the shape of the two seeds within. At first a rich green, it later becomes brown and brittle.

The leaves vary in size, the largest being about 10 by 6.3 cm. They grow opposite, have a short, strong stalk, a rounded base and pointed apex. Dark green on the upper surface, they are silvery green underneath, the silveriness caused by a multitude of fine hairs. So round and hard are these leaves that they are frequently used as fine sandpaper for polishing.

From the orange tubes a rich dye is obtained. This gives the colour used for the robes of Buddhist priests and is a suitable dye for Tussore silk.

This shrub, which is found in the sub-Himalayan forest and other northern and central hills, is an important constituent of the undergrowth, for it densely covers the ground forms humus and is rarely eaten by goats. It gives an excellent fuel and makes a batten base for tile or grass thatch roofs and so is cultivated freely in other parts of India. The principle flowering time is December but blooms appear off and on throughout the year. The Gods of-the Forest usually receive an offering of these flowers for favouring the Shikari and they are often used for garlands and placed on biers.

The names arbor-tristis and Tree of Sorrow or Sadness refer to the night-flowering habit of the plant. There is a tale that a certain King's daughter fell in love with the Sun, who very soon deserted her. In despair she killed herself and was cremated. From where her ashes fell arose this Tree of Sorrow which, unable, to bear the sight of the sun, blooms at night and drops its flowers each morning. It is an easy plant to raise from seeds or cuttings during the rains and is not fussy as to soil. A semi-shady spot seems to suit it best.

Nyctanthes is a name built from two Greek words, nyx meaning "night" and anthos, "flower".



TREE OF SORROW

YELLOW ELDER

TECOMA STANS Syn. *Stenolobium stans*, *Bignonia stans*

Fam. Bignonaceae. Yellow Elder, Trumpet Flower Yellow, Bells (Eng.)

THE Yellow Elder is native to South America, but is now widely naturalised tropical regions. Its handsome, yellow flowers and elegant foliage have made it a popular garden shrub, and it is one which retains its attractive appearance practically throughout the year. Growing nearly to the size of a small tree and branching quite low, it bears its bright green foliage almost to the ground. The bark is light brown and corky.

The leaves are large, with a long stalk and are divided into between five and eleven leaflets. These grow in pairs, each pair being in opposite direction to the previous pair. Each leaflet is from 5 to 7.5 cm long, with a wedge-shaped base, long, tapering point and serrate edge. They are smooth but not glossy and a bright pale-green, paler underneath. The end leaflet is usually the longest. When new the leaves are a beautiful fresh colour, but after the dry season they become dull and tired.

The clear yellow, fragrant flowers appear in close, drooping clusters from the ends of the branchlets. They do not top the foliage as do the flowers of so many of our trees, but hide amongst the branches, in and around the shrub. Each bloom is a 5 cm. trumpet which, on emerging from the pale-green calyx, suddenly bellies out and opens into five wavy lobes. Three of these lobes lie straight, the upper two fold back and the whole flower measures some 3.8 cm. across. Inside, the throat is delicately etched with orange. The fruits appear in bunches of long, slender capsules, green at first, but later turning brownish.

The principal flowering seasons are during the rains and the cold weather, but most shrubs produce a few clusters throughout the year. As the flowers fall before they wither and the shrub has the capacity of seeding itself, the ground below a Yellow Elder is often scattered with blossoms lying amongst numerous little sprouting shrubs.

There are several other species of *Tecoma* deservedly popular in Indian gardens. *J. chrysantha* is similar to the above but has larger cluster of flowers and more deeply serrated leaves. *T. capensis* now called *Tecomaha capensis*, the Cape Honeysuckle, a rambling shrub with a tendency to climb to about 2m. The flowers, which appear throughout the year, are tubular and a bright orange-scarlet.

T. radicans, which has changed its name to *Campsis radicans* and is known as the Trumpet Vine, is excellent for covering walls, old tree stumps or steep banks as it climbs by means of aerial roots. The scarlet, tubular flowers are constantly borne in profusion. It is, popular in the United States.

T. grandiflora, *Campsis grandiflora*, *C. Chinensis* or *Jelcoma grandiflora*, the Chinese Trumpet Creeper is also an extensive climber, bearing during the rains and hot seasons pendulous clusters of orange and scarlet flowers, shorter and broader than those of *Campsis radicans*. Its pretty foliage falls during the cold weather.

T. jasminoides (*Pandora jasminoides*), the Bower Plant, is a handsome evergreen climber with shiny, dark green foliage and wide open trumpet flowers, white or pink, with dark, pink and purple markings in the throat.

These *Tecomas* can be propagated by cutting or seeds.

Tecoma is from the Mexican name and *stans* means "erect".



YELLOW ELDER

RAILWAY CREEPER

IPOMEA PALMATA

Fam; Convolvaceae. Bhaura (Mar.); Railway Creeper, Porter's Joy, Morning Glory (Eng.)

ONE of the commonest yet most useful of the evergreen creepers, refreshing the eye in the hottest weather with its clear, green leaves and delicate, mauve blooms, the Railway Creeper is found in gardens, villages, and on practically every Railway Station, thus earning for itself its two nicknames. It is the easiest plant to propagate, grows quickly and produces its charming, ephemeral flowers every morning of the year. Ipomoeas are of the Convolvulus family, of which there are several hundreds, found in most tropical or sub-tropical countries. The flowers are either salver, bell or tunnel-shaped and usually brightly coloured, large and showy. Those of the Railway Creeper are salver-shaped about 6.3 cm. across and of a soft, mauve shade, enriched by a throat of bright purple. The calyx is a round, green cup borne on a short stalk. A characteristic of all Ipomoeas is revealed by a close examination of flower and bud. Most of the flower is soft and delicate but there are five long, narrow triangles from the centre to the edge which are smooth and strong and of a slightly different shade. The buds, which are long cones twisted to the right, are folded so that all the delicate parts are within, protected on the outside by these five firm triangles.

The leaves are small and deeply cleft into seven lobes of varying sizes. They rise on short stalks from the soft, round, green stems. These frequently end in tendrils which twin themselves very firmly around a branch they meet.

Morning glory is a name given to two varieties of ipomoea. One is *Laccuminata* Syn. known as Blue Dawn Flower, a native of tropical South America, whose large purple-blue flowers are more often seen in a cultivated state than wild. Trained over a screen it is a magnificent sight in the early mornings, rich green foliage studded with large purple discs. In shade their beauty lasts till afternoon but the heat of the sun quickly drains their bold colour; they fade to mauve, crumple and fall. The five firm divisions are crimson purple, the throat and corolla tube mauve; the calyx is a narrow tube dividing into five slim, pointed sepals.

The leaves vary considerably in size and shape; the largest are about 10 cm. long as much across, heart-shaped and either entire or three to five lobed. Smaller ones are more often deeply lobed but sometimes entire, narrow and pointed.

The other Morning Glory is *I. tricolor* an annual round growing wild in much the same localities as the Railway Creeper. The flowers are rather more blue than *Laccuminata* and slightly smaller and the throat and corolla tube are white; the five sepals are very short and pointed. The leaves are from 2.5 to 12.5 cm. long, heart-shaped and three lobed, borne on a long stalk. Leaves and stalks and round brown stems are all clothed in long, dense hairs. This and the short sepals serve to differentiate the two species. *I. tricolor* comes from Mexico and it is said that the Aztecs used the plant as hallucinogen in religious ceremonies. *I. hederacea* (*I. coerulia*), *I. purpurea* and *I. nil* are three other blue-flowered annuals which are rather difficult to separate. The first is a tropical American plant which tends to become weedy on waste places where it grows wild. Here it is often found in cultivation. The second is a native of India and tropical America and grows in wild spots in this country. In the west seeds are sold under the name of *Convolvulus major* but this name has no botanical standing. *I. nil*, with a 5 cm. corolla of violet, purple, rose or blue is related to *I. purpurea* and sometimes confused with *I. hederacea*.

The beautiful night-flowering Moonflower *I. alba*, *I. grandiflora* *I. bonanx*, Chandra Kanti in Malayalam, is of the same family. An exceedingly fast grower, its large black or white seeds can germinate in 24 hours. It is fascinating to watch the large, scented flowers unfold at sunset. Within ten minutes the long, twisted bud has opened into a glorious, white salver. By moonlight they have a mysterious, silvery charm.

The Sweet Potato (*I. batatas*), Madhura kizhengu in Malayalam and Ubtkeladt in Malay, often called "yam" but not the true yam, is another member of the family. It is an annual and more inclined to creep along the ground than climb. The flowers are in clusters of three or four, whitish outside the purple within. There are three varieties; one has red tubers, another white and the third yellow. The former is thought to be the best. In England they were considered a great delicacy long before the introduction of our common potato, and are both palatable and nutritious. It is grown for food all over the tropics.

I. carnea has large campanulate flowers - rose or pale pink in colour. It is a sturdy bush, or rather coarse woody climber, with large, smooth leaves. The Crimson Ipomoea (*I. horsfallioe*) is another of the family and is rapidly becoming more popular, in spite of the fact that it is often rather difficult to propagate. It makes a fine show covering a trellis, along a veranda or round the bare trunks of old trees. It is evergreen, but unlike those Ipomoeas which flower throughout the year, blooms for a couple of months only at the beginning of the year. Masses of round, green buds appear and from them protrude glossy, rose-crimson corollas, shining like polished metal. Daily these open into lovely, funnel-shaped flowers, each about 6.3 cm. in length. They have no perfume but make up for this lack by their brilliance and beauty. The leaves are palmately divided into five narrow lobes with undulated margins and very greatly in size. The crimson Ipomoea grows freely in the West Indies and is cultivated in many tropical areas. It's also popular as greenhouse plant.

Quamodit lobata (*Ipomoea lobata* or Mina Lobota) called the Cypress Vine and Cardinal Climber is a vigorous but not very extensive annual with three-lobed leaves and one-sided sprays of small, crimson flowers which fade to orange and then to pale yellow.



RAILWAY CREEPER



CRIMSON IPOMEA

GLORY LILY

GLORIOSA SUPERBA

Fam. Liliaceae. Cariari (Hind.); Bishnangul (Beng.); Coatijan, kannuvelli (Tam.); Mettonnt, matattamara (Mal.); Wag nakhi; (Mar.); Adivi-nabhi, kalappa-gadda, pottidumpa, ganjeri (Tel.); Karadikannina gedde (Can.); Niyanala (Sinh.); Glory Lily, Tiger's Claws Climbing Lily (Eng.)

WALKING and riding in some of our fine, open country is becoming increasingly popular and those who take particular pleasure in that shrubby, palm-studded country which, during the early part of the monsoon, becomes clothed in verdant green, cannot fail to have noticed the flaming colours of the Glory Lily twining among the bushes. Many have risked scratches and tears to pluck a few sprays. Placed in vases when they practically arrange themselves, their lasting charm and freshness well repays any trouble taken in the plucking.

It is a herbaceous climber, dying down during the dry season and the tubers remaining dormant until the following rains. Therefore, it is a fragile plant with soft, round, green stems. The bright, smooth leaves are variable in length and breadth, stalkless and often terminate in spiral tendrils which cling tenaciously to anything they touch. They grow singly or opposite, are lance-shaped, broadest in the middle and fold over at the base.

The flowers, conspicuous against the fresh green of monsoon growths, change colour as they open and present lovely variations of yellow, orange and crimson. They grow singly on long stems which bend over at the tip. As buds they are pendent ovals with prominent, rounded wings. On opening, the six long, frilly petals bend right back from the small keel lying in each channelled base. Green at the bottom they shade to pale yellow and become abruptly orange at the end, the centre rib and edges remaining yellow. The six protruding stamens - like yellow mallets - soon open out into spoke formation and the orange of the petals becomes vermilion. From the large, green ovary the pistil juts out sideways. Age changes the yellow to orange, then each petal becomes entirely crimson and stamens and petals lie alongside—altogether an unusual form of inflorescence.

Many fatal cases of poisoning among the poor have been reported, caused by the fleshy tubers of the Glory Lily having been mistaken for yams. On the other hand there are some writers who say it has not been proved to be a virulent poison, but it is generally agreed that, like many poisons, small doses are definitely tonic. Made into a paste, the roots are widely used among village women to promote labour.

In Guiana the juice of the leaves is used to destroy hair lice.

There are several species, differing in the size of the flower and the distribution of the yellows and reds. In the garden they are attractive grown in tubs or pots, trained over a wire, or bamboo 'balloon'. The rhizomes, or rooting tubers, are divided and planted one to an 20 cm. pot, or six to a large tub, in a light, rich soil.

The Glory Lily is a popular plant throughout tropical Africa, Asia and the hotter parts of America. Large greenhouses in the west usually manage to accommodate a plant, more often the large cultivar *G. rothschildiana*, called the Flame.

Both the words *Gloriosa* and *superba* mean "superb".



GLORY LILY

HEAVENLY BLUE

THUNBERGIA GRANDIFLORA

Fam. Acanthaceae Mulata (Hind.); Akar patut tuau (Malay). Blue Trumpet Vine, Clock Vine, Skyflower (Eng.)

THIS extensive and luxuriant climber is a native of Bengal, Assam and Chittagong, but is now found in gardens all over India and Malaysia and also in the tropical U.S.A. It can always be recognised by its dense, green curtain of foliage and large, lavender-blue flowers. There are two varieties; one has smooth leaves and flowers when of quite small size and the other has rough, hairy leaves and a more vigorous growth. It is the latter which is described here.

The flowering branches are long and pendent, the blooms being borne opposite-sometimes in pairs—every couple of inches. Up to five or six may be seen open along each branch. Each flower consists of a longish stem, a thick, green calyx heavily streaked with purple-red and a long, broad corolla. The calyx is contracted towards the base, pointed at the apex and nearly divides into two segments when the corolla emerges. This corolla is from 5 to 7.5 cm. long. The tube is whitish outside, more yellow within and contracts upwards in the middle before dilating into a bell-shape which opens into five round, spreading lobes. The base of each lobe, particularly the lower protruding one, is smudged with white. The rest is a lovely, pastel mauve. Before they wither the flowers fall leaving for a while the empty calices. The flowering period is principally from March until the end of the rains, but throughout the year odd flowers may be seen.

The leaves vary considerably in size, shape and colour. New ones are a bright, clear green after they have passed the pink-tinged baby age and are narrow ovals tapering to a long point. Old leaves are a deep, dark green and much broader, sometimes almost heart-shaped. The edge is either entire or develops two or three indefinite, pointed lobes. On 7.5 cm. stems, the leaves are opposite and fairly widely spaced along the stout branches. Sometimes, though, the leaf branches are long and slender and terminate in bracts.

There are white and blue varieties which have slightly larger flowers and leaves with more definite lobes. As a garden climber it is better kept under control by means of judicious pruning and can be trained over a trellis or other strong support.

I do not know whether Indians make any use of this plant beyond that of decoration, but in Malaya a decoction of the leaves is used in the cure of stomach complaints and also, from the leaves, effective poultices are made. *T. fragrans* and *T. alata* are two slender, herbaceous climbers suitable for growing over screens. The former has snow-white flowers, unscented in spite of its name, and similar in gardens of tropical Africa. The other, Named cultivars, with differences in flower colour, have been developed, the Black-eyed Susan has yellow or buff flower with a brown or purple centre.

T. erecta known as King's Mantle or Bush Clock Vine and also found in tropical Africa, is a small, upright shrub reaching about 120cm. which can be shaped by regular clipping. The leaves, as in the other *Thunbergias*, are in opposite pairs on short stalks, but they have wavy edges and sometimes a broad, triangular tooth or lobe at each side. It likes a sunny situation and blooms in the cold season when it is a charming sight studded with violet flowers, the rounded lobes spreading from cream and ochre tubes. There is also a white variety.

T. cocdnea (*Hexacenths cocdnea*) and *T. mysorensis* (*H. mysorensis*) are other good climbers capable of covering a large area. The first has sprays of yellow-throated, red flowers which hang on long, lax branches and the other bears orchid-like racemes of yellow, orange or purple flowers. Some of these *Thunbergias* can be propagated by seed and many of them by cuttings or layers.

The name *Thunbergia* commemorates the Swedish botanist Karl Thunberg, a student of Linnaeus who travelled in Japan and South Africa.



HEAVENLY BLUE

ALLAMANDA

ALLAMANDA CATHARTICA

Fam: Apocynaceae. Har-kakra (Beng.); Kaha munda (Sinh.); Akar chempaka kuning (Malay). Golden Trumpet (Eng.)

DR. Allamand of Leyden gave his name to this very showy plant which has now become one of the most popular of garden shrubs Cathartica means “purgative”. The deep green, shining, evergreen, foliage and waxy, yellow flowers are an attractive contrast and although it is generally considered to be without scent, a faint but rich smell of spices can sometimes be detected.

Originally from America, it has been planted so widely in India that it can now be found wild in many parts of the country.

It is a fairly large climber, upright, and climbing to a considerable height under suitable conditions. Trained over a screen it forms an admirable hedge or, pruned into a more compact formation in a tub, it makes a cheerful splash of colour on a veranda Its capacity for producing flowers throughout the year is another point in its favour even if there is a period when these are few in number, small and imperfect.

Young branches are round and smooth and green, often maroon on the upper side, but with age they turn to ashy brown and become slightly scaly. The leaves sometimes grow in pairs, sometimes in groups of fours. Narrow and pointed they have practically no stem and are a rich, glossy green above, much paler below and about 10 cm. in length. Being slightly folded and curved, their shining surfaces catch every light.

The flowers do not grow from the ends of the branches but from short-stemmed side shoots on which one or two buds may bloom at the same time. These buds in themselves have great charm; twisted to a long point they are a lovely blend of bronze and lime green. Each flower consists of a loose, calyx, smooth and slender, dividing into five red-tinged, green sepals, and a funnel shaped corolla. The corolla tube emerges as a slim cylinder, bellies out and opens into five broad petals, rounded at one side and sometimes having a short point at the other. Inside the throat is pencilled with deep orange veins. The whole flower is about 8.8 cm in diameter. There are varieties of this species with slight differences in size and throat markings of the flowers. Greenhouse cultivars AC grandiflora and A.C.hendersonii are improvements of the common Allamand A. neriifolia, which means “having leaves like the Oleander”, but is certainly not a description of this plant, is also evergreen and is a dwarf shrub with a tendency to climb. The flowers, which appear in the hot season, are slightly different to the preceding species in that the contracted base of the corolla tube is much shorter and the upper swollen part much longer. The colour is a deep yellow and the petals are streaked with orange. Gardemers in South America grow this species

A. violacea (A. purpurea) called the Purple Allamanda is an erect, sometimes scrambling shrub, distinct from the other species and varieties in the colour of its flower, which are violet, purple or purple-brown. All like a very sunny position and well-drained soil and should be literally fed with manure. A. cathartica and A. neriifolia can be propagated from cuttings but A. violacea does not strike easily and is best grafted on to a variety of A. cathartica.



ALLAMANDA

End of book