

ORNAMENTAL GARDEN PLANTS OF THE GUIANAS:

An Historical Perspective of Selected Garden
Plants from Guyana, Surinam and French Guiana



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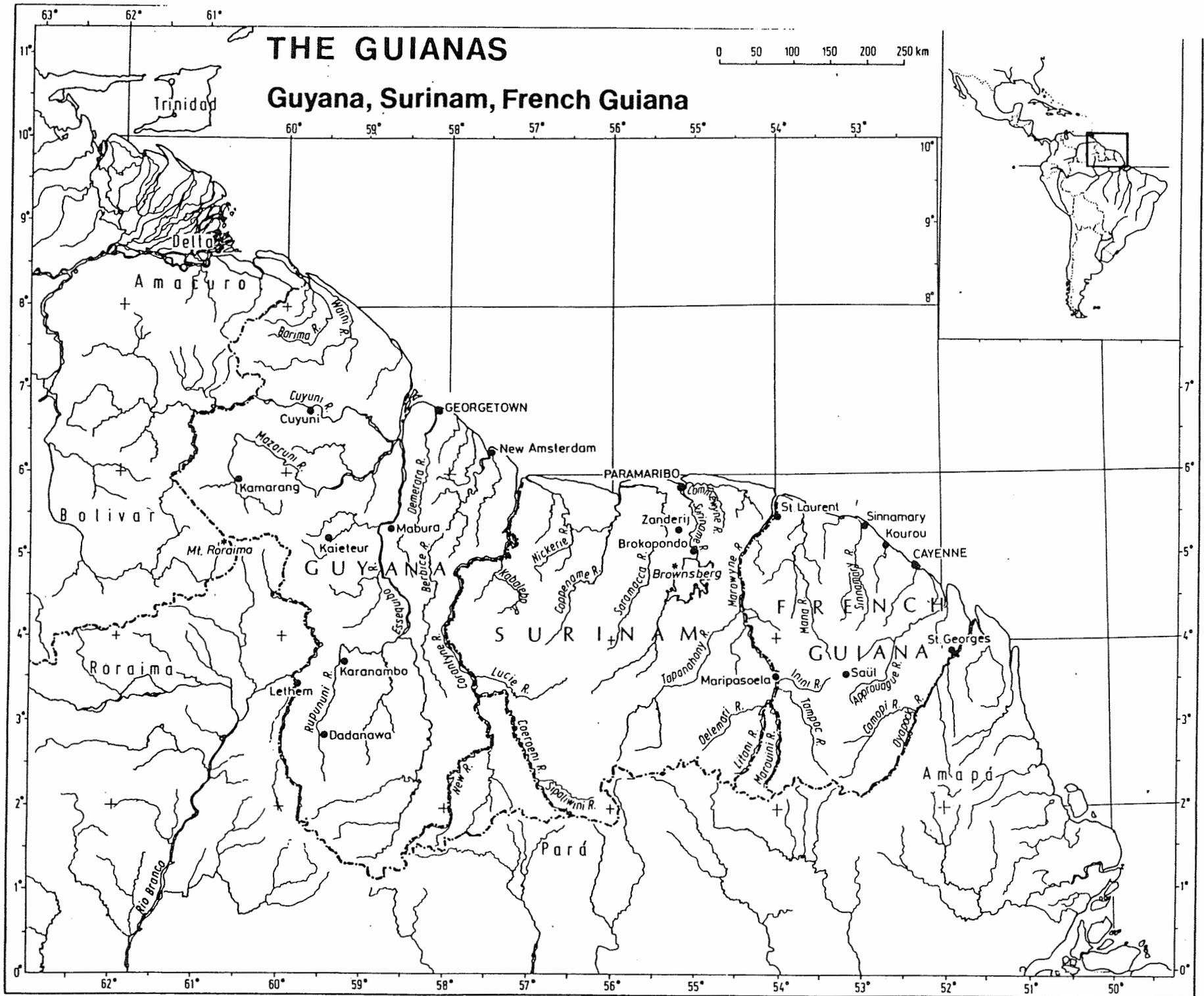
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ORNAMENTAL GARDEN PLANTS OF THE GUIANAS

Introduction

I. Historical Setting of the Guianan Plant Heritage

The Guianas are embedded high in the green shoulder of northern South America, an area once known as the "Wild Coast". They are the only non-Latin American countries in South America, and are situated just north of the Equator in a configuration with the Amazon River of Brazil to the south and the Orinoco River of Venezuela to the west. The three Guianas comprise, from west to east, the countries of Guyana (area: 83,000 square miles; capital: Georgetown), Surinam (area: 63,037 square miles; capital: Paramaribo) and French Guiana (area: 34,740 square miles; capital: Cayenne).

Perhaps the earliest physical contact between Europeans and the present-day Guianas occurred in 1500 when the Spanish navigator Vincente Yanez Pinzon, after discovering the Amazon River, sailed northwest and entered the Oyapock River, which is now the eastern boundary of French Guiana. As early as 1503 French colonists attempted to settle the island upon which Cayenne is built. Within the boundaries of today's Guianas, the land was originally occupied by Amerindians of Carib and Arawak language-families, and from the late 1500's onwards was almost interchangeably settled by Spanish, British, Dutch, and French traders, adventurers, agriculturists and colonists.

Gradually the land was sorted into areas controlled exclusively by either British, Dutch or French interests. The former British domains became independent on May 26, 1966 as the Cooperative Republic of Guyana, and the former Dutch domains became independent on November 25, 1975 as the Republic of Surinam. French Guiana became an Overseas Department of France in 1946 and is an integral part of France.

Most of the species of tropical ornamental plants utilized at present in the Guianas were introduced in historical eras, and under circumstances, which seem the distance of a universe away from the conditions that often obtain today. For a long time the New World itself was only a vague vision. The earliest European acquaintance with tropical vegetation was a result of Alexander the Great's invasion of northern India in 326 B.C., at which time the banyan tree (*Ficus bengalensis*) was first observed by the Western eyes of the conqueror's Greek forces (Stearn, 1976, 1988). Information about the wondrous banyan fig tree with its dangling aerial roots flowed back to Greece and was recorded by the classical Greek scholar Theophrastus. The impressive Indian vegetation was soon largely forgotten by Europe; indeed, the literature was later sometimes suppressed for being of pagan (non-Christian) origin.

h Desmond
1992.

The first travellers came to South America primarily in search of gold, spices, and new souls for the Church, for in the 16th century, the divine scheme of the universe was the redemption of sinners in a disobedient world prior to the second coming of Christ. Thus the



PLATE I. The city of Amsterdam receiving products of the four continents, including a gift from an allegorized American, during the Dutch Golden Age.

discoverers, after praying to the Madonna of the Navigators for protection, sailed to bring news of "The Redeemer" to the "misguided" peoples of America.

It required many years to acknowledge the existence of South America and fit it into the already established "triple-world" cosmography of Asia, Africa and Europe, an essentially Mediterranean-oriented concept of the globe. A four-part world was gradually accepted in the 16th century, comprising the four great land masses of Asia (formerly one-half the world), Europe (formerly one-quarter of the world), Africa (formerly perceived to be one-quarter of the world), and America as a fourth continent often signified by the River Plate (now Argentina).

As the existence of South America became recognized, the pace of scientific explorations and discoveries quickened, leading to works such as *Plantae Surinamenses* (1775) by Carl Linnaeus's Swedish pupil Jacob Alm (based on Surinam collections made by Carl Gustav Dalberg in 1754-1755 under a subvention from Gustav III, King of Sweden), and the *Histoire des plantes de la Guiane Francoise* by Fusee Aublet, published also in 1775. The Amerindians indigenous to the Guianas in the 1700's lived in uncontaminated ecological harmony with their forested surroundings and had a thorough knowledge of the uses of plants. In contrast, the first Europeans in the area often felt themselves imprisoned in an impenetrable and meaningless green blanket, as they eked out a living from the forest.

The perceived role of man in the forest was early studied and influenced by the famous French naturalist, Count George-Louis Leclerc de Buffon (1707-1788), who produced in 44 volumes the encyclopedic *Histoire Naturelle* (1707-1788). Buffon was the *intendant* (supervisor) of the Jardin du Roi in Paris from 1739-1788; during his tenure the South American expedition of C.-M. de la Condamine discovered a species of rubber, *Hevea guyanensis* in French Guiana. Buffon was deeply interested "in the changes which men had made in their natural environment, particularly the transformations which had accompanied the growth and expansion of civilization and the migration and dispersion of human beings and their domesticated plants and animals throughout the habitable parts of the earth" (Glacken, 1960).

In the days of Buffon (long before the "greenhouse effect" was understood), many believed that Nature is of divine origin and must be improved and arranged by Man, who is also of divine origin. This led to several erroneous theories, including the idea that humanity must aid nature by changing it through deforestation so that more of the sun's heat could warm the earth's surface, and compensate for the heat lost due to the cooling of the earth. Thus, Buffon's studies of the physical effects of man's intervention in the world environment led him to consider the climatic changes that occurred as a result of land-clearing, agriculture and drainage, as being in a beneficial context.

Buffon's viewpoint, as expressed by Glacken (1960), was that, for 3,000 years, "Flowers, fruits, grains, useful species of animals have been transported, propagated, and increased without number; useless species have been eliminated. Mining has advanced. Torrents have been restrained and the rivers directed and controlled. The sea has been conquered. Land has been restored and made fertile." He believed France would be much colder than it is, if its forests had not been cut. Unfortunately, for partial proof of this theory he chose to indicate "the deforestation, scarcely a century earlier, of a district around Cayenne (there



HORTI
MEDICI
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PLANTARUM
HISTORIA

Ex Epitaphia P. J. BLAEV Prostant apud A. van SOMEREN 169-
PLATE II. Potted pineapple (*Ananas*) and other plants, with attendant allegory of America as an Amerindian, at the Amsterdam Hortus Medicus, or botanical garden.

are many references to French Guiana throughout the *Histoire Naturelle*), which caused considerable differences in air temperature, even at night, between the cold, wet, dense forest into which the sun seldom penetrated and the clearings; rains even began later and stopped earlier in them (clearings) than in the forest" (Glacken, 1960).*

An article on forest conservation was published by Count Buffon in 1739, as he also believed that deforestation could be reconciled with conservation under certain locally mitigating circumstances. Essentially, he felt that "large areas inimical to man had to be cleared to make the earth habitable, but once societies were established on them, the forests were resources which had to be treated with care and foresight."

At the present time the need for environmental conservation in the Guianas has been addressed by numerous researchers including, for Guyana the work of Sullivan (1990) and Pearce (1990); for Surinam the work of Boxman et al. (1987) and Mittermeier et al. (1990); and for French Guiana the work of Clavel, Profizi and Sallee (1978), de Granville (1975), Sastre (1980) and Wencelius (1984). The judicious exploitation of indigenous ornamental plant resources through careful inventorying of species and habitats in the Guianas will hopefully assist the economic development of the area.

As the Europe of earlier times became intrigued by the human inhabitants of the New World, the Amerindians were gradually incorporated to an extent into European culture. The famous natural historian Alexander von Humboldt, for example, noted in the early 1800's that "when we speak in Europe of a native of Guiana, we figure to ourselves a man whose head and waist are decorated with the fine feathers of the macaw, the toucan and the hummingbird. Our painters and sculptors have long since regarded these ornaments as the characteristic marks of an American" (Honour, 1975).

Inevitably, New World plants were destined to play a much more important role in European life than would American tribal peoples and wildlife. Useful plants of New World origin sent to Europe from 1493 onwards include maize (Indian corn), tobacco, sweet potatoes, white potatoes, tomatoes, vanilla, cotton, chocolate, red peppers and pineapples. Other plants, such as annatto, performed different functions.

The annatto plant, *Bixa orellana*, which is now sometimes grown as an ornamental in the Guianas, produces a seed from which a food-coloring paste is made. Formerly the plant was intensively cultivated on plantations in French Guiana as a source of red fabric dye from the seeds. In the year 1752, for example, exports of *Bixa* from French Guiana amounted to 260, 541 pounds, which outweighed the colony's combined production that year of sugar, cotton, coffee, cacao and timber. All of that produce was the result of labor from 90 French families, 125 Amerindian slaves and 1,500 black slaves (Rodway, 1912). In 1772, a half-Scots soldier in Surinam, Captain John Stedman, encountered a liberally *Bixa*-painted Indian from Cayenne, and asked him why he was painted red. The Indian replied, in French, that he painted himself red because the substance keeps his skin soft, prevents excess perspiration, is a good mosquito repellent, and it is a beautiful color. He then asked Stedman why he was painted white! Apparently Stedman was following the current European fashion of powdering one's hair with flour, which had sifted down onto his shoulders (Van Lier, 1972; see also Collis, 1965 and Price & Price, 1990).

* A similar theory pertained regarding the St. Lawrence Valley in North America (also with French settlements): "The theory was that the forests held the cold; once the land was cleared and brought into cultivation, the climate would then become like that of France." (Dickason, 1984).



PLATE III. Allegory of America as an Amerindian presenting the gift of the pineapple (*Ananas*) to Europe.

True to the spirit of the famous Netherlands Golden Age of seaborne mercantilism, trading and investment (Koningsberger, 1967; Schama, 1987), Surinam itself was administered as a business enterprise; in the year 1684 the society of shareholders, each owning one-third of the Surinam trade, consisted of the Dutch West India Company; the City of Amsterdam; and the private possession of the family Van Aerssen van Sommelsdijk (Heniger, 1987). A number of the Society of Surinam directors were also directors of the Dutch East India Company, and commissioners of the Amsterdam Hortus Medicus, or botanical garden.

Consequently a strong interrelationship of plant exchanges developed between Surinam, the Dutch East Indies, and the Amsterdam garden (Wijnands, 1987; Stearn, 1988A). Cornelius van Sommelsdijk, the Governor of Surinam residing in Paramaribo, received from the Amsterdam garden various plants such as mulberry trees, peach trees, pomegranates and rhubarb, to be propagated on the plantations. In return, Surinam ornamental plants soon arrived in Holland, such as *Canna indica* in 1687 and the tree-cactus *Cereus hexagonus* in 1689. The introduction of Surinam plants to the Netherlands has been accorded extensive study by Brinkman (1980).

The wild *Caladium bicolor* (Araceae) was sent from Surinam to the Amsterdam botanical garden in 1704; at least 1,500 cultivars (cultivated varieties) of this decorative plant have subsequently been developed. In Surinam, coffee was first planted in 1711 and exported in 1721; cacao was first planted in 1700 and first exported to Holland in 1706; and cotton was first cultivated on a large scale in 1763 (Van Lier, 1972). A ship's captain introduced pineapple plants (*Ananas comosus*) from Surinam to the Amsterdam and Leiden botanical gardens in 1680, and mass plantings under glass began on Netherlands estates in 1700 (Wijnands, 1983). Pineapples are today occasionally grown for ornament in the Guianas, and a beautiful rendering of the plant is found in the 1705 book by Maria Sibylla Merian, a famous Dutch artist who traveled to Surinam to study tropical insects. Her sumptuous volume is entitled *Metamorphosis Insectorum Surinamensium*; several of the plates have been designated as "type" for Surinam species, e.g. *Hippeastrum puniceum* and *Manihot esculenta* (Anonymous, 1962; Engle, 1988; Stearn, 1982; Welebit, 1988); Valiant (1992).

Certain pineapple plants which differed from the ordinary by having leaves with a desirable smooth (not spiny) margin were sent from Cayenne, French Guiana to France in 1820 and grown at Versailles. This Smooth Cayenne cultivar later became the basis of the formidable Hawaiian pineapple industry, for in 1886 Captain John Kidwell planted 1,000 crowns of Smooth Cayenne in Hawaii to establish large-scale cultivation of the fruit.

The first plant collector in French Guiana was Pierre Barrere (1690-1755) who as early as the years 1722-1725 botanized along the coastal area in his capacity as "medecin-botaniste du roi" in Cayenne (Vermuelen, 1985). He was later followed by J.B.C.F. Aublet (1720-1778) who collected plants from 1762-1764 as "apothecaire-botaniste du roi" in Cayenne (Bernardi, 1976; Howard, 1983; Zarucchi, 1984; Plotkin, Boom & Allison, 1991). Empress Josephine of France, wife of Napoleon Bonaparte, assembled a large collection of plants from around the world in her garden at Malmaison, a chateau about seven miles west of Paris (David, 1966; Lamb, 1991; Mauguin, 1933). Plants were sent to her from French Guiana by Joseph Martin, director of a national spice plantation at La Gabrielle, 20 km. south of Cayenne. During the Napoleonic Wars in 1803, two British privateers

(Ly-Tio-Fane, 1991).

Further explorations were carried out by Jean-Baptiste Patris, another "medecin-botaniste" from 1764-1786 (Chaia 1970).

PLATE IV. Drawing of banana (*Musa*) inflorescence and fruits from Surinam, by Maria Sibylla Merian.



captured a French ship laden with 140 tubs of living plants which had been gathered during six years of work in French Guiana by Mr. Martin.

Martin was aboard the ship, and the plants were intended for Josephine's garden and the Paris Natural History Museum. In England, even the influence of Sir Joseph Banks, who wanted to send the plants forward to Josephine, was not successful and three barges dragged the plants up the Thames River, to be planted at the Royal Botanic Gardens, Kew. The plants did not survive and the unfortunate prisoner Mr. Martin was repatriated to France, never to see the fruits of his labor again (Stearn & Williams, 1957). He is commemorated by the plant named *Bignonia martini* A.P. DeCandolle (Bignoniaceae).

In the Indian Ocean, the French *King's Garden* on Mauritius provided Cayenne with seedlings of two precious spices, clove and nutmeg, in hopes of breaking the Dutch monopoly of the spice trade in the late 1770's (Duval, 1982; Ly-Tio-Fane, 1982). As noted by Howard (1953), "with seeds or plants, new plantations could be established in other areas of the world and new supplies of spices obtained for the markets of Europe." In 1791, French Guiana supplied nutmeg plants to the St. Vincent Botanic Garden in the West Indies, and it is believed that all the nutmegs so important in the economy of St. Vincent, and Trinidad, are progeny of those originally introduced from French Guiana (Howard, 1954).

One of the first British adventurers to exert influence in the Guianas was Sir Walter Raleigh, Captain of the Guard to Queen Elizabeth I. Led on by samples of marcasite of dubious origin, he went searching for the site of lost gold mines said to be in a fabled new empire, which supposedly had furnished the golden walls of the Peruvian Inca's Palace of the Sun. The mines were thought to be at the golden city of Manoa, called by the Spanish "El Dorado", beside a certain Lake Parima (Lacey, 1973). Raleigh twice visited the Orinoco River region of the then Spanish Guiana (now Venezuela), in 1595 and 1617 (Lacey, 1973; Rowse, 1962; Waldman, 1950; Winton, 1975). On the 1617 trip he traveled under the auspices of King James I, a monarch who was 700,000 pounds sterling in debt and had been promised the gold mines in return for supporting Raleigh, and after he reached the Oyapock River (French Guiana) he went ashore at Cayenne for a feast of roasted mullet and armadillo.

Today, it is realized (Hills, 1961) that the legendary Lake Parima sought by Raleigh is Lake Amuku, a "wet weather lake" in the northern savannas, north of the Kanuku Mountains in Guyana; it is caused by annual inundation of the Rupununi savannas by the adjacent rivers, and thus a "disappearing" lake which exists only at intervals. Raleigh was often cited as the first person to record in European literature (in 1595) the existence of curare, a paralytic, plant-derived poison used in fishing and hunting by the Amerindians. The distinction of the first mention of curare in European writings is now accorded to Pieter Martyr d'Anglera around the year 1500 (McIntyre, 1947; Thomas, 1963). Curare is of two kinds, based either on *Strychnos* (Loganiaceae) or on Menispermaceae (Krukoff & Moldenke, 1938; Schultes & Raffauf, 1990). The kind known as tube-curare is prepared from several genera (e.g. *Chondodendron*) of the moonseed family (Menispermaceae); purified extracts of the dextrorotatory form of tubocurarine, a chemical from the bark and leaves, is used in modern medicine for a muscle relaxant for shock treatment of mental illness, and as an adjunct to anaesthesia in heart surgery.

curare causes death by asphyxiation (numbing/losing control) of muscles essential in respiration



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|--|------------------------------------|--------------------------------|
| 1. Palmier maripa. | 4. Grappe du régime de comon | 7. Racine du Palmier zambécle. |
| 2. Racine de maripa, et Fruit détaché. | 5. Grappe du régime d'aveira. | 8. Cœur de zambécle. |
| 3. Fruit de comon. | 6. Fruit du Palmier bache détaché. | 9. Cœur de zambécle. |

PLATE V. Plants of French Guiana depicted by the botanist Aublet in 1775.

The paralyzing effects of the curare samples obtained in Kern in 1742 by the French scientist and explorer C.-M. de la Condamine (1701-1774)

Using Surinam plants, Johann C.D. von Schreber in 1783 was the first person to describe precisely which plant species enter into the composition of curare; later, Richard and Robert Schomburgk identified certain plant components of the curare prepared by the Macusi people of Guyana. Ironically, it was not until the explorations of the Schomburgk brothers in the 1830's that the legendary city of Manoa so diligently sought by Raleigh was finally proved to be non-existent.

Queen Victoria (1819-1901), who reigned from 1837-1901, gave her name to the Victorian Age, a period when unprecedented discoveries and explorations were taking place all over the British Empire. A famous plant named for her is the extremely decorative royal water lily (*Victoria amazonica*), which was rediscovered on the Berbice River in Guyana in 1837 by Robert Schomburgk, explorer for the Royal Geographical Society. He considered the plant to be "the most beautiful specimen of Flora of the Western Hemisphere." In 1848 seeds were sent to Kew from Demerara, Guyana, and once successfully germinated the seedlings were distributed to other gardens. Soon afterward, special conservatories ("Vic-Houses") intended solely to supply the space requirements of the gigantic leaves of the *Victoria* were being constructed all over Europe: at Leiden, Kew, Exeter, Sheffield, Syon House (England), Brussels, Bonn and Berlin (Hix, 1974).

During the late Victorian era, Guyana became richly populated with exotic plants from across the earth. Reports of the Botanic Gardens, Georgetown indicate that in a relatively short period of five years in the 1880's (exemplified by Jenman, 1888), ornamental plant interchanges took place involving Georgetown and the botanic gardens in Trinidad; India (Calcutta, Saharunpur, Bangalore, Ootacamund, Seebpore); England (Kew, Cambridge); Jamaica; Ceylon; Singapore; Mauritius; Australia (Brisbane, Melbourne); Dominica; and Java. In present times it has become feasible to receive plants from Cuba in Georgetown.

While plants from around the world are quite prominent in the Guianas, there are numerous indigenous plants which deserve attempts at a wider dissemination for outdoor tropical landscaping, such as many orchids, *Phenakospermum guyanense* and *Brocchinia micrantha*. The horticultural potential of the Mount Roraima area of Guyana has been discussed by Mr. Alan Toogood (1983) in an article entitled "Plant Trek to the Lost World"; populations of wild *Vriesea splendens* growing there seem to have more visual appeal in their bronze leaf-bands than do the selected forms now in cultivation.

Much effort has recently been devoted to the selection, hybridization and commercial production of local *Heliconia* species, a promising addition to the cut-flower trade in the Guianas. Hopefully we are on the cusp of a new era of interest in the ornamental, as well as medicinal and other useful, plants of the region.

II. Background to the Present Work

In general, when botanists consider the origin of the vegetation and plant communities (floristic composition) of an area, they do so in terms of reference to factors such as: continental drift and the direction of plant migration routes; geological factors, including the orogenic elevation of mountains, and soil types; climatic and biogeographical patterns; and concepts of refugia, endemism, successional changes, evolution and extinction. For an application of these scientific concepts to the indigenous forest flora of the Guianas, see de

were first discovered by him in Surinam, French Guiana, and later in Leiden, Holland (Eaton, 1963).



PLATE VI. The Ewaipanema, a tribe of headless giants said to reside in the area of El Dorado, sought by Sir Walter Raleigh in the Guianas. The Ewaipanema are mentioned in two Shakespeare plays, Othello and The Tempest.

Granville (1988), Lindeman & Mori (1989), and Schnell (1965). The serenity of a Surinam rain forest is depicted in Barnett (1954).

However, the background of ornamental plants as a class of study, is of a different nature: "human nature"! Ornamental plants are dispersed, in contrast to natural means, by way of gardeners with a contagious enthusiasm for growing things and distributing them; by plant collectors, hobbyists and economic botanists; by botanic gardens whose mandated purpose is often to introduce new plants to cultivation and to improve wild species for enhancement of the public life; and by landscapers, land developers and town planners.

Many ornamental plants are actually multiple-purpose plants which can be employed in several ways at once, without invoking the statement by the Puritan divine and clergyman Cotton Mather (1663-1728), who entreated: "That which is not useful is vicious." In addition to being decorative, which signifies the appeal of a plant to one's sense of taste and beauty, some ornamentals are also variously used for food (fruit, storage roots, stems, leaves); fiber, oils, shade providers, medicines and drugs (herbal preparations), fencing material or as living fences, timber, veneer wood, and fuelwood or firewood. The coconut palm (*Cocos nucifera*) is but one good example of a multiple-use ornamental plant of the Guianas.

In the old days, some ornamentals in Georgetown, Guyana were utilized in still other ways: fire and disease prevention. The trees lining the streets and avenues in decorative fashion were useful in preventing fire from spreading from one house to another. Unlike some trees of northern climates, certain tropical broadleaf trees do not ignite unless the heat first dries them thoroughly and completely. As for disease prevention, the planted trees were important agents in draining pools of stagnant water with their roots; stagnant water was the breeding place for mosquitoes transmitting yellow fever, malaria and elephantiasis.

In the Guianas are myriads of plants indigenous to the tropical zones of Central and South America, the West Indies, Africa, Asia, Australia and the Pacific Islands. They are favored survivors over many introduced species which the dictates of fashion allowed to eventually sink into obscurity. Biologically, the ornamental trees may be climatically adapted to a seasonality whereby in dry seasons the leaves are dropped and flowers produced; others may appear to be continually evergreen (Bernhardt, 1987; Kingdon-Ward, 1956; Lewis, 1989). This phenomenon is due to their evolutionary adaptation in a particular region, often foreign, where the climatic combination of temperature, rainfall and humidity may be either somewhat different than, or the same as, in the Guianas. The answer (at least partial) to the seeming compatibility or incompatibility of introduced plants in a new region may be sought in the study of homologous habitats or environments in different regions of the world, as demonstrated by the writings of V.M. Meher-Homji (1964, 1964A, 1965, 1971, 1971A; cf. also Bharucha & Meher-Homji, 1965, and Uichanco, 1969).

+ homologous agricultural crop zones. 75% of the world's population

The data presented in this publication are a combination of observations made during three trips from Washington, D.C. to the Guianas in 1985 (Guyana and French Guiana), 1989 (Surinam) and 1990 (Surinam), plus information generously donated by botanical colleagues in the Guianas and elsewhere, who provided lists of plants grown in their countries. The standard botanical literature consulted for this study is cited in the *Basic Bibliography* which follows the *Literature Cited* after this Introduction.



PLATE VII. Display of exotic tropical plants in the Palm House at the Royal Botanic Gardens, Kew, England c. 1850 during the Victorian Age.

There are notable places to observe ornamental plants in each of the Guianas. Not the least are well-planted hotels (as the Hotel Tower, Georgetown; Hotel Montabo, Cayenne; Torarica Hotel, Paramaribo), which encapsulate the pride of a nation's devotion to horticulture. Prominent civic or governmental plantings offer rich rewards, and the major ones in our area of interest include: the Botanic Gardens and the Promenade Gardens in Georgetown, Guyana; the Palmentuin and the sierplanten (ornamental plants) area of the Cultuurtuin (Cultural Garden) in Paramaribo, Surinam; and the Jardin Botanique Municipal and the Place des Palmistes in Cayenne, French Guiana. University grounds, plant shops, parks, commercial growers, the gardens and lawns of the people, and roadside and avenue tree plantings, all provide fruitful discoveries.

In the text, the keys and genus and species descriptions are intended to represent characteristics of the plants as found in the Guianas, rather than to account for the worldwide range of variation in a taxon, although the latter is often *de facto* included. For the range, or geographical distribution, the natural range is indicated first and followed by a period (full stop); then examples of the range of the plant as an ornamental in the Guianas are stated.

The delimitation of families and the genera they contain is based largely upon Arthur Cronquist, *Integrated System of Classification of Flowering Plants* (1981), which allows, for example, the placement of leguminous plants into three families (Caesalpinaceae, Fabaceae, Mimosaceae) instead of the traditional single family Leguminosae, and recognition of several small families such as Cecropiaceae (*Cecropia* formerly placed in Moraceae or Urticaceae) and Hydrangeaceae (*Hydrangea* formerly placed in Saxifragaceae), as well as a realignment of some petaloid monocot genera comprising Agavaceae, Amaryllidaceae and Liliaceae.

Coverage aims to include most of the frequently encountered ornamentals, but does not claim to be absolutely exhaustive, the latter an unachievable expectation even for treatments of the more elusive spontaneous Guianan flora. There are always numerous new accessions of plants arriving at local botanic gardens, as well as a continual expansion of specialist hobby collections such as orchids. In this connection it has been noted by Dr. Marga Werkhoven, Curator of the National Herbarium in Paramaribo (pers. comm., 6 November 1990), that: "There are several horticulturists in Suriname: Sjak Shie, Gonesz, Tewari, Sarinah (all professional or semi-professional orchid growers), Zaandam, Prakwaki, Elias, Rampersad, and Nanhoe (ornamental garden and pot plants), Zondervan (roses)." For historical interest the past cultivation record of some notable species is given, but plants formerly grown and now discontinued have not as a rule been included.

Of nomenclatural interest in this publication are yellow flower-color forms newly proposed in the caesalpinoid legume (Caesalpinaceae) genera *Caesalpinia* and *Delonix*.

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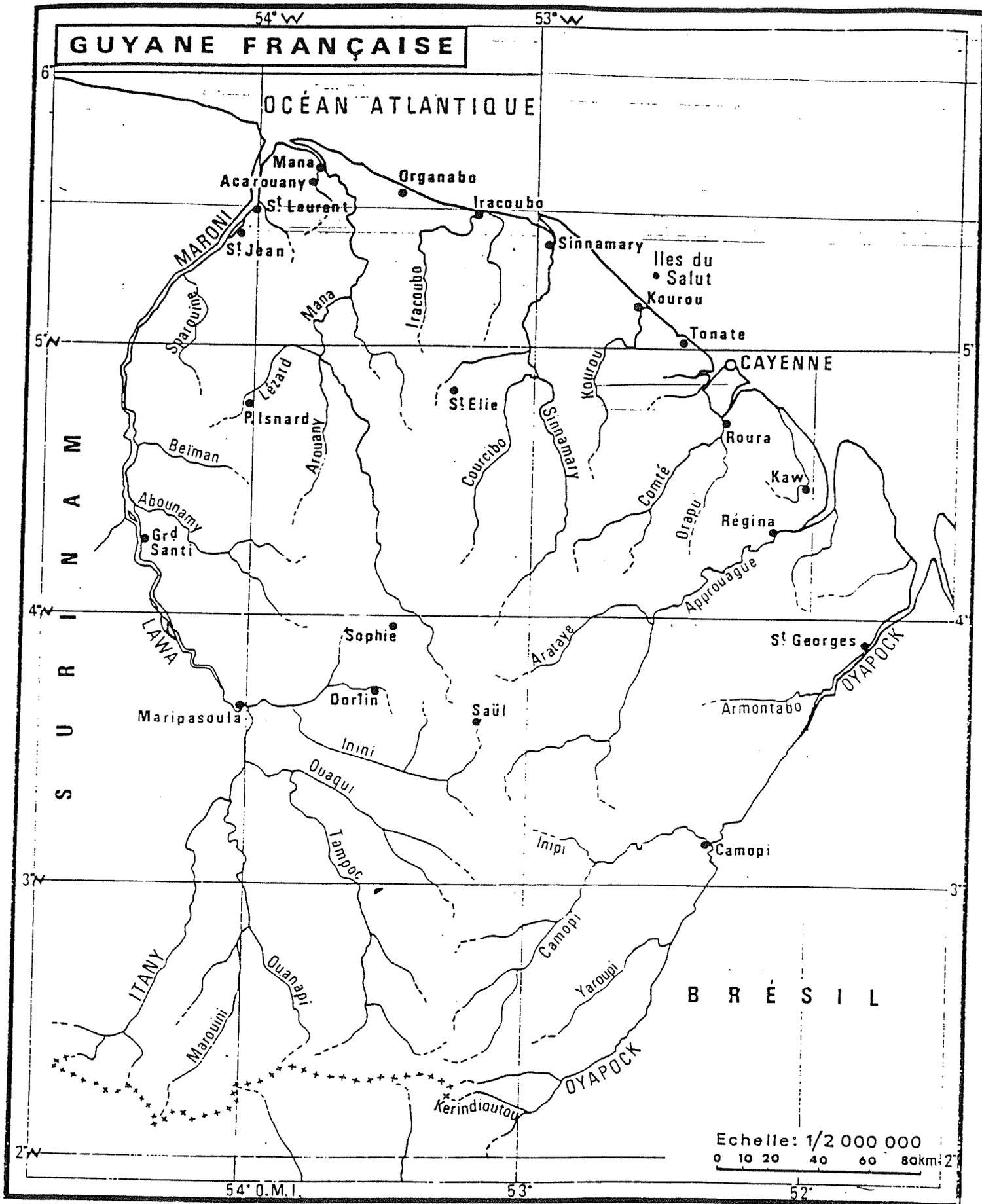
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carte O.A.S.T.O.N.

GYMNOSPERMS

Araucariaceae

Monoecious or dioecious, evergreen coniferous trees of columnar to pyramidal shape. Branches symmetrically whorled. Leaves opposite or spirally arranged, sessile, evenly distributed or crowded on the branches, broadly ovate, scale-like or needle- (awl-) like. Male cones consisting of solitary or fasciculate catkins. Female cones large, terminal on short shoots, more or less globose; seed one per cone-scale, large, winged or unwinged.

1. *Araucaria* Jussieu

Characteristics of the family Araucariaceae, with the leaves spirally arranged and crowded on the branches, ovate-lanceolate to needle-like and scale-like.

Key to Species

1. Mature crown of tree dome-shaped; leaves all of one kind; seed not winged
1. *A. araucana*
1. Mature crown of tree pyramidal; leaves dimorphic (the juvenile needle-like, the adult scale-like)
2. *A. heterophylla*

1. *Araucaria araucana* (Molina) K. Koch, *Dendrologie* 2(2): 206 (1873). MONKEY PUZZLE TREE. Dioecious, dome-crowned tree to 15 (-40) m, with symmetrically (4-) 5 (-8)-whorled, horizontally spreading branching pattern. Leaves decurrent, all of one kind, ovate-lanceolate, with spinose apex, 2.5-5 cm. Male cones cylindrical, to 12 cm. Female cones erect, ovoid to spherical, to 13 x 5 cm, with long-acuminate cone-scales. Seed oblongoid, not winged, to 4 cm.

Range: Chile, Argentina. Grown as an ornamental on Torarica hotel grounds in Paramaribo, Surinam.

2. *Araucaria heterophylla* (Salisbury) Franco, *Anais Instituto Superior de Agronomia* (Lisbon) 19: 11 (1952). NORFOLK ISLAND PINE. Dioecious, pyramidal tree to 24 (-60) x 2.1 m, with symmetrically 4- to 7-whorled, horizontally spreading branching pattern. Leaves crowded, decurrent, dimorphic, the juvenile leaves needle- or awl-like and 6-13 mm, the adult leaves scale-like, ovate, c.7 mm; leaves deciduous with the twigs. Male cones oblongoid, to 5 cm. Female cones erect, subglobose, to 12.5 x 15 cm, with acuminate cone-scales. Seed oblongoid, winged, to c.3.2 cm.

Range: Norfolk Island (Pacific Ocean). Occasionally grown as a decorative accent plant in gardens of the Georgetown area, Guyana; on Torarica hotel grounds and in roadside gardens in Paramaribo and environs (e.g. along Camelanstraat), Surinam; and in Cayenne, French Guiana.

Literature: Cherry, E.C. 1968. Norfolk Island pine. *Garden Journal* 18(6): 188-189.

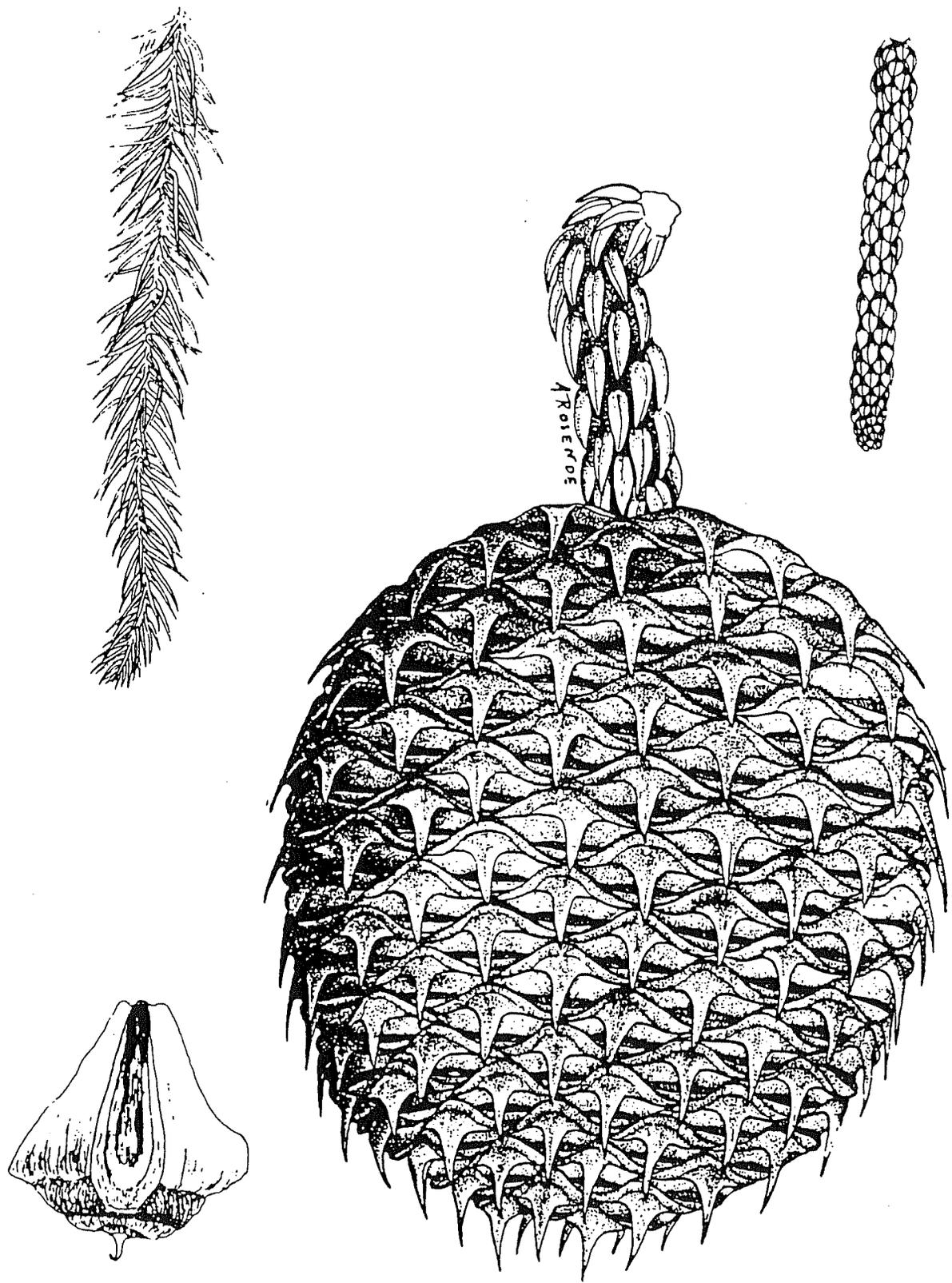


Fig. 1. *Araucaria heterophylla* (Araucariaceae).

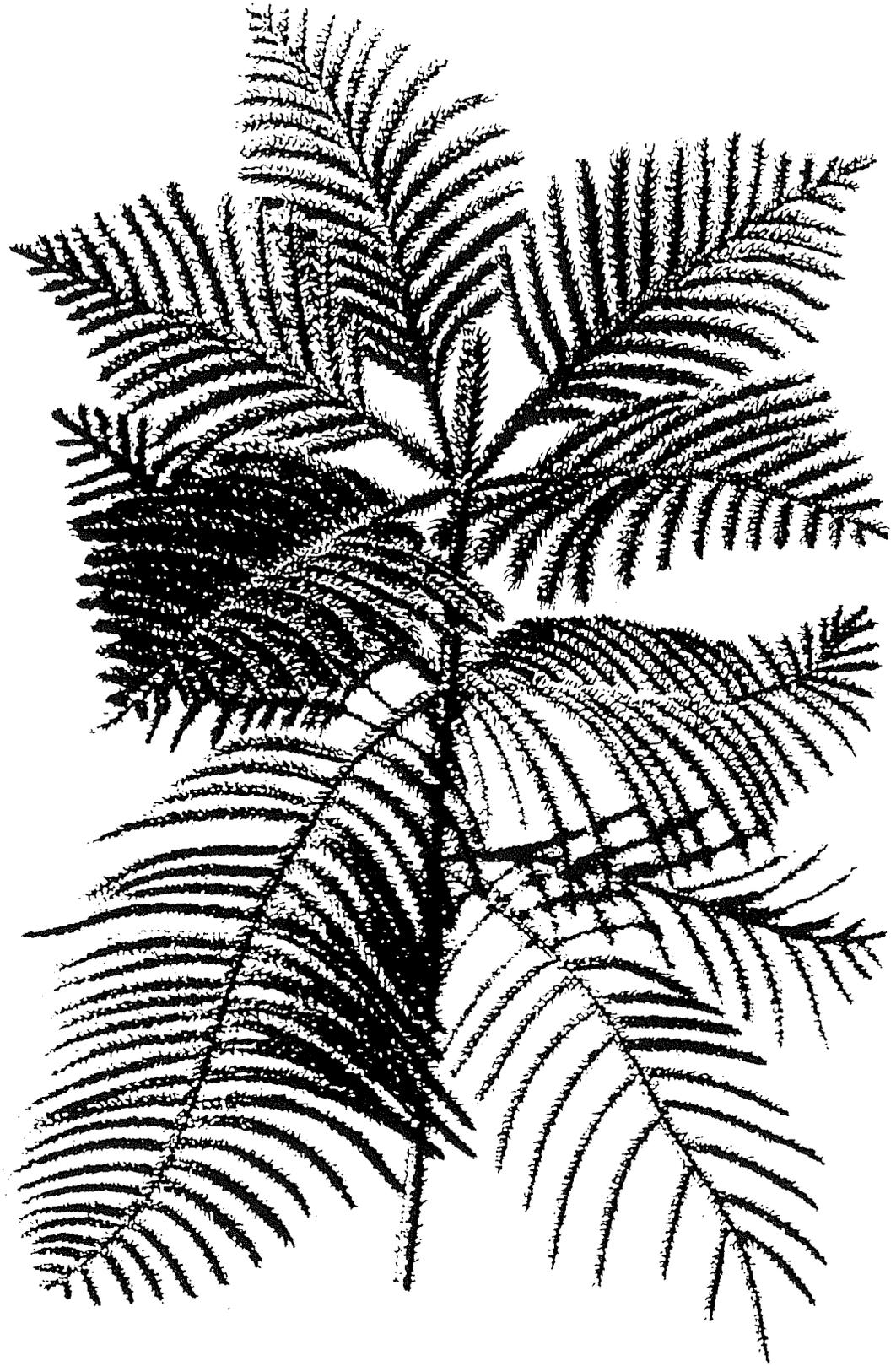


Fig. 2. *Araucaria heterophylla* (Araucariaceae).

Cupressaceae

Monoecious or dioecious, coniferous, usually evergreen trees or shrubs; sap resinous. Trunk branched. Leaves 4-ranked in opposite pairs or verticillate in whorls of 3, usually needle-like on juvenile branches and scale-like on adult branches. Male cones in leaf-axils or terminal at tips of branches. Female cones terminal or on short branches, with opposite, paired scales, dry, leathery or fleshy and berry-like; ovules 1-20 per scale. Seeds unwinged or 2- to 3-winged.

Key to Genera

1. Juvenile (needle-like) leaves 4-ranked in opposite pairs; fruiting cones dry, woody, hard
1. *Cupressus*
1. Juvenile (needle-like) leaves usually verticillate in whorls of 3; fruiting cones fleshy, berry-like
2. *Juniperus*

1. *Cupressus* Linnaeus

Monoecious, evergreen, coniferous, often pyramidal trees. Branches radiating, flattened; sap resinous. Leaves 4-ranked in opposite pairs (decussate), appressed, dimorphic, those of young plants linear or awl-shaped, those of adult plants scale-like. Cones terminal on the branches, solitary; male cones small; female cones shortly stipitate, the scales woody, peltate, persistent, variably umbonate. Seeds 6-20 per fertile scale, with narrow wing.

1. *Cupressus sempervirens* Linnaeus, *Species Plantarum* 1002 (1753). MEDITERRANEAN CYPRESS. Erect tree to 55 x 3 m, often smaller, sometimes strictly columnar; branches ascending to horizontally spreading; branchlets forming a spray in one plane. Adult leaves scale-like, obtuse, appressed, 4-ranked, 0.5-1.0 mm, with glandular dot on the back. Female cones ellipsoid-oblong, 4.0 x 3.5 cm, of 8-14 scales each bearing 8-20 seeds.

Range: Aegean Sea region (Greece, Crete); Southwest Asia. Grown as an ornamental in Paramaribo, Surinam (Ostendorf, 1962).

An undetermined species of *Cupressus* is grown for ornament in French Guiana (de Granville, 1985A).

2. *Juniperus* Linnaeus

Dioecious (usually) or monoecious, evergreen, coniferous trees or shrubs. Branches radiating. Leaves monomorphic and needle-like or dimorphic; when dimorphic those of adult foliage on older branches in opposite pairs, usually appressed, overlapping, and scale-like, those of juvenile foliage opposite or in whorls of 3 (ternate), needle-like. Male cones catkin-like; female cones maturing as a berry-like structure comprising 3-8 coalesced, fleshy scales. Seeds 1-12 per fertile scale, not winged.

1. *Juniperus chinensis* Linnaeus, *Mantissa Plantarum* 1: 127 (1767). CHINESE

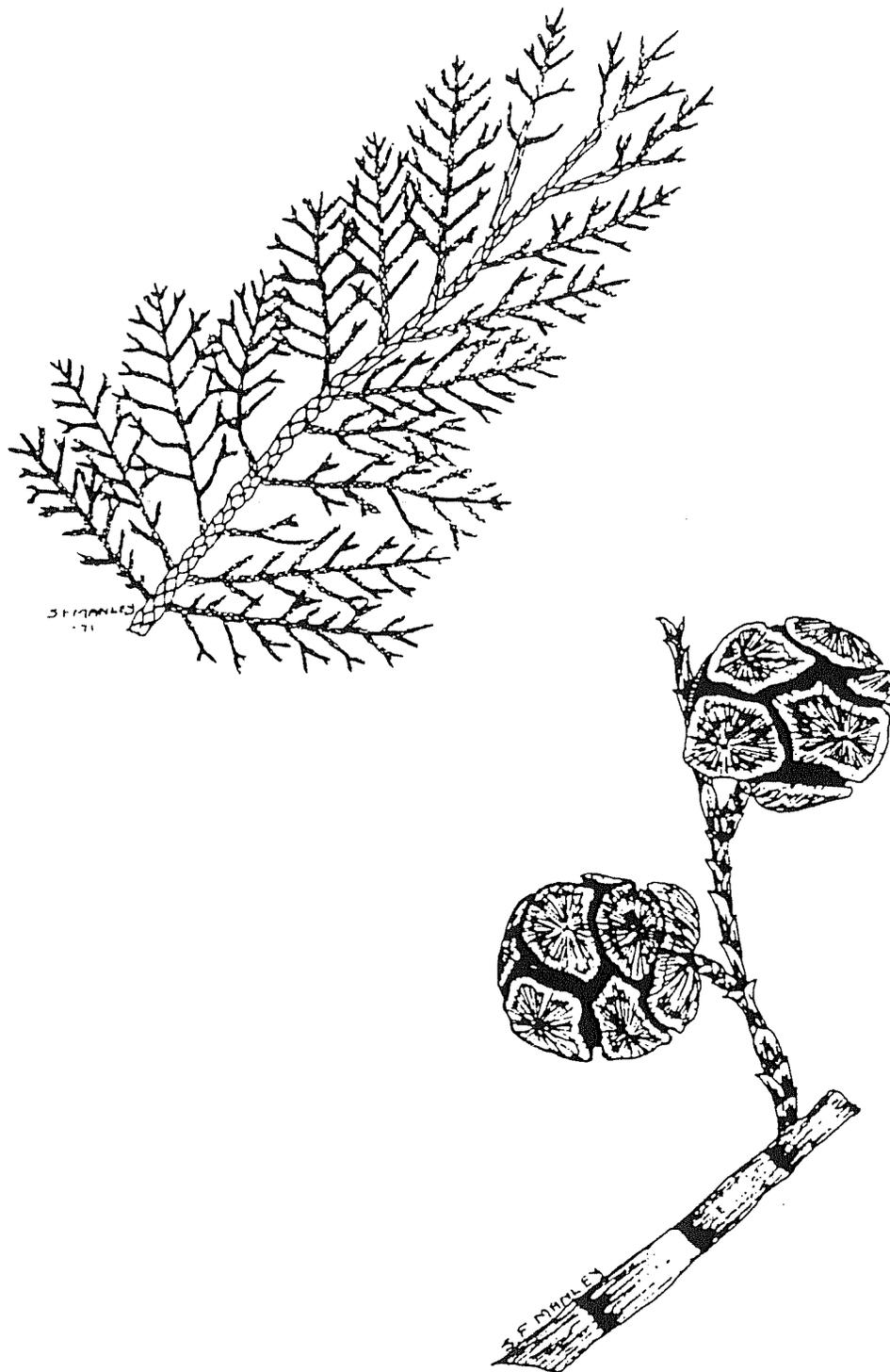


Fig. 3. *Cupressus sempervirens* (Cupressaceae).

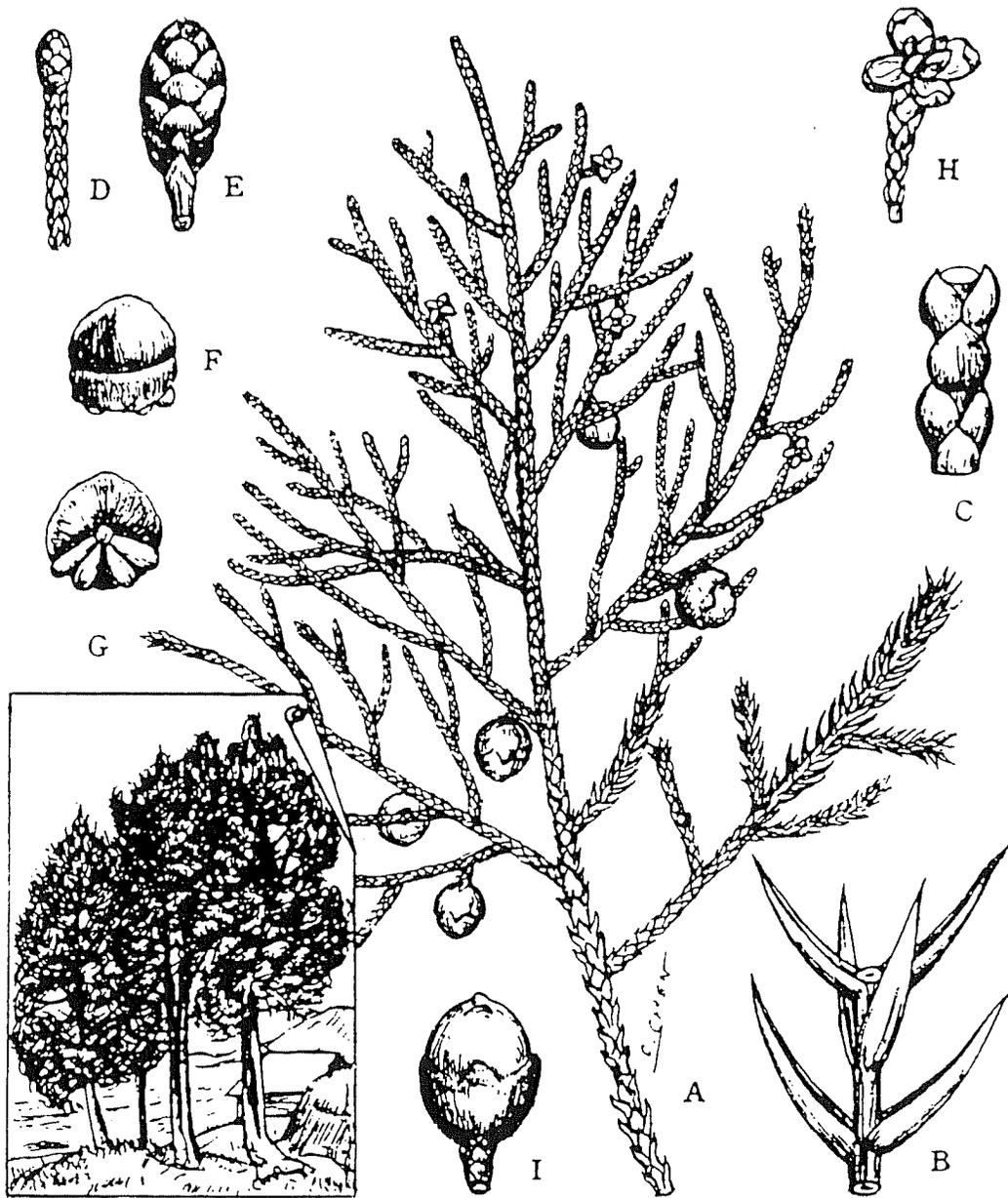


Fig. 4. *Juniperus chinensis* (Cupressaceae).

JUNIPER. Dioecious, conical or pyramidal trees to 20 m, or much smaller, mounded shrubs; branches short. Leaves dimorphic; juvenile leaves needle-like, mostly in whorls of 3 (ternate), spreading, 5-12 mm; adult leaves in opposite pairs, scale-like, appressed, c.1.5 mm, with glandular dot on the back. Female cones (berries) dark purple or blue, glaucous, 2- to 5-seeded, subglobose, 6-8 mm wide.

Range: Mongolia, China, Japan. Grown as an ornamental in the Promenade Gardens, Georgetown, Guyana.

More than 100 named cultivars and "clonal sports" exist; grown principally in the world's North Temperate climatic zone.

Cycadaceae

Dioecious, evergreen, palm-like plants. Trunk mostly unbranched, ringed with persistent leaf-bases. Leaves usually in a terminal, spreading crown, petiolate, pinnate or bipinnate (*Bowenia*); pinnae with prominent midrib, without lateral veins. Sporophylls (seed-bearing organs) spirally arranged, the male scale-like and in cones, the female toothed to pinnatifid, with 2-10 marginal ovules, not organized into a cone, but in loose terminal, massed clusters. Seeds flattened.

Literature: Gilbert, S. 1984. *Cycads: Status, Trade, Exploitation, and Protection, 1977-1982*. 72 pp. Washington, D.C.: TRAFFIC (U.S.A.). Johnston, E.F. 1967. How cycads reproduce. *Garden Journal* 17(5-6): 155-159. Read, R.W. and M. Solt. 1986. Bibliography of the living cycads (Annotated). *Lyonia* 2(4): 33-200. Thieret, J.W. 1958. Economic botany of the cycads. *Economic Botany* 12(1): 3-42.

1. *Cycas* Linnaeus

Characteristics of the family Cycadaceae, with leaves pinnate, in a terminal spreading crown.

Key to Species

1. Leaflets (pinnae) with flat margin, the margin not distinctly thickened, to 35 x 0.9-1.4 cm, pliable, fern-like, gracefully spreading; leaves mostly to 2.5 m; trunk usually to 4.5 (-12) m
1. *C. circinalis*
1. Leaflets (pinnae) with revolute (rolled-under) margin, the margin distinctly thickened, to 20 x 0.7 cm, stiff and rigid; leaves mostly to 1.5 m; trunk usually less than 1.8 m (to 4 m)
2. *C. revoluta*

1. *Cycas circinalis* Linnaeus, *Species Plantarum* 1188 (1753). GROTE FOENGOE PALM (Surinam); FERN PALM, QUEEN SAGO, SAGO PALM. Trunk usually unbranched, often bearing suckers (plantlets), to 4.5 (-12) m x 30 cm. Leaves 1.8-2.5 (-3.6) m; leaflets 40-50 pairs, narrowly linear-lanceolate, 15-35 x 0.9-1.4 cm, the margin flat, not distinctly thickened. Male cones cylindrical, to 70 cm. Sterile part of megasporophyll serrate. Seeds yellow to brown, to 5.5 cm.



Fig. 5. *Cycas circinalis* (Cycadaceae).

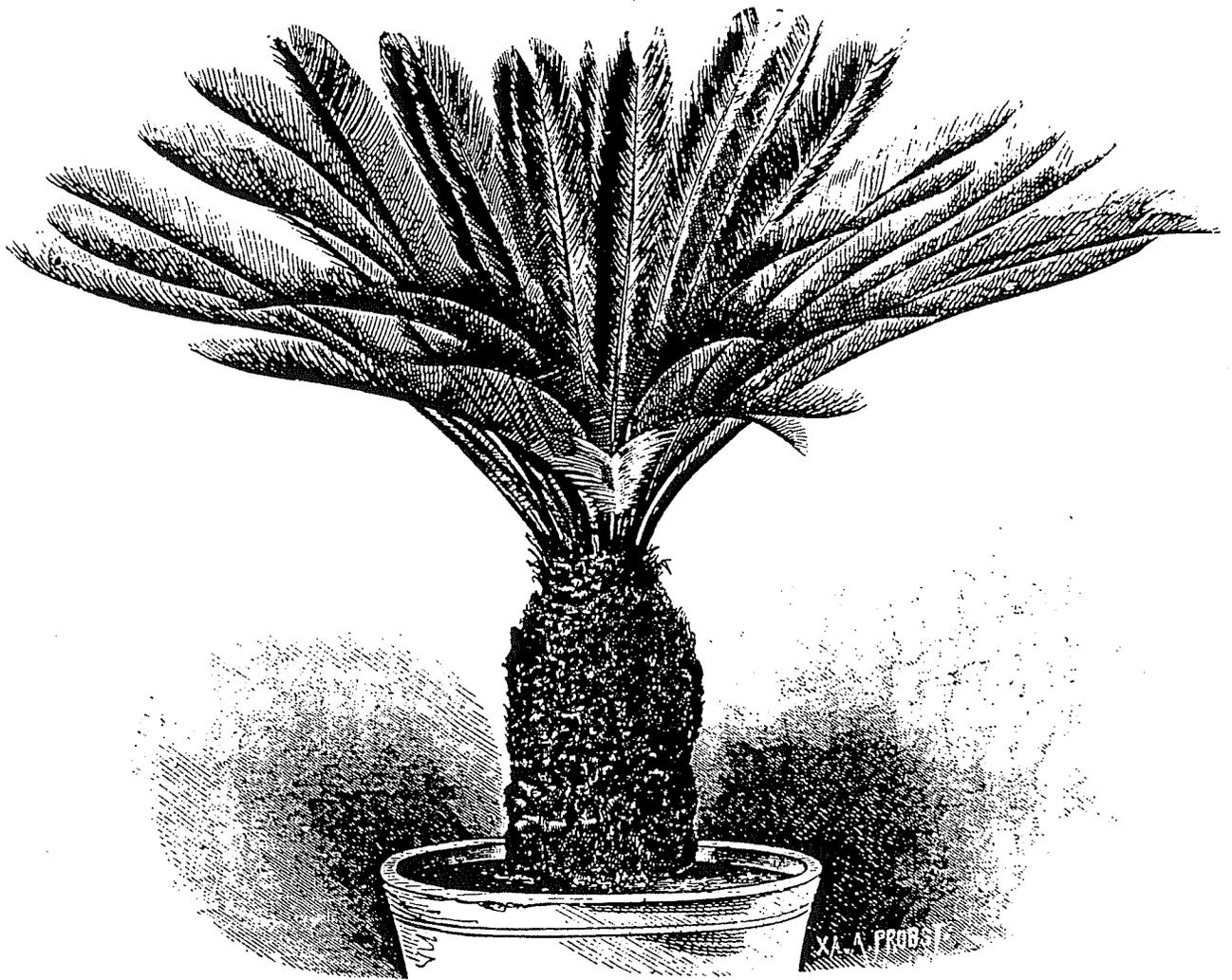


Fig. 6. *Cycas revoluta* (Cycadaceae).

Range: East Indies. Grown as an ornamental in the Promenade Gardens and Botanic Gardens, Georgetown, and on Timehri Airport grounds, Guyana; on hotel grounds, in roadside gardens, at the Palmentuin, and in the sierplanten area of the Cultuurtuin, Paramaribo, as well as in yards along Kwattaweg road outside Paramaribo, Surinam; and in the Jardin Botanique and on hotel grounds in Cayenne, French Guiana.

This species had already reached Cayenne, French Guiana by the middle 1700's (Aublet 2: 973. 1775).

2. *Cycas revoluta* Thunberg, *Flora Japonica* 229 (1784). KLEINE FOENGOE PALM (Surinam); JAPANESE SAGO PALM, SAGO PALM. Trunk sometimes branched above, to (2.1) 4 m x 30 cm. Leaves 75 cm - 1.5 m; leaflets c.60 pairs, linear, 10-20 x 0.7 cm, the margin revolute, distinctly thickened. Male cones cylindrical, to 50 cm. Sterile part of megasporophyll pinnatifid. Seeds red or orange, to 3.8 cm.

Range: Southern Japan and Ryukyu Islands. Grown as a potted ornamental at the Esther Stichting near Paramaribo, and on Gravenstraat opposite the Parket van de Procureur General in Paramaribo, Surinam.

Pinaceae

Monoecious, evergreen or sometimes deciduous, coniferous trees of conical or pyramidal shape, with resinous sap. Branches usually whorled. Leaves alternate, spirally arranged, or in fascicles of 2-30, linear and needle-like. Male cones consisting of clustered catkins. Female cones often large, solitary or few together on a branch, with spirally arranged, usually distinct bract-scales and fertile seed-bearing scales; seeds 2 per scale, often winged.

1. *Pinus* Linnaeus

Characteristics of the family Pinaceae, with leaves in fascicles of 2-5 and cone-scales bearing an apical projection (umbo).

1. *Pinus caribaea* Morelet, *Revue Horticole de la Cote d'Or* (Dijon) 1: 107 (1851). PIN DES CARAIBES (French Guiana); CARIBBEAN PINE. Tree to 30 m x 6 dm. Leaves in fascicles of 3 (4-5), 12-30 cm; basal sheath of fascicle persistent. Female cones conical, to 14 x 4 cm; cone-scales reddish-brown, with an apical prickle. Seeds with persistent wing to 2.5 cm.

Range: Bahamas; Cuba; Central America from Belize to Nicaragua. Grown as an ornamental in garden on Borretstraat in Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

Literature: Little, E.L. 1983. *Common Fuelwood Crops*. Morgantown, West Virginia: Communi-Tech Associates (pp.212-215). Mirov, N.T. 1967. *The Genus Pinus*. New York: Ronald Press (pp.227-230). National Academy of Sciences. 1983. *Firewood Crops*, Volume 2. Washington, D.C.: National Academy Press (pp.22-23).

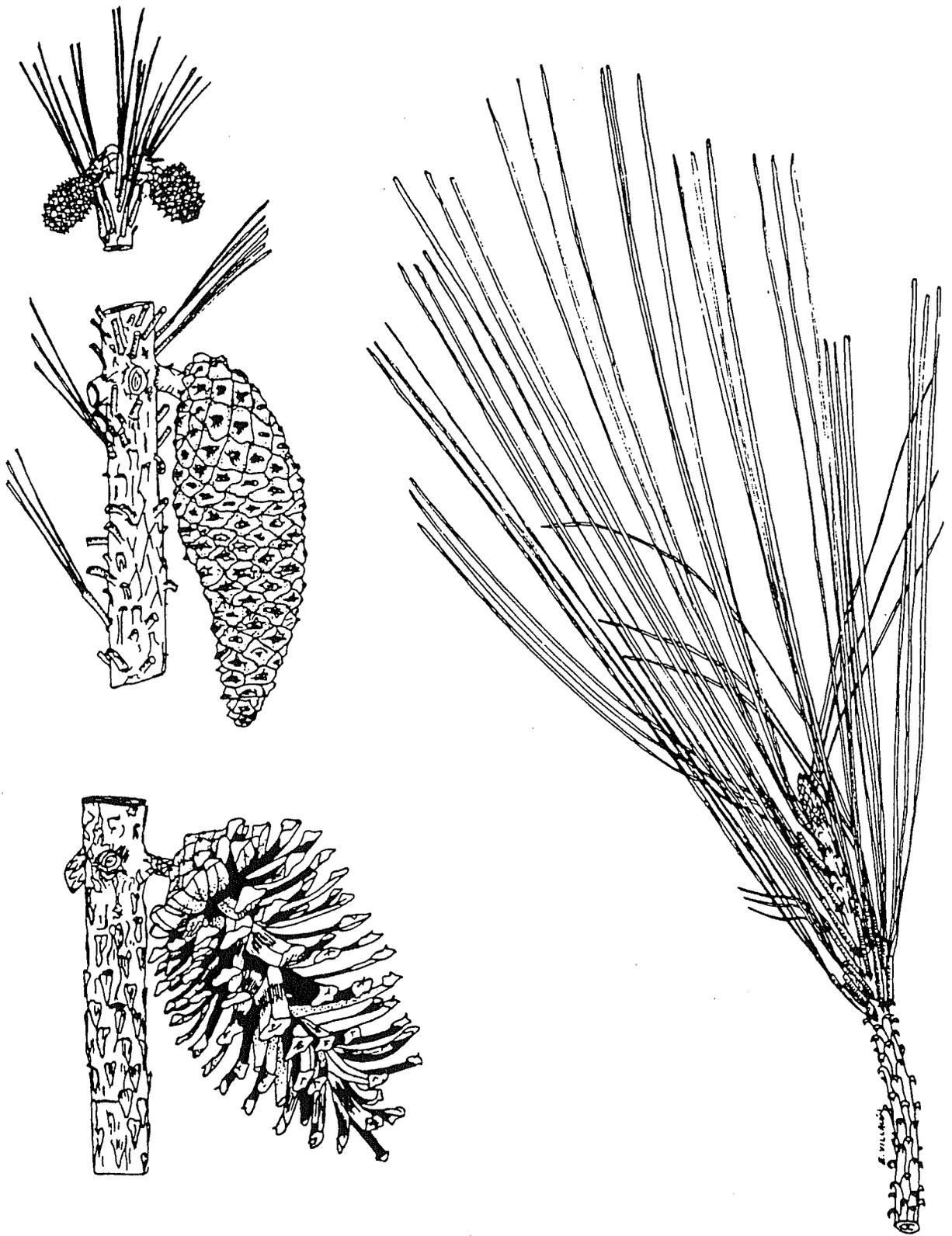


Fig. 7. *Pinus caribaea* (Pinaceae).

Zamiaceae

Dioecious, evergreen, palm-like plants. Trunk mostly unbranched, ringed with persistent leaf-bases. Leaves in a terminal, spreading rosette or crown, petiolate, pinnate or bipinnate; pinnae without midrib, with lateral, dichotomously branched veins. Sporophylls (reproductive structures) spirally arranged, the male in a cone, the female peltate, with 2 ovules beneath the apex, organized in a cone. Seeds not flattened.

1. *Microcycas* (Miquel) DeCandolle

Characteristics of the family Zamiaceae, with leaves pinnate, in a terminal spreading crown.

1. *Microcycas calocoma* (Miquel) DeCandolle, *Prodromus Systematis Naturalis Regni Vegetabilis* 16(2): 538 (1868). PALMA CORCHO. Trunk unbranched, conspicuously ringed, 3-9 m. Leaves 0.6-1 m; leaflets 50-80 pairs, opposite or alternate, revolute-margined, parallel-veined, 8-12 cm, villous-pubescent when young, glabrous in age. Male cones cylindrical, to 30 cm. Female cones narrowly conical, to 70 cm.

Range: Western Cuba (Pinar del Rio province). Recently introduced from Cuba to the Botanic Gardens nursery, Georgetown, Guyana.

Literature: Caldwell, O.W. and C.F. Baker. 1907. The identity of *Microcycas calocoma*. *Botanical Gazette* 43: 330-335.

According to Cuban folklore, the roots are useful as a rat poison. This endangered species is being grown in several botanic gardens as a conservation measure.

DICOTYLEDONS

Acanthaceae

Perennial, evergreen herbs, vines, shrubs and trees. Leaves opposite, simple, petiolate; stipules absent. Inflorescence a terminal or axillary spike, raceme, cyme or panicle, or flowers solitary and axillary; bracts often large, conspicuous, colored, sometimes 4-ranked or paired. Flowers bisexual, irregular or nearly regular; sepals 4-5, united below in a 4- or 5-toothed calyx; petals 5, united in a 2-lipped or 5-lobed corolla-tube. Stamens 2 or 4, often didynamous when 4; staminodes present or absent; anther-sacs 1 or 2. Ovary superior, 2-celled; ovules 2-10 per cell. Fruit a capsule; seeds usually on a peg-like funicle (retinaculum, jaculator), flat.

Key to Genera

1. Prostrate herbs with stems rooting at the nodes.
 2. Fertile stamens 2; corolla 2-lipped; leaves white-veined 5. *Fittonia*
 2. Fertile stamens 4; corolla 5-lobed; leaves purple 7. *Hemigraphis*
1. Erect herbs, shrubs or trees, or vines, the stems not rooting at the nodes.
3. Inflorescence-bracts minute, inconspicuous.
 4. Fertile stamens 4; corolla 5-lobed; flowers secund 2. *Asystasia*
 4. Fertile stamens 2; corolla 2-lipped; flowers not secund.
5. Corolla purple or red.
 6. Leaves green 8. *Justicia*
 6. Leaves with irregular blotches of white or yellow 6. *Graptophyllum*
5. Corolla white or tinged purplish, with purplish spots 11. *Pseuderanthemum*
3. Inflorescence-bracts large, conspicuous, often colored.
7. Corolla 5-lobed.
 8. Stamens 2; inflorescence-bracts red; corolla-tube not widened or dilated above 12. *Sanchezia*
 8. Stamens 4; inflorescence-bracts green; corolla with expanded limb or tube swollen above.
9. Corolla parted to the base on one side; anther-sac 1; seed with fringed scales 4. *Crossandra*
9. Corolla not parted to the base; anther-sacs 2; seed glabrous or hairy, without scales.
 10. Leaves variegated with pink or purple; one leaf of a pair larger than the other 13. *Strobilanthes*
 10. Leaves not variegated; both leaves of a pair equal.
11. Bracts 2 per flower, not spine-toothed; plants often twining vines; seeds glabrous 14. *Thunbergia*
11. Bract 1 per flower, often spine-toothed 3. *Barleria*
7. Corolla 2-lipped.
 12. Stamens 4; anther-sac 1; leaves with white or silver veins 1. *Aphelandra*
 12. Stamens 2; anther-sacs 2; leaves without white or silver veins.
13. Bracts bright yellow or orange-yellow, glandular-pilose 10. *Pachystachys*
13. Bracts pink, red, reddish-purple or -brown, or white with green veins, not glandular.
 14. Inflorescence of spikes; corolla c.3 cm; stems not glandular 8. *Justicia*
 14. Inflorescence a panicle; corolla to 6 cm; stems glandular in lines 9. *Megaskepasma*



Fig. 8. *Aphelandra aurantiaca* var. *aurantiaca* (Acanthaceae).

Hypoestes phyllostachya Baker (Synonym: *H. sanguinolenta* sensu auth., non (Van Houtte) Hooker fil.), the POLKA-DOT PLANT or FRECKLEFACE from Madagascar, is a perennial herb with leaves irregularly spotted purplish-pink on a dark green background, inconspicuous inflorescence-bracts, and lavender flowers with stamens 2; it is occasionally grown in Guyana as an ornamental (Ted Hubbard, pers. comm., 1986).

1. *Aphelandra* R. Brown

Evergreen shrubs, subshrubs or herbs; stems smooth, rarely spiny. Inflorescence a terminal or axillary spike; bracts imbricate, 4-ranked, large, showy. Calyx of 5 sepals free almost to the base; corolla 2-lipped, the upper lip 2-lobed, the lower lip 3-lobed, the tube straight or curved. Stamens 4, exserted; anther-sac 1 (monotheous). Fruit a capsule; seeds 2-4.

Literature: Wasshausen, D.C. 1975. The genus *Aphelandra* (Acanthaceae). *Smithsonian Contributions to Botany* 18: 1-157.

1. *Aphelandra aurantiaca* (Scheidweiler) Lindley, *Edwards's Botanical Register* 31: t.12 (1845), var. *aurantiaca*. (Synonyms: *A. aurantiaca* var. *roezlii* Van Houtte, *A. roezlii* (Van Houtte) Carriere, *A. aurantiaca* cv. *Roezlii*). Herb or subshrub to 1.5 m. Leaves elliptical or ovate, glabrous, variegated with white or silver along the veins, to 28 x 12 cm. Inflorescence to 17 cm; bracts elliptical or ovate, imbricate, stiff, to 3 cm, serrate with sharply spinose teeth. Corolla red or orange-red, puberulent outside, to 6 cm.

Range: Mexico to Bolivia. Grown for ornament at the Botanic Gardens, Georgetown, Guyana as early as the 1880's (*Report on the Botanic Gardens for 1887*, p.27, 1888). A species of *Aphelandra* which is grown for ornament in French Guiana (de Granville, 1985) is yet undetermined.

2. *Asystasia* Blume

Evergreen shrubs or herbs, sometimes climbing. Leaves opposite, simple, entire. Inflorescence of secund flowers in a terminal spike, raceme or panicle; bracts minute, inconspicuous. Sepals 5, linear, free; petals 5, united in a 5-lobed tube, the tube expanded above the middle, the lobes spreading. Stamens 4, didynamous; anther-sacs 2, often with minute spur at the base. Fruit a 2- or 4- seeded capsule.

Literature: Kang, L.C. 1981. *Asystasia*. *Nature Malaysiana* 6(2): 14-17.

Key to Species

1. Flowers with corolla-tube whitish or bright yellow, the lobes greenish-yellow, pink or pale purple; inflorescence a raceme 1. *A. gangetica*
1. Flowers violet-blue or violet-red; inflorescence a panicle branched from the base 2. *A. violacea*

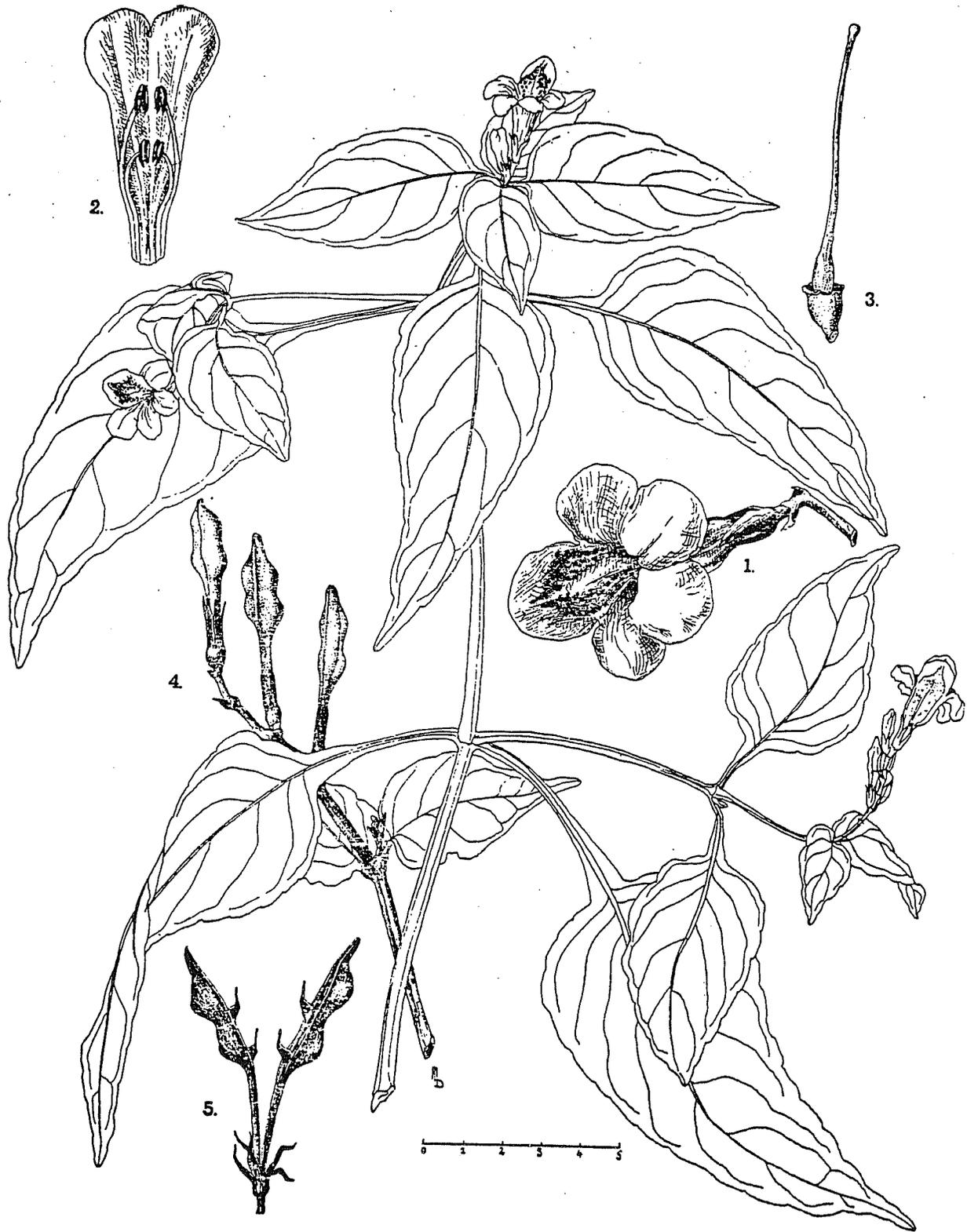


Fig. 9. *Asystasia gangetica* (Acanthaceae).

1. *Asystasia gangetica* (Linnaeus) T. Anderson in Thwaites, *Enumeratio Plantarum Zeylaniae* 235 (1860). (Synonym: *A. coromandeliana* Nees). DEMERARA PRIMROSE (Guyana). Shrub or herb, the stems scrambling to 1.2 (-4) m. Leaves ovate, to 10 x 6 cm. Inflorescence a secund raceme. Corolla c.4 cm, the tube whitish or bright yellow, the lobes greenish-yellow, pink or pale purple.

Range: Tropical Africa and Asia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and in French Guiana (de Granville, 1985).

2. *Asystasia violacea* Dalziel ex C.B. Clarke in J.D. Hooker, *The Flora of British India* 4(11): 494 (1884). FILIGRAINBLOEMPJE, MOEDERZEGEN (Surinam). Subshrub to 1.2 m. Leaves ovate, to 17.5 x 7.5 cm. Inflorescence a many-flowered panicle. Corolla c.4 cm, violet-blue or violet-red.

Range: India. Grown as an ornamental in Surinam (Ostendorf, 1962).

3. *Barleria* Linnaeus

Evergreen shrubs and herbs, sometimes armed with spines at the nodes. Leaves opposite, entire, subsessile to petiolate. Inflorescence a terminal spike, or flowers axillary, solitary or in cymes; bracts large, often toothed, sometimes imbricate. Sepals 4, the outer 2 large, the inner 2 small; petals 5, united in a 5-lobed tube, the tube widened above. Stamens 4, didynamous; fertile stamens sometimes 2, with 2 staminodes. Fruit a capsule; seeds 4, flat, covered with matted or curled hairs.

Key to Species

1. Plants unarmed; flowers axillary, solitary or in small cymes; inflorescence-bracts not imbricate; corolla pale violet, pink or white; 2 larger sepals pectinate-spiny 1. *B. cristata*
1. Plants armed with paired spines at nodes; flowers in a terminal spike; inflorescence-bracts imbricate; corolla bright yellow; all sepals entire 2. *B. lupulina*

1. *Barleria cristata* Linnaeus, *Species Plantarum* 636 (1753). PHILIPPINE VIOLET. Unarmed shrub to 8 m, or lower herb; stems pubescent. Leaves elliptical or ovate, to 12 x 6 cm. Flowers axillary, solitary or in small cymes; inflorescence-bracts not imbricate. Calyx with the 2 larger sepals ovate, conspicuously veined, pectinate-spiny, with an apical spine; 2 smaller sepals linear, entire; corolla pale violet, pink or white, 5-7 cm. Stamens 4.

Range: India. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

2. *Barleria lupulina* Lindley, *Edward's Botanical Register* 18: t.1483 (1832). Shrub to 1 m, armed with paired, down-pointed spines c.2 cm at the nodes; stems glabrous. Leaves narrowly lanceolate, to 15 x 2 cm. Inflorescence a terminal spike, c.7 cm; inflorescence-bracts imbricate, ovate. Calyx with the 2 larger sepals ovate, entire; 2 smaller sepals linear, entire. Corolla bright yellow, 2.5-4 cm. Stamens 4.



Fig. 10. *Crossandra infundibuliformis* (Acanthaceae).

Range: Madagascar. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

4. *Crossandra* Salisbury

Unarmed, evergreen shrubs or herbs. Leaves opposite or whorled, petiolate. Inflorescence a terminal or axillary, pedunculate spike; bracts imbricate, 4-ranked, large. Flowers irregular; sepals 5, united in a 5-lobed tube; petals 5, united in a slender tube with flat, 1-lipped (one-sided), 5-lobed limb, the limb parted to the base on one side. Stamens 4, didynamous, included; anther-sac 1 (monothealous). Ovary 2-celled; ovules 2 per cell. Fruit a 4-angled capsule; seeds with hairs or scales.

1. *Crossandra infundibuliformis* (Linnaeus) Nees in Wallich, *Plantae Asiaticae Rariores* 3: 98 (1832). ROSIENTJE (Surinam); FIRECRACKER FLOWER. Shrub to 90 cm. Leaves lanceolate or ovate, to 12.5 cm, the margin undulate. Inflorescence to 15 cm; peduncle c.2.5 cm; bracts elliptical, pubescent, c.1.3 cm. Flowers bright orange or salmon, the tube c.2.5 cm, the lip c.3 cm wide. Seeds with fringed scales.

Range: India, Sri Lanka. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); and in Surinam (Ostendorf, 1962).

5. *Fittonia* Coemans

Unarmed, evergreen, perennial, prostrate or ascending herbs. Leaves entire, petiolate, variegated on the veins. Inflorescence a terminal, erect, pedunculate, bracteate spike; bracts conspicuous, 4-ranked. Flowers irregular; sepals 5, united at base in a 5-toothed calyx; petals 4, united in a slender, 2-lipped corolla-tube, the upper lip entire, the lower lip 3-lobed. Stamens 2, included; anther-sacs 2. Fruit a capsule; seeds 2 or 4.

Literature: Brummitt, R.K. 1979. Tab.788 *Fittonia albivenis* (Acanthaceae). *Curtis's Botanical Magazine* 182(4): 157-168.

1. *Fittonia albivenis* (Lindley ex Veitch) Brummitt, *Curtis's Botanical Magazine* 182(4): 165 (1979), *Argyroneura* cultivar group. (Synonyms: *F. argyroneura* Coemans, *F. verschaffeltii* (Lemaire) Coemans var. *argyroneura* (Coemans) Regel, *F. verschaffeltii* cv. *Argyroneura*). SILVER-NET PLANT. Stems prostrate, or ascending to 25 cm in flower, rooting at the nodes, pubescent. Leaf-blades broadly elliptical or ovate, reticulately variegated with white on the veins, to 12 cm. Inflorescence to 9 cm; bracts cuneate, ovate or suborbicular, usually glandular-pubescent, 5-12 mm. Corolla lemon-yellow, 1.0-1.4 cm. Seeds 2, flat, papillate.

Range: Peru, Bolivia, Colombia. Grown as an ornamental in the nursery of the Botanic Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

The flowers of this plant are insignificant compared to the decorative qualities of the leaves.

6. *Graptophyllum* Nees

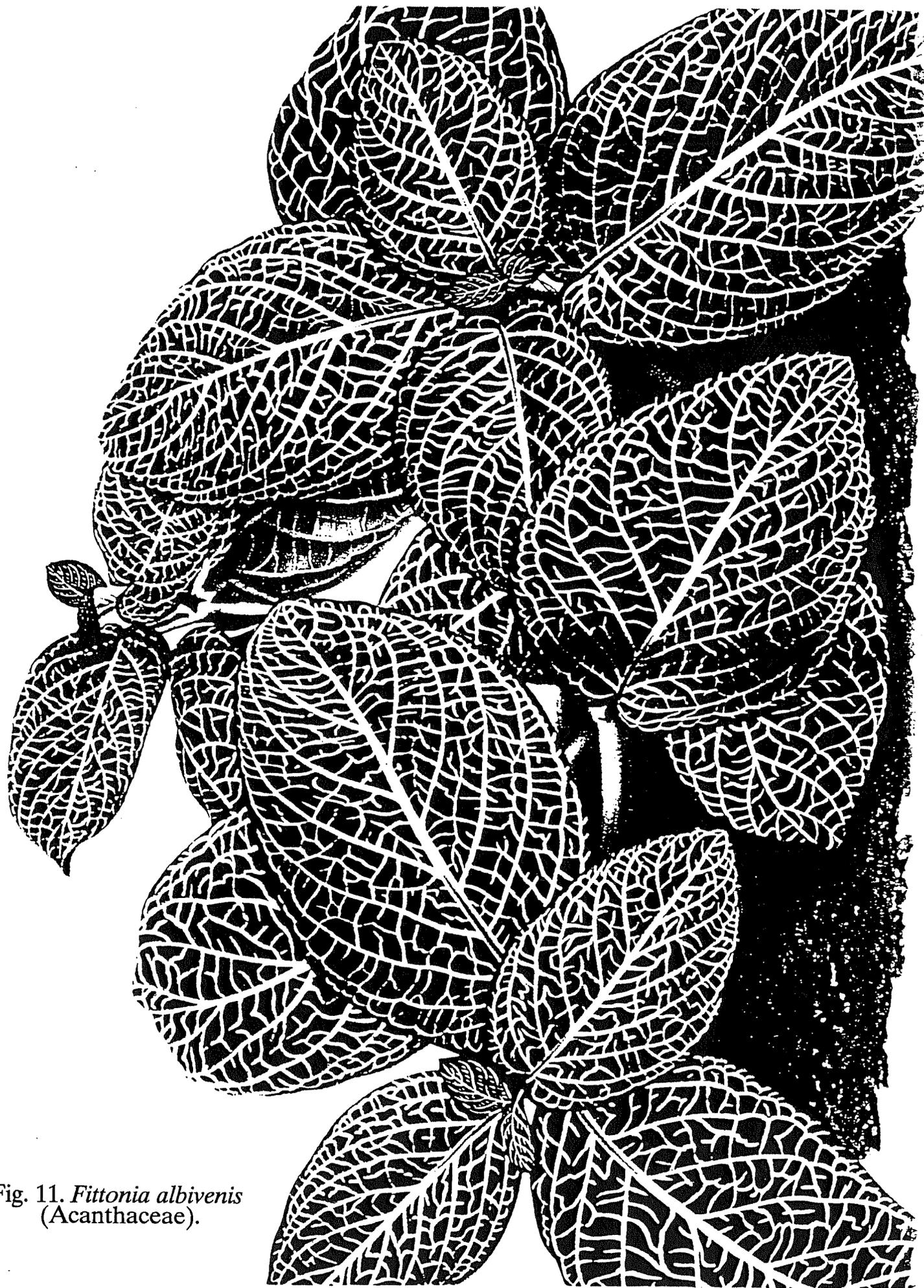


Fig. 11. *Fittonia albivenis*
(Acanthaceae).

Unarmed, evergreen shrubs and trees. Leaves entire, often variegated, sessile or petiolate. Inflorescence of solitary, axillary flowers, or a terminal or axillary cyme or raceme; bracts minute, subulate. Flowers irregular; sepals 5, united below; petals 5, united in a funnellform, 2-lipped corolla-tube widened at the throat, the upper lip 2-lobed, the lower lip 3-lobed. Stamens 2, exserted; anther-sacs 2; staminodes 2. Fruit a capsule; seeds 2-4.

1. *Graptophyllum pictum* (Linnaeus) Griffith, *Notulae ad Plantas Asiaticas* 4: 139 (1854). (Synonym: *G. hortense* (Linnaeus) Nees). CARICATURE PLANT. Shrub or tree, attaining 3-6 m in age. Leaf-blades ovate or elliptical, glabrous, green, sometimes purplish, variegated with irregular blotches or splashes of white, cream or yellow, to 15 (-20) cm; petiole, midvein and major side-veins dilute pink. Inflorescence a terminal raceme; bracts 3 mm, ciliolate. Corolla reddish-purple or crimson-red, glandular-puberulent, 4.5-8 cm.

Range: New Guinea. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); at the Esther Stichting near Paramaribo and on hotel grounds in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana.

7. *Hemigraphis* Nees

Unarmed, evergreen subshrubs or annual or perennial herbs. Leaves usually with toothed or undulate margin, petiolate. Inflorescence a terminal or axillary spike; bracts opposite, imbricate, large. Flowers irregular; sepals 5, united below in a tube; petals 5, united in a narrow, 5-lobed corolla-tube with spreading limb. Stamens 4, didynamous; anther-sacs 2; staminodes absent. Fruit a capsule; seeds 6-12, pubescent. (10)

1. *Hemigraphis alternata* (Burman fil.) T. Anderson, *Journal of the Linnean Society of London* 7: 114 (1864). (Synonym: *H. colorata* (Blume) Hallier). RED IVY. Prostrate, pubescent, perennial herbs; stems rooting at the nodes. Leaf-blades ovate or ovate-oblong, crenate, bullate (puckered surface texture), crenately toothed, silvery- or metallic-purplish above, purple beneath, to 6 cm; petiole to 5 cm. Inflorescence a terminal spike to 3 (-10) cm; bracts ovate-lanceolate, to 1.5 cm. Corolla white with purple lines, 1.5-2 cm.

Range: Malaysia. Grown as an ornamental on hotel premises in Cayenne, French Guiana.

8. *Justicia* Linnaeus

Unarmed, perennial, evergreen shrubs or herbs. Leaves petiolate. Inflorescence a terminal or axillary spike or panicle, or the flowers solitary; bracts small or conspicuous, often imbricate and colorful. Flowers irregular; sepals (4-) 5, united below in a (4-) 5-toothed calyx; petals 5, united in a long, 2-lipped corolla-tube, the lower lip 3-toothed (sometimes indistinctly so), the upper lip 2-toothed or entire. Stamens 2; anther-sacs 2. Ovary 2-celled. Fruit a (2-) 4-seeded capsule.



Fig. 12. *Justicia betonica* (Acanthaceae).

Key to Species

1. Inflorescence-bracts small (1.5 x 0.6 mm), green 3. *J. calycina*
1. Inflorescence-bracts prominent, with white or reddish coloration.
 2. Inflorescence-bracts dull (terra-cotta) red or reddish-brown when mature (yellowish-green at first); spikes patent (horizontally spreading), arching or nodding 2. *J. brandegeana*
 2. Inflorescence-bracts white with green veins; spikes erect 1. *J. betonica*

1. *Justicia betonica* Linnaeus, *Species Plantarum* 15 (1753). (Synonym: *Nicoteba betonica* (Linnaeus) Lindau). SILVER SHRIMP PLANT, WHITE SHRIMP PLANT. Shrub to 1.2 m. Leaf-blades elliptical, to 12.5 cm. Inflorescence of terminal and axillary, erect spikes to c.10 cm; bracts 4-ranked, imbricate, ovate, white with green veins. Corolla c.3 cm, white.

Range: Tropical Africa and Asia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; at the Esther Stichting near Paramaribo, and on university grounds and in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam.

2. *Justicia brandegeana* Wasshausen and L.B. Smith in Reitz, P.R., ed., *Flora Illustrada Catarinense*, Pt.I: Acantaceas 102 (1969). (Synonyms: *Beloperone guttata* Brandegee, *Drejerella guttata* (Brandegee) Bremekamp, *Calliaspidia guttata* (Brandegee) Bremekamp). SHRIMP PLANT. Herb or shrub to 1 (-2) m. Leaf-blades ovate or elliptical, to 7 cm. Inflorescence of terminal and axillary, patent to arching or nodding, spikes to 15 cm; bracts 4-ranked, imbricate, ovate, dull (terra-cotta) red or reddish-brown when mature (yellowish-green at first). Corolla c.3 cm, white, the lower lip with 2-3 rows of purple, elongated spots.

Range: Mexico (San Luis Potosi state). Grown as an ornamental in the Promenade Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962; Wessels Boer et al., 1976).

3. *Justicia calycina* (Nees) V.W. Graham, *Kew Bulletin* 43(4): 610 (1988). (Synonym: *Rhacodiscus calycinus* (Nees) Bremekamp). BAKROE WIWIRI (Surinamese Creole). Shrub to 2.5 m. Leaf-blades lanceolate, to 36 cm. Inflorescence of terminal, arching, spike-like racemes to 12 cm; bracts triangular, green. Corolla to 6 cm, brick red or pale red.

Range: Guyana, Surinam. Cultivated as an ornamental specimen on Torarica hotel grounds, Paramaribo, Surinam.

9. *Megaskepasma* Lindau

Unarmed, evergreen shrubs. Leaves shortly petiolate. Inflorescence a terminal spike or panicle of spikes; bracts conspicuous, colorful. Flowers irregular; sepals 5, united at the base in a 5-toothed calyx; petals 5, united in a long, 2-lipped corolla-tube, the upper lip entire or obscurely 2-toothed, the lower lip 3-toothed at apex. Stamens 2; anther-sacs 2. Fruit a 4-seeded capsule.

1. *Megaskepasma erythrochlamys* Lindau, *Bulletin de l'Herbier Boissier* 5: 666 (1897).

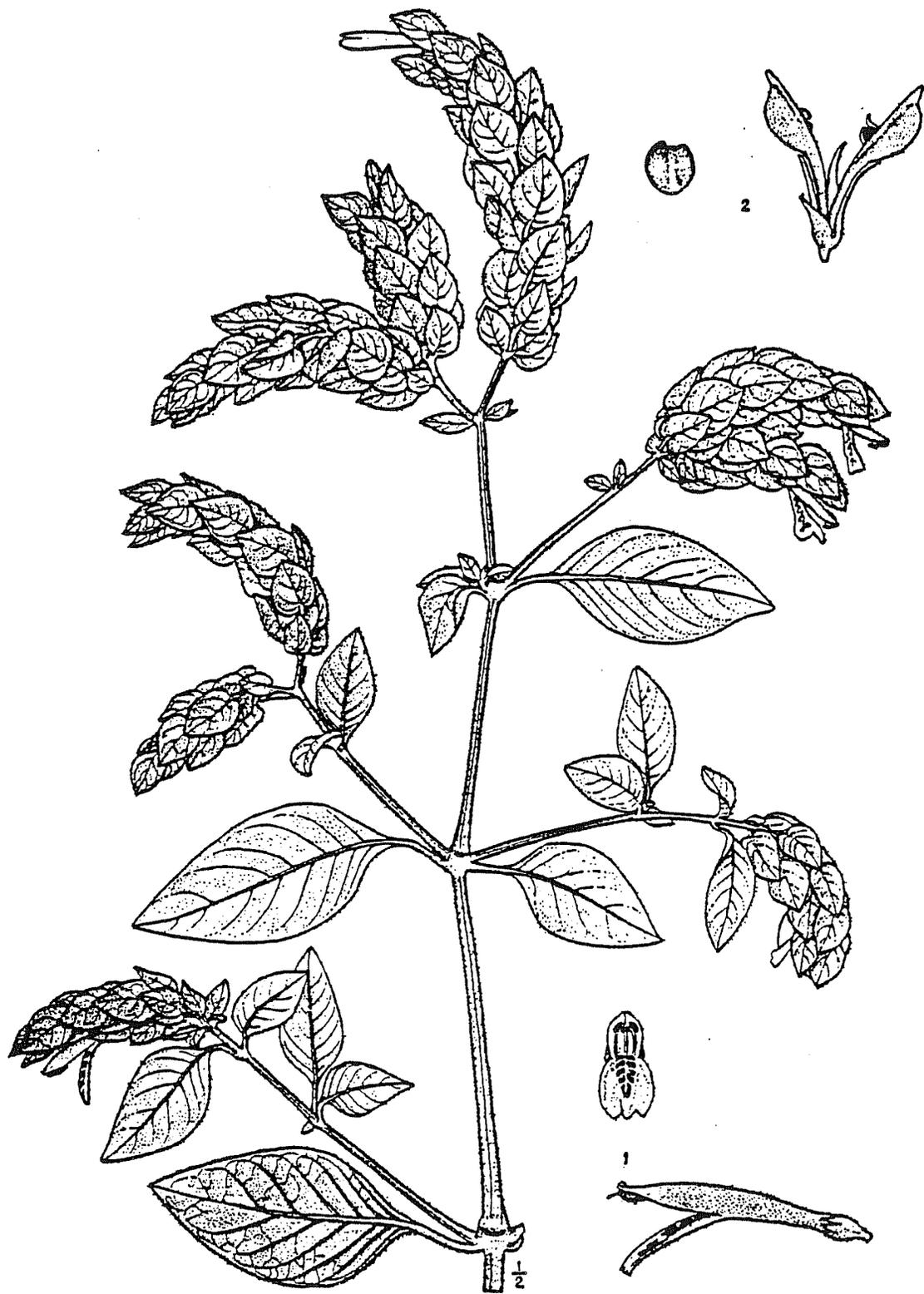


Fig. 13. *Justicia brandegeana* (Acanthaceae).

ADATODE (Surinam); BRAZILIAN RED CLOAK. Shrub to 4 m; stems appressed-brownish-pubescent, with glands in lines on the angles. Leaf-blades lance-elliptical to ovate, to 30 (-40) cm. Inflorescence a panicle to 30 cm; bracts conspicuous, ovate or ovate-lanceolate, pink to reddish-purple, the largest to c.3.5-4.7 cm. Corolla white or tinged with pink, to 6 cm.

Range: Venezuela (Merida Province). Currently grown as an ornamental in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam. A specimen, *Hermelijn 3* (US), was collected on September 21, 1962.

Literature: Ballard, F. 1934. Tab.9379 *Megaskepasma erythrochlamys*. *Curtis's Botanical Magazine* 157: t.9379, +2 pp.

10. *Pachystachys* Nees

Unarmed, evergreen shrubs or herbs. Leaves petiolate. Inflorescence a terminal spike, the flowers of the spike solitary or in few- (to 4-) flowered verticillasters; bracts conspicuous, imbricate. Flowers irregular; sepals 5, united below in a 5-toothed calyx; petals 5, united in a curved, 2-lipped corolla-tube, the upper lip 2-lobed, the lower lip 3-lobed. Stamens 2; anther-sacs 2. Fruit a 4-seeded capsule.

Literature: Wasshausen, D.C. 1986. The systematics of the genus *Pachystachys* (Acanthaceae). *Proceedings of the Biological Society of Washington* 99(1): 160-185.

1. *Pachystachys lutea* Nees in De Candolle, *Prodromus Systematis Naturalis Regni Vegetabilis* 11: 320 (1847). LOLLIPOP PLANT. Shrub to 2.5 m. Leaf-blades oblong-lanceolate or narrowly ovate, puberulent, to 18 cm. Inflorescence an erect spike to 10 cm; bracts bright yellow or orange-yellow, ovate-cordate, glandular-pilose, to 2.5 cm. Corolla white, pilose and glandular-punctate, to 5.5 cm.

Range: Peru. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

The attractive *P. spicata* (Ruiz & Pavon) Wasshausen (Synonym: *P. coccinea* sensu auctt., non (Aublet) Nees), with green bracts and scarlet corolla, is indigenous to French Guiana, though seemingly not in cultivation there.

11. *Pseuderanthemum* Radlkofer

Unarmed, evergreen trees, shrubs or perennial herbs. Leaves petiolate. Inflorescence an erect, terminal or axillary spike, raceme, spicate panicle, or cymose panicle (thyrses); bracts small, inconspicuous. Flowers irregular; sepals 4-5, united below in a 4- or 5-toothed calyx; petals 5, united in a cylindrical, 2-lipped corolla-tube, the upper lip 2-lobed, the lower lip 3-lobed. Stamens 2; anther-sacs 2; staminodes 0 or 2. Fruit a (2-) 4-seeded capsule.

1. *Pseuderanthemum carruthersii* (Seemann) Guillaumin, *Annales de l'Institut Botanique-Geologique Colonial de Marseille* 6(5-6): 48 (1948), var. *atropurpureum* (Bull) Fosberg, *Phytologia* 5(7): 290 (1955). (Synonyms: *Eranthemum atropurpureum* Bull, *Pseuderanthemum atropurpureum* (Bull) Bailey, cv. *Variegatum*). PURPLE FALSE



Fig. 14. *Thunbergia erecta* (Acanthaceae).

ERANTHEMUM. Shrub or tree to 4 m. Leaf-blades oblong, elliptical or ovate, variegated with purple, pink, yellow, grey and white, to 15 cm. Inflorescence a panicle to c.20 cm; bracts narrow, inconspicuous. Corolla white or tinged purplish, with purple-spotted throat and proximal parts of lobes, 1.5-2 cm.

Range: Polynesia. Grown as an ornamental at the Esther Stichting near Paramaribo, Surinam.

Literature: Fosberg, F.R. and M.-H. Sachet. 1985. History of the generic name *Pseuderanthemum* Radlkofer (Acanthaceae). *Baileya* 22(4): 178-179.

12. *Sanchezia* Ruiz & Pavon

Evergreen herbs, shrubs or vines; stems smooth. Inflorescence a terminal or axillary spike, raceme, panicle or head; bracts often large, showy. Calyx of 5 sepals; corolla tubular, equally 5-lobed, the tube straight, the lobes revolute. Stamens 2, exserted; anther-sacs 2. Fruit a 6- to 8-seeded capsule.

1. *Sanchezia speciosa* J. Leonard, *Journal of the Washington Academy of Sciences* 16: 490 (1926). Shrub to 1.5 (-2) m. Stems 4-angled. Leaves oblong-ovate, acuminate, entire or toothed, green, with white or yellow veins, to 30 cm. Inflorescence a panicle of short spikes; bracts red, to c.3.5 cm. Corolla yellow, c.5 cm.

Range: Northwestern South America. Grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986), and on University grounds in Paramaribo, Surinam.

13. *Strobilanthes* Blume

Unarmed, evergreen shrubs or perennial herbs. Leaves of a pair often of unequal size, and connate by tissues between petiole-bases, sometimes sessile. Inflorescence an axillary, sometimes terminal, cone-like spike or panicle, or flowers solitary; bracts conspicuous. Flowers irregular; sepals 5, united at base in a 5-toothed calyx; petals 5, united in a 5-lobed or 2-lipped corolla-tube dilated above, the lobes unequal. Stamens 4 and didynamous, or 2. Fruit a clavate, 4-seeded capsule.

1. *Strobilanthes dyerianus* Hort. Sander ex M.T. Masters, *Gardeners' Chronicle* ser.3, 13(329): 442 (1893). PERSIAN SHIELD. Shrub to 90 cm. Leaves elliptical, lance-ovate or ovate, dentate, variegated rich, iridescent pink or lavender between blackish-green veins above, purplish-red beneath, to 20 cm, sessile. Inflorescence an axillary spike to 15 cm. Corolla 5-lobed, pale violet, c.3.8 cm.

Range: Burma. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

14. *Thunbergia* Retzius

Unarmed, perennial or sometimes annual, vines or shrubs. Leaves petiolate. Inflorescence of 1-2 axillary flowers, or a terminal raceme; bracts 2, conspicuous,

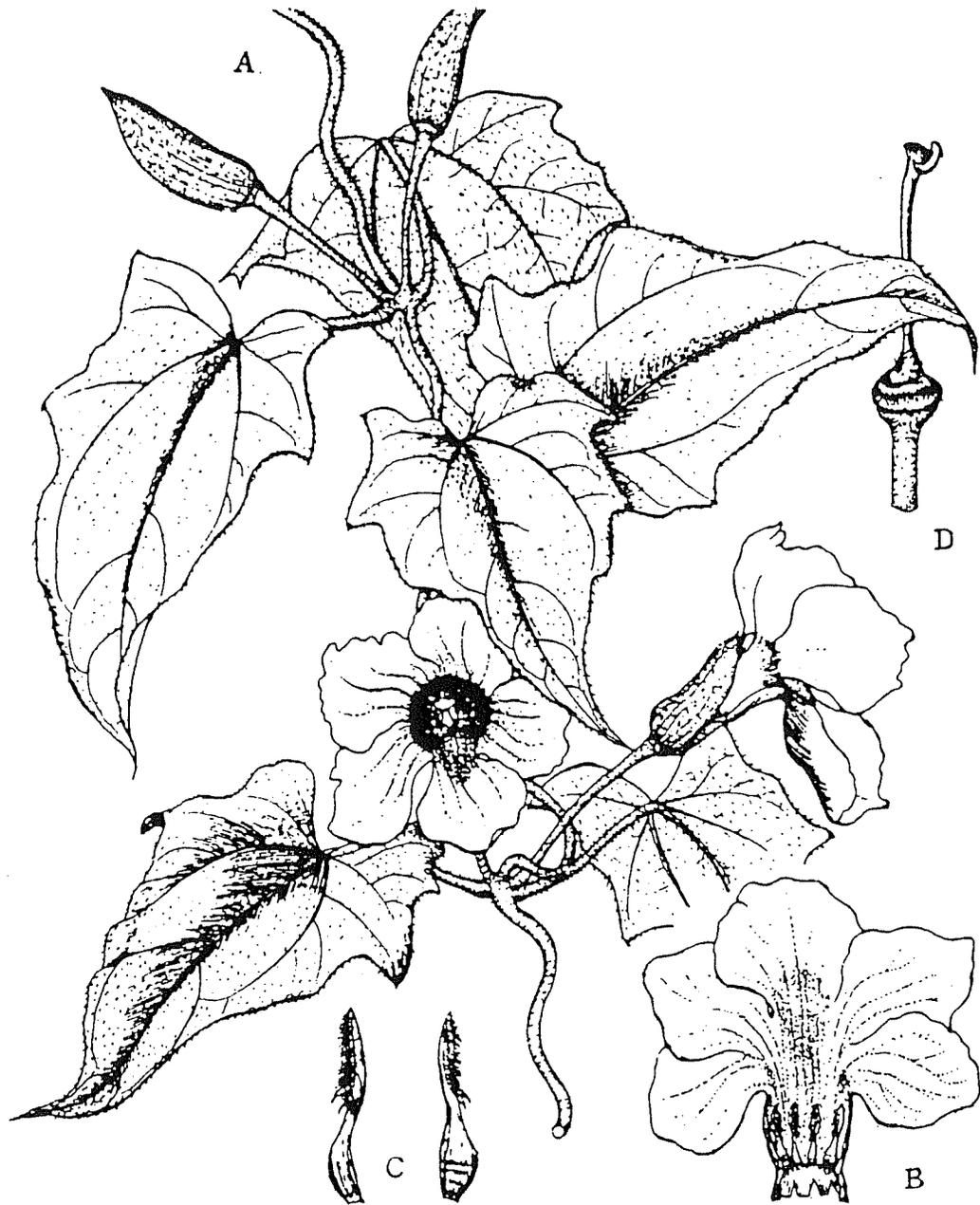


Fig. 15. *Thunbergia grandiflora* (Acanthaceae).

foliaceous. Flowers irregular, pedicellate; sepals small, united in an 8- to 16-toothed, or an entire and ring-like, calyx; petals 5, united in a 5-lobed corolla-tube often swollen on one side. Stamens 4, didynamous; anther-sacs 2. Fruit a capsule, globose and fertile below, beaked and sterile above; seeds 4, without retinaculum.

Literature: Karsten, M.C. 1939. Carl Peter Thunberg, an early investigator of Cape botany, Part I. *Journal of South African Botany* 5(1): 1-27.

Key to Species

1. Plant erect, not twining; petiole 2-3 mm 2. *T. erecta*
1. Plant with twining stems; petiole 1.5-8 cm.
 2. Petiole winged; corolla-tube yellow or orange 1. *T. alata*
 2. Petiole not winged; corolla-tube white, blue or bluish-purple.
3. Corolla white, 3-5 cm; calyx 12- to 16-toothed 3. *T. fragrans*
3. Corolla blue or bluish-purple, 6-8 cm; calyx entire and ring-like 4. *T. grandiflora*

1. *Thunbergia alata* Bojer ex Sims, *Curtis's Botanical Magazine* 52: t.2521 (1825). BLACK-EYED SUSAN. Annual or perennial herbaceous vine, twining, to 2.4 m. Leaf-blades ovate, toothed, the base cordate or hastate, pubescent, to 8 cm; petiole winged. Flowers solitary; bracts to 2 cm; calyx-teeth 10-16. Corolla to 4 cm, the tube yellow or orange, the lobes yellow or orange, the eye (center) dark purple or black.

Range: Southern Africa. Grown as an ornamental in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam.

2. *Thunbergia erecta* (Bentham) T. Anderson, *Journal of the Linnean Society of London, Botany* 7: 18 (1864). BUSH CLOCK-VINE. Shrub to 3 m. Leaf-blades oblong or ovate, entire or toothed, glabrous or subglabrous, 2-5 (-7.5) cm; petiole unwinged. Flowers solitary; bracts to 2 cm; calyx-teeth 8-12. Corolla to 7 cm, the tube white or yellowish-white, the lobes dark blue or purple, the eye (center) orange or yellow.

Range: Tropical and southern Africa. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

3. *Thunbergia fragrans* Roxburgh, *Plants of the Coast of Coromandel* 1: 47 (1796). (Synonym: *T. laevis* Nees). Woody vine, twining. Leaf-blades oblong, lanceolate or ovate, subentire or toothed, the base cordate or hastate, pubescent or subglabrous, to 12 cm; petiole unwinged. Flowers solitary or 2 per axil; bracts to 2 cm; calyx-teeth 12-16. Corolla 3-5 cm, the tube white, the lobes white, the eye (center) greenish.

Range: India to South China. Grown as an ornamental on hotel grounds in Paramaribo, Surinam.

4. *Thunbergia grandiflora* (Roxburgh ex Rottler) Roxburgh, *Hortus Bengalensis* 45 (1814). BENGAL CLOCK-VINE. Woody vine, twining and climbing to 21 m. Leaf-blades lanceolate or ovate, angularly toothed or lobed, pubescent or subglabrous, scabrid, to 20 cm; petiole unwinged. Flowers 8-10 in a terminal pendent raceme, or solitary; bracts 3-3.5

cm; calyx truncate, reduced to a toothless ring. Corolla 6-8 cm, the tube blue or bluish-purple, the lobes blue or bluish-purple, the eye (center) yellow.

Range: India to South China. Grown as an ornamental in Surinam (Ostendorf, 1962); and in Cayenne, French Guiana (Lemeë, 1953).

Amaranthaceae

Annual or perennial herbs, sometimes shrubs. Leaves opposite or alternate, green or variegated, sessile or petiolate. Inflorescence of terminal or axillary, sessile or pedunculate spikes, heads or panicles, sometimes fasciated or subtended by foliaceous bracts. Flowers bisexual or unisexual, subtended by 1-3 chaffy scales. Sepals 3-5. Petals absent. Fertile stamens 1-5; filaments often united below in a cup or tube. Ovary superior, 1-celled. Fruit a 1-seeded utricle, achene, or few- to many-seeded circumscissile capsule.

Key to Genera

1. Leaves variegated.
 2. Stamens with free filaments; flowers unisexual; herb to 1.2 m 2. *Amaranthus*
 2. Stamens with filaments united below in a tube; flowers bisexual; dwarf herb to 20 cm 1. *Alternanthera*
1. Leaves green.
 3. Inflorescence of globose heads 4. *Gomphrena*
 3. Inflorescence of spikes or panicles.
 4. Flowers unisexual; stamens with free filaments; fruit a utricle; inflorescence not crested 2. *Amaranthus*
 4. Flowers bisexual; stamens with filaments united below in a tube; fruit a circumscissile capsule; inflorescence sometimes crested 3. *Celosia*

Iresine herbstii Hooker, cv. Aureo-reticulata, a South American plant known as CHICKEN GIZZARD, is an herb with broadly ovate or suborbicular leaf-blades notched at the apex and variegated green or greenish-red with yellow veins, and red petioles; it is occasionally grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986).

1. *Alternanthera* Forsskal

Herbs, sometimes shrubs. Leaves opposite, green or variegated. Inflorescence of axillary or terminal, small, sessile or pedunculate heads. Flowers bisexual, subtended by scales. Sepals 5. Petals absent. Fertile stamens 3-5, alternating with the same number of staminodes; filaments united below in a tube. Fruit a utricle.

1. *Alternanthera paronychioides* A. St. Hilaire, *Voyage dans l'Interieur du Bresil* 2(2): 43 (1850), cv. Amoëna. (Synonym: *A. amoëna* (Lemaire) Voss). CEYLON-GRAS (Surinam); PARROTFLEAF. Dwarf perennial herb; stems procumbent, or erect and to 20 cm. Leaves lanceolate or elliptical, to 7.5 cm, variegated with splashes of red and orange, on a yellowish-green background. Inflorescence sessile; flowers whitish.

See
H. J. W.
Lusitania
33

Range: Cultivar with no original range; typical wild plants occur from Mexico to South America, including the three Guianas. Grown as a bedding and border ornamental in roadside gardens near Georgetown, Guyana; in Surinam (Ostendorf, 1962); and on hotel grounds in Cayenne, French Guiana.

2. *Amaranthus* Linnaeus

Annual herbs. Leaves alternate, green or variegated. Inflorescence of axillary or terminal spikes or heads. Flowers unisexual, subtended by scales. Sepals 3 or 5. Petals absent. Stamens 2-5, free. Fruit a utricle.

Key to Species

- 1. Flowers in long, pendent spikes; leaves green 1. *A. caudatus*
- 1. Flowers in short, erect, head-like clusters; leaves variegated with several colors 2. *A. tricolor*

1. *Amaranthus caudatus* Linnaeus, *Species Plantarum* 990 (1753). LOVE LIES BLEEDING. Herb to 1.8 m. Leaves ovate, green. Inflorescence of long, pendent, tail-like, red spikes.

Range: Old World tropics. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); and in the 1930's in Surinam (Pulle, 1932).

2. *Amaranthus tricolor* Linnaeus, *Species Plantarum* 989 (1753). JOSEPH'S COAT. Herb to 1.2 m. Leaves ovate, variegated with blotches of green, red, purple and yellow.

Range: Old World tropics (plants with non-variegated leaves); plants with highly colored foliage are cultivars with no original range. Grown as an ornamental in the 1930's in Surinam (Pulle, 1932); and in French Guiana since the era of Aublet in the late 1700's (Lemee, 1955).

3. *Celosia* Linnaeus

Annual or perennial herbs. Leaves alternate. Inflorescence of dense terminal spikes or panicles, sometimes fasciated. Flowers bisexual, subtended by scales. Sepals 5. Petals absent. Stamens 5; filaments united below in a cup. Fruit a few- to many-seeded, circumscissile capsule.

1. *Celosia cristata* Linnaeus, *Species Plantarum* 205 (1753). Annual herb to 1 m, often smaller. Leaves linear, lanceolate or ovate, to 12 cm. Inflorescence of clustered fasciated spikes or of non-fasciated panicles, to 20 cm. Flowers red, magenta, yellowish-orange or yellow.

Range: Without an original range, this taxon is a tetraploid horticultural assemblage derived from the tropical Asiatic *C. argentea* Linnaeus.

Key to Cultivars

1. Inflorescence fasciated in a bifacially flattened, fan-like crest resembling a cockscomb
1a. Cockscomb Group
1. Inflorescence feathery, plume-like, not fasciated
1b. Plumosa Group

1a. *C. cristata* Cockscomb Group. (Synonyms: *C. argentea* f. *cristata* (Linnaeus) Schinz, *C. argentea* var. *cristata* (Linnaeus) Kuntze). HANEKAM (Surinam), COCKSCOMB. Range: Grown as an ornamental near Turkeyen, Guyana; in Surinam (Ostendorf, 1962); and in French Guiana (de Granville, 1985A).

1b. *C. cristata* Plumosa Group. (Synonym: *C. argentea* f. *plumosa* Voss). PLUME CELOSIA. Range: Grown as an ornamental in Surinam (Ostendorf, 1962).

4. *Gomphrena* Linnaeus

Annual or perennial herbs. Leaves opposite. Inflorescence of dense terminal heads, subtended by 2-3 foliaceous bracts. Flowers bisexual, subtended by scales. Sepals 5. Petals absent. Stamens 5; filaments united in a prominent tube. Fruit a utricle.

1. *Gomphrena globosa* Linnaeus, *Species Plantarum* 224 (1753). STANDVASTIG (Surinam), GLOBE AMARANTH. Annual herb to 1 m. Leaves oblong, elliptical or ovate, entire, pubescent, ciliate, to 10 cm. Inflorescence with heads sometimes clustered, terminal, globose, to 2.5 cm wide. Scales subtending the flowers winged, much longer than the perianth of sepals. Sepals lanate with reddish or brownish hairs. Flowers reddish-purple, white, pink or yellow.

Range: Tropical Asia. Grown as an ornamental in roadside gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962). Naturalized in Surinam and French Guiana.

Literature: SECAB. 1989. *Gomphrena globosa*. *Especies Vegetales Promisorias* 1: 103-115.

Anacardiaceae

Evergreen or deciduous trees and shrubs; sap resinous or milky; plants often polygamous (male, female and bisexual flowers borne on the same tree). Leaves alternate or subopposite, simple or pinnately compound, petiolate. Inflorescence a terminal or lateral panicle or raceme. Flowers regular; sepals 4-5; petals 4-5. Stamens 1-10, often only 1 or 2 of them fertile. Ovary superior, 1- to 6-celled. Fruit a nut or drupaceous; seeds 1-several, flattened.

Key to Genera

1. Leaves pinnately compound; fertile stamens 8-10
3. *Spondias*
1. Leaves simple; fertile stamens 1-2.
 2. Leaves broadly obovate or oblong-ovate; sap milky; petals reflexed at middle; fruit a

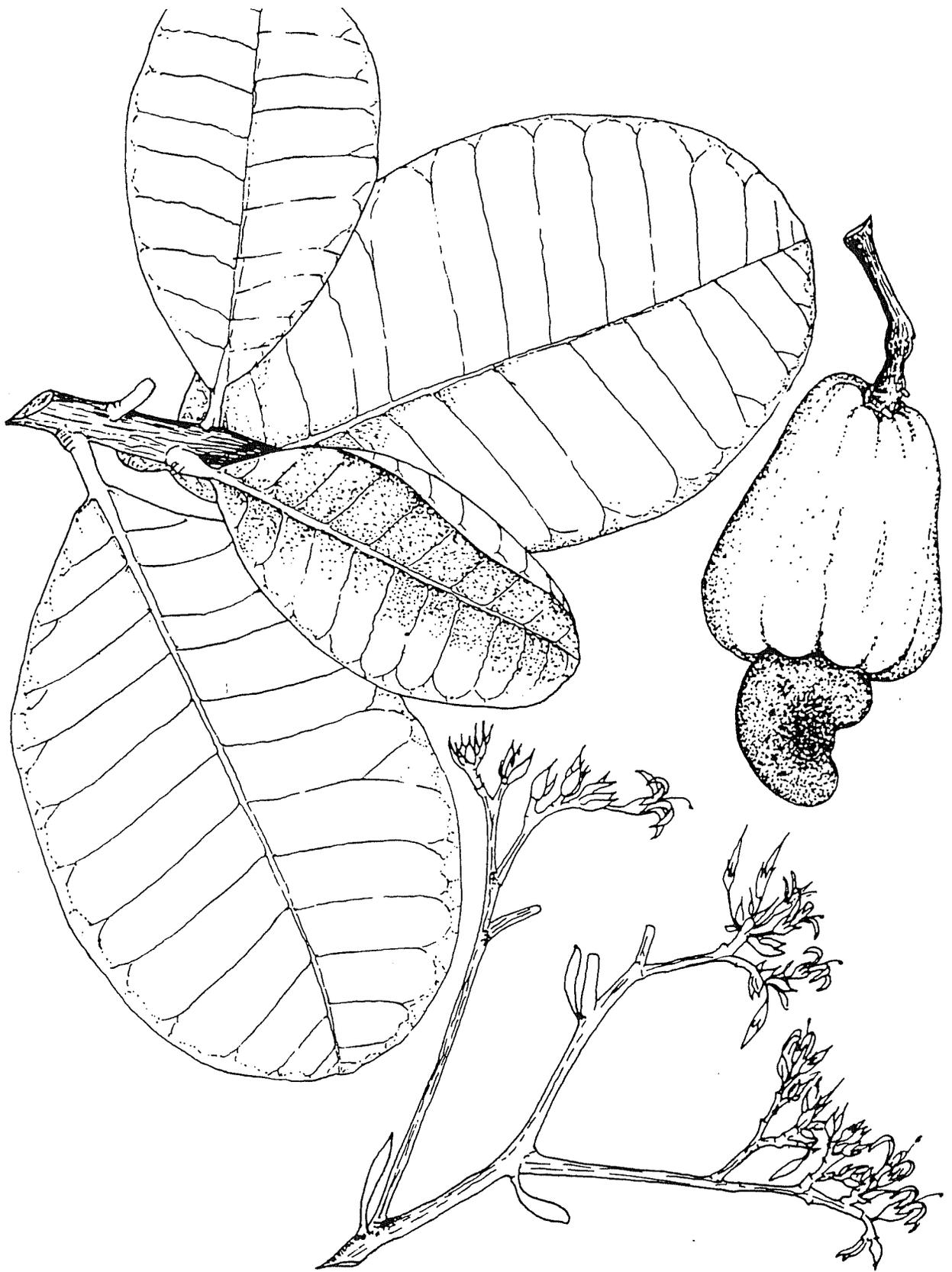


Fig. 16. *Anacardium occidentale* (Anacardiaceae).

- reniform nut surmounting an enlarged receptacle 1. *Anacardium*
2. Leaves lanceolate or oblong; sap resinous; petals straight; fruit (usually) ovoid or cordiform, an asymmetrically tapering drupe, not surmounting a receptacle 2. *Mangifera*

1. *Anacardium* Linnaeus

Evergreen trees or shrubs; plants polygamous (male and bisexual flowers borne on the same tree). Leaves alternate, simple, coriaceous, petiolate. Inflorescence a terminal panicle. Sepals 5; petals 5. Stamens 5-10, often only 1 of them fertile. Fruit a reniform "nut" (drupe) positioned laterally atop a large, fleshy "receptacle" (enlarged, accrescent apex of pedicel); seed reniform.

Literature: Mitchell, J.D. and S.A. Mori. 1987. The cashew and its relatives. *Memoirs of the New York Botanical Garden* 42: 1-76. Morton, J.F. 1961. The cashew's brighter future. *Economic Botany* 15(1): 57-78. Morton, J.F. 1967. Maranon. *La Hacienda* September, 1967: 6 pp. SECAB. 1989. *Anacardium occidentale*. *Especies Vegetales Promisorias* 1: 138-163.

1. *Anacardium occidentale* Linnaeus, *Species Plantarum* 383 (1753). KASJOE, KASJOEMA (Surinam), MEREHE (Surinamese Arawak), OROI (Surinamese Carib), DJAMBOE MONJET (Surinamese Malayan); CAJOU (French Guiana); CASHEW. Tree to 8 (-12) m; sap milky. Leaves broadly obovate or oblong-ovate, entire, obtuse, to 15 (-20) cm. Inflorescence a subcorymbose panicle, to 25 cm. Flowers yellowish-pink or reddish, c.7 mm wide, the petals reflexed at middle. Fruit comprising a red or yellow, pyriform or apple-shaped receptacle to 9 cm, bearing an apical, reniform nut to 3.5 cm.

Range: Tropical America. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); and as an ornamental in French Guiana (de Granville, 1985).

2. *Mangifera* Linnaeus

Evergreen trees; plants polygamous (male and female flowers borne on the same tree). Leaves alternate or subopposite, simple, coriaceous, petiolate. Inflorescence a terminal panicle. Sepals 4-5; petals 4-5. Stamens 1-5, with only 1 or 2 of them fertile. Fruit a fleshy, large, pendent drupe; seed flattened, covered by a dense mass of fibers.

1. *Mangifera indica* Linnaeus, *Species Plantarum* 200 (1753). MANJA (Surinam), MANGGA (Surinamese Malayan); MANGUIER (French Guiana); MANGO. Tree to 27 (-40) m. Leaves lanceolate or oblong, acuminate, entire, the margin slightly undulate, to 30 (-40) cm. Inflorescence to 50 cm, the branches reddish-hairy. Flowers pinkish-white, yellowish or greenish, to c.6 mm wide, the petals spreading; fertile stamen 1; style lateral on the ovary. Fruit ovoid, cordiform (heart-shaped) or reniform, often gradually and asymmetrically tapered to one end, green, yellow or red, to 20 x 8 cm.

Range: Tropical Asia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); at the Cultuurtuin, Paramaribo, Surinam (Teunissen &

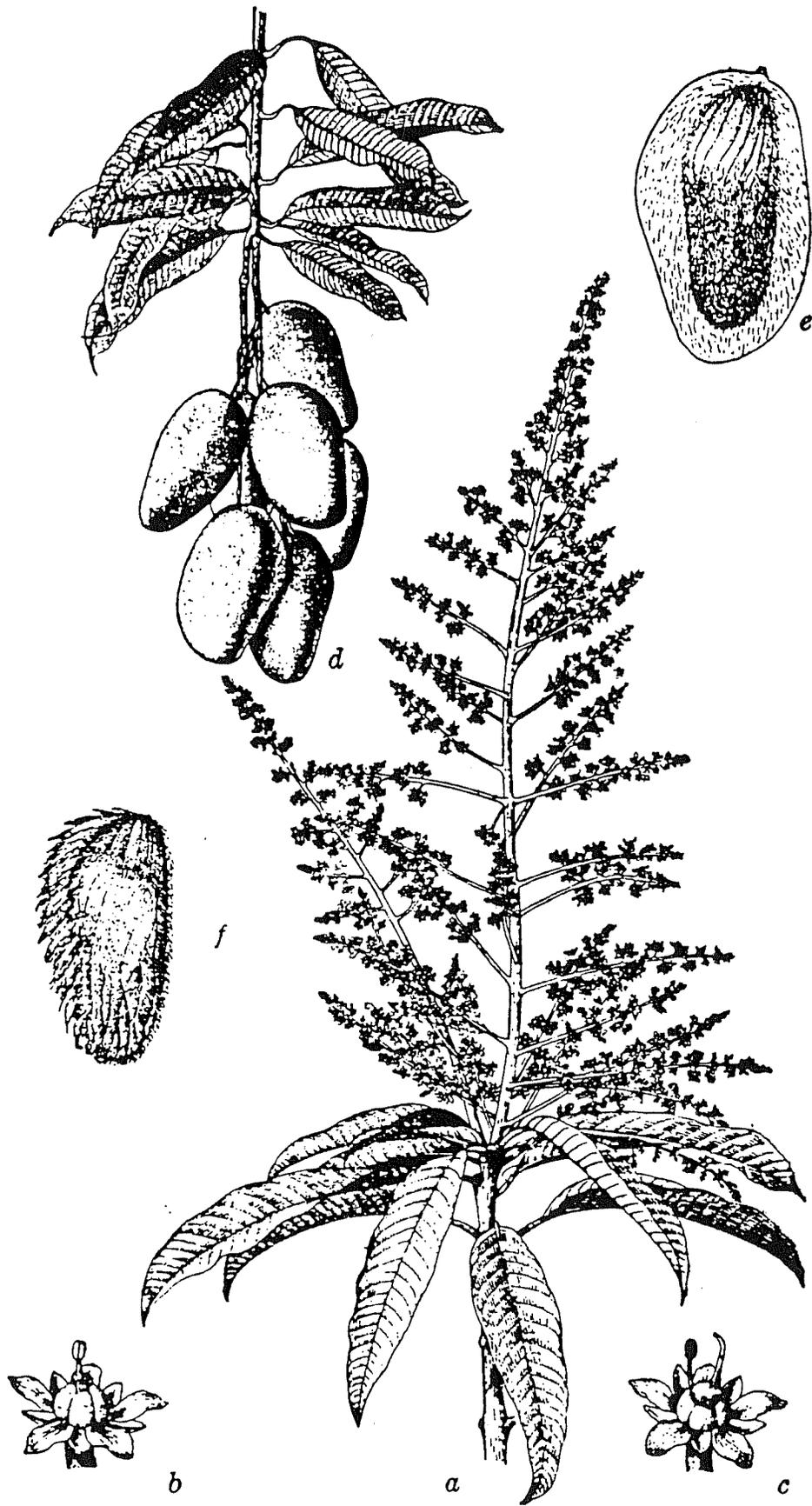


Fig. 17. *Mangifera indica* (Anacardiaceae).

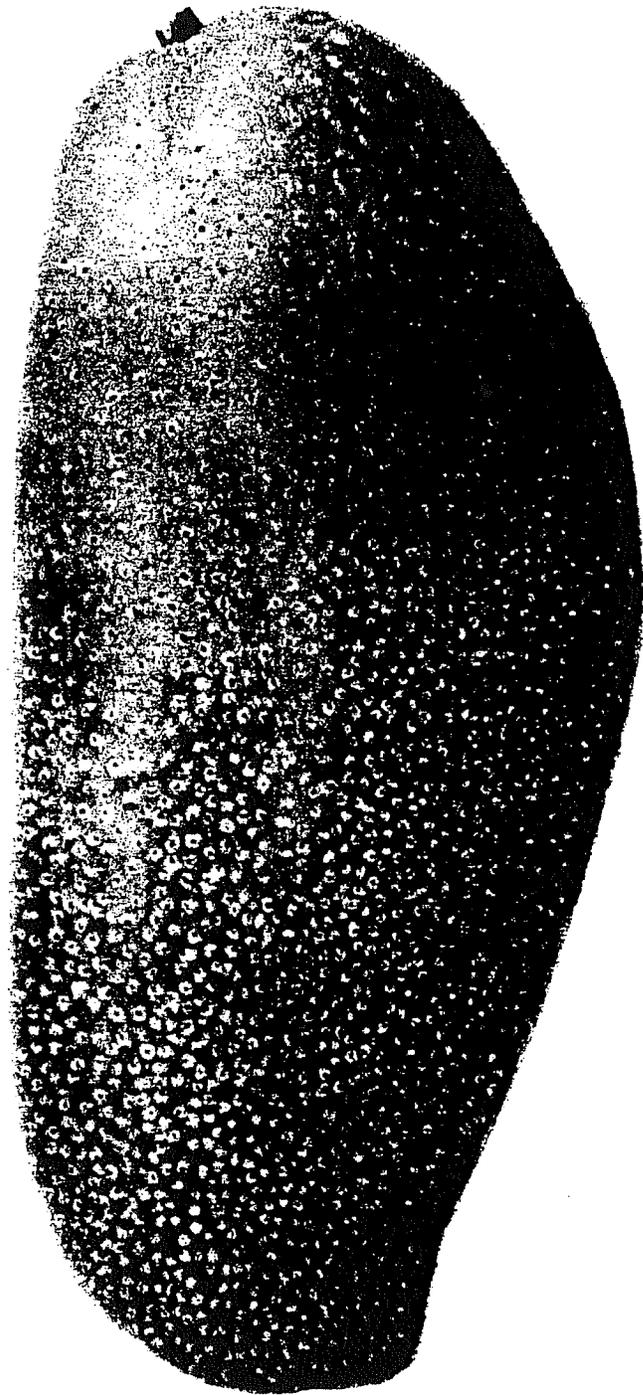


Fig. 18. *Mangifera indica* (Anacardiaceae).

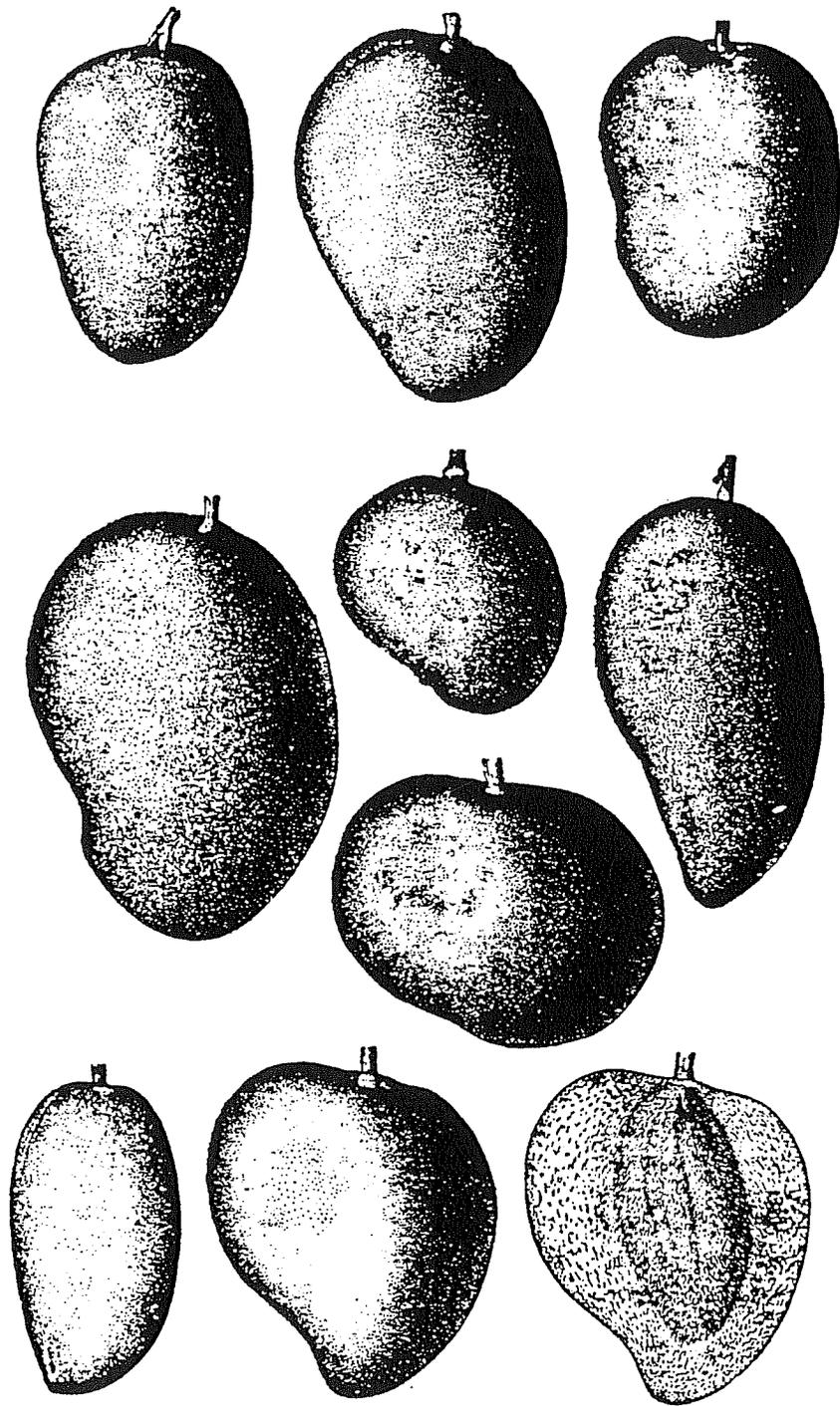


Fig. 19. *Mangifera indica* (Anacardiaceae).

Lande, 1980); and in the Jardin Botanique, Cayenne and elsewhere in French Guiana.

Literature: Singh, L.B. 1960. *The Mango*. London: Leonard Hill.

3. *Spondias* Linnaeus

Deciduous or semideciduous trees; plants polygamous (male, female and bisexual flowers borne on the same tree). Leaves alternate or subopposite, pinnately compound, imparipinnate, petiolate. Inflorescence a terminal raceme or panicle. Sepals 4-5. Petals 4-5, spreading. Stamens 8-10, all fertile. Fruit fleshy, ovoid, drupaceous; seeds 1 or several, enclosed in a stone.

Key to Species

1. Leaflets with low teeth; leaves to 75 cm; bark smooth, greenish 1. *S. cytherea*
1. Leaflets entire; leaves to 45 cm; bark furrowed with numerous spine-like projections, grey or brownish-white 2. *S. mombin*

1. *Spondias cytherea* Sonnerat, *Voyage aux Indes Orientales* 3: 242 (1782). (Synonym: *S. dulcis* Parkinson). CYTHERE (French Guiana), POMME DE CYTHERE (Surinam); GOLDEN APPLE, OTAHEITE APPLE. Tree to 18 m; bark smooth, greenish. Leaves to 75 cm; leaflets 5-11 pairs, elliptical or oblong, with low teeth, to c.9 cm. Flowers whitish or yellowish-green; stamens 10. Fruit yellow, tough-skinned, to 7.5 cm; seeds 1-5.

Range: Society Islands (French Polynesia). Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982) and frequently for ornament in French Guiana (de Granville, 1985A). Cultivated as a useful fruit tree in Surinam (Ostendorf, 1962) and represented in the Cultuurtuin, Paramaribo (Teunissen & Lande, 1980), and also as a fruit tree in French Guiana (Lemee, 1952).

2. *Spondias mombin* Linnaeus, *Species Plantarum* 371 (1753). HUBU (Surinamese Arawak), MOPE (Surinam), MOMBIN (French Guiana). Tree to 18 m; bark furrowed with numerous spine-like projections, grey or brownish-white. Leaves to 45 cm; leaflets 3-10 pairs, elliptical or ovate-lanceolate, entire, to 12.5 cm. Flowers yellowish-white; stamens 10. Fruit yellow, thin-skinned, to 5 cm; seeds 1-5.

Range: Tropical America, including the three Guianas. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982), and in French Guiana (de Granville, 1985). Cultivated as a useful fruit tree in Surinam (Ostendorf, 1962) and represented in the Cultuurtuin, Paramaribo (Teunissen & Lande, 1980).

Annonaceae

Evergreen or deciduous trees and shrubs. Leaves alternate, simple, entire, petiolate. Inflorescence of solitary or fasciculate flowers. Flowers regular, bisexual; sepals 3, united below in a shallow cup; petals 6, free, in 2 series. Stamens numerous; filaments short, fleshy. Ovary superior, 1-celled. Pistils few to numerous, free or connate. Fruit a fleshy syncarp (pistils adnate to a receptacle) or berry-like; seeds 1-numerous, often arillate.

Literature: Mennega, E.A. 1985.
Bibliography of the Annonaceae. 37
149 pp. Utrecht, The Netherlands: Institute
of Systematic Botany.

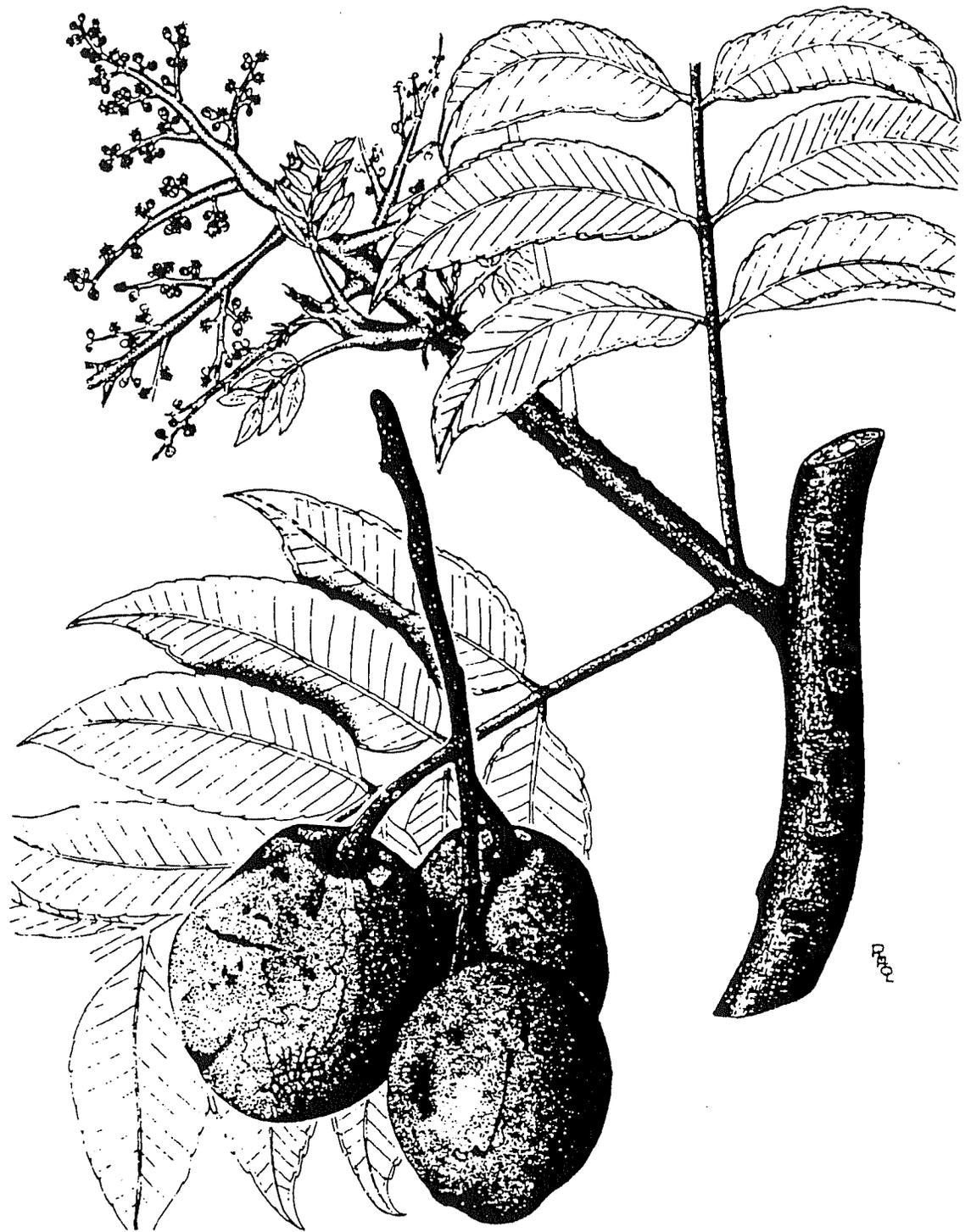


Fig. 20. *Spondias cytherea* (Anacardiaceae).



Fig. 21. *Spondias mombin* (Anacardiaceae).

1. *Cananga* (DeCandolle) J.D. Hooker & T. Thomson

Evergreen trees. Leaves alternate. Inflorescence of axillary fascicles of pedicellate flowers. Pistils numerous. Fruit an oblong, fleshy syncarp; seeds 4-12, flat, in 2 rows.

1. *Cananga odorata* (Lamarck) J.D. Hooker & T. Thomson, *Flora Indica* 1: 130 (1855). (Synonym: *Canangium odoratum* (Lamarck) King). KENANGA (Surinamese Javan), YLANG-YLANG. Tree to 24 m. Leaves ovate, lanceolate or oblong-lanceolate, acuminate, pubescent beneath, to 20 cm. Flowers pendent; petals subequal, greenish-yellow to ivory white, linear, to 12.5 x 1.3 cm. Fruit pedicellate, greenish or black, to c.2.5 cm; seeds 4-5.

Range: Southeast Asia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982), having been present there since the 1930's (Department of Agriculture, 1934).

Surinamese Javans grow the plant for the flowers, used to scent clothing and hair (Ostendorf, 1962). Distilled flowers are the source of ylang-ylang, a perfume oil produced in quantity in the Philippines.

Apocynaceae

Trees, shrubs, woody-based herbs, or vines; sap milky, often poisonous. Leaves alternate, opposite, whorled or spirally arranged, simple, entire, sessile or petiolate. Inflorescence a terminal or lateral cyme, raceme, corymb or panicle, or flowers solitary. Flowers bisexual; sepals 5, usually united at the base in a 5-toothed calyx, the teeth often with squamellate basal glands inside; petals 5, united below in a funnellform or salverform corolla-tube, sometimes with 5 scales (appendages) inside throat at orifice. Stamens 5, included or exserted, sometimes arching over head of stigma; anthers free or united at apex, sometimes sagittate at base or with terminal awn-like appendage. Ovary superior (rarely semi-inferior), 2-carpellate, syncarpous or apocarpous, 2-celled. Fruit a follicle, berry or drupe; seeds winged, naked, or with tuft(s) of hair.

Key to Genera

1. Trunk obesely gouty-swollen; seeds with 2 tufts of hair (at apex and base) 1. *Adenium*
1. Trunk not swollen as above; seeds without, or with only one, tuft of hair.
 2. Climbing vines.
 3. Fruit a spiny capsule; seeds concentrically winged 2. *Allamanda*
 3. Fruit of paired, non-spiny follicles; seeds with a tuft of hair at one end 5. *Odontadenia*
 2. Shrubs or trees.
 4. Fruit a capsule or drupe.
 5. Fruit a spiny capsule; ovary syncarpous; seeds concentrically winged; leaves opposite or whorled, obovate or oblanceolate; corolla without scales in the throat 2. *Allamanda*
 5. Fruit a 3- or 4-angled drupe; ovary apocarpous; seeds not winged; leaves alternate or spirally arranged, linear; corolla with 5 scales in the throat 8. *Thevetia*
 4. Fruit of 2 paired follicles.

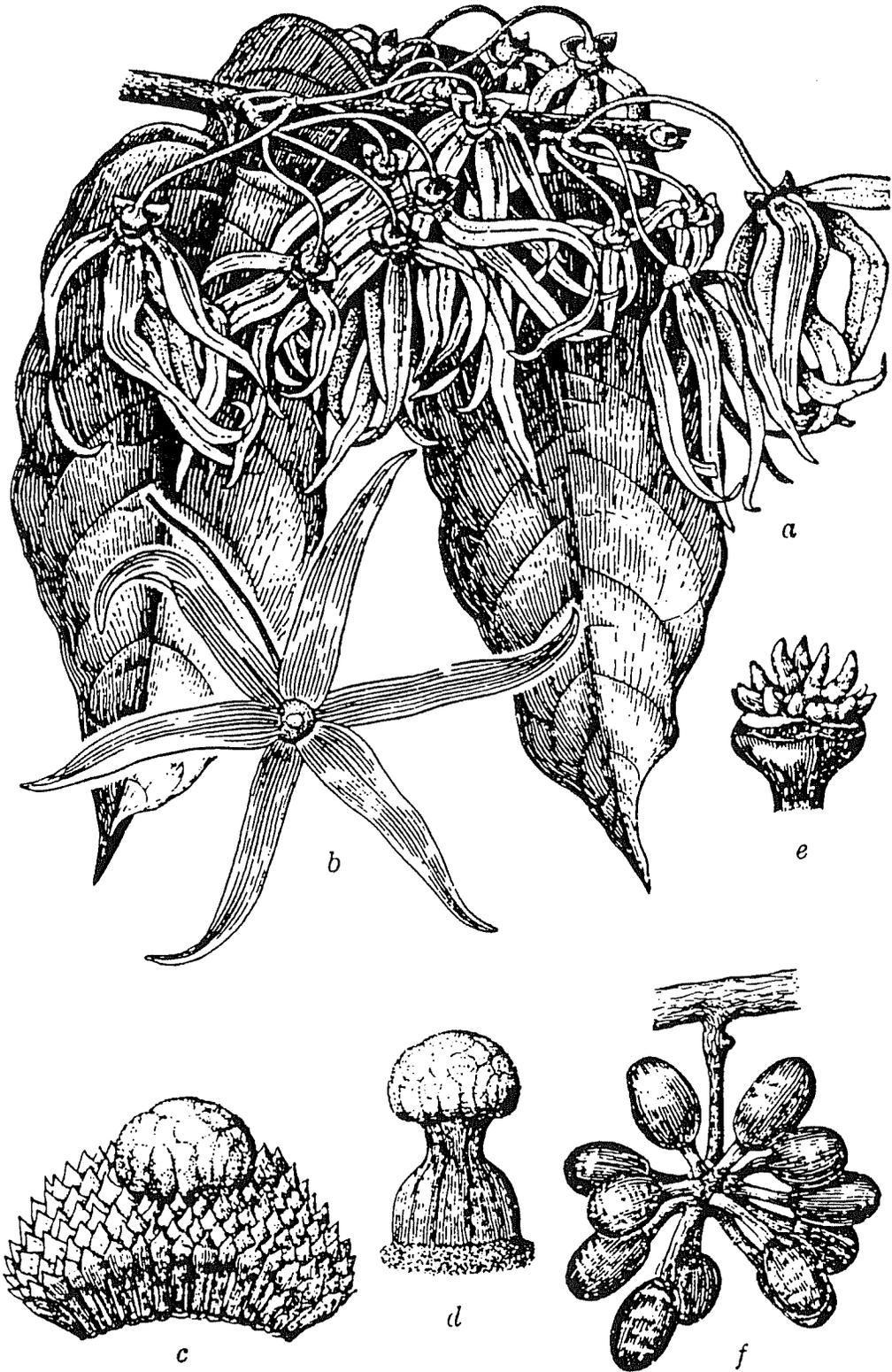


Fig. 22. *Cananga odorata* (Annonaceae).

- 6. Herb; deciduous; seeds reticulately pitted 3. *Catharanthus*
- 6. Shrub or tree; usually evergreen; seeds not pitted.
- 7. Corolla with 5 scales in the throat; anthers united; seeds with apical tuft of hair; leaves in whorls of 3 4. *Nerium*
- 7. Corolla without scales in the throat; anthers free; seeds without tuft of hair; leaves opposite or spirally arranged.
- 8. Leaves spirally arranged; anthers not sagittate; seeds winged at one end 6. *Plumeria*
- 8. Leaves opposite, those of a pair unequal in size; anthers sagittate; seeds not winged 7. *Tabernaemontana*

Beaumontia grandiflora (Roxburgh) Wallich, HERALD'S TRUMPET, is a Himalayan vine with paired follicles and a white, trumpet-shaped corolla to 10 cm; it is grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986). The flower of *Beaumontia* may superficially resemble that of *Solandra* (Solanaceae).

Carissa grandiflora (E.H. Meyer) A. DeCandolle, the NATAL PLUM from South Africa, is a woody shrub to 9 m. with large, forked spines, white flowers and a plum-like, edible fruit; it is occasionally grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986).

Strophanthus preussii Engler & Pax, a West African shrub with very long-caudate corolla lobes, is sometimes grown as an ornamental in Georgetown, Guyana (Ted Hubbard, pers. comm., 1986).

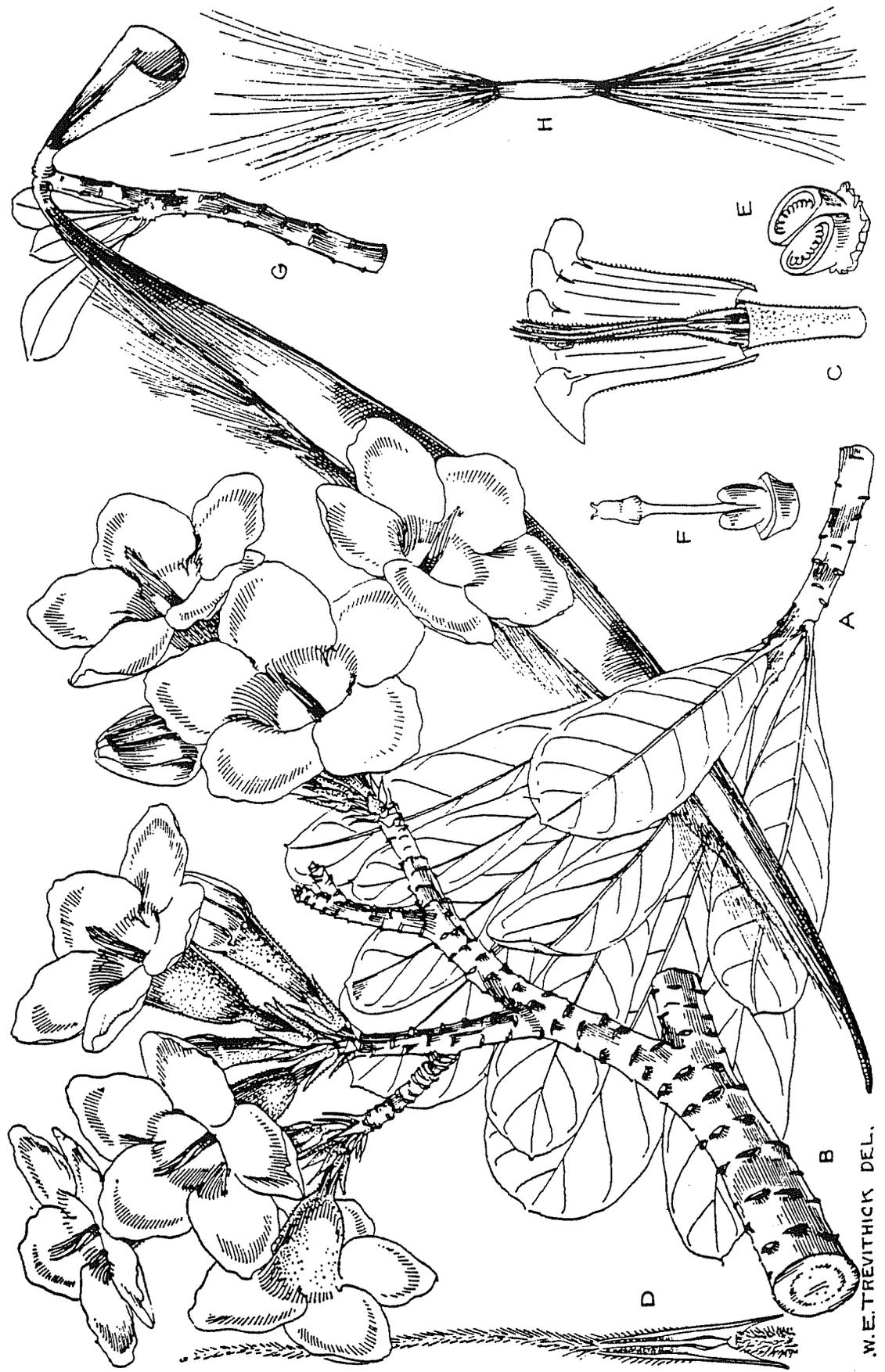
1. *Adenium* Roemer & Schultes

Evergreen or deciduous, unarmed trees or shrubs; stems succulent; sap milky. Leaves alternate or spirally arranged, somewhat succulent, entire, petiolate. Inflorescence a terminal corymb. Flowers bisexual; petals 5, united below in a funnelform or salverform, 5-lobed corolla-tube. Stamens 5, pubescent; anthers united in a cone, with filiform apical appendage and sagittate base. Fruit of 2 paired, narrow follicles; seeds numerous, linear-oblong, with tuft of long, retrorsely barbellate hair at each end.

1. *Adenium obesum* (Forsskal) Roemer & Schultes, *Systema Vegetabilium* ed.16, 4: 411 (1819). DESERT ROSE, IMPALA LILY. Shrub or tree to 4.5 m; trunk obesely swollen; branches forked, greyish-green, with prominent leaf-scars. Leaves spirally arranged, in clusters at apex of branches, very shortly petiolate, obovate, glabrous or tomentose, to 15 cm. Corolla salverform, pubescent outside, to 5 x 6.5 cm; lobes undulate, bright pink or white, with dark red margin. Stamens slightly exerted by the appendages.

Range: Eastern Africa to Arabia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (Ted Hubbard, pers. comm., 1985).

Literature: Dimmitt, M.A. and C. Hanson. 1991. The genus *Adenium* in cultivation. Part I: *A. obesum* and *A. multiflorum*. *Cactus and Succulent Journal* (U.S.) 63(5): 223-225.



W.E.TREVITHICK DEL.

Fig. 23. *Adenium obesum* (Apocynaceae).

2. *Allamanda* Linnaeus

Unarmed, evergreen shrubs or vines; sap milky. Leaves whorled or opposite, entire, shortly petiolate. Inflorescence a terminal or axillary cyme or panicle. Flowers bisexual; sepals 5, free, unequal; petals 5, united in a funnellform, 5-lobed corolla-tube. Stamens 5, epipetalous, free except at joined apices, included. Fruit a densely spinose capsule; seeds numerous, flat, concentrically winged.

The genus *Allamanda* is named for the Swiss physician Frederic Allamand (born 1735), who visited Surinam in 1756 and 1760, and made available his botanical annotations of those trips to Carl Linnaeus (Markgraf & Steiger, 1969).

Literature: Sakane, M. and G.J. Shepherd. 1986. A revision of the genus *Allamanda* L. (Apocynaceae). *Revista Brasileira de Botanica* 9(2): 125-149. Markgraf, F. and R. Steiger. 1969. F. Allamand und seine botanischen Beobachtungen. *Taxon* 18(4): 421-424.

Key to Species

- | | |
|--|-------------------------|
| 1. Plant to 6 (-15) m; corolla to 12.2 cm wide | 1. <i>A. cathartica</i> |
| 1. Plant to 1.5 m; corolla to 6.3 cm wide | 2. <i>A. schottii</i> |

1. *Allamanda cathartica* Linnaeus, *Mantissa Plantarum* 214 (1771). BAREDABALLI (Surinamese Arawak), WILKENSBITA (Surinam); GOLDEN TRUMPET. Clambering vine to 6 (-15) m; sap poisonous. Leaves in whorls of 3-4, or opposite, obovate. Corolla yellow, sometimes striped with faint orange veins inside tube, to 12.2 cm wide.

Range: Northern South America, including the three Guianas. Grown as an ornamental at Timehri Airport and in gardens near New Hope, as well as at the Botanic Gardens, Georgetown, Guyana; in gardens and indoors in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana.

2. *Allamanda schottii* Pohl, *Plantarum Brasiliae Icones et Descriptiones* 1: 58 (1827). (Synonym: *A. neriifolia* Hooker). BUSH ALLAMANDA. Low shrub to 2.5 m. Leaves in whorls of 3-5, or opposite, oblanceolate. Corolla yellow, striped with orange veins inside tube, to 6.3 cm wide.

Range: Brazil. Grown as an ornamental in Surinam (Ostendorf, 1962).

3. *Catharanthus* G. Don

Deciduous annual or perennial herbs; sap slightly milky. Leaves opposite, entire, sessile or shortly petiolate, stipulate. Inflorescence of solitary, axillary flowers, or few-flowered axillary cymes. Flowers bisexual; sepals 5, free; petals 5, united in a cylindrical, 5-lobed corolla-tube, the limb salverform, the throat with 2 rings of hair, one of which closes the orifice (opening, or eye) of the throat. Stamens 5, free, inserted at throat of corolla-tube and included in it; anthers subsessile, sagittate, glabrous. Stigma a drum-shaped cap upon the narrow style. Fruit of 2 paired follicles; seeds numerous, verrucose, pitted.

1. *Catharanthus roseus* (Linnaeus) G. Don, *General History of the Dichlamydeous Plants*

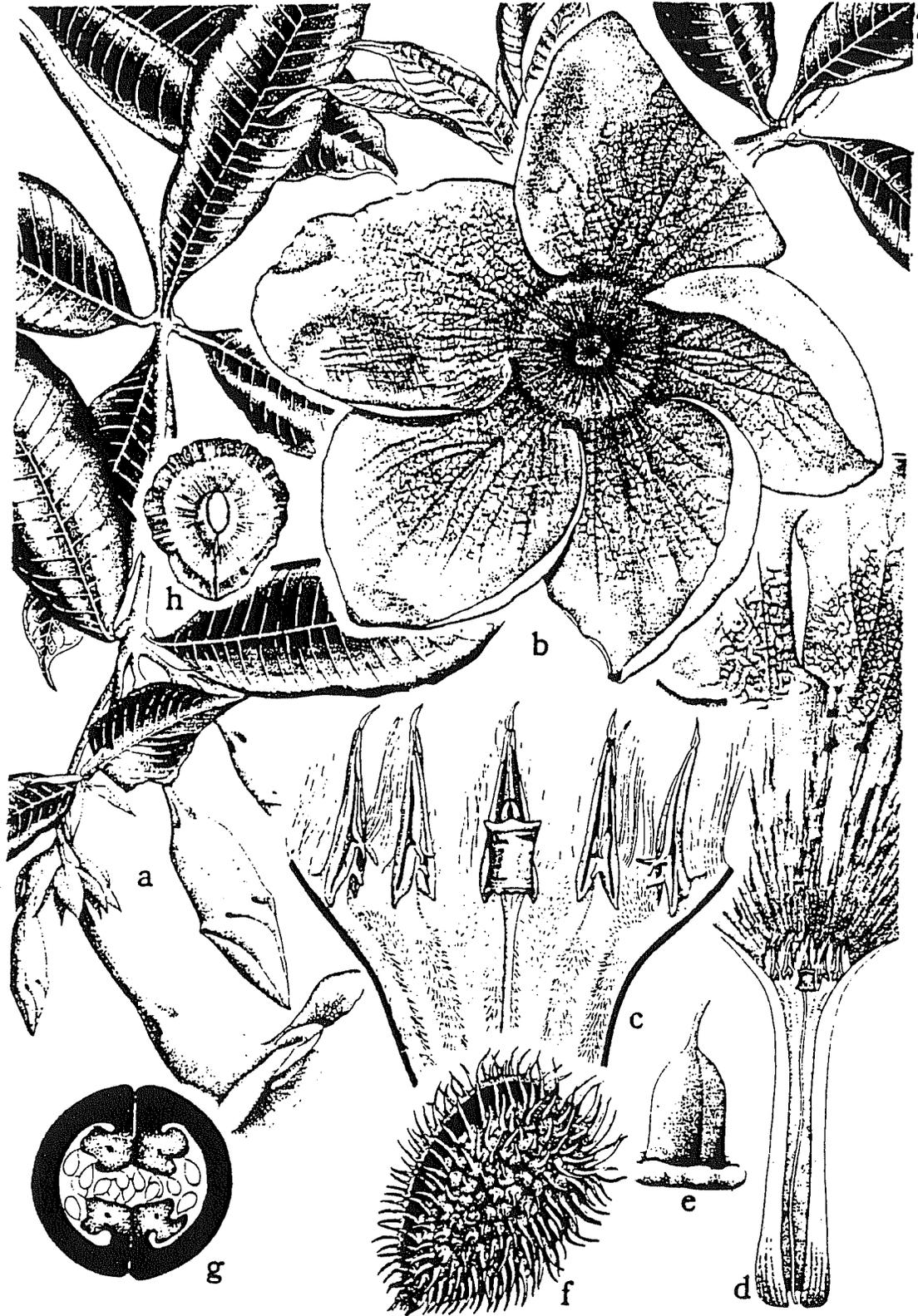


Fig. 24. *Allamanda cathartica* (Apocynaceae).

4: 95 (1838). (Synonyms: *Vinca rosea* Linnaeus, *Lochnera rosea* (Linnaeus) Reichenbach). MADAGASCAR PERIWINKLE; CACA-POULE (French Guiana); KOTOMISI (Surinamese Carib); JONGEMANSLIEFDE, SOLDATENBLOEM (Surinam). Annual or woody-based perennial herb to 80 cm. Leaves deciduous, oblong, elliptical or obovate, pubescent, shining, to 9 x 3.5 cm. Flowers subsessile, 1-4 together in axillary cymes of upper leaves. Corolla to 3 (tube) x 4 (limb) cm, pink, red, purple or white; lobes obovate or dolabriform (axehead-shaped), apiculate or aristulate. Fruit linear, pubescent, to 3.5 cm; seeds oblong, black.

Range: Madagascar. Pink-, red-, and purple-flowered plants are variously grown as ornamentals at the Promenade Gardens and Botanic Gardens, Georgetown and Timehri Airport, Guyana; and on hotel grounds and at the Jardin Botanique, Cayenne as well as elsewhere in French Guiana. The completely white-flowered cv. *Albus* is grown for ornament at the Esther Stichting and on hotel grounds in Paramaribo, Surinam. Cultivar *Ocellatus* (or, cv. *Bright Eyes*) has white flowers with a red or deep pink eye, and is grown in gardens of Paramaribo, Surinam.

Literature: Plaizier, A.C. 1981. A revision of *Catharanthus roseus* (L.) G. Don (Apocynaceae). *Mededeelingen van de Landbouwhogeschool Wageningen* 81-9: 1-12. Taylor, W.I. and N.R. Farnsworth. 1975. *The Catharanthus Alkaloids*. 323 pp. New York: Marcel Dekker, Inc.

Alkaloids isolated from this species are used in modern medicine for treating certain human neoplasms (cancer), acute children's leukemia, and Hodgkin's disease.

4. *Nerium* Linnaeus

Evergreen shrubs or small trees; sap milky, poisonous. Leaves opposite or whorled, entire, subsessile or petiolate. Inflorescence a terminal cyme or thyrse. Flowers bisexual; sepals 5, free, with numerous basal squamellae inside; petals 5, united in a funnelform, 5-lobed corolla-tube, the throat ringed inside at orifice with 5 lacinate scales. Stamens 5, included or subexserted; anthers united, with filiform apical appendage and sagittate base. Fruit of 2 paired follicles; seeds numerous, with tuft of long hair at apex.

Literature: Pagen, F.J.J. 1987. Oleanders: *Nerium* L. and the oleander cultivars. 113 pp. *Agricultural University Wageningen Papers* 87-2. Wageningen, The Netherlands.

1. *Nerium oleander* Linnaeus, *Species Plantarum* 209 (1753). LAURIER ROSE (French Guiana); OLEANDER. Shrub or small tree to 6 m; young stems puberulent. Leaves in whorls of 3, coriaceous, narrowly elliptical or linear-lanceolate, glabrous, with conspicuous midvein, dark green above, paler beneath, the blade to 21 cm; petiole to 1 cm. Flowers (cultivated specimens) sometimes double or triple and sterile; corolla white, yellow, pink, pinkish-orange, scarlet or purple, the face to 7.5 cm wide. Fruit pendulous, to 17.5 cm.

Range: Mediterranean Sea region to India. Grown as an ornamental in the Promenade Gardens, Georgetown and gardens elsewhere in Guyana, and along the Route de Montabo, Cayenne, French Guiana. The pink-flowered cv. *Roseum* is planted at the Esther Stichting near Paramaribo and in gardens of Paramaribo, Surinam.

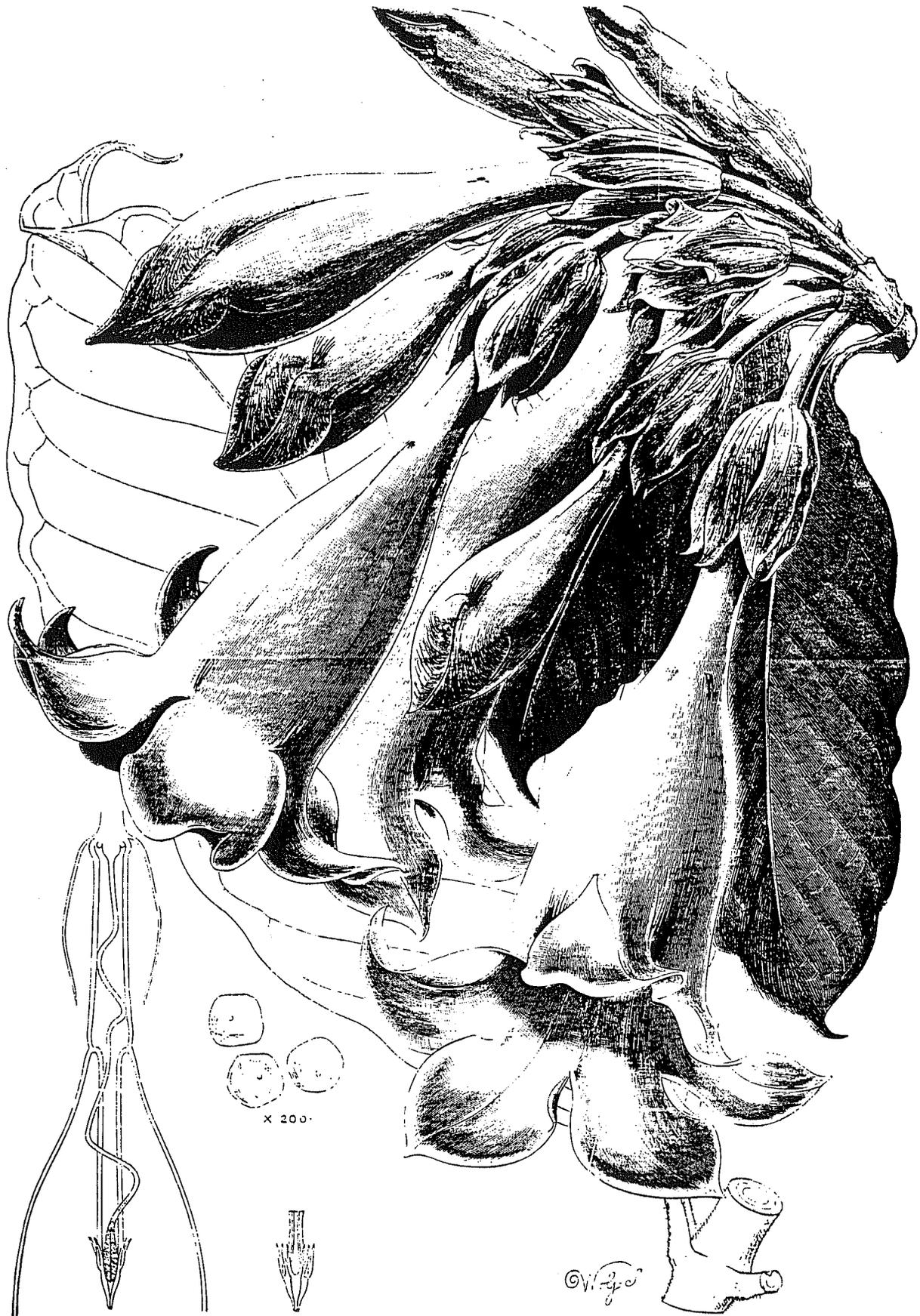


Fig. 25. *Beaumontia grandiflora* (Apocynaceae).

The sap, leaves, wood, flowers, stems and roots of this plant are extremely poisonous to livestock and humans, whether ingested (eaten), touched, or inhaled in smoke from the burning plant. As noted by Pagen (1987), there are 401 distinct cultivars of this species, of which about 175 are presently available in trade around the world.

5. *Odontadenia* Benth

Shrubby, climbing vines; sap milky. Leaves opposite, petiolate, stipulate or exstipulate. Inflorescence a terminal or axillary raceme, cyme, thyrse or panicle. Flowers bisexual; sepals 5, free, equal or unequal, with basal squamellae inside; petals 5, united in a funnellform or salverform, 5-lobed corolla-tube. Stamens 5, included; anthers united above the stigma, sagittate. Fruit of 2 paired follicles (one sometimes aborted); seeds numerous, cylindrical to terete, with a long tuft of hair at apex.

1. *Odontadenia macrantha* (Roemer & Schultes) Markgraf in Pulle, A., ed., *Flora of Suriname* 4(1): 461 (1937). (Synonyms: *O. grandiflora* (G. Meyer) Miquel, *O. speciosa* Benth). TOPOE KENG, KIERAPOLANG, MELKI TETEI (Surinamese Carib). Tall-climbing vine; stems hollow, often rooting at the nodes if touching the ground. Leaves elliptical or lanceolate, glabrous, to 20 (-36) cm; stipules ovate, to 3 mm. Inflorescence a cyme or thyrse. Corolla orange-yellow or apricot, tinged reddish inside, the face to 7.5 cm wide. Fruit woody, oblong-ellipsoid, to 22 x 6 cm.

Range: Trinidad; Central and South America, including the three Guianas. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

6. *Plumeria* Linnaeus

Evergreen or deciduous trees and shrubs; stems often hollow, with prominent leaf-scars; sap milky. Leaves spirally arranged, crowded at tips of branches, entire, petiolate. Inflorescence a terminal cyme, corymb, thyrse or panicle. Flowers bisexual; sepals 5, free, small, with apical gland; petals 5, united in a funnellform or salverform, 5-lobed corolla-tube, the tube villous throughout inside. Stamens 5, free, included. Ovary half-inferior. Fruit of 2 paired follicles; seeds numerous, flat, with irregular long wing at one end.

Literature: Criley, R.A. and J. Little. 1991. The Moragne plumerias. *American Horticulturist* 70(4): 16-21. Menninger, E.A. 1950. Frangipani, a tree of tropical America. *Journal of the New York Botanical Garden* 51(611): 265-268.

Key to Species

1. Leaves oblong-linear, 0.5-1.5 (-4) cm wide, with puckered-revolute margin, without a vein parallel to the margin to which the main lateral veins are joined; corolla white
1. *P. alba*
1. Leaves elliptical or oblong-lanceolate, 10-15 cm wide, with flat margin, with a prominent vein parallel to the margin to which the main lateral veins are joined; corolla white, yellow, pink or rose-red
2. *P. rubra*

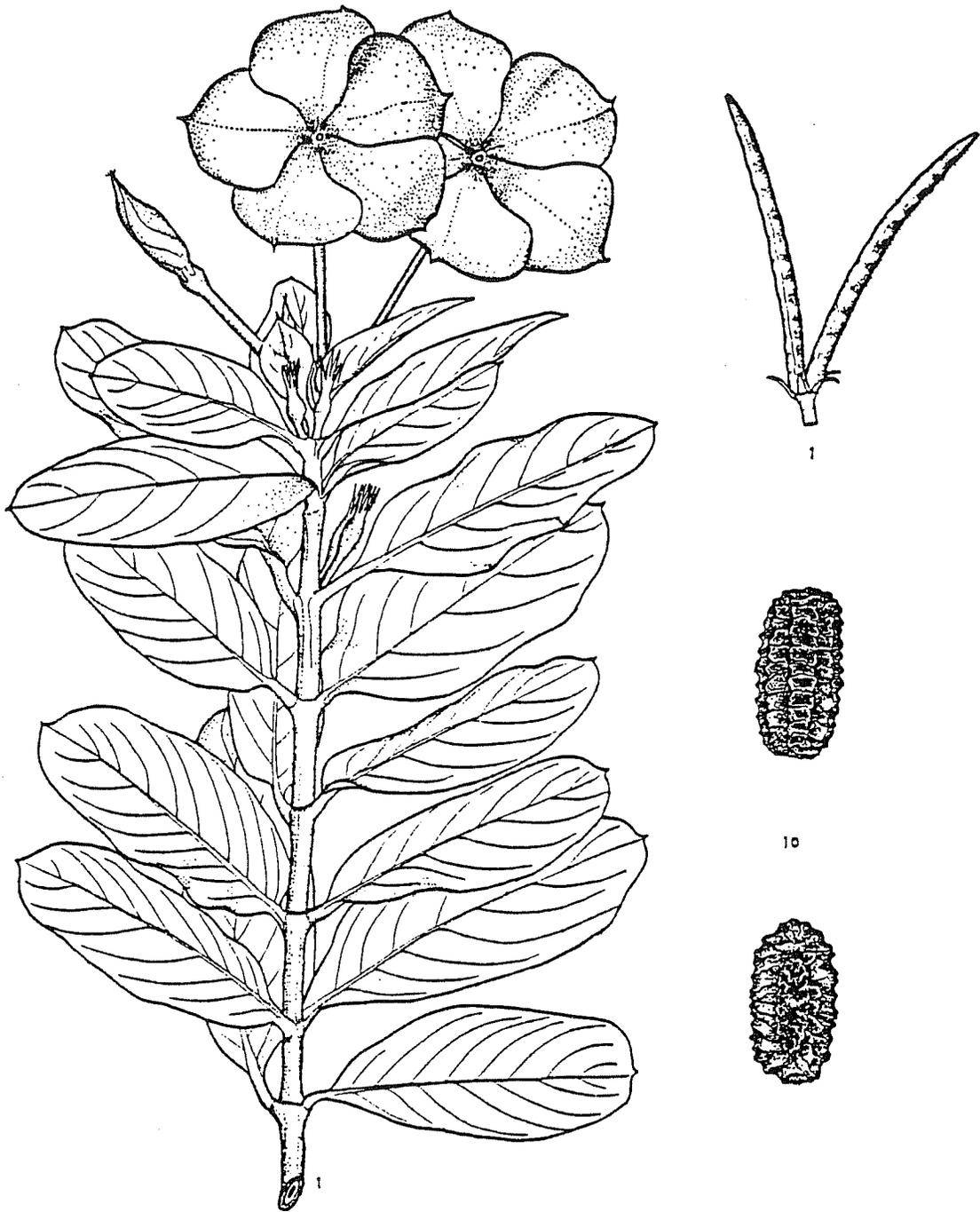


Fig. 26. *Catharanthus roseus* (Apocynaceae).

1. *Plumeria alba* Linnaeus, *Species Plantarum* 210 (1753). FRANGIPANIER BLANC (French Guiana). Tree to 12 m. Leaves oblong-linear, to 30 x 0.5-1.5 (-4) cm, with puckered-revolute margin, densely pubescent beneath. Corolla salverform, white with a yellow eye, the face to 7.5 cm wide, the tube to c.2.2 cm. Fruit to 15 cm.

Range: West Indies. Grown as an ornamental on Main Street, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and at the Jardin Botanique, on hotel grounds and elsewhere in Cayenne, French Guiana.

Literature: SECAB. 1989. *Plumeria alba*. *Especies Vegetales Promisorias* 1: 367-373.

2. *Plumeria rubra* Linnaeus, *Species Plantarum* 209 (1753). (Synonym: *P. purpurea* Ruiz & Pavon). FRANGIPANI. Tree to 8 m; branches swollen, pale green, semi-succulent. Leaves elliptical or oblong-lanceolate, to 50 x 10-15 cm, with flat margin, glabrous to densely pubescent beneath. Corolla salverform, white, yellow, pink or rose-red, often with a yellow eye, the face to c.10.5 cm wide, the tube to 2.5 cm. Fruit to 30 cm.

Range: Mexico and Central America.

Literature: Popham, S. 1980. The temple trees (*Plumeria rubra*). *Bulletin of the Pacific Tropical Botanical Garden* 10(3): 62-64. Steenis, C.G. van. 1937. Kambodja's. *De Tropische Natuur* 26: 63-66. Stone, B.C. 1970. Fruits and seeds of the frangipani (*Plumeria*). *Malayan Nature Journal* 23(4): 143-144. SECAB. 1989. *Plumeria rubra*. *Especies Vegetales Promisorias* 1: 374-378.

Key to Cultivars

- 1. Corolla pink or rose-red (usually with a yellow eye) 2b. f. *rubra*
- 1. Corolla white or yellow.
 - 2. Corolla white (usually with a yellow eye, occasionally flushed with pink on outer surface) 2a. f. *acutifolia*
 - 2. Corolla yellow (occasionally flushed with pink on outer surface) 2c. f. *lutea*

2a. *P. rubra* f. *acutifolia* (Poiret) Woodson, *Annals of the Missouri Botanical Garden* 25(1): 211 (1938). (Synonym: *P. acuminata* Aiton). KAMBODJA (Surinamese Javan); PAGODA TREE. Range: Grown as an ornamental in Surinam (Ostendorf, 1962).

2b. *P. rubra* f. *rubra*. FRANGIPANIER ROSE (French Guiana). Range: Grown as an ornamental in yards along Kwattaweg road outside Paramaribo, and in a garden near the University, Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

2c. *P. rubra* f. *lutea* (Ruiz & Pavon) Woodson, *Annals of the Missouri Botanical Garden* 25(1): 211 (1938). Range: Perhaps grown as an ornamental in Surinam (Ostendorf, 1962).

7. *Tabernaemontana* Linnaeus

Armed or unarmed, evergreen trees and shrubs. Leaves opposite, with one of a pair often larger than the other, entire, petiolate. Inflorescence a terminal or axillary cyme,



Fig. 27. *Nerium oleander* (Apocynaceae).

umbrella
7
corymb or umbel. Flowers bisexual; sepals 5, united below in a 5-toothed calyx-tube, the teeth minutely glandular-squamellate at base inside; petals 5, united in a salverform, 5-lobed calyx-tube. Stamens 5, free, included; anthers sagittate at base. Fruit of 2 paired follicles; seeds 1-numerous, ribbed, arillate.

1. *Tabernaemontana divaricata* (Linnaeus) R. Brown ex Roemer & Schultes, *Systema Vegetabilium* ed.16, 4: 427 (1819). (Synonyms: *T. coronaria* (Jacquin) Willdenow, *Ervatamia coronaria* (Jacquin) Stapf). DUBBELE JASMIJN, JASMIJN (Surinam); KEMBANG MANTEGA (Surinamese Malayan); JASMIN (French Guiana); CRAPE JASMINE. Unarmed shrub to 4 m. Leaves of a pair unequal in size, elliptic-oblong or oblong-lanceolate, glabrous, to 16 cm. Flowers sometimes double (cv. Flore Pleno); corolla white, with a tiny yellow eye, the face to c.3.7 cm wide, the tube to 2.2 cm, the lobes broadly falcate, with undulate margin. Fruits oblong, recurved, to 5 (-7.5) cm; aril red.

Range: India. Grown as an ornamental at the Cultuurtuin, Paramaribo and elsewhere in Surinam (Ostendorf, 1962; Teunissen & Lande, 1980); and in French Guiana (de Granville, 1985).

Literature: Allorge, L. 1983. *Morphologie, Systematique, Chimio-taxonomie et Biogeographie des Tabernaemontanoidees (Apocynacees) Americaines*. 545 pp. Ph.D. Thesis. Universite de Paris-Sud, Centre d'Orsay.

This plant is used in herbal medicine in Southeast Asia, for complaints as diverse as eye disease and diarrhoea; the chemical constituents are summarized by Allorge (p. 484, 1983).

8. *Thevetia* Linnaeus

Evergreen trees and shrubs; sap milky, poisonous. Leaves alternate or spirally arranged, entire, sessile or petiolate. Inflorescence of terminal and lateral, pedunculate cymes. Flowers bisexual; sepals 5, united below in a 5-toothed calyx, the teeth with squamellate glands inside; petals 5, united in a funnellform or salverform, 5-lobed corolla-tube, the tube with 5 pubescent scales in the throat, the throat pubescent inside below the scales. Stamens 5, free, included; anthers with lamellate terminal appendage. Fruit a 3- or 4-angled drupe, wider than long; seeds 2-4 inside a woody stone.

1. *Thevetia peruviana* (Persoon) K. Schumann in Engler & Prantl, *Die Natürlichen Pflanzenfamilien* 4(2): 159 (1895). (Synonym: *T. neriifolia* Jussieu ex Steudel). JORO-JORO, JURRI-JURRI (Surinamese Bush Negro); SEWEJOE (Surinamese Arawak); KARAWASSI (Surinamese Carib); LAURIER JAUNE (French Guiana); YELLOW OLEANDER. Shrub or tree to 9 m; all parts poisonous. Leaves crowded on the branches, spirally arranged or alternate, linear, glabrous, shining above, the margin slightly revolute, to 15 x 1 cm, subsessile and decurrent at the base. Corolla yellow, to 8 cm; face to 5 cm wide. Fruit red or black, to 2.5 (-4) x 5 cm; seeds brown, 1 x 2.5 cm.

Range: South America. Grown as an ornamental at the Promenade Gardens, Georgetown, Guyana; and in French Guiana (de Granville, 1985).

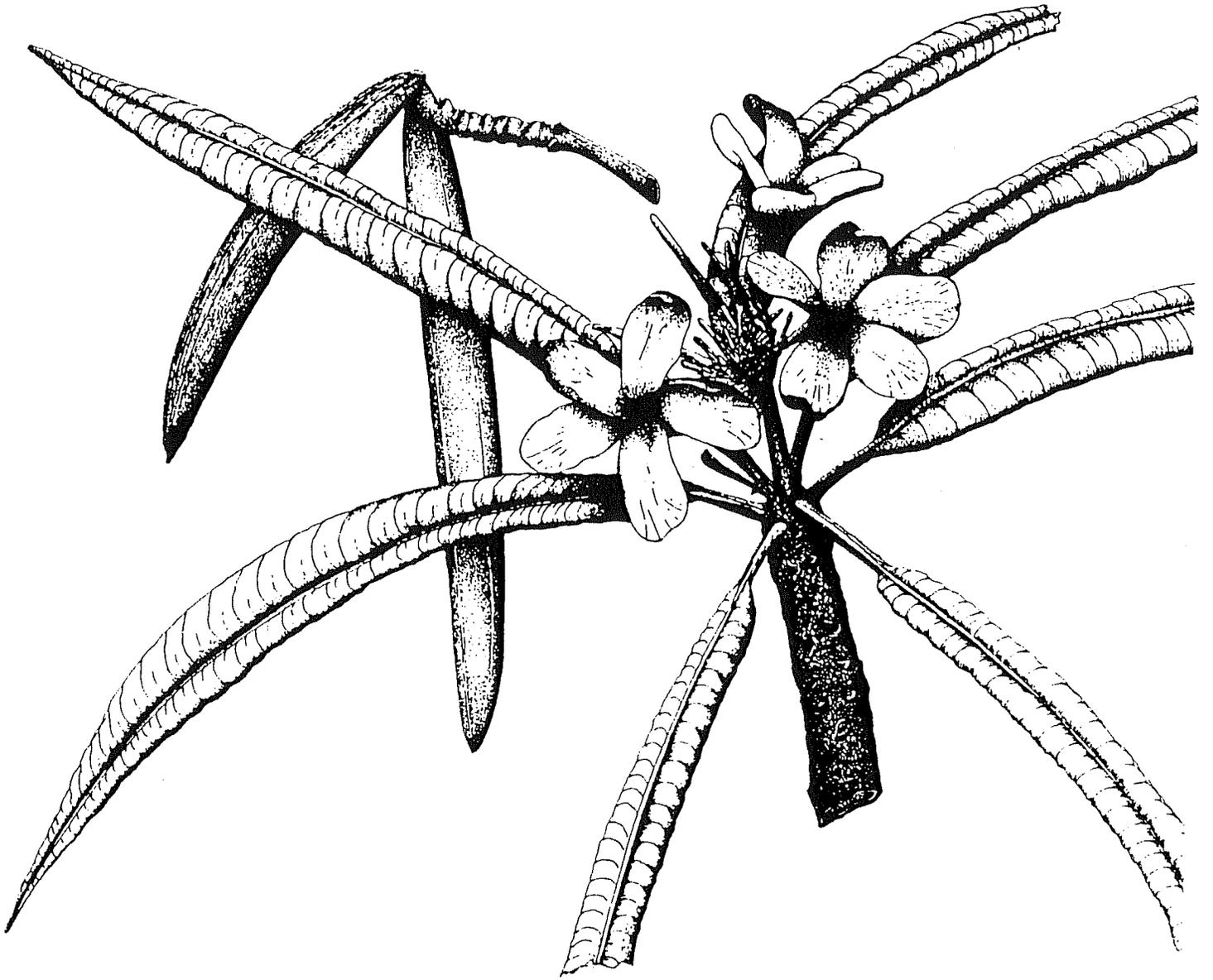


Fig. 28. *Plumeria alba* (Apocynaceae).

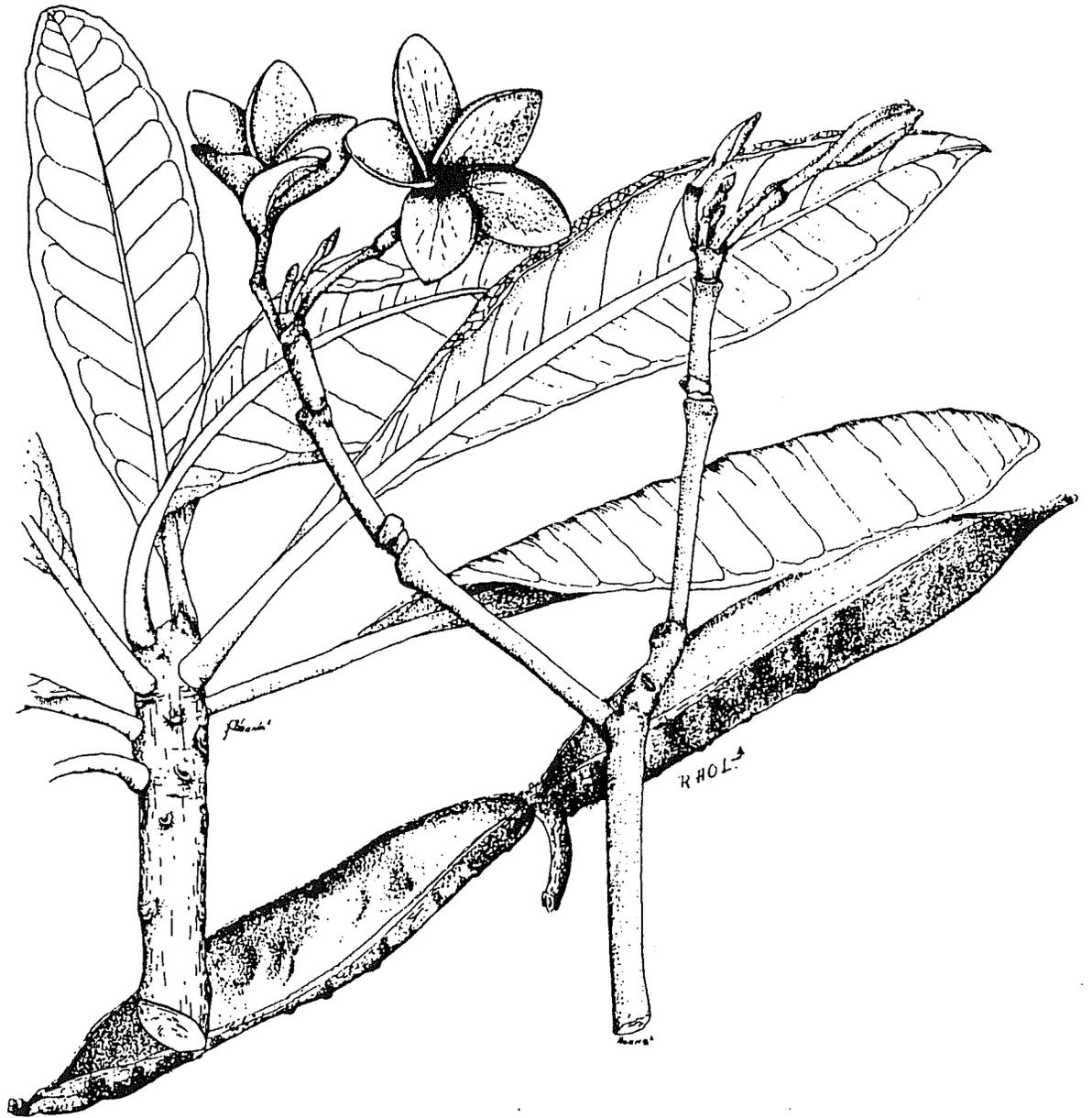


Fig. 29. *Plumeria rubra* (Apocynaceae).



Fig. 30. *Thevetia peruviana* (Apocynaceae).

Literature: SECAB. 1989. *Thevetia peruviana*. *Especies Vegetales Promisorias* 1: 394-399.

The seeds are used as noise-makers in rattles and ankle-bands by the bush people of Surinam (Ostendorf, 1962).

Araliaceae

Armed or unarmed, evergreen trees, shrubs, vines or perennial herbs, sometimes epiphytic. Leaves alternate, simple, palmately compound or 1- to 3-pinnately compound, petiolate; leaflets petiolulate. Inflorescence a terminal or axillary, simple or compound umbel, raceme or panicle, bearing pedunculate or sessile umbels of pedicellate or sessile flowers. Flowers bisexual or unisexual, regular; sepals 4-5, free or united in a shallow, sometimes entire cup; petals 5-12, valvate. Stamens 5-12. Ovary inferior, 1- to 12-celled. Fruit a berry, sometimes drupe-like; seeds 1-12, often flattened.

Literature: Smith, A.C. and B.C. Stone. 1968. Studies of Pacific Island plants, XIX. The Araliaceae of the New Hebrides, Fiji, Samoa and Tonga. *Journal of the Arnold Arboretum* 49(4): 431-501.

Key to Genera

1. Leaves pinnately compound, or sometimes seeming simple; pedicels jointed (articulated) at the apex 2. *Polyscias*
1. Leaves palmately compound.
 2. Flowers sessile; petals red; stamens 12; ovary 10- to 12-celled; leaflets 7-16 on mature-leaved plants 3. *Schefflera*
 2. Flowers pedicellate; petals whitish, yellowish-green or brown; stamens 5-7; ovary 2- to 10-celled; leaflets 6-12 on mature-leaved plants.
3. Leaflets linear, serrately lobed 3. *Schefflera*
3. Leaflets obovate or elliptical, entire or serrately toothed.
 4. Leaflets to 42.5 cm, those of juvenile leaves pubescent; plant not climbing or epiphytic 1. *Didymopanax*
 4. Leaflets to 17.5 cm, glabrous; plant often climbing or epiphytic 3. *Schefflera*

1. *Didymopanax* Decaisne & Planchon

Evergreen trees or shrubs. Leaves alternate, often crowded towards apex of branches, palmately compound, petiolate; leaflets radiating in a whorl at apex of petiole, petiolulate. Inflorescence an axillary or terminal panicle with branches bearing pedunculate umbels of pedicellate flowers. Flowers bisexual; sepals 5; petals 5. Stamens 5. Ovary 2- or 3-celled. Fruit a transversely flattened berry; seeds 2.

1. *Didymopanax morototoni* (Aublet) Decaisne & Planchon, *Revue Horticole* ser.4, 3: 109 (1854). MOROTOTO, KAROHORO, MATCHWOOD (Guyana); ARBRE DE SAINT-JEAN (French Guiana); LUCIFERSHOUT, CASSAVEHOUT (Surinam), KASABA-OEDOE, KOBE, TOBI-TOETOE (Surinamese Creole), KARAHORO (Surinamese Arawak); MOROTOTO (Surinamese Carib). Tree to 35 m. Leaf-petiole to 1



Fig. 31. *Didymopanax morototoni*
(Araliaceae).

m; leaflets 7-12, elliptical, acuminate, to 42.5 cm, those of juvenile leaves pubescent on both surfaces, serrate, those of mature-leaved plants glabrous above and entire. Inflorescence a terminal panicle bearing umbels. Flowers white. Fruit grey, compressed, wider than long, to 6 x 12 mm.

Range: New World tropics, including the three Guianas. Grown as an ornamental at the Cultuurtuin, Paramaribo, Surinam (Teunissen & Lande, 1980).

2. *Polyscias* J.R. Forster & G. Forster

Trees and shrubs. Leaves alternate, trifoliolate or 1- to 3-pinnately compound with several to many pairs of leaflets, imparipinnate, petiolate; leaflets petiolulate. Inflorescence a terminal or lateral panicle, with branches bearing pedunculate heads or umbels of pedicellate flowers; pedicels jointed. Flowers bisexual; sepals 4-5 (-8); petals 4-5 (-8). Stamens 4-5. Ovary 2- to 8-celled. Fruit a drupe-like berry; seeds 5-8.

Literature: Elbert, G.A. 1988. Prodigal polyscias's return. *Garden* 12(1): 10-12,14-15. Smith, A.C. and B.C. Stone. 1968. Studies of Pacific island plants, XIX. The Araliaceae of the New Hebrides, Fiji, Samoa, and Tonga. *Journal of the Arnold Arboretum* 49(4): 431-501. Stone, B.C. 1965. Notes on *Polyscias* (Araliaceae) from Micronesia. *Micronesica* 2: 51-59.

Key to Species

- | | |
|--|--------------------------|
| 1. Leaves often simple (unifoliolate), concave and saucer-like, green | 4. <i>P. scutellaria</i> |
| 1. Leaves 3-foliolate or 1- to 3-pinnately compound, the leaflets usually not concave and saucer-like, green or with a white margin. | |
| 2. Leaflets concave and saucer-like | 4. <i>P. scutellaria</i> |
| 2. Leaflets not concave and saucer-like, but sometimes irregularly bullate, crisped or crumpled. | |
| 3. Leaves 3-pinnate; leaflets to 7 or more pairs per leaf | 2. <i>P. fruticosa</i> |
| 3. Leaves 1- or 2-pinnate; leaflets to 4 pairs per leaf. | |
| 4. Leaflets oblong or narrowly lanceolate, to 30 cm; stems purplish | 1. <i>P. filicifolia</i> |
| 4. Leaflets ovate or orbicular, to 12.5 cm; stems green | 3. <i>P. guilfoylei</i> |

1. *Polyscias filicifolia* (C. Moore ex E. Fournier) L.H. Bailey, *Rhodora* 18(211): 153 (1916). (Synonym: *Polyscias guilfoylei* (Bull) L.H. Bailey, cv. *Filicifolia*). FERNLEAF ARALIA. Shrub to 2.4 m; stems purplish. Leaves 1- or 2-pinnate; leaflets (primary) c.10 or more pairs per leaf, oblong or narrowly lanceolate, acuminate, entire to sharply dentate, green, sometimes with white margin, to 30 cm.

Range: Pacific Islands. Grown as an ornamental on hotel grounds in Paramaribo, Surinam, and at Rochambeau Airport and the Jardin Botanique, Cayenne, French Guiana.

2. *Polyscias fruticosa* (Linnaeus) Harms, in Engler & Prantl, *Die Naturlichen Pflanzenfamilien* 3(8): 45 (1894). MING ARALIA. Shrub to 2.4 m; stems green. Leaves 3-pinnate; leaflets (primary) to 6 pairs per leaf, narrowly ovate to lanceolate, acuminate, dentate to lacerate, green, to 11 cm.



Fig. 32. *Polyscias guilfoylei* (Araliaceae).

Range: Pacific Islands. Grown as an ornamental on hotel grounds in Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

3. *Polyscias guilfoylei* (Bull) L.H. Bailey, *Rhodora* 18 (211): 153 (1916). GERANIUM-LEAF ARALIA. Shrub or tree 3-7 m; stems green. Leaves 1-pinnate; leaflets up to 4 pairs per leaf, ovate or orbicular, obtuse, serrate to lobed, green, often with white margin, to 12.5 cm.

Key to Cultivars

1. Leaflets irregularly and shallowly to deeply lobed, the margin green.
 2. Leaflets 5-lobed, resembling an oak (*Quercus*) 3b. cv. Quercifolia
 2. Leaflets many-lobed, resembling celery (*Apium*) 3c. cv. Quinquifolia
1. Leaflets shallowly serrate to deeply cut, divided or laciniate, the margin white.
 3. Leaflets shallowly serrate 3e. cv. Wild Coffee
 3. Leaflets cut, divided or laciniate into sharply pointed teeth.
 4. Leaves yellowish-green 3d. cv. Victoriae
 4. Leaves green or greyish-green 3a. cv. Laciniata

Numerous intermediates between various cultivars are encountered as ornamentals in the Guianas, particularly Surinam.

3a. *P. guilfoylei* cv. Laciniata. LACE-LEAF PAPUA. Range: Grown as an ornamental on hotel grounds in Paramaribo, Surinam.

3b. *P. guilfoylei* cv. Quercifolia. OAKLEAF PANAX. Range: Grown as an indoor potted ornamental in hotel in Paramaribo, Surinam.

3c. *P. guilfoylei* cv. Quinquifolia. CELERY-LEAVED PANAX. Range: Grown as a tubbed ornamental on hotel grounds in Paramaribo, Surinam.

3d. *P. guilfoylei* cv. Victoriae. LACE ARALIA. Range: Grown as an ornamental on hotel grounds in Paramaribo, Surinam.

3e. *P. guilfoylei* cv. Wild Coffee. (Synonym: *P. guilfoylei* var. *guilfoylei*). WILD COFFEE. Range: Pacific Islands. Grown as a tubbed subject at Timehri Airport and on hotel grounds in Georgetown, Guyana; on hotel grounds in Paramaribo, Surinam; and on hotel grounds in Cayenne, and elsewhere in French Guiana.

4. *Polyscias scutellaria* (Burman fil.) Fosberg, *University of Hawaii Occasional Papers* 46: 9 (1948). (Synonyms: *Nothopanax cochleatum* (Lamarck) Miquel, *Polyscias balfouriana* (Andre) L.H. Bailey). Shrub or tree to c.4 m; stems green. Leaves often seeming simple (unifoliolate), to 3-foliolate or 1-pinnate; leaflets up to 2 pairs on compound leaves, ovate, orbicular or cordate, obtuse, concave and saucer-like, dentate, green, sometimes with a white margin, to 22 cm.

Range: New Hebrides, New Caledonia, Solomon Islands. Grown as an ornamental on

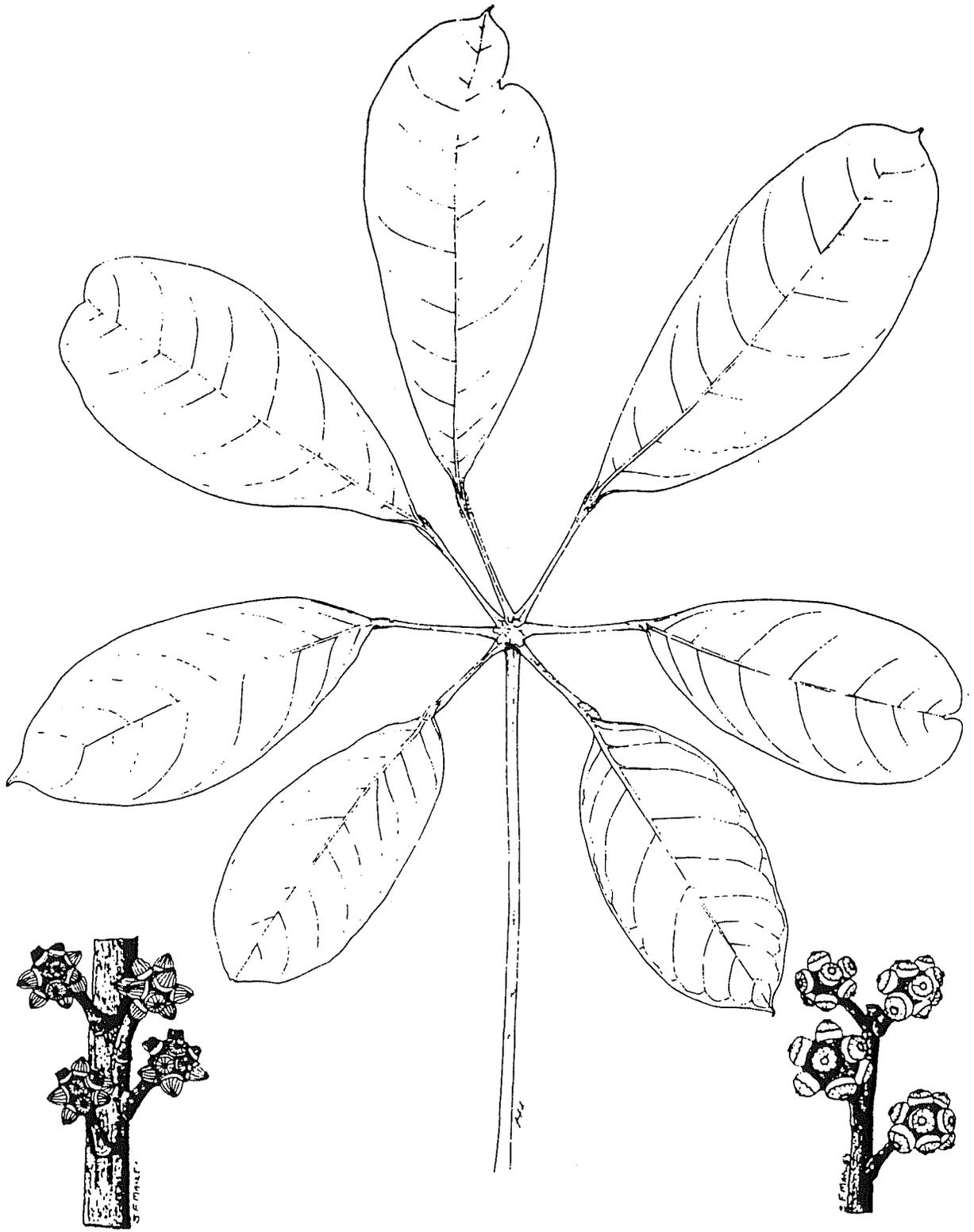


Fig. 33. *Schefflera actinophylla* (Araliaceae).

hotel grounds in Paramaribo, Surinam, and on hotel grounds and elsewhere in Cayenne, French Guiana.

3. *Schefflera* J.R. Forster & G. Forster

Evergreen trees and shrubs, sometimes climbing or epiphytic; plants sometimes dioecious. Leaves alternate, palmately compound, petiolate; leaflets radiating in a whorl at apex of petiole, the branches bearing pedunculate umbels of pedicellate flowers. Flowers bisexual or unisexual; sepals 4-5, the calyx entire or a 5-dentate cup; petals 5-12, valvate. Stamens 5-12. Ovary 5- to 12-celled. Fruit a globose, small berry; seeds 1-12, compressed.

Key to Species

1. Flowers sessile; petals red; stamens 12; ovary 10- to 12-celled; leaflets 7-16 on mature-leaved plants 1. *S. actinophylla*
1. Flowers pedicellate; petals whitish, yellowish-green or brown; stamens 5-7; ovary 2- to 10-celled; leaflets 6-12 on mature-leaved plants.
 2. Leaflets linear, serrately lobed 3. *S. elegantissima*
 2. Leaflets obovate or elliptical, entire 2. *S. arboricola*

1. *Schefflera actinophylla* (Endlicher) Harms, in Engler & Prantl, *Die Naturlichen Pflanzenfamilien* 3(8): 36 (1894), cv. Variegata. (Synonym: *Brassaia actinophylla* Endlicher, cv. Variegata). OCTOPUS TREE, UMBRELLA TREE, VARIEGATED SCHEFFLERA. Tree to 15 (-30) m, sometimes an epiphytic strangler in nature. Leaf-petiole to 60 cm; leaflets 3-5 and c.5-dentate on each side of midvein on juvenile leaves, 7-16 and entire on mature-leaved plants, oblong, glossy green, variegated with creamy white or pale yellow, to 30 cm. Inflorescence to 1.5 m, its branches borne above the foliage and radiating in a circle. Flowers red; stamens 12. Fruit subglobose, purplish-red; seeds 10-12.

Range: Queensland, Australia and Papua New Guinea (non-variegated plants). Variegated plants are grown as ornamentals in the nursery area of the Botanic Gardens, Georgetown, Guyana.

Literature: Fosberg, F.R. 1973. The name of the octopus tree. *Baileya* 19(1): 45-46.

2. *Schefflera arboricola* (Hayata) Hayata [*Icones Plantarum Formosananarum* 6: 23 (1916), in syn.] ex Merrill, *Lingnan Science Journal* 5(1-2): 139 (1927). (Synonym: *Heptapleurum arboricolum* Hayata). HAWAIIAN ELF, MINIATURE SCHEFFLERA, DWARF UMBRELLA TREE. Shrub or tree, often climbing or epiphytic, to (4-) 7.5 m. Leaf-petiole to 15 cm; leaflets 7-9, obovate or elliptical, obtuse or acute, entire, coriaceous, glabrous, the blade to 17.5 cm. Inflorescence stellate-pubescent, to 45 cm. Fruit 5- or 6-angled, to 5 mm.

Range: Hainan Island (South China Sea) and Taiwan. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana and as a potted plant in Paramaribo, Surinam.

3. *Schefflera elegantissima* (Veitch ex Masters) Lowry & Frodin, *Baileya* 23(1): 9 (1989).



Fig. 34. *Schefflera arboricola* (Araliaceae).

(Synonyms: *Aralia elegantissima* Veitch ex Masters, *Dizygotheca elegantissima* (Veitch ex Masters) R. Viguier & Guillaumin). FALSE ARALIA. Shrub or tree to 25 m; stems variegated with cream blotches. Leaflets 6-10, linear, serrately lobed, coriaceous, brownish-green, sometimes variegated with green blotches, to 25 cm. Flowers whitish. Fruit subglobose or ellipsoid.

Range: New Caledonia. Grown as an ornamental potted subject in a Paramaribo, Surinam plant shop; and in French Guiana (de Granville, 1985).

Asclepiadaceae

Perennial herbs, shrubs or twining vines; sap usually milky. Leaves opposite or whorled, sometimes succulent, subsessile to petiolate. Inflorescence of terminal or axillary umbels, umbelliform cymes or umbelliform racemes. Flowers bisexual, regular; sepals 5, the calyx 5-toothed; petals 5, united below in a very short to prominent, 5-lobed tube, bearing a 1- or 2-seriate crown (corona) of appendages, the corona 5-lobed and sometimes with a spur or horn on each lobe. Stamens 5; filaments united below in a tube, the tube united to base of corolla; pollen of each anther-cell adherent in a waxy mass (pollinium). Ovary of 2 carpels, superior, connate below, free above, 1-celled. Fruit of paired, sometimes solitary, follicles; seeds numerous, flattened, with a tuft (coma) of hair at one end.

Key to Genera

1. Herb or shrub with non-twining stems; corona-lobes with a horn or spur.
 2. Leaves glabrous or glabrescent; corolla orange-red; corona-lobes with a horn inside
1. *Asclepias*
 2. Leaves white-tomentose beneath; corolla greenish-white; corona-lobes with a spur outside
2. *Calotropis*
1. Vine or vine-like shrub with twining stems; corona-lobes not horned or spurred.
3. Corolla-tube very short, not funnelform; corolla-lobes bearded inside
3. *Hoya*
3. Corolla-tube long (to 4-5 cm), funnelform; corolla-lobes glabrous
4. *Stephanotis*

Cryptostegia grandiflora R. Brown, the RUBBER VINE, is an African vine differing from *Stephanotis* in its purple flowers, and is sometimes grown in Georgetown, Guyana as an ornamental (Ted Hubbard, pers. comm., 1986).

1. *Asclepias* Linnaeus

Perennial, sometimes annual, herbs; sap milky. Leaves opposite or whorled. Inflorescence of terminal and axillary umbels. Calyx 5-toothed. Corolla 5-lobed, the lobes often reflexed. Corona of 5 hooded lobes, each often bearing a horn inside. Fruit of paired, sometimes solitary, erect, follicles, the subtending pedicel erect or reflexed; seeds numerous, flattened, with a tuft (coma) of silky hairs at one end.

1. *Asclepias curassavica* Linnaeus, *Species Plantarum* 215 (1753). BOUQUET SOLDAT, CODIO (French Guiana); KONINGSBLOEMPJE (Surinam); BLOOD FLOWER. Annual or perennial herb to 1 m. Leaves opposite, or sometimes in whorls of 3,

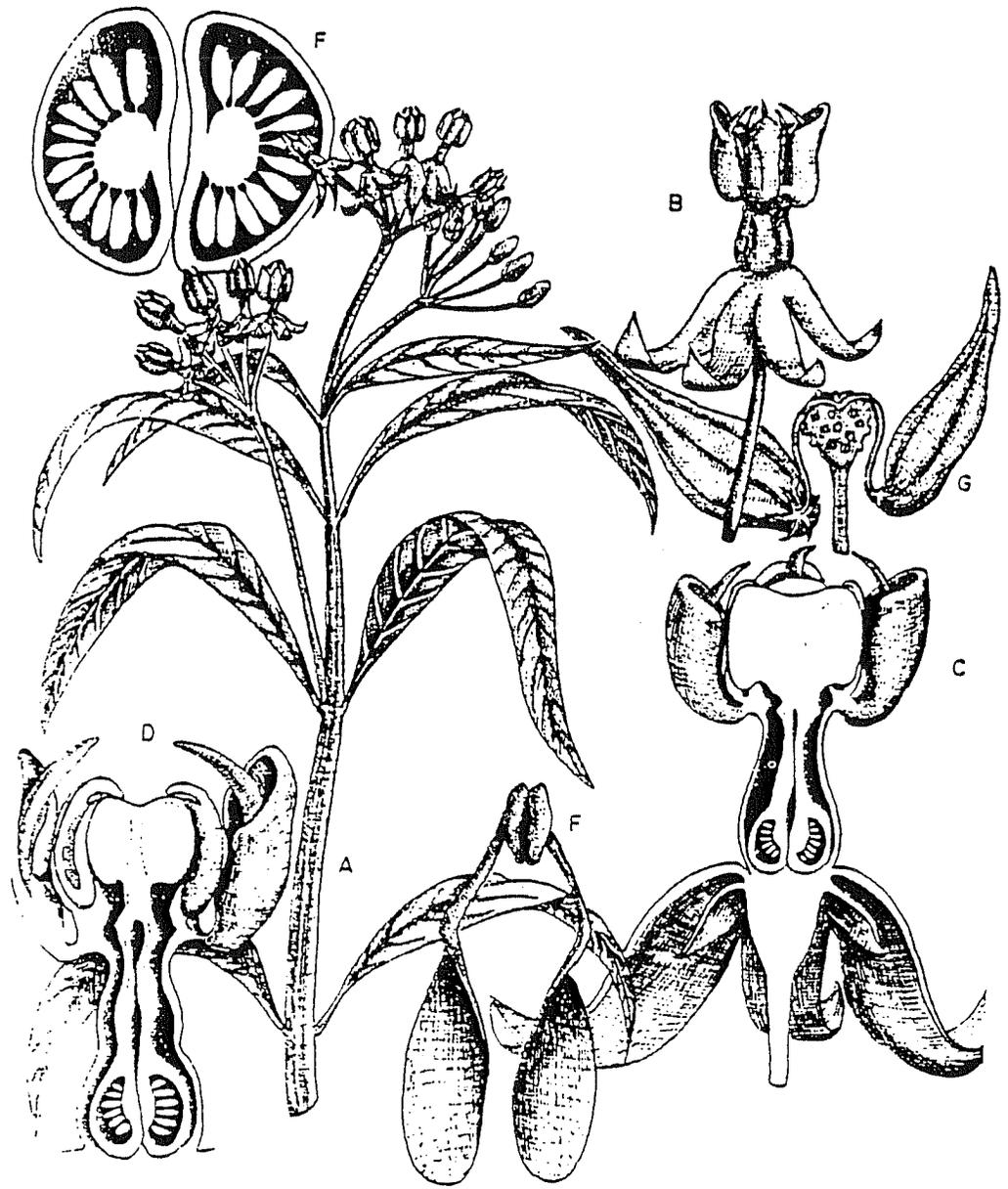


Fig. 35. *Asclepias curassavica* (Asclepiadaceae).

narrowly ovate, elliptic-lanceolate or oblong-lanceolate, entire, glabrous or glabrescent, to 18 cm. Corolla orange-red; corona-hoods with an acicular, incurved horn c.6 mm, the hoods and horns orange-yellow. Follicle usually solitary, fusiform, c.10 cm; seeds c.100 per follicle.

Range: Probably indigenous to South America, the range presently including the three Guianas. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); occasionally on building grounds in Paramaribo, Surinam; and in French Guiana (de Granville, 1985A).

Literature: SECAB. 1989. *Asclepias curassavica*. *Especies Vegetales Promisorias 2*: 1-22.

2. *Calotropis* R. Brown

Evergreen shrubs or trees; sap milky. Leaves opposite, subsessile. Inflorescence of terminal and axillary umbellate cymes or racemes. Calyx 5-toothed. Corolla 5-lobed, the lobes often reflexed. Corona of 5 lobes adnate to staminal column, each lobe bearing a basally curled exterior spur with apical tubercles. Fruit of paired follicles; seeds numerous, with a tuft (coma) of silky hair.

1. *Calotropis gigantea* (Linnaeus) Aiton, *Hortus Kewensis* ed. 2, 2: 78 (1811). MOEDAR (Surinamese Hindu), WIDOERI (Surinamese Javan); CROWN FLOWER. Tree to 4.5 m, often smaller; stems white-tomentose. Leaves obovate or broadly elliptical, cordate at base, subsessile and clasping the stem, white-tomentose beneath, to 13 (-20) cm. Corolla greenish-white, tinged pink or purple; corona purplish, white-pubescent. Follicle ovoid, to 10 cm.

Range: Tropical Asia. Grown as an ornamental at the Botanic Gardens, Promenade Gardens, and elsewhere in Georgetown, Guyana. Cultivated for medicinal and other utilitarian purposes in Surinam (Ostendorf, 1962).

Literature: SECAB. 1989. *Calotropis gigantea*. *Especies Vegetales Promisorias 2*: 23-31.

3. *Hoya* R. Brown

Evergreen, climbing or twining vines or shrubs. Leaves opposite, semi-succulent or coriaceous, petiolate. Inflorescence of axillary umbelliform cymes or umbelliform racemes. Calyx 5-toothed. Corolla 5-lobed, the lobes spreading or reflexed, fleshy and waxy in appearance. Corona of 5 spreading lobes. Fruit of paired follicles; seeds numerous, with a tuft (coma) of silky hair.

Literature: Fitch, C.M. 1979. The exotic hoyo. *Garden* 3(1): 4-8.

1. *Hoya carnosa* (Linnaeus fil.) R. Brown, *Memoirs of the Wernerian Natural History Society* 1: 27 (1809). WAX PLANT. Semi-succulent vine-like shrub; stems climbing or trailing, rooting at the nodes, to 2.4 m. Leaves elliptical, oblong-ovate or ovate, glabrous or puberulent, to 8 (-12) cm. Inflorescence pendent; pedicels pubescent. Corolla-lobes spreading, pinkish-white, bearded inside. Corona pink or red.

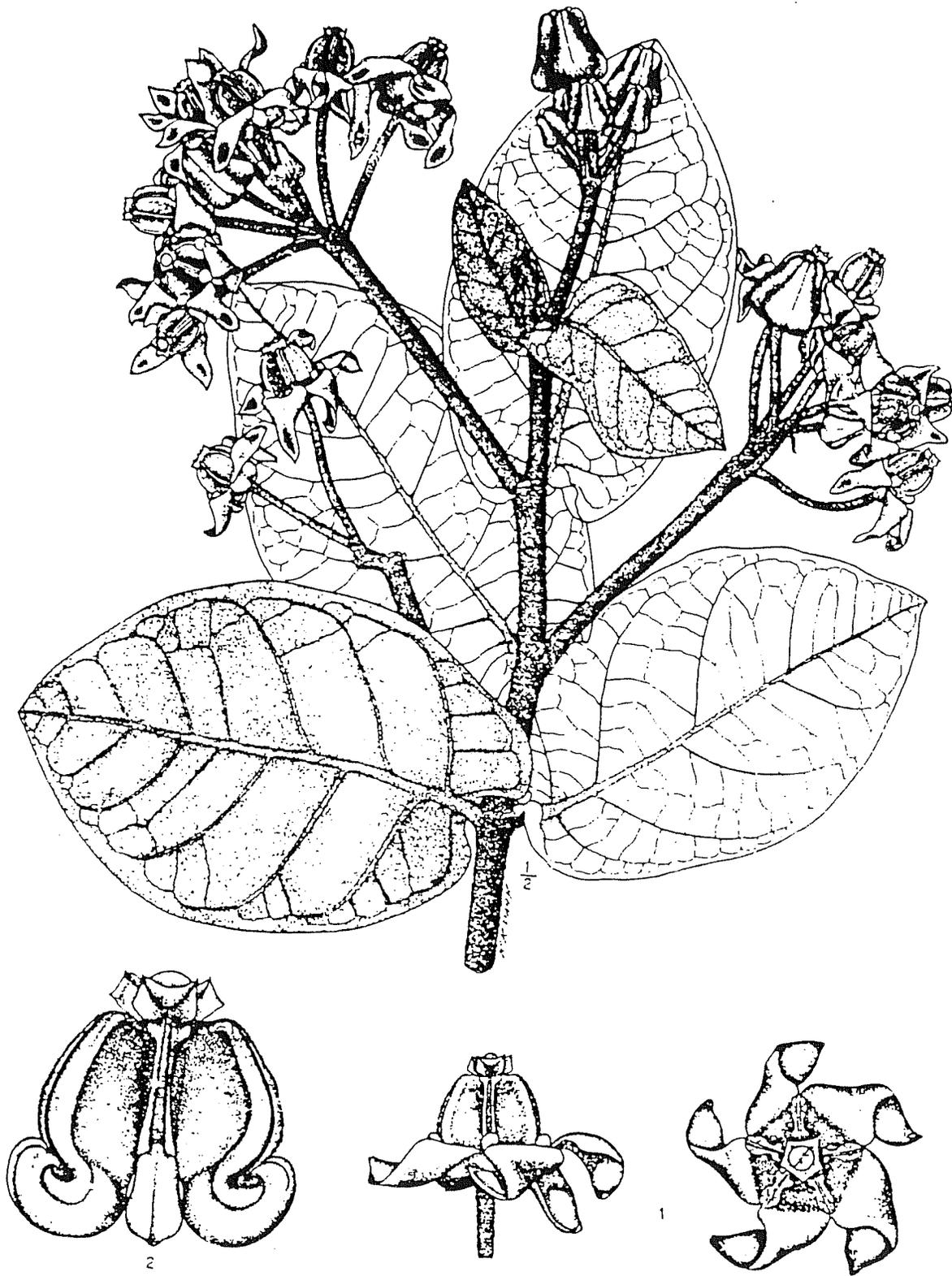


Fig. 36. *Calotropis gigantea* (Asclepiadaceae).

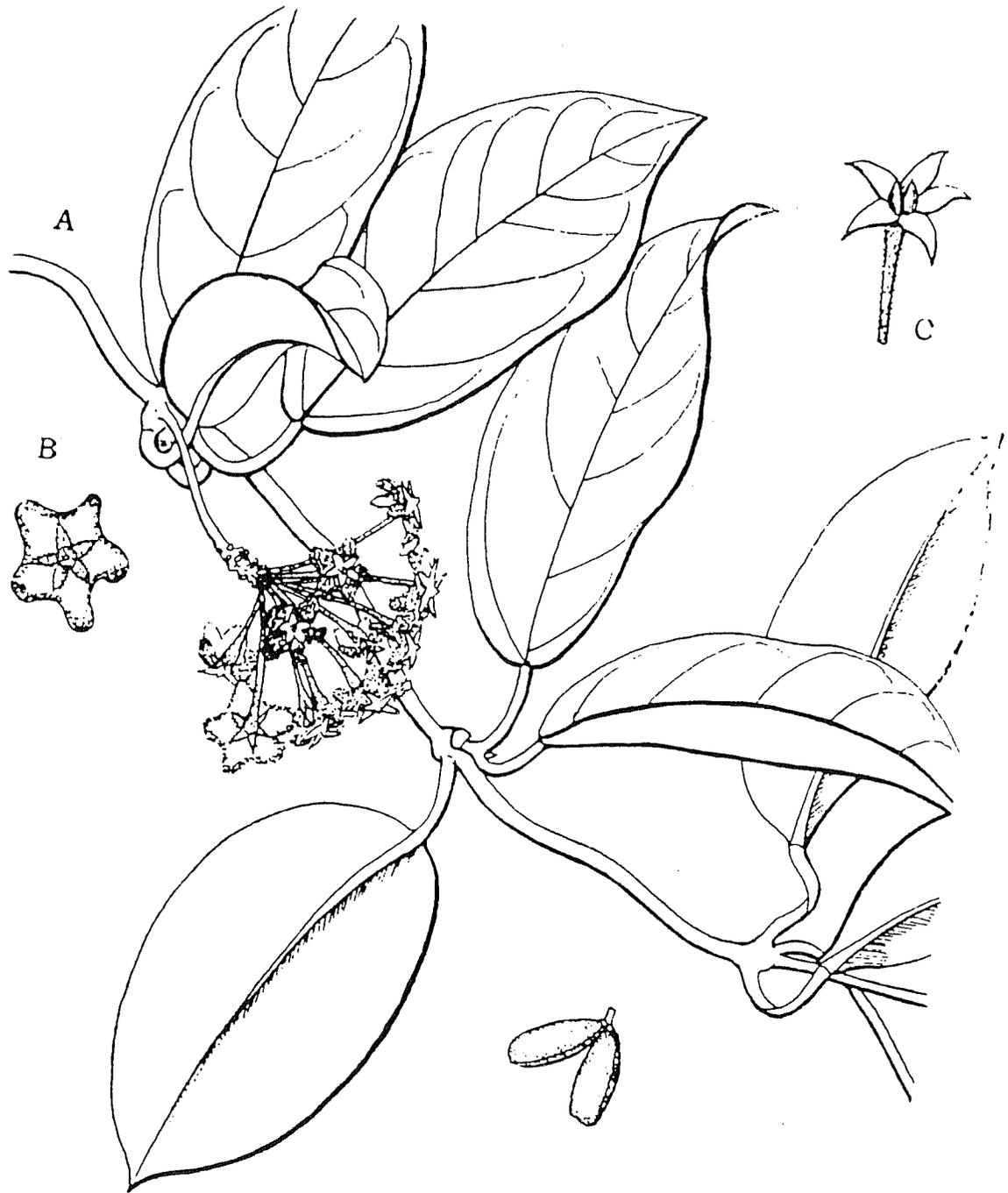


Fig. 37. *Hoya carnosa* (Asclepiadaceae).



Fig. 38. *Stephanotis floribunda* (Asclepiadaceae).

Fig. 84. *Ipomoea carnea* subsp. *fistulosa* (Convolvulaceae).



5. Sepals acuminate; corolla-limb blue; leaves unlobed or 3-lobed

^{indica}
1. ~~*I. acuminata*~~
3. *I. carnea*

5. Sepals obtuse; corolla-limb pinkish-purple; leaves unlobed

Ipomoea indica (Burman) Merrill, ~~fl. Ind. 1: 117 (1846)~~
(Synonym: 1. *Ipomoea acuminata* (Vahl) Roemer & Schultes in Linnaeus, *Systema Vegetabilium*

ed.4, 228 (1819). (Synonym: *I. learii* Paxton). BLUE DAWN FLOWER. Unarmed perennial vine to 12 m; stems pubescent. Leaves simple, unlobed or 3-lobed, ovate-cordate to orbicular, puberulent, to 20 cm. Sepals acuminate. Corolla funnelform, c.7 cm, the tube white, the limb blue.

Literature: Fosberg, F.R., 1976, *Ipomoea indica* taxonomy; a tangle of morning glories. *Bot. Notiser* 129: 35-38.

Range: Tropical America. Grown as an ornamental in Surinam (Ostendorf, 1962).

2. *Ipomoea alba* Linnaeus, *Species Plantarum* 161 (1753). (Synonym: *Calonyction bonanox* (Linnaeus) Bojer). MAANBLOEM (Surinam); MOONFLOWER. Armed perennial vine to 30 m; sap milky; stems, especially below, with prickly spines or warts to 4 mm. Leaves simple, unlobed or 3-lobed, ovate-cordate to orbicular, glabrous, the blade to 20 cm. Sepals acuminate, awned. Corolla funnelform, to 17 cm, the tube white or greenish-white, the limb white with greenish longitudinal plait-stripes.

Range: Possibly Indo-Malaysia or tropical America. Grown as an ornamental in Surinam (Ostendorf, 1962).

Literature: Gunn, C.R. 1972. Moonflowers, *Ipomoea* Section *Calonyction*, in temperate North America. *Brittonia* 24(2): 150-168.

3. *Ipomoea carnea* Jacquin, *Enumeratio Systematica Plantarum* 13 (1760). Unarmed perennial vine or subshrub; stems becoming woody. Leaves simple, unlobed, broadly to narrowly ovate, cordate or rounded at the base, glabrous or pubescent, to 15 cm. Sepals obtuse. Corolla funnelform, pinkish-purple, to 8 cm.

Key to Subspecies

- 1. Leaves broadly ovate-cordate
- 1. Leaves lanceolate-ovate

- 3a. subsp. *carnea*
- 3b. subsp. *fistulosa*

3a. *I. carnea* subsp. *carnea*. Usually a vine; leaves broadly ovate-cordate, pubescent. Range: Mexico; Central and South America. Grown as an ornamental in Surinam (Ostendorf, 1962).

3b. *I. carnea* subsp. *fistulosa* (Martius ex Choisy) D.F. Austin, *Taxon* 26(2-3): 237 (1977). (Synonym: *I. fistulosa* Martius ex Choisy). Usually a subshrub; leaves lanceolate-ovate, mostly glabrous. Range: Florida and Texas (U.S.A.) to South America. Grown as an ornamental in French Guiana (de Granville, 1985).

4. *Ipomoea hederifolia* Linnaeus, *Systema Naturae* ed.10, 2: 925 (1759). (Synonym: *Quamoclit hederifolia* (Linnaeus) G. Don). Unarmed annual vine; stems glabrous. Leaves simple, 3- to 5-lobed, broadly ovate-cordate in outline, glabrous, c.8 cm. Sepals acuminate. Corolla red, to 4.5 cm, the tube narrow, slender.

Range: Southern United States to South America. Grown as an ornamental in Surinam (Ostendorf, 1962).

5. *Ipomoea horsfalliae* Hooker, *Curtis's Botanical Magazine* 61: t.3315 (1834). BARNETSBLOEM (Surinam). Unarmed perennial vine to 10 m; stems woody, glabrous. Leaves palmately compound; leaflets 5-7, obovate, entire, undulate, glabrous, to 12 cm. Sepals obtuse. Corolla funnellform, pink or purple, to 6.5 cm.

Range: West Indies. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

6. *Ipomoea quamoclit* Linnaeus, *Species Plantarum* 159 (1753). (Synonym: *Quamoclit pennata* (Desvaux) Bojer). DUIVELSNAAGAREN (Surinam); CYPRESS VINE. Unarmed annual vine to 6 m; stems glabrous. Leaves pinnatifid, to 10 cm, the segments numerous, filiform, glabrous. Sepals acuminate. Corolla red, to c.3.8 cm, the tube narrowly slender.

Range: Tropical America. Grown as an ornamental at the nursery of the Botanic Gardens, Georgetown, Guyana, and in gardens of Paramaribo, Surinam.

3. *Operculina* Silva Manso

Perennial herbs or woody vines; stems, petioles and peduncles often winged. Leaves alternate, simple, entire to pinnately parted, petiolate. Inflorescence of axillary, solitary flowers or few-flowered cymes. Corolla tubular or campanulate, 5-lobed. Stamens 5. Ovary 2-celled. Fruit a circumscissile capsule; seeds 1-4, smooth.

1. *Operculina hamiltonii* (G. Don) D.F. Austin & Staples, *Journal of the Arnold Arboretum* 64(3): 487 (1983). (Synonym: *O. alata* (Hamilton) Urban). Woody vine; stems either terete, ribbed or narrowly winged, glabrous. Leaves simple, entire to palmately lobed, ovate or oblong-ovate, the base cordate or truncate, glabrous or sparsely pubescent, to 18 x 10 cm. Flowers solitary or 2 together, long-pedunculate; peduncle (above) and pedicel winged; sepals ovate, obtuse. Corolla campanulate, yellow, to 5 cm. Fruit to 3 x 4 cm; seeds 3-angled, to 1.5 cm.

Range: West Indies; tropical America, including the three Guianas. Grown as an ornamental in Surinam (Ostendorf, 1962).

4. *Porana* N. Burman

Evergreen, annual or perennial, herbaceous or woody vines, or shrubs. Leaves alternate, simple, unlobed, petiolate. Inflorescence of axillary and terminal panicles or cymes; sepals often unequal; some or all sepals enlarging and dehiscing with the fruit. Corolla tubular or campanulate, 5-lobed. Stamens 5. Ovary 2-celled. Fruit a 1-seeded capsule, surrounded by enlarged sepals.

1. *Porana paniculata* Roxburgh, *Plants of the Coast of Coromandel* 3: 31, t.235 (1815). CORONILLA (Surinam); CHRISTMAS VINE. Perennial, woody vine twining up to 9 m.



Fig. 85. *Ipomoea quamoclit* (Convolvulaceae).

Leaves ovate, cordate at the base, acuminate, glabrous above, the young leaves white-tomentose beneath, the older leaves glabrous beneath, to 15 x 8 cm. Inflorescence a large, many-flowered panicle. Corolla white, small, to c.8 x 6-8 mm. Capsule globose, pubescent, c.5 mm, subtended by 3 enlarged, membranous sepals.

Range: India, Nepal, Burma. Grown as an ornamental in Surinam (Ostendorf, 1962).

5. *Stictocardia* H.G. Hallier

Evergreen, perennial, herbaceous or woody vines. Leaves alternate, simple, densely black glandular-dotted beneath, petiolate. Inflorescence of axillary, solitary flowers, or few-flowered cymes; sepals enlarging and enclosing the fruit. Corolla funnelform, 5-lobed, the limb plaited. Stamens 5. Ovary 2-celled. Fruit a 4-seeded, dry berry surrounded by fleshy, enlarged calyx, eventually irregularly split.

S. filifolia is correct.
1. *Stictocardia campanulata* (Linnaeus) Merrill, *Philippine Journal of Science* 9: 133 (1914). (Synonym: *S. tiliifolia* (Desrousseaux) H.G. Hallier). Woody vine to 4 m. Leaves ovate, cordate at the base, glabrous or puberulent, densely black glandular-dotted beneath, the blade to 25 cm. Sepals densely black glandular-dotted outside. Corolla red, the throat yellow with red lines inside, 5-8 cm, the plaits glandular outside. Fruits to 3.5 cm wide; seeds black or dark brown, pubescent, c.1 cm.

Range: Circumtropical, but of local occurrence. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

Literature: Gunn, C.R. 1972. Notes on *Stictocardia campanulata* (L.) Merrill and *S. jucunda* (Thw.) C.R. Gunn (Convolvulaceae). *Brittonia* 24(2): 169-176.

Austin, D.F., Powell, D.A. and D.H. Nicolson, 1978. *Stictocardia tiliifolia* (Convolvulaceae) re-evaluated. *Brittonia* 30: 195-198.

Succulent herbs or shrubs. Leaves alternate, opposite or whorled, simple or pinnately compound, sessile to petiolate. Inflorescence of terminal spikes, racemes, cymes, corymbs or panicles. Flowers bisexual, regular; sepals 4-5, free or united below in a 5-toothed calyx-tube; petals 4-5, free or united below in a 5-toothed corolla-tube. Stamens 4-10, free. Ovary superior, the 4-5 carpels free to the base or nearly so. Fruit of follicles; seeds numerous.

1. *Kalanchoe* Adanson

Characteristics of the family Crassulaceae, with the calyx and corolla 4-merous and stamens 8; viviparous plantlets sometimes arising from leaves or inflorescences.

Key to Species

- | | |
|---|------------------------|
| 1. Leaves in whorls of 3, subcylindrical, sessile | 6. <i>K. tubiflora</i> |
| 1. Leaves opposite, flat, petiolate or subsessile. | |
| 2. Leaves pinnately compound with 3-5 leaflets | 5. <i>K. pinnata</i> |
| 2. Leaves simple. | |
| 3. Leaves blotched with purple beneath; corolla purplish; flowers pendent | |

2. *K. daigremontiana*

3. Leaves green beneath; corolla red, pink or yellow; flowers erect.

4. Leaves subsessile, entire; flowers red or pink

3. *K. flammea*

4. Leaves petiolate, crenate or sinuately scalloped; flowers yellow or red.

5. Herb to 30 cm; leaves to 7.5 cm; corolla red or yellow

1. *K. blossfeldiana*

5. Herb or subshrub to 1.8 m; leaves to 15-30 cm; corolla yellow

4. *K. integra*

1. *Kalanchoe blossfeldiana* Poellnitz, *Feddes Repertorium* 35: 159 (1934). Herb to 30 cm. Leaves opposite, simple, elliptic-oblong, crenate in upper part, green, glabrous, to 7.5 cm, petiolate. Flowers erect; corolla red or yellow, c. 1.2 cm.

Range: Madagascar. A yellow-flowered cultivar is grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

2. *Kalanchoe daigremontiana* Hamet & Perrier de la Bathie, *Annales de l'Institut Botanico-Geologique Colonial de Marseille* ser.3, 2: 128 (1914). DEVIL'S BACKBONE. Herb to 90 cm. Leaves opposite, simple, oblong-lanceolate, serrate, blotched with purple beneath, glabrous, to 25 cm, petiolate. Flowers pendent; corolla purplish, c.2.5 cm.

Range: Madagascar. Grown as an ornamental in French Guiana (de Granville, 1985).

3. *Kalanchoe flammea* Stapf, *Kew Bulletin* 1897: 266 (1897). Herb to 45 cm. Leaves opposite, simple, obovate, entire, green, glabrous, to c.9 cm, subsessile. Flowers erect; corolla red or pink, c.1.3 cm.

Range: Somalia. Grown as an ornamental in Surinam (Ostendorf, 1962).

Literature: Cufodontis, G. 1965. The species of *Kalanchoe* occurring in Ethiopia and Somalia Republic. *Webbia* 19(2): 711-744.

4. *Kalanchoe integra* (Medicus) O. Kuntze, *Revisio Genera Plantarum* 1: 229 (1891), var. *crenata* (Andrews) Cufodontis, *Oesterreichische Botanische Zeitschrift* 116: 320 (1969). Herb or subshrub to 1.8 m. Leaves opposite, simple, ovate or oblong, crenate, green, glabrous, to 15-30 cm, petiolate. Flowers erect; corolla yellow, c.1.3 cm.

Range: Eastern and Southern Africa. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

5. *Kalanchoe pinnata* (Lamarck) Persoon, *Synopsis Plantarum* 1: 146 (1805). (Synonyms: *Bryophyllum calycinum* Salisbury, *B. pinnatum* (Lamarck) Oken). FEUILLE PESCE (French Guiana); WONDERBLAD (Surinam); KALABANA (Surinamese Arawak); AIR PLANT. Herb or subshrub to 1.8 m; stems hollow. Leaves opposite, pinnately compound with 3-5 leaflets (odd-pinnate with 1-2 pairs of leaflets), petiolate; leaflets elliptical or oblong, crenate, green, glabrous, to 21 cm. Flowers pendent; corolla reddish, sparsely glandular, to c.7.5 cm.

Range: Origin unknown. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, at the Esther Stichting near Paramaribo, Surinam, and in Cayenne

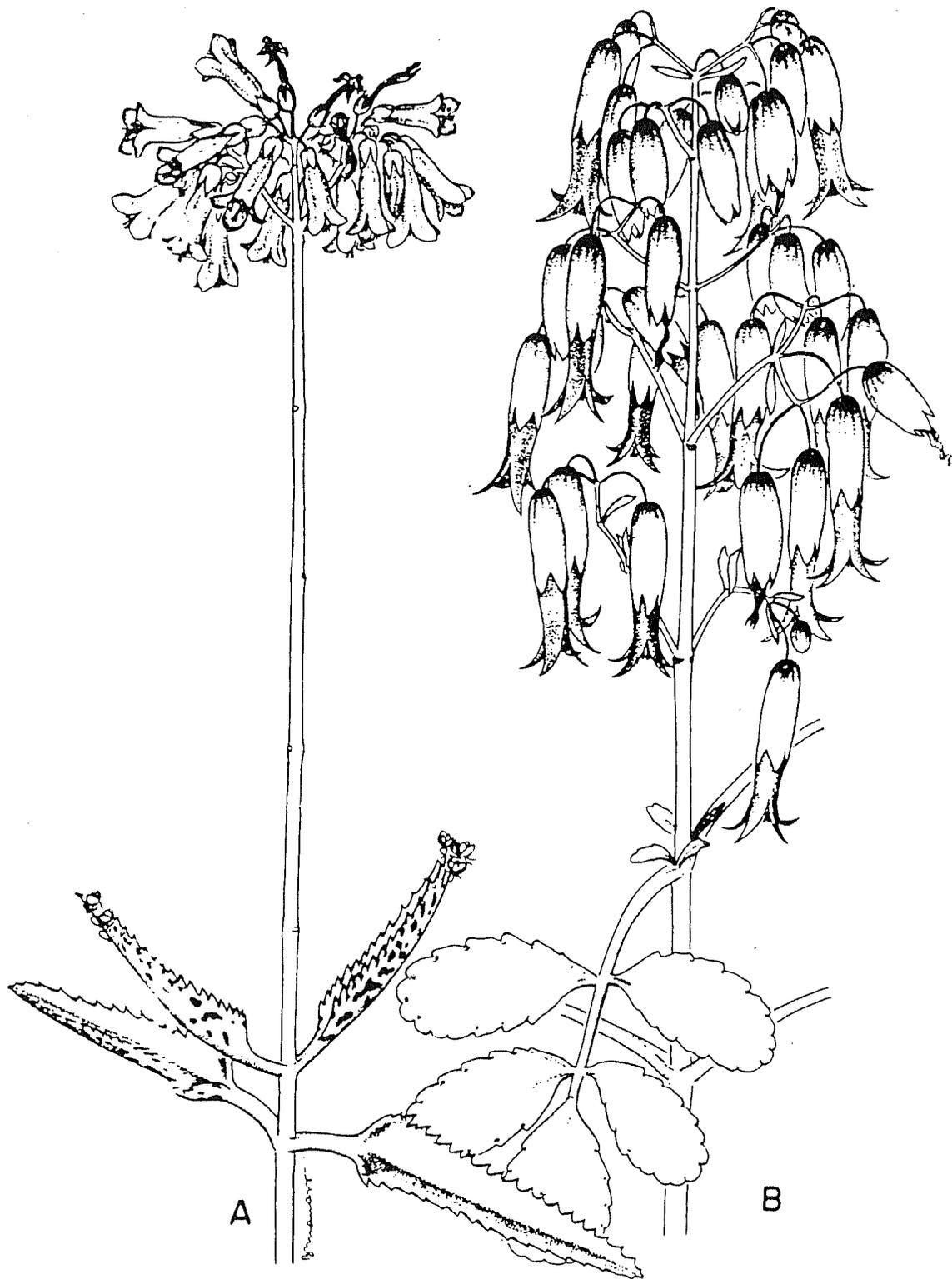


Fig. 86. *Kalanchoe daigremontiana* (left); *Kalanchoe pinnata* (right)
(Crassulaceae).

and Isle Royale, French Guiana.

Literature: SECAB. 1991. *Bryophyllum pinnatum*. *Especies Vegetales Promisorias* 6: 191-200.

6. *Kalanchoe tubiflora* (Harvey) Hamet, *Beihefte zum Botanischen Centralblatt* 29(2): 41 (1912). (Synonym: *K. verticillata* Scott-Elliott). MUIZESTAARTJES (Surinam); CHANDELIER PLANT. Herb to 90 cm (-1 m). Leaves whorled, simple, subcylindrical, toothed at the apex, spotted with purplish-brown, glabrous, to 7-15 cm, sessile. Flowers pendent; corolla pink or red, c.3 cm.

Range: Southern Africa, Madagascar. Grown as a potted ornamental in Tankarastraat, Paramaribo, Surinam.

Dilleniaceae

Evergreen or deciduous trees, shrubs or woody vines. Leaves alternate, simple, petiolate. Inflorescence usually a terminal, solitary flower, or the flowers in racemes or panicles. Flowers bisexual, regular; sepals 5 (10), free; petals 5, free. Stamens numerous, free or united at the base. Ovary superior; carpels 1-20, 1-celled, free or united. Fruit of dehiscent follicles, or indehiscent, berry-like, and enclosed by the enlarged sepals; seeds numerous.

1. *Dillenia* Linnaeus

Evergreen trees. Leaves pinnately veined; petiole sometimes sheathing the stem. Inflorescence of terminal or axillary, solitary flowers, or flowers few together. Fruit dehiscent, or indehiscent and enclosed by the enlarged sepals; seeds arillate or exarillate.

1. *Dillenia indica* Linnaeus, *Species Plantarum* 535 (1753). ELEPHANT APPLE. Evergreen or seasonally deciduous tree to 15 m. Leaves elliptic-oblong or oblanceolate, serrate, conspicuously parallel-veined, the blade to 37.5 cm; petiole sheathing at the base. Flowers solitary, axillary, long-pedicellate, to 22.5 cm wide; petals spreading, white. Stamens very numerous (several hundred). Fruit indehiscent, an aggregate of 15-20 carpels, pendent, globose, enclosed by the 5 large, expanded, imbricated, fleshy sepals, to 10 cm wide, edible; seeds 5 per carpel, reniform, flattened.

Range: India, Southeast Asia and Indonesia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

Ebenaceae

Evergreen or deciduous trees and shrubs; plants usually dioecious. Leaves alternate, simple, entire, petiolate, exstipulate. Inflorescence a solitary, axillary flower, or of cymes or fascicles. Flowers regular (actinomorphic), bisexual or unisexual; sepals 3-7, united below in a short tube; petals 3-7, united below in a short, campanulate to cylindrical tube. Stamens as many as, or 2-3 times as many as, the petals; female flower with staminodes. Ovary superior, 2- to 16-celled; styles 2-8. Fruit a berry.

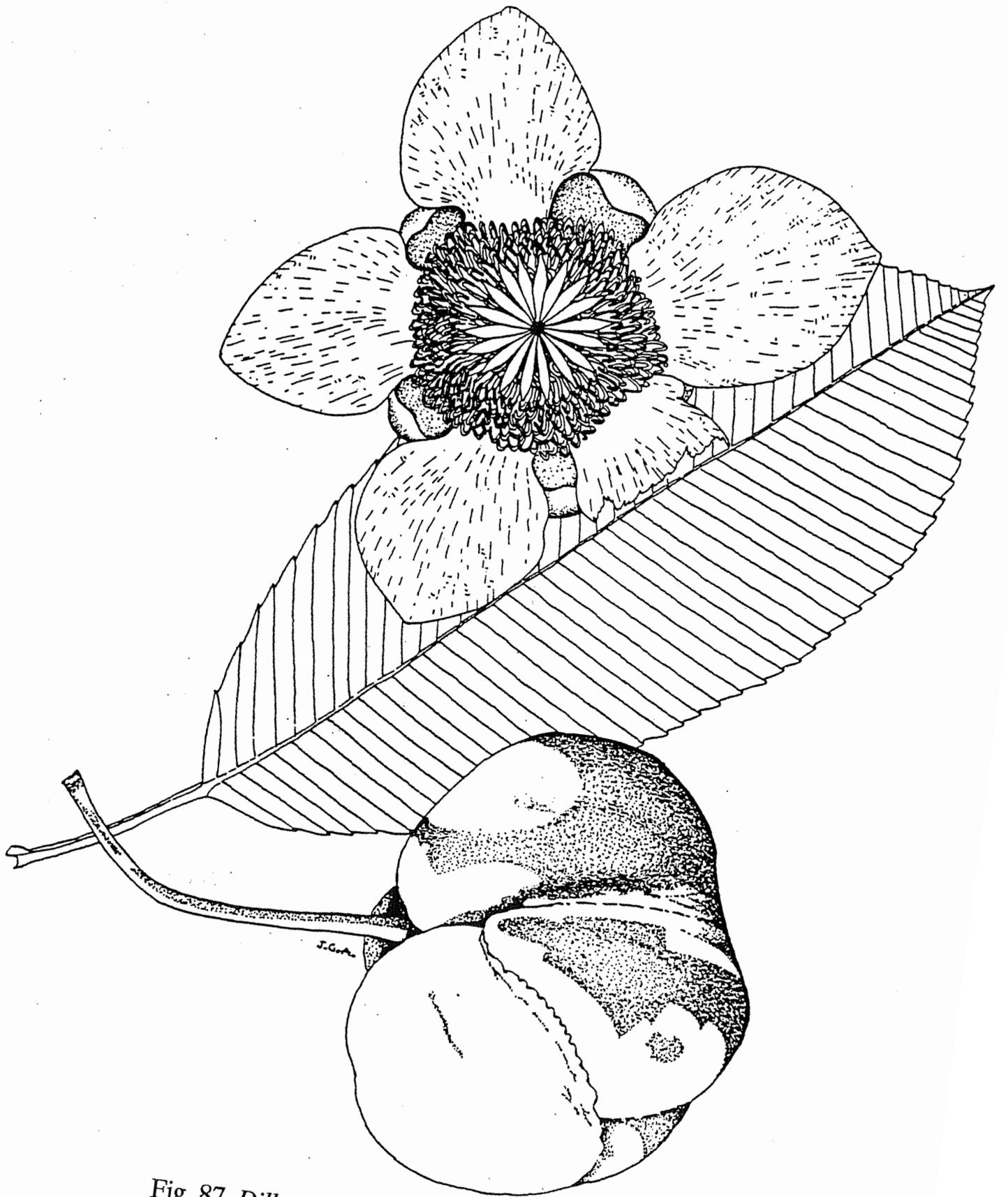


Fig. 87. *Dillenia indica* (Dilleniaceae).

1. *Diospyros* Linnaeus

Trees and shrubs; plants polygamodioecious. Sepals 4-5; petals 4-5. Female flowers solitary; staminodes 4-8; styles 2-6. Male flowers in cymes or fascicles; stamens 4-16. Fruit a berry, with persistent, enlarged calyx; seeds 1-10.

Key to Species

- 1. Leaves pubescent beneath, often acuminate; fruit to 7.5 (-10) cm wide, edible
1. *D. discolor*
- 1. Leaves glabrous, obtuse; fruit to 2 cm wide, inedible
2. *D. ebenum*

1. *Diospyros discolor* Willdenow, *Species Plantarum* ed.4, 4: 1108 (1806). PEACH TREE (Guyana); PHILIPPINE PERSIMMON, VELVET APPLE. Tree to 13.5 m. Leaves oblong, often acuminate, coriaceous, pubescent beneath. Male inflorescence a 7-flowered cyme; male flower with 24 stamens. Fruit globose, to 7.5 (-10) cm wide, purplish, yellowish or brownish.

Range: Philippines, Malaysia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

2. *Diospyros ebenum* J. Koenig ex Retzius, *Physiographiska Salskapets Handlingar* 1: 176 (1776). Tree to 18 m. Leaves elliptical, obtuse, coriaceous, glabrous. Male inflorescence a 3- to 15-flowered cyme; male flower with c.16 stamens. Fruit globose, to 2 cm wide.

Range: India, Sri Lanka. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

The jet-black heartwood of this species provides the best ebony, used for inlay work and piano keys.

Euphorbiaceae

Unarmed or armed, succulent or non-succulent, herbs, shrubs or trees; plants usually monoecious; sap often milky or watery, often poisonous. Leaves alternate, simple or compound, subsessile or petiolate, with or without stipules. Inflorescence a spike, raceme, panicle, corymb or cyme, or flowers sometimes solitary or fasciculate. Flowers unisexual, actinomorphic (regular), without involucre, or sometimes enclosed in a regular or irregular (zygomorphic), glandular involucre (cyathium) in groups of 1 female and few or numerous male flowers. Sepals 0-5, united below in a short tube; petals 0-5, free; stamens 1-1,000, free or united by the filaments. Ovary superior, 3-celled; ovules 1-2 per cell. Fruit a dehiscent capsule, or indehiscent and drupaceous; seeds with or without caruncle.

Literature: Lanjouw, J. 1931. *The Euphorbiaceae of Suriname*. 195pp. Amsterdam: J.H. de Bussy.

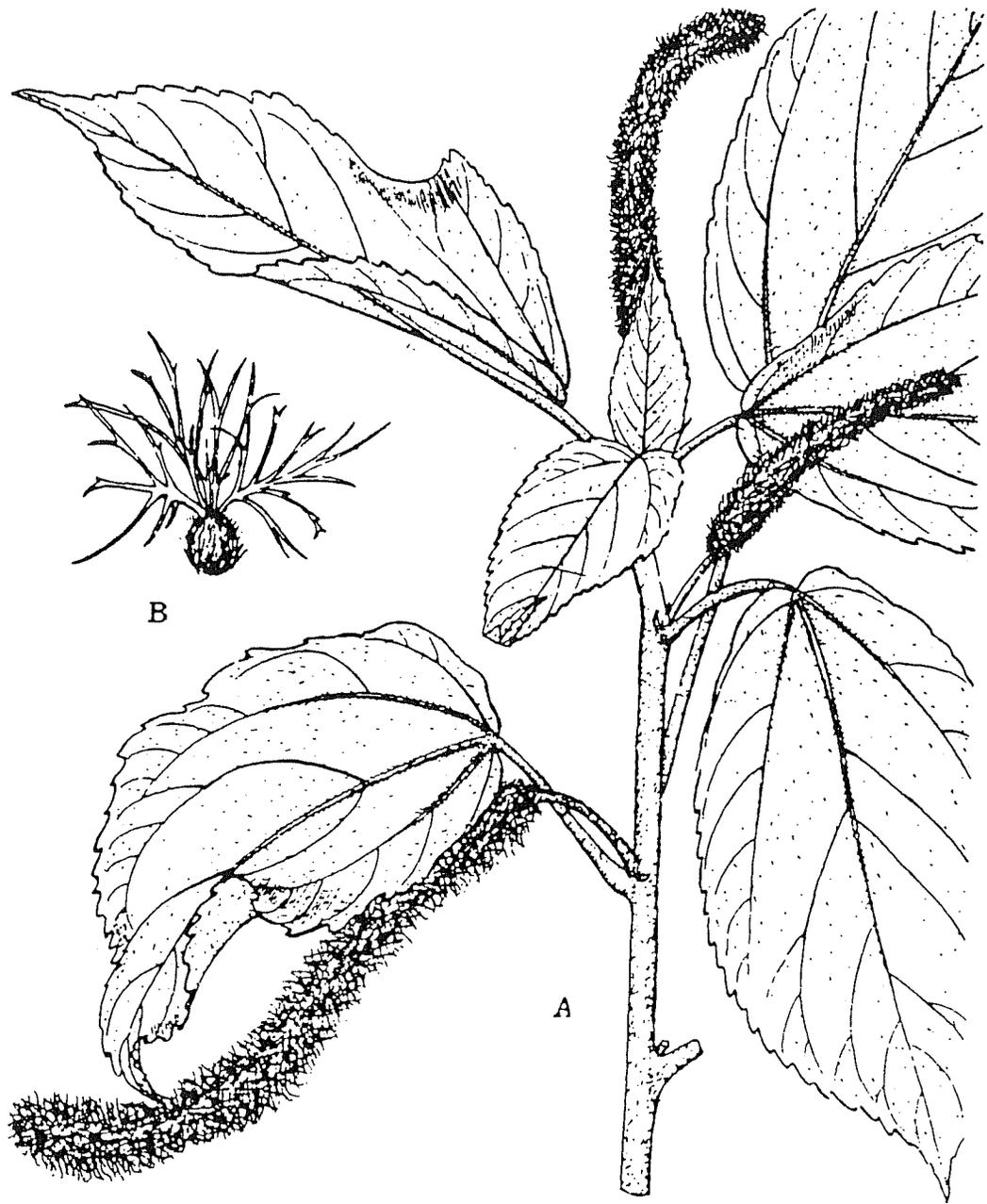


Fig. 88. *Acalypha hispida* (Euphorbiaceae).

Key to Genera

1. Flowers (1 female and several male) enclosed in a cup-shaped involucre (cyathium), the involucre with external or internal gland(s); male flower, or stamen, jointed on a pedicel.
 2. Involucre regular (actinomorphic), resembling a calyx, not spurred, with glands along rim; plants armed or unarmed 4. *Euphorbia*
 2. Involucre irregular (zygomorphic), resembling a slipper, spurred, with glands inside the spur; plants unarmed 10. *Pedilanthus*
1. Flowers not in an involucre; stamens not jointed, not pedicellate.
3. Leaves 3-foliolate (trifoliolate) 5. *Hevea*
3. Leaves simple, entire to deeply lobed.
 4. Fruit indehiscent, fleshy, resembling a small apple; stamens 2 6. *Hippomane*
 4. Fruit dehiscent, capsular, sometimes dividing into cocci.
5. Stem armed with spines; fruit with up to 20 segments; stigmatic surface of many radiating lobes, peltate on the style 7. *Hura*
5. Stem not spinose; fruit with (2) 3 (5 or 10) segments; stigma not radially lobed and peltate on the style.
 6. Female flowers solitary in a leaf-axil; seeds 2 per cell; stamens 3 2. *Breynia*
 6. Female flowers not solitary and axillary, arranged along an inflorescence-axis; seed 1 per cell; stamens 8-30.
7. Perianth composed of sepals and petals, at least in male flowers.
 8. Inflorescence a raceme; leaves usually variegated; stamens 20-30; flowers white 3. *Codiaeum*
 8. Inflorescence a dichotomously branched cyme; leaves green; stamens 8-12; flowers red, sometimes greenish-white 8. *Jatropha*
7. Perianth of sepals only.
9. Leaves unlobed; stigmas filiform-fimbriate 1. *Acalypha*
9. Leaves deeply palmately lobed; stigmas capitate or 2-branched.
 10. Leaves peltate; stamens numerous (to 1,000), with much-branched filaments; leaves not variegated; petiole hollow; inflorescence with male flowers below, female flowers above; leaf-lobes serrate; roots fibrous 11. *Ricinus*
 10. Leaves not peltate; stamens 10, with unbranched filaments; leaves variegated; petioles solid; inflorescence with female flowers below, male flowers above; leaf-lobes entire; roots tuberous-enlarged 9. *Manihot*

Phyllanthus acidus (Linnaeus) Skeels, the OTAHEITE GOOSEBERRY, is an Asiatic fruit tree with pinnately compound leaves and is relatively common in gardens of Georgetown, Guyana, where it is sometimes grown as an ornamental (Lynn Gillespie, pers. comm., 1990).

1. *Acalypha* Linnaeus

Non-succulent trees or shrubs; plants monoecious or dioecious. Leaves alternate, simple, petiolate, often dentate. Inflorescence an axillary or terminal spike or raceme. Flowers small, bracteate at the base; calyx 3- to 5-parted; petals absent. Stamens 8-16. Ovary 3-celled; stigmas 3, filiform-fimbriate, their massed effect the conspicuous part of the



Fig. 89. *Breynia disticha* (Euphorbiaceae).

inflorescence. Fruit a capsule; seeds 3, 1 per carpel.

Key to Species

1. Leaves variegated; female inflorescence short, to 10 (-20) cm 1. *A. amentacea*
1. Leaves all green, not variegated; female inflorescence long, to 20-45 cm.
 2. Bracts of female flowers entire 2. *A. hispida*
 2. Bracts of female flowers 13- to 27-dentate 3. *A. macrostachys*

1. *Acalypha amentacea* Roxburgh, *Flora Indica* 686 (1832), subsp. *wilkesiana* (Mueller Argau) Fosberg, *Smithsonian Contributions to Botany* 45: 10 (1980), f. *wilkesiana*. (Synonym: *A. wilkesiana* Mueller Argau). COPPERLEAF, JACOB'S COAT. Monoecious shrub to 3 m or more. Leaves broadly ovate to suborbicular, acuminate, greenish-bronze with coppery, purple or red blotches, to 20 cm. Female inflorescence a spike to 10 (-20) cm; flowers (styles) reddish; bracts 9- to 13-dentate.

Range: Pacific Islands, the exact origin unknown. Typical f. *wilkesiana* (leaf color described above) is grown for ornament at the Promenade Gardens, Georgetown, and elsewhere in Guyana.

Several of the more striking color variations in the leaves of this subspecies are seen in the Guianas, and are keyed below.

Key to Cultivars

1. Leaves green and white.
 2. Leaves green with cream margin and teeth 1a. cv. Godseffiana
 2. Leaves basically cream or white, variegated with irregular green markings and specklings of various shades 1b. cv. Java White
1. Leaves reddish-brown or brownish-purple.
3. Leaves russet-brown or wine-purple, without a brightly differentiated margin 1c. cv. Macrophylla
3. Leaves with crimson red or pink margin brightly differentiated from brownish-purple base color of the blade 1d. cv. Marginata

1a. *A. amentacea* subsp. *wilkesiana* cv. Godseffiana. (Synonyms: *A. wilkesiana* Mueller Argau, cv. Hoffmannii; *A. godseffiana* Hort. Sander ex M.T. Masters). Range: Grown for ornament in roadside gardens, Georgetown, Guyana; as a street planting and on hotel grounds in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana.

1b. *A. amentacea* subsp. *wilkesiana* cv. Java White. Range: Grown for ornament at the Botanic Gardens, Georgetown, Guyana.

1c. *A. amentacea* subsp. *wilkesiana* cv. Macrophylla. (Synonyms: *A. macrophylla* Veitch, *A. wilkesiana* f. *macrophylla* (Veitch) J.J. Smith). GIANT REDLEAF. Range: Grown for ornament at the Botanic Gardens, Georgetown, Guyana, and at the Esther Stichting near Paramaribo as well as on hotel grounds and at the Palmentuin in Paramaribo, Surinam.

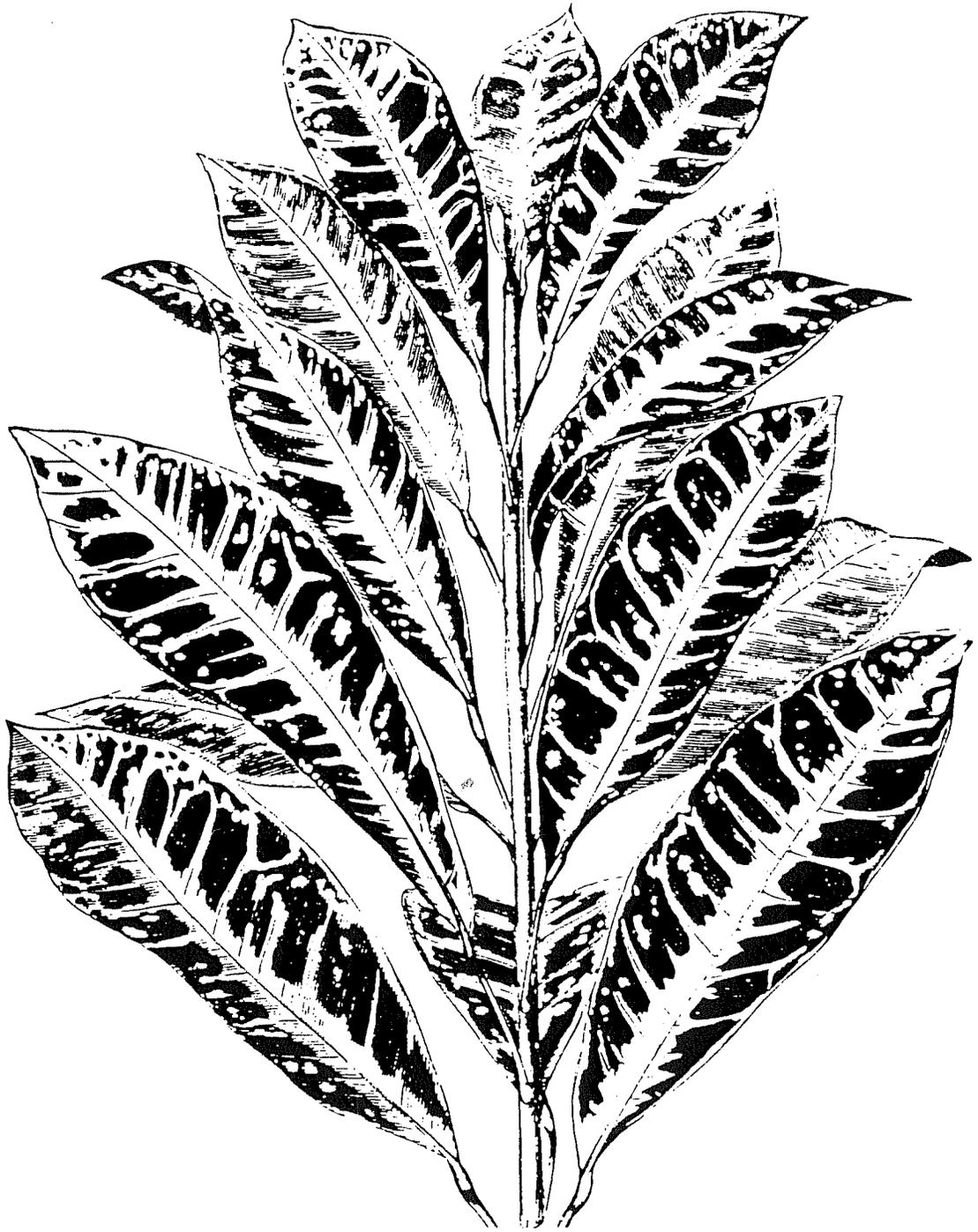


Fig. 90. *Codiaeum variegatum* (Euphorbiaceae).

1d. *A. amentacea* subsp. *wilkesiana* cv. Marginata. (Synonyms: *A. marginata* Hort., non (Poiret) K. Sprengel; *A. wilkesiana* var. *marginata* Hort.). Range: Grown for ornament in the Cultuurtuin, Paramaribo and elsewhere in Surinam (Teunissen & Lande, 1980; Ostendorf, 1962).

2. *Acalypha hispida* Burman fil., *Flora Indica* 203 (1768). KATTESTAART (Surinam); CHENILLE PLANT, RED HOT CATTAIL. Dioecious shrub to 4.5 m. Leaves ovate, acuminate, green, to 22.5 cm. Female inflorescence a pendent spike to 45 cm; flowers (styles) red or purple; bracts entire.

Range: Malaysia. Typical plants with red or purple flowers are grown for ornament in the Promenade Gardens and the Botanic Gardens, Georgetown, Guyana; at the Esther Stichting near Paramaribo, and on hotel grounds and in the Palmentuin in Paramaribo, Surinam; and in gardens and hotel grounds in Cayenne, French Guiana.

The cv. Alba with female flowers greenish-white is cultivated at the Botanic Gardens, Georgetown, Guyana.

3. *Acalypha macrostachya* Jacquin, *Plantarum Rariorum Horti Caesarei Schoenbrunnensis* 2: 63, t.245 (1797). Monoecious or dioecious shrub or small tree to 12 m. Leaves ovate, acuminate, green, to 21 cm. Female inflorescence a pendent spike to 20-40 cm; flowers (styles) red; bracts 13- to 27-dentate.

Range: Mexico to Brazil. Grown as an ornamental in the Cultuurtuin, Paramaribo, and elsewhere for hedges in Surinam (Teunissen & Lande, 1980; Ostendorf, 1962).

2. *Breynia* J.R. & G. Forster

Non-succulent trees and shrubs; plants monoecious. Leaves alternate, simple, entire, petiolate, stipulate. Female inflorescence a solitary, axillary flower; male inflorescence usually a few-flowered fascicle, or flowers solitary. Flowers regular, pedicellate; sepals 5-6, united below in a 5- to 6-lobed, campanulate calyx; petals absent. Stamens 3, with the 6 cells of the anthers united on a common column. Ovary 3-celled. Fruit a berry; seeds 6, 2 per carpel.

1. *Breynia disticha* J.R. & G. Forster, *Characteres Generum Plantarum* 146, t.73 (1776). (Synonym: *B. nivosa* (W.G. Smith) Small). SNEEUWBLAD, SNEEUW-WIT, ZILVERBLAD (Surinam); SNOWBUSH. Shrub to 2 m; branches lax, somewhat zigzag, reddish. Leaves variegated and mottled green and white, sometimes all white, often distichously spreading, ovate, broadly elliptical or elliptic-oblong, to 5 cm. Flowers long-pedicellate, greenish. Fruit c.1.2 cm wide.

Range: Pacific Islands. Grown as an ornamental in the Botanic Gardens, Georgetown, Guyana; in roadside garden in Tankarastraat, Paramaribo, Surinam; and in French Guiana (de Granville, 1985A).



Fig. 91. *Euphorbia cotinifolia* (Euphorbiaceae).

3. *Codiaeum* A. Jussieu

Non-succulent, evergreen trees and shrubs; plants monoecious. Leaves alternate, simple, glabrous, petiolate; sap slightly milky. Inflorescence an axillary raceme; racemes unisexual. Flowers regular; male flowers pedicellate, with sepals (3-) 5 (-6), petals 5, and stamens 20-30; female flowers sessile, with sepals 5, petals absent. Ovary 3-celled. Fruit a capsule; seeds 3, 1 per cell.

1. *Codiaeum variegatum* (Linnaeus) Blume, *Bijdragen tot de Flora van Nederlandsch Indie* 606 (1826), var. *variegatum*. (Synonyms: *C. variegatum* var. *pictum* (Loddiges) Mueller Argau, *C. pictum* Loddiges). CROTON. Shrub or tree to 2.4 (-9) m. Leaves variegated with dots, blotches, streaks or mottlings of one or several colors depending upon the individual cultivar (often red, purple, yellow or white), entire or sometimes lobed, or incised as deep as to the midvein to produce an interrupted lamina, linear to ovate, the margin flat to undulate. Flowers white.

Range: Malaysia. Grown as an accent ornamental in numerous gardens of Guyana; at the Esther Stichting near Paramaribo, and at the Palmentuin, the sierplanten area of the Cultuurtuin and on hotel grounds in Paramaribo, Surinam; and in the Jardin Botanique and hotel grounds of Cayenne, French Guiana.

4. *Euphorbia* Linnaeus

Armed or unarmed, succulent or non-succulent trees, shrubs or herbs; plants monoecious, rarely dioecious; sap milky, often poisonous; branches sometimes with stipular, paired spines. Leaves alternate, opposite or whorled, simple, petiolate or sessile, entire to toothed or lobed, sometimes very reduced or absent. Inflorescence-unit a cyathium, comprising 1 female flower (a pistil) and several male flowers (1 stamen with jointed pedicel) in an involucre formed of fused bracts, which is itself provided with 1-5 cup-like nectar glands which may have bract-like or petaloid appendages. Inflorescence terminal or axillary, of cyathia disposed in simple to paniculate cymes. Petals absent. Ovary 3-celled. Fruit a 3-seeded, 3-valved capsule.

Key to Species

1. Stems succulent, fleshy; leaves either very small, sessile and caducous, or fleshy.
 2. Stems cylindrical, unarmed 9. *E. tirucalli*
 2. Stems 3- to 6-angled, armed with spines. 7. *E. nerifolia*
3. Leaves fleshy, persistent, 7.5-30 cm 7. *E. nerifolia*
3. Leaves thin, small and caducous, to 1.2 cm (or more), or absent.
 4. Stems glaucous-blue, 4- to 6-angled, not banded 1. *E. coerulescens*
 4. Stems not glaucous-blue, 3-angled, the surface between angles with white, longitudinal banding or mottling.
5. Leaves prominent, spatulate, to 1.2 cm (or more) 10. *E. trigona*
5. Leaves absent, or suborbicular and to 6 mm 4. *E. lactea*
1. Stems not succulent and fleshy; leaves large, thin, petiolate, not fleshy.
 6. Leaves whorled, or rarely opposite.
7. Leaves usually in whorls of 3, green to reddish-bronze above; involucre bracts not

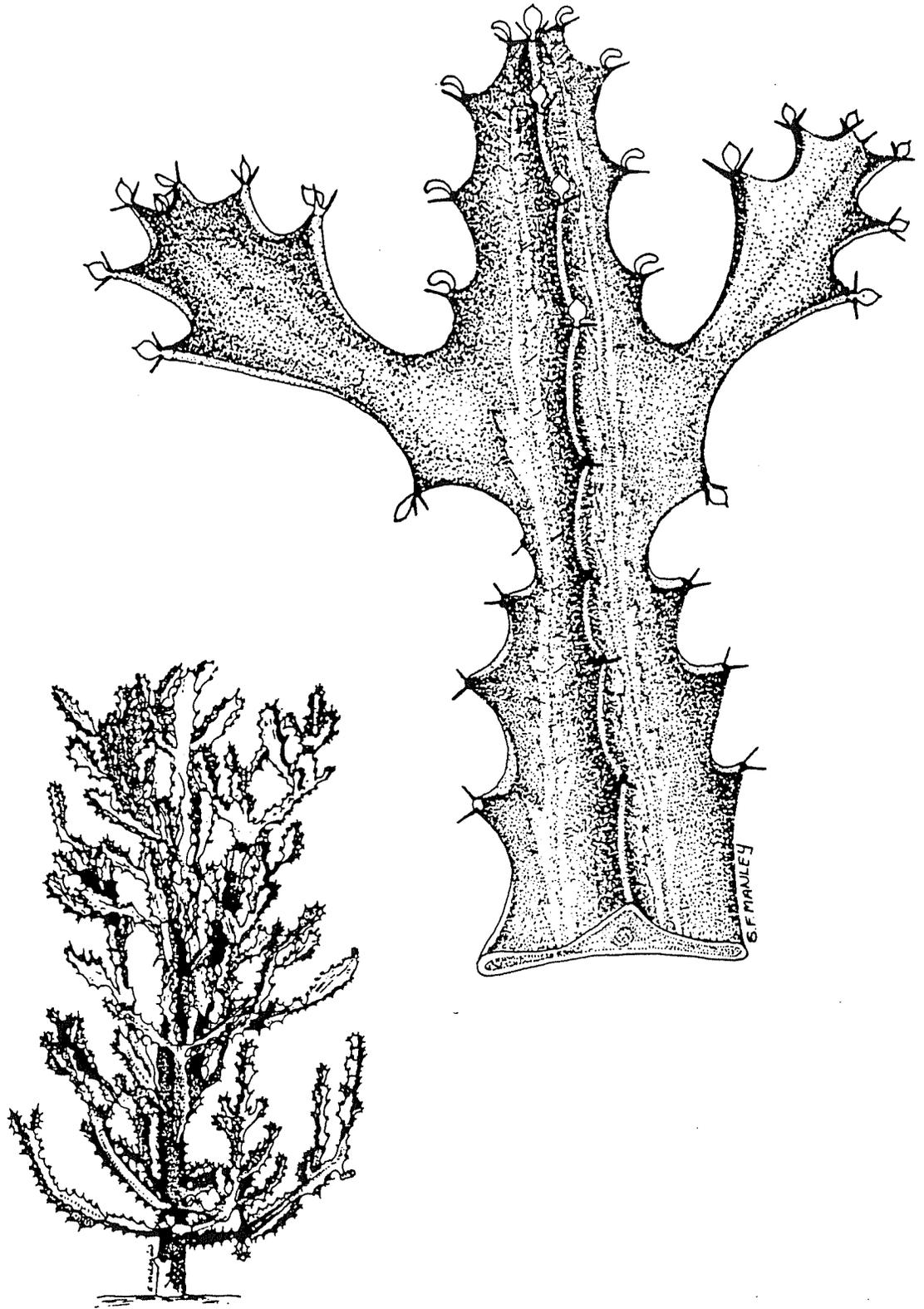


Fig. 92. *Euphorbia lactea* (Euphorbiaceae).

- enlarged and white
7. Leaves usually in whorls of 4-11, green; involucre bracts enlarged, spatulate, white
6. Leaves alternate.
8. Stems woody, scrambling, armed with spines
8. Stems herbaceous, erect, unarmed.
9. Annual herb; foliaceous involucre bracts often purple-spotted
9. Perennial shrub; foliaceous involucre bracts all red
2. *E. cotinifolia*
5. *E. leucocephala*
6. *E. milii*
3. *E. heterophylla*
8. *E. pulcherrima*

1. *Euphorbia coerulescens* Haworth, *Philosophical Magazine* 276 (1827). (Synonym: *E. coerulea* Hort.). Succulent, armed shrub to 1.8 m, branched from the base; young branches (stems) glaucous-blue, 4- to 6-angled, constricted into segments; spines paired, to 6 mm. Leaves minute, caducous. Inflorescence of 9 cyathia, arranged as 3 cymes, each comprising 3 cyathia. Involucre campanulate, yellow; glands 5.

Range: South Africa. Grown for ornament in French Guiana (de Granville, 1985).

As noted in *Hortus Third* (1976), this plant is frequently confused in cultivation with *E. ledienii* A. Berger, also of South Africa, which has less conspicuously jointed stems.

2. *Euphorbia cotinifolia* Linnaeus, *Species Plantarum* 453 (1753). (Synonyms: *E. cotinoides* Miquel, *E. caracasana* (Klotzsch & Garcke) Boissier, *E. caracasana sanguinea* Hort. Graf; *Alectoroctonum caracasenum* Klotzsch & Garcke). KOENAPAROE, KONOEPAROE (Surinamese Carib), ALASOE (Surinamese Arawak), GUNAPALU (Surinam); CONABARU (Guyana Warrau), CONAPARU (Guyana Arawak). Monoecious, unarmed shrub or tree to 10 m; sap milky. Leaves in whorls of 3 (-4); petiole to 12 cm; blade ovate or orbicular, to 14 cm, entire, green to reddish-bronze above, green and glaucous beneath. Inflorescence of cyathia in terminal and axillary panicles. Cyathial glands 5, brown, each with a greenish or white appendage.

Range: Mexico to northern South America, including Guyana and Surinam (Jablonski, p.187, 1967). Grown as an ornamental in the Promenade Gardens and Botanic Gardens, Georgetown, Guyana; on hotel grounds in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana; infrequently grown elsewhere in gardens of French Guiana (de Granville, 1985A, as *E. caracasana* var. *sanguinea*).

Literature: Graf, A.B. 1970. *Exotica 3, Century Edition*. 1,834 pp. East Rutherford, New Jersey: Roehrs Company. Jablonski, E. 1967. Euphorbiaceae, pp.80-190, in Maguire, B., The botany of the Guayana Highland - Part VII. *Memoirs of the New York Botanical Garden* 17(1): 1-439. Webster, G.L. and D. Burch. 1967. Family 197. Euphorbiaceae, pp.211-350, in Woodson, R.E., et al., *Flora of Panama*, Part VI. *Annals of the Missouri Botanical Garden* 54(3): 201-307. Wijnands, O. 1983. *The Botany of the Commelins*. Rotterdam: A.A. Balkema.

These poisonous plants had been introduced from Surinam to various European gardens by the year 1688 (Wijnands, p.99, 1983). Their toxic milky sap is frequently used as a fish poison by Amerindians. A specimen (*Archer 2422* (US)) from Morawhanna, Northeast District, Guyana is noted as a "red-leaved "conaparu" with leaves reddish above,



Fig. 93. *Euphorbia milii* (Euphorbiaceae).

green below; said to be more toxic than ordinary conoparu." Another specimen (*Archer* 2617, coll. 1934 (US)), from the vicinity of Georgetown, Guyana bears the observation: "Cultivated in many negro dooryards. Some say as ornament, others to keep away witches".

E. caracasana, a plant noted by Webster & Burch (1968) as often planted for hedges in Central America, with bright red leaves, is of somewhat questionable disposition though acknowledged to be very close to *E. cotinifolia*, and is included here in synonymy of that plant following the placement by Graf (p.1783, 1970) of *E. caracasana sanguinea* into the synonymy of *E. cotinifolia*.

3. *Euphorbia heterophylla* Linnaeus, *Species Plantarum* 453 (1753). MELKIE WIWIERIE (Surinam); MEXICAN FIRE PLANT, MEXICAN POINSETTIA. Annual, unarmed herb to c.1 m. Leaves opposite and alternate, ovate, lanceolate or pandurate, green, the upper leaves and inflorescence-bracts green and usually spotted purple (though not red-spotted). Inflorescence-bracts enlarged, foliaceous, often lobed. Inflorescence of cyathia in irregular terminal cymes. Cyathial gland(s) 1(-2), funnelform; appendages absent.

Range: Florida, West Indies; Mexico to South America. Grown as an ornamental in Surinam (Ostendorf, 1962).

Literature: Gorts-van Rijn, A.R.A. 1976. Euphorbiaceae, pp.387-424, in Lanjouw, J. and A.L. Stoffers, *Flora of Suriname*, vol. II, part 2. Additions and Corrections (pp. 385-712). Leiden: E.J. Brill.

A weed of disturbed ground in Surinam (where it has been collected in the Cultuurtuin, Paramaribo) and elsewhere in the tropics (Gorts-van Rijn, p.423, 1976).

4. *Euphorbia lactea* Haworth, *Synopsis Plantarum Succulentarum* 127 (1812). CACTUS SURINAM (Netherlands Antilles); CANDELABRA PLANT, MOTTLED SPURGE. Succulent, armed, candelabra-form or cactus-like shrub or tree to 4.5-5 m; stems 3(-4)-angled with rounded angles, the flat sides green, banded with white marbling down the center, scalloped between the raised spine-bearing bases; spines paired, to 6 mm. Leaves suborbicular, to 6 mm, or absent. Inflorescence of cyathia in terminal or lateral, 1- to few-flowered cymes. Cyathia subtended by dilated bracts; glands entire, without appendages.

Range: Peninsular India. Grown as an ornamental in Georgetown, Guyana, on museum grounds in Paramaribo, Surinam, and in the Jardin Botanique, Cayenne and on hotel grounds in Kourou, French Guiana.

5. *Euphorbia leucocephala* Lotsy, *Botanical Gazette* (Crawfordsville) 20: 350, t.24 (1895). Unarmed shrub or tree to 6 m. Leaves in whorls of 4-11, variably oblong to elliptical or oblong-lanceolate, to 7.5 cm, long-petiolate. Inflorescence of cyathia in umbels. Involucral bracts enlarged, spatulate, white. Cyathial glands 5; appendages triangular, petaloid, white.

Range: Mexico to El Salvador. Grown as an ornamental in the Botanic Gardens, Georgetown, Guyana.

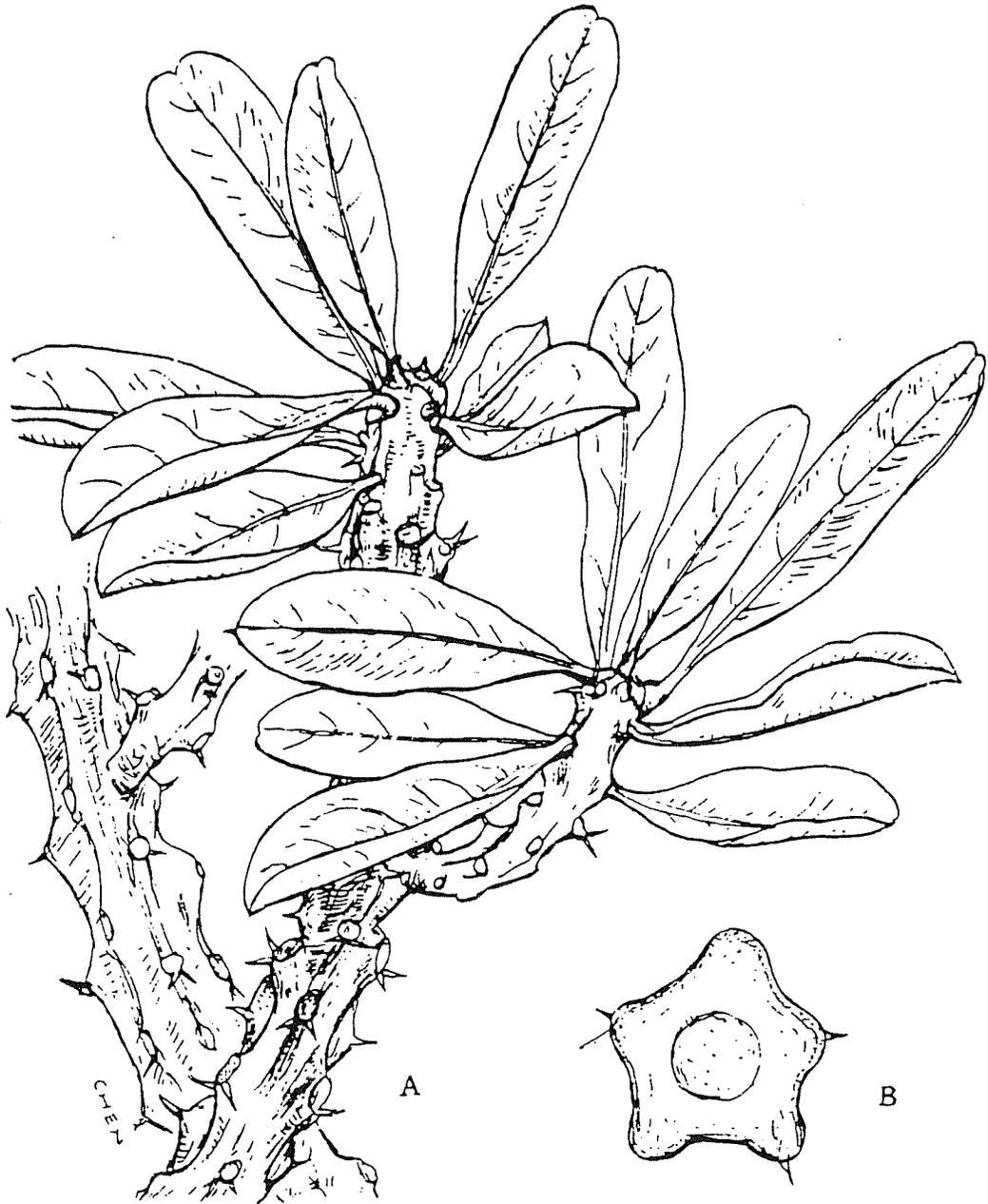


Fig. 94. *Euphorbia neriifolia* (Euphorbiaceae).

6. *Euphorbia milii* Desmoulins, *Bulletin de l'Histoire Naturelle de la Societe Linneenne de Bordeaux* 1: 27, pl.1 (1826), var. *splendens* (Bojer ex Hooker) Ursch & Leandri, *Memoires de l'Institut Scientifique de Madagascar*, ser.B, 5: 148 (1954). (Synonym: *E. splendens* Bojer ex Hooker). CHRISTUSDOORN, TWEE-EN-EEN, MEISJESLIPPEN (Surinam); CROWN OF THORNS. Scrambling woody, armed shrub; stems to 1.8 m; stipular spines and adventitious spines to c.2 cm. Leaves oblong-ovate, the base cuneate, the apex truncate and mucronate, to 5 cm. Inflorescence of cyathia in long-pedunculate, glandular, forked cymes. Involucral appendages 2, ovate, red or yellow.

Range: Southwestern Madagascar. Grown as an ornamental in the Botanic Gardens, Georgetown, Guyana, on hotel grounds and in waterfront park in Paramaribo, Surinam; and in French Guiana (de Granville, 1985A).

Literature: Rauh, W. 1985. Madagascarian euphorbias: life and growth forms. *The Euphorbia Journal* 3: 19-37. Taloumis, G. 1984. Crown of thorns. *Flower and Garden* 28(6): 22-23. Ursch, E. and J. Leandri. 1954. Les euphorbes malgaches epineuses et charnues du jardin botanique de Tsimbazaza. *Memoires de l'Institut Scientifique de Madagascar*, ser.B, 5: 109-185.

The most frequently seen plants have bracts red, although yellow-bracted plants are also grown in the Botanic Gardens, Georgetown, Guyana. A key and illustrations to variants of this species will be found in Ursch & Leandri (pp.144-154, 1954).

7. *Euphorbia neriiifolia* Linnaeus, *Species Plantarum* 451 (1753). HEDGE EUPHORBIA. Succulent, armed, evergreen or deciduous, monoecious, erect tree to 7.2 m, comprising a single trunk branched in a whorl at the apex; branches 5-angled, the angles somewhat rounded; spines paired, to 3 mm. Leaves spatulate, fleshy, stiff, shortly petiolate, 7.5-30 cm, clustered at the tips of branchlets. Inflorescence of cyathia in axillary, few-flowered cymes. Cyathial glands 5, greenish or yellowish-green.

Range: Western India; perhaps also East Indies. Grown as an ornamental in the Promenade Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

Literature: Meher-Homji, V.M. 1964. A parallel in the habit and the habitat of the cactiform euphorbias of India. *Journal of Biological Sciences (Bombay)* 7(2): 64-67;64A-B.

8. *Euphorbia pulcherrima* Willdenow ex Klotzsch, *Allgemeine Gartenzeitung* 2: 27 (1834). (Synonym: *Poinsettia pulcherrima* (Willdenow ex Klotzsch) Graham). KERSTSTER (Surinam); POINSETTIA. Unarmed shrub to 3 m; sap milky. Leaves lanceolate, ovate, or elliptic-ovate, entire to toothed or lobed, long-petiolate, to 17.5 cm. Inflorescence of cyathia in a terminal, umbelliform cyme, subtended by numerous foliaceous (leaf-like), red bracts. Cyathial gland cup-shaped, yellow.

Range: Mexico and Central America. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and in French Guiana (de Granville, 1985).



Fig. 95. *Euphorbia pulcherrima* (Euphorbiaceae).

Literature: Dyer, G.B. and C.L. Dyer. 1954. A century of strategic intelligence reporting: Mexico, 1822-1919. *Geographical Review* 44(1): 49-64. Moon, M.H. 1956. A short history of the poinsettia. *Baileya* 4(4): 176-180. Taloumis, G. 1969. Poinsettia - the Christmas flower. *Garden Journal*: 19(6): 164-169.

The common name "poinsettia" commemorates Joel R. Poinsett (1799-1851), a United States official in Mexico who first sent the plant to North America. He also is known as an agent who subtly collected observations on Mexican landscape for strategic use by the U.S. government (Dyer & Dyer, 1954).

9. *Euphorbia tirucalli* Linnaeus, *Species Plantarum* 452 (1753). MILK BUSH, PENCIL TREE. Succulent, unarmed tree to 9 m; sap milky, poisonous; branches cylindrical, forked, jointed, longitudinally lined, often clustered apically on a stem, to 10 x 6 cm. Leaves alternate, minute or up to 2.5 cm, caducous. Inflorescence of cyathia in sessile clusters, crowded at apices of branchlets. Cyathial glands 5, entire, transversely oblong.

Range: Southern and eastern Africa. Grown as an ornamental in Georgetown, Guyana; in roadside gardens of Old Site Town and Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

Literature: DeFilipps, R.A. 1987. Topics in the succulent plant trade: Euphorbias, pp.11-31, in Fuller, D. and S. Fitzgerald, eds., *Conservation and Commerce of Cacti and Other Succulents*. 264 pp. Washington, D.C.: TRAFFIC (U.S.A.) and World Wildlife Fund.

Articles on the use of *E. tirucalli* as a living fence and its milky sap for rubber are summarized by DeFilipps (1987).

10. *Euphorbia trigona* Haworth, *Synopsis Plantarum Succulentarum* 27 (1812). AFRICAN MILK TREE. Succulent, armed shrub or tree to c.5 m; branches jointed into segments with wing-like angles, 3- to 4-angled, green, banded with white marbling down the center; spines paired, to 8 mm. Leaves spatulate, to c.1.2 cm or more. Inflorescence of cyathia in terminal or lateral cymes. Cyathia subtended by bracts; glands entire, without appendages.

Range: Peninsular India; possibly also Africa. Grown as an ornamental in shop windows and elsewhere in Paramaribo, Surinam.

Literature: Koutnik, D. 1991. *Euphorbia trigona* Miller...or is it *E. hermetiana* Lemaire? *The Euphorbia Journal* 7: 11-14.

5. *Hevea* Aublet

Non-succulent, unarmed trees; plants monoecious; sap milky. Leaves alternate, trifoliolate (leaflets 3), long-petiolate; petiole glandular at apex. Inflorescence a panicle of cymes, with several staminate (male) flowers surrounding 1 or a few pistillate (female) flowers. Flowers apetalous; sepals 5, the calyx 5-toothed or -lobed; stamens 5-10, united in a column by the filaments. Pistillate flower with ovary 3-celled. Fruit a capsule, splitting into 3, 2-valved follicles; seeds 3, large.

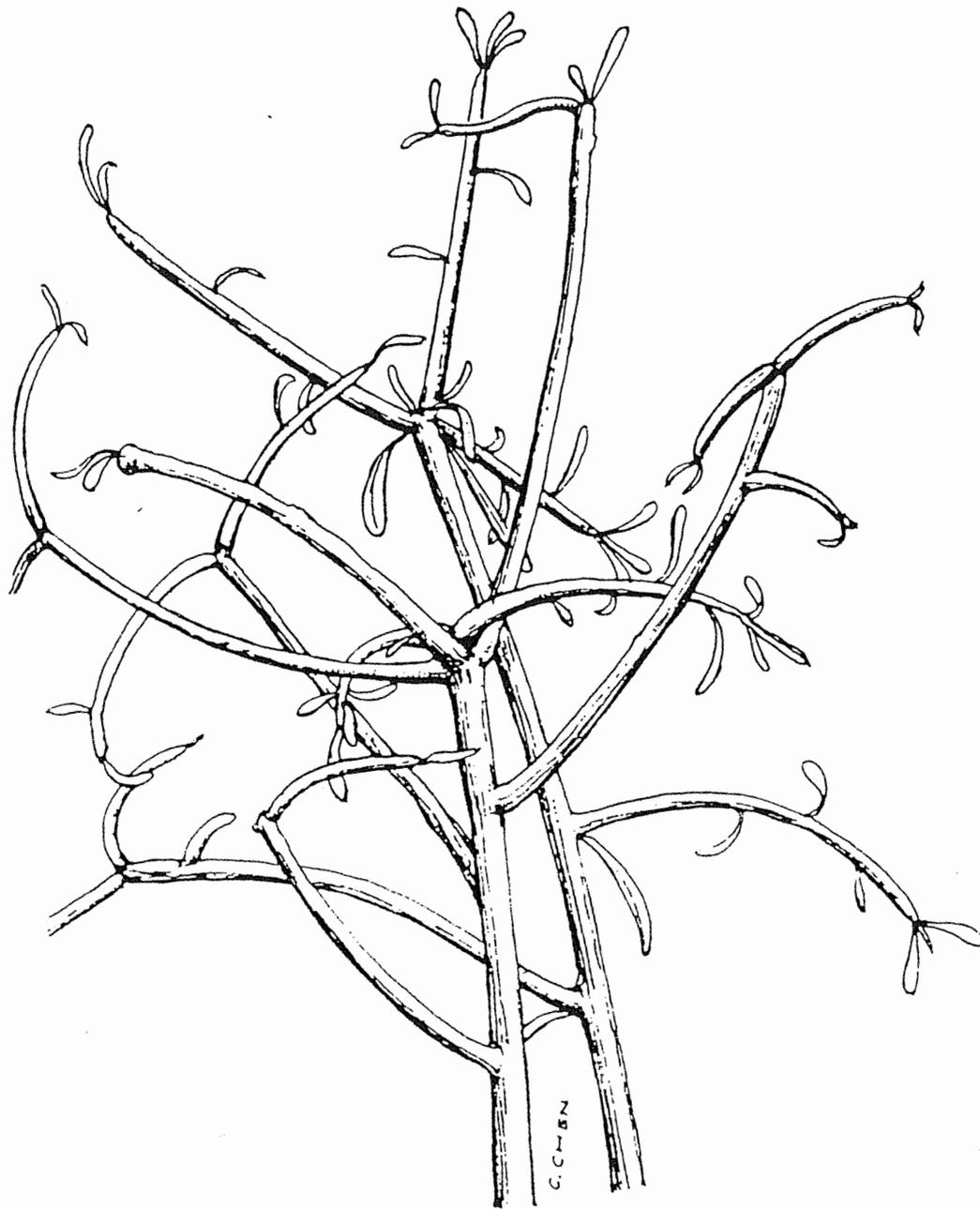


Fig. 96. *Euphorbia tirucalli* (Euphorbiaceae).

1. *Hevea brasiliensis* (Willdenow ex A. Jussieu) Mueller Argau, *Linnaea* 34: 204 (1865). RUBBERBOOM (Surinam); PARA RUBBER TREE. Tree to 18 (-40) m. Leaflets elliptical to oblong-obovate, coriaceous, entire, the blade to 60 cm; petiole of leaf to 30 cm. Flowers whitish-yellow, whitish-tomentose; stamens (anthers) 10. Fruit 3-lobed, to 4 cm; seeds to 3 cm.

Range: South America (Amazon River drainage), including French Guiana. Recently re-introduced, for decoration, at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); grown in the Gardens as an economic tree in the 1930's (Department of Agriculture, 1934). Introduced to Surinam in 1897 (Ostendorf, 1962) and formerly grown in the Cultuurtuin, Paramaribo (Lanjouw, 1931).

6. *Hippomane* Linnaeus

Non-succulent, unarmed trees or shrubs; plants monoecious; sap milky, poisonous. Leaves alternate, petiolate, stipulate; petiole with gland at juncture of petiole and lamina. Inflorescence a terminal spike with thick rachis. Flowers apetalous; staminate (male) flowers in 5- to 15-flowered glomerules in upper part of spike, the calyx 2- to 3-lobed, the stamens 2; pistillate (female) flowers 1-2, solitary in lower part of spike, the calyx 3-lobed, the ovary 6- to 9-celled. Fruit a drupe with mealy pulp, resembling an apple; seeds 6-9, flattened.

1. *Hippomane mancinella* Linnaeus, *Species Plantarum* 1191 (1753). MANCHINEEL. Tree to 15 (-20) m, often smaller. Leaves ovate or elliptical, shining above, crenulate, the blade to 10 cm, the petiole to 6 cm. Inflorescence to 10 cm. Calyx of staminate flowers c.1 mm; calyx of pistillate flowers c.3 mm. Fruit suborbicular or globose, to c.3.5 cm wide, red or yellow, poisonous; seeds brown.

Range: Southern Florida, Bahamas, West Indies; Mexico to western South America. Grown as a decorative subject at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); a specimen was growing there as early as the 1930's (Department of Agriculture, 1934).

Literature: Howard, R.A. 1981. Three experiences with the manchineel (*Hippomane* spp., Euphorbiaceae). *Biotropica* 13(3): 224-227.

7. *Hura* Linnaeus

Non-succulent, armed, buttressed, deciduous or semi-deciduous trees; trunk and branches with conical spines; plants monoecious; sap milky, poisonous. Leaves alternate, simple, long-petiolate; petiole with 2 glands at apex. Male inflorescence of numerous sessile flowers on a long-pedunculate, terminal, cylindrical spike. Female inflorescence a solitary, pedicellate, axillary flower. Flowers apetalous; calyx cup-shaped, irregularly toothed; stamens 8-20, in 2-5 whorls of anthers, with the filaments united in a column; ovary 5- to 20-celled; style long; stigma peltate, with c.16 linear, papillose lobes radiating from a central, depressed disc. Fruit a large, woody, deeply ribbed, 11- to 20-segmented capsule, explosively dehiscent; seeds discoid, compressed.

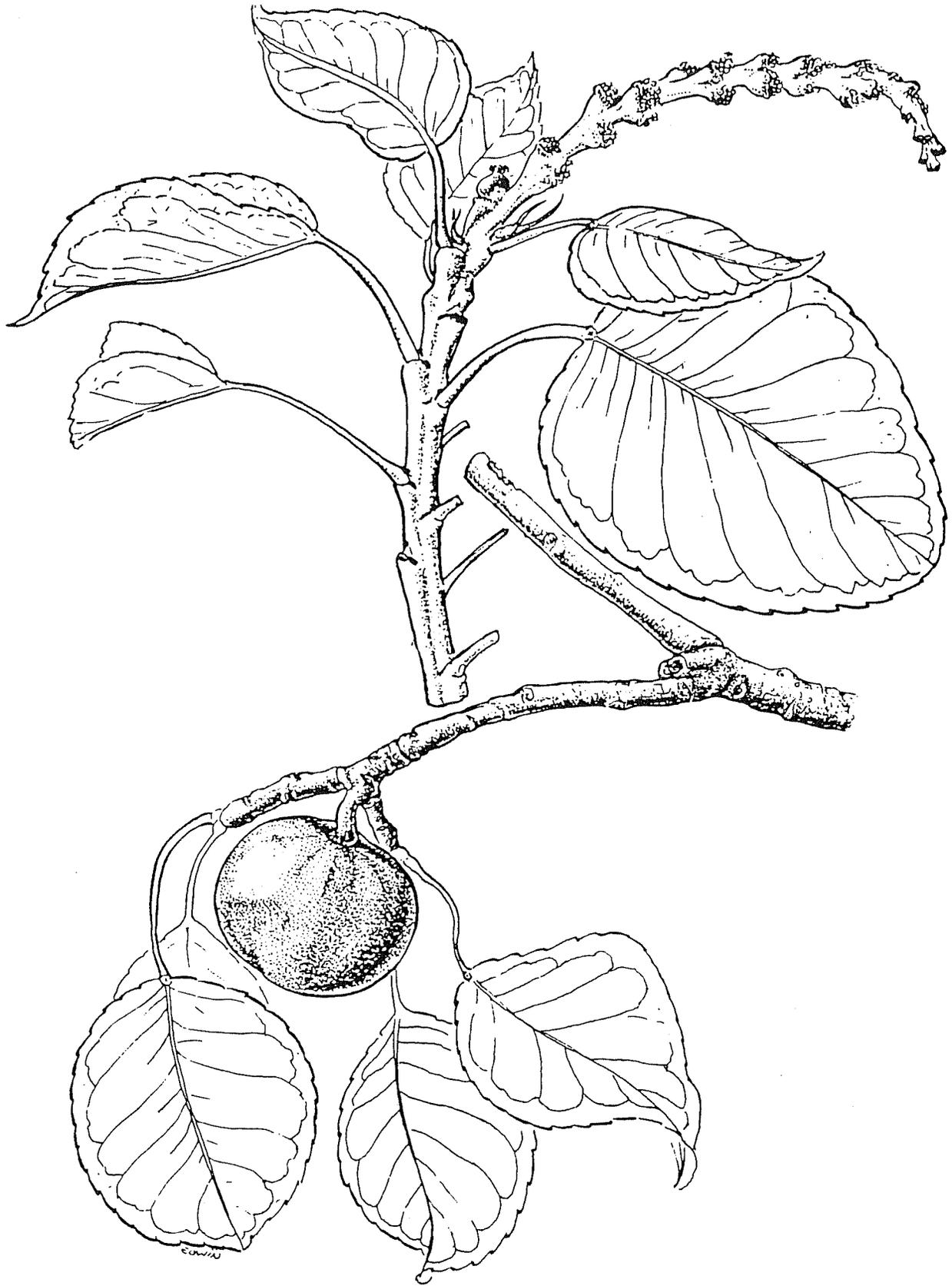


Fig. 97. *Hippomane mancinella* (Euphorbiaceae).

1. *Hura crepitans* Linnaeus, *Species Plantarum* 1008 (1753). BOIS DIABLE (French Guiana); MONKEY DINNER-BELL, SANDBOX (Guyana); POSSENTRIE, POSSUM (Surinam); ASIWAKARA, POEKOERI (Surinamese Carib); WARAJOEWA (Surinamese Arawak). Tree to 40 m; trunk and branches often with conical, blackish spines to c.1.8 cm. Leaves ovate, cordate at the base, serrate to undulate; blade to 20 (-50) cm; petiole to c.20 cm. Flowers purplish-red. Male inflorescence comprising c.100 flowers, the spike 4-6 x 2 cm; peduncle to 10 cm. Fruit the size and shape of a peeled orange, with 11-15 (-20) furrows, splitting explosively into crescent-shaped segments (cocci), woody, to 8 (-10) cm wide; seed 1 per segment, to 2.4 cm wide.

Range: West Indies, Central and South America, including the three Guianas. Grown for ornament at the Botanic Gardens, Georgetown, Guyana; and in French Guiana (de Granville, 1985A). Cultivated for other purposes in Surinam (Lanjouw, 1931; Ostendorf, 1962).

8. *Jatropha* Linnaeus

Non-succulent, unarmed trees, shrubs or perennial herbs; plants monoecious or dioecious; sap milky or watery, poisonous. Leaves alternate, simple, entire to lobed or palmately incised, petiolate; venation palmate or pinnate. Inflorescence a mostly terminal, dichotomous, simple or compound cyme, sometimes racemiform or paniculiform. Flowers unisexual, regular; sepals 5, often united below in a tube; petals 5, free or united below in a tube, sometimes absent; stamens 8-12, sometimes in 2 sets of unequal length or united by the filaments. Ovary (2-) 3 (-5) -celled. Fruit a capsule, rarely semi-drupaceous and tardily dehiscent; seed 1 per cell, carunculate.

Literature: Dehgan, B. 1984. Phylogenetic significance of interspecific hybridization in *Jatropha* (Euphorbiaceae). *Systematic Botany* 9(4): 467-478.

Key to Species

1. Petals greenish- or yellowish-white; fruit semi-drupaceous, tardily dehiscent; stipules obsolete 1. *J. curcas*
1. Petals red; fruit a dry capsule; stipules present (except *J. integerrima*).
 2. Leaves peltate; stem gouty-swollen 5. *J. podagrica*
 2. Leaves not peltate; stem not swollen.
3. Stipules obsolete or entire; leaves frequently hastate 3. *J. integerrima*
3. Stipules dissected into bristles; leaves not hastate.
 4. Stipules glandular; leaves 3- to 5-lobed, glandular-ciliate, the lobes not incised; petals purplish 2. *J. gossypifolia*
 4. Stipules not glandular; leaves 8- to 12-lobed to the base, the lobes incised-pinnatisect; petals red 4. *J. multifida*

1. *Jatropha curcas* Linnaeus, *Species Plantarum* 1006 (1753). PURGEERNOOT, SCHIJTNOOTEN (Surinam); DJARAK PAGER (Surinamese Javan); PO-OKA (Surinamese Bush Creole); PHYSIC NUT. Shrub or tree to 5 m. Leaves unlobed to shallowly 3- to 5- (-7) -lobed, glabrous, the blade to 30 x 17.5 cm; stipules obsolete. Petals

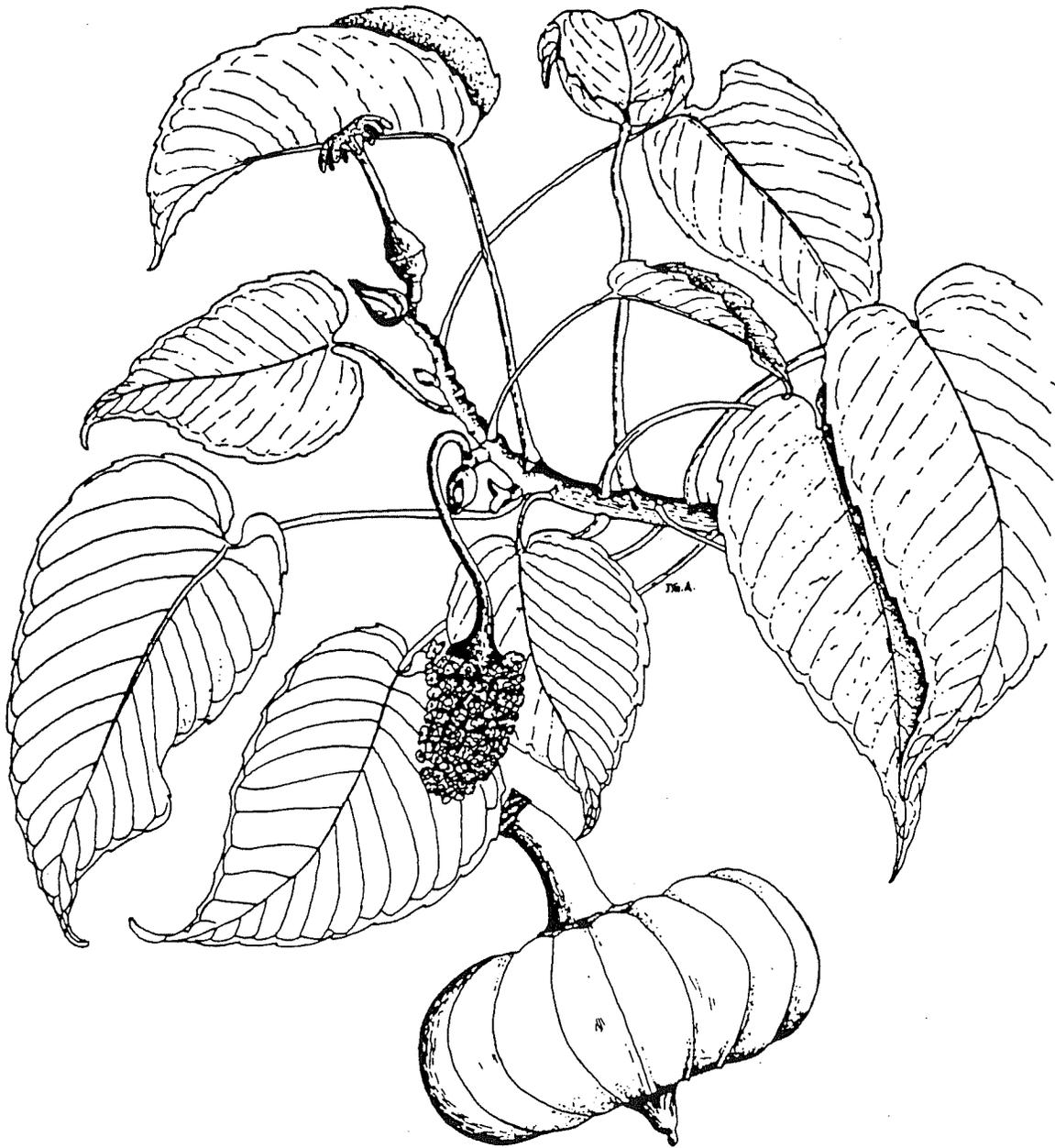


Fig. 98. *Hura crepitans* (Euphorbiaceae).

greenish- or yellowish-white, united below in a tube, 4-8 mm. Stamens 8-10.

Range: Tropical America, including Surinam. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982), and for hedges in Surinam (Ostendorf, 1962).

2. *Jatropha gossypifolia* Linnaeus, *Species Plantarum* 1006 (1753). Subshrub to 2 m. Leaves palmately 3- to 5-lobed, stipitately glandular-pubescent, the blade to 8 x 15 cm; stipules dissected into bristles, glandular. Petals purplish, free, 4 mm. Stamens 10-12.

Range: West Indies; Mexico to South America, including Surinam and French Guiana. Grown as an ornamental in Surinam (Ostendorf, 1962), and in French Guiana (de Granville, 1985A).

3. *Jatropha integerrima* Jacquin, *Enumeratio Systematica Plantarum* 32 (1760). (Synonym: *J. hastata* Jacquin). Shrub or tree to 4 m. Leaves oblong, variably 3-lobed, often hastate, glabrous or sparsely puberulent, the blade to 15 x 8 (-13) cm; stipules obsolete. Petals red, free, 1 cm. Stamens 10.

Range: Greater Antilles (Cuba, Hispaniola, Puerto Rico). Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and occasionally in gardens of buildings in Paramaribo, Surinam.

4. *Jatropha multifida* Linnaeus, *Species Plantarum* 1006 (1753). CORAL PLANT, PHYSIC NUT. Shrub or tree to 6 m. Leaves palmately 8- to 12-lobed to the base, the lobes incised-pinnatisect, glabrous, glaucous beneath, the blades to c.30 x 30 cm; stipules dissected into bristles, not glandular. Petals red, free, 6 mm. Stamens 7-8.

Range: Tropical America. Grown as an ornamental in a garden and on university grounds in Paramaribo, Surinam; and in French Guiana (de Granville, 1985A).

5. *Jatropha podagrica* Hooker, *Curtis's Botanical Magazine* 74: t.4376 (1848). GOUT PLANT. Shrub to 1.5 m; stem gouty-swollen, rough. Leaves peltate, deeply 3- to 5-lobed, glabrous, the blades to c.30 x 30 cm; stipules dissected into bristles, glandular. Petals red, free, 6-7 mm. Stamens 6-9.

Range: Central America. Grown as an ornamental at the Promenade Gardens and Botanic Gardens, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and on hotel grounds in Cayenne, French Guiana.

Literature: Brown, J.R. 1947. *Jatropha podagrica* Hook. *Cactus and Succulent Journal* (U.S.) 19(12): 187-188. Pickoff, L. 1986. *Jatropha podagrica*. *Cactus and Succulent Journal* (U.S.) 58(3): 117-118.

9. *Manihot* Miller

Non-succulent, unarmed trees, shrubs or perennial herbs; plants monoecious; sap milky. Stems branched, smooth or with pegs (protruding leaf-scars) at the nodes. Leaves

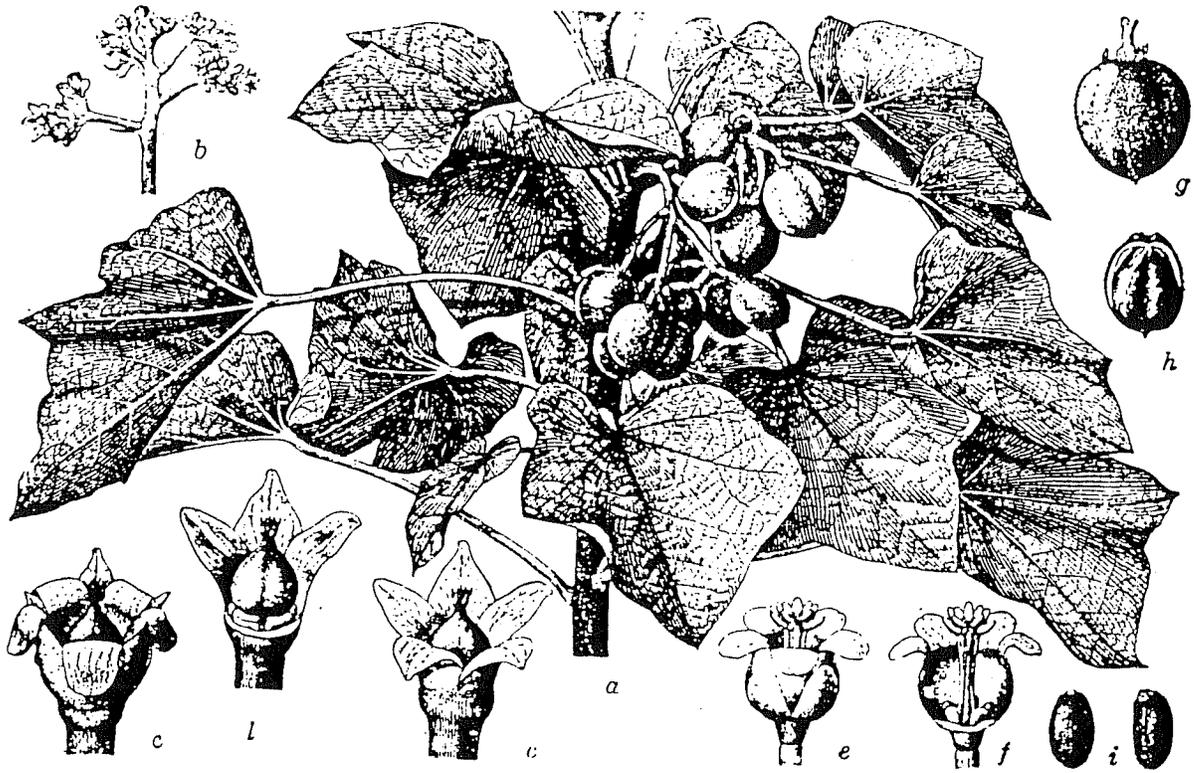


Fig. 99. *Jatropha curcas* (Euphorbiaceae).

alternate, simple, often deeply palmately lobed, sometimes peltate, petiolate. Inflorescence a terminal or axillary raceme or panicle, with male flowers more numerous than the proximal solitary or few female flowers. Flowers apetalous; sepals 5, united below in a 5-lobed tube; stamens 10, free. Ovary 3-celled. Fruit a capsule; seeds 3, carunculate.

1. *Manihot esculenta* Crantz, *Institutiones Rei Herbariae* 1: 167 (1776), cv. Variegata. (Synonym: *M. utilissima* Pohl, cv. Variegata). MANIOC (French Guiana); BITTERE CASSAVE, KASABA (Surinamese Creole); KETELA POEHOEN (Surinamese Javan); VARIEGATED CASSAVA. Shrub 1-4 m; adventitious roots (subterranean) tuberous-enlarged, cylindrical to ovoid, with white to yellow flesh, sometimes containing toxic HCN (hydrocyanic acid, prussic acid). Stems brown or silver, often bearing pegs. Leaf-blades deeply palmately 3- to 7- (-10) lobed, the lobes linear to oblanceolate, entire, to 17 cm, glabrous to sparsely puberulent, glaucous beneath, green and variegated with yellow; veins and petiole red. Inflorescence to 10 cm; flowers yellowish-green; anthers puberulent at apex. Fruit to 2 cm, 6-angled, the angles narrowly winged; seeds to 1 cm.

Range: Variegated plants occupy no original geographical range. Typical non-variegated plants originated in tropical America, and were first domesticated in Central America and Brazil. Variegated plants are grown as ornamentals at the Botanic Gardens, Georgetown, Guyana; non-variegated plants are grown for ornament in a garden in Paramaribo, Surinam.

Literature: Engle, M.M. 1988. Maria Sibylla Merian: 17th century jungle scientist. *South American Explorer* 17: 4-11. Rogers, D.J. and S.G. Appan. 1973. *Flora Neotropica Monograph No. 13: Manihot, Manihotoides* (Euphorbiaceae). 272 pp. New York: Hafner Press. Rogers, D.J. and H.S. Fleming. 1973. A monograph of *Manihot esculenta*. *Economic Botany* 27(1): 1-113. Renvoize, B.S. 1973. The area of origin of *Manihot esculenta* as a crop plant: a review of the evidence. *Economic Botany* 26(4): 352-360. Cassava Information Center. 1975. *2,000 Abstracts on Cassava*, Volume I. 584 pp.; *Abstracts on Cassava*, Volume II. 303 pp. 1976. Cali, Colombia: CIC, Centro Internacional de Agricultura Tropical.

Lanjouw (p.159, 1931) lists 35 Surinamese vernacular names for typical *M. esculenta*, the lectotype of which is figs.4 and 5 of Maria Sibylla Merian's *Dissertatio de generatione et metamorphosis insectorum Surinamensium* (1726), as selected by Rogers & Appan (1973) following H.J. Crantz. Crantz in 1766 originally cited Merian's Surinam cassava illustrations to represent the species, and one of the figures is shown in Engle (p.10, 1988). Green-leaved plants are grown in the three Guianas for the edible, starchy roots; yellow leaf-variegation as illustrated by Rogers & Appan (p.30, fig.6B, 1973) is of minor significance among the numerous other categories of variation exhibited by this complex species.

10. *Pedilanthus* Poiteau

Succulent or non-succulent, unarmed, deciduous or evergreen shrubs; plants monoecious; sap milky. Leaves alternate, simple, subsessile to shortly petiolate, somewhat, somewhat fleshy, distichously spreading. Inflorescence-unit a cyathium, the cyathia in terminal or lateral cymes; cyathia comprising numerous male, and 1 female, flowers. Involucre of the cyathium partly closed around flowers of cyathium, asymmetrical, 2-lipped, slipper-shaped, with 2-4 glands in a gibbous, pocket-like basal protuberance or spur. Male

Fig. 100. *Jatropha multifida* (Euphorbiaceae).



flower with no perianth, stamen 1, in clusters of up to 34 stamens per cyathium; female flower with perianth of 0-3 small scales. Ovary 3-celled, pedicellate, exserted; styles united in a protruding column. Fruit a 3-seeded, pedicellate capsule, or indehiscent.

Literature: Dressler, R.L. 1957. The genus *Pedilanthus* (Euphorbiaceae). *Contributions from the Gray Herbarium of Harvard University* 182: 1-118. Koutnik, D.L. 1985. An introduction to the genus *Pedilanthus*. *The Euphorbia Journal* 3: 38-42.

1. *Pedilanthus tithymaloides* (Linnaeus) Poiteau, *Annales du Museum National d'Histoire Naturelle, Paris* 19: 390 (1812). MELKSAPBLAD (Surinam), NENGRE-MOFO (Surinamese Creole), SLIPPER FLOWER. Deciduous or evergreen shrub to 2 (-3) m; stems straight or zigzag, somewhat fleshy. Leaves subsessile, soon dropping from lower part of stems, oblong, ovate, or ovate-lanceolate, keeled on the midvein beneath, to 10 cm. Involucre bright red distally, green or greenish-yellow at base, with red spur, slipper-shaped, to 1.4 cm. Fruit somewhat triangular.

Range: Florida, West Indies; Mexico to northern South America.

Key to Cultivars

- 1. Leaves variegated with white and tinged with pink or red 1c. cv. Variegata
- 1. Leaves all green.
 - 2. Leaves approximate, spreading comb-like in 2 rows, narrowly lanceolate; stem short, straight 1b. cv. Nana-Compacta
 - 2. Leaves rather distant, not spreading comb-like, ovate or ovate-lanceolate; stem tall, zigzag 1a. subsp. *tithymaloides*

1a. *P. tithymaloides* subsp. *tithymaloides*. Range: Mexico to northern South America, including Guyana and Surinam. Grown as an ornamental and hedge plant in Surinam (Ostendorf, 1962).

1b. *P. tithymaloides* cv. Nana-Compacta. Range: Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

1c. *P. tithymaloides* subsp. *tithymaloides* cv. Variegata. Range: Grown as an ornamental in Georgetown, Guyana, at the Palmentuin in Paramaribo, Surinam, and in Cayenne, French Guiana.

11. *Ricinus* Linnaeus

Non-succulent, unarmed annual to perennial shrubs; plants monoecious; sap watery. Leaves alternate, peltate, palmately lobed, petiolate, with 1 or 2 glands at apex of petiole; stipules sheathing, calyptrate. Inflorescence a terminal or seemingly axillary raceme or narrow panicle, with fascicles of male flowers below and female flowers above. Flowers apetalous; sepals 3-5, united below in a cup; stamens numerous (up to 1,000), filaments multi-branched and variously coalesced. Ovary 3-celled, muricate; stigmas 3, 2-branched. Fruit a 3-seeded capsule, often spiny; seeds carunculate.



Fig. 101. *Phyllanthus acidus* (Euphorbiaceae).



Fig. 102. *Ricinus communis* (Euphorbiaceae).

1. *Ricinus communis* Linnaeus, *Species Plantarum* 1007 (1753). DJARAK (Surinamese Javan), KRAPATA (Surinamese Creole), REER (Surinamese Hindu); CASTOR BEAN, CASTOR OIL PLANT. Herb to 4.5 m, varying to tree-like shrub up to 12 m; stems glaucous, with enlarged nodes. Leaf-blades palmately 5- to 11-lobed, to 1 m wide, glabrous, glaucous, green to purplish or red, the lobes serrate with gland-tipped teeth; petiole hollow, to c.25 cm. Flowers green. Fruits brown, variously mottled and marbled, to 2 x 1.7 cm.

Range: Tropical Africa. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; and in French Guiana (de Granville, 1985A).

Scarpa, A. and A. Guerci. 1982. Various uses of the castor oil plant (*Ricinus communis* L.): a review. *Journal of Ethno-pharmacology* 5(2): 117-137.

Cultivated for utilitarian purposes in the three Guianas, as the plant's seeds are the source of castor oil (wonderolie), a renowned laxative. Uses of the plant in Surinam are discussed by Lanjouw (pp.56-57, 1931).

Fabaceae

Trees, shrubs, vines or herbs, armed or unarmed. Leaves alternate, petiolate, often 1-pinnate, sometimes simple or 3-foliolate. Inflorescence an axillary or terminal raceme or panicle, or flowers fasciculate or solitary. Flowers bisexual, 5-merous, irregular; calyx of sepals united in a 5-toothed tube; corolla papilionaceous, comprising an upper erect to recurved standard (banner, vexillum) petal, 2 lateral paired wing petals, and 2 petals usually fused in a curved keel, sometimes free, the keel often enclosing or enfolding the stamens. Stamens (9) 10, all united by the filaments, or 9 united and 1 free. Ovary superior, 1-celled. Fruit a dehiscent or indehiscent legume, rarely (*Derris*) a drupe.

Literature: National Academy of Sciences. 1979. *Tropical Legumes: Resources for the Future*. 332 pp. Washington, D.C.: National Academy of Sciences.

Key to Genera

1. Leaves simple or 3-foliolate.
 2. Plant unarmed, a non-climbing subshrub; leaves simple; flowers yellow 4. *Crotalaria*
 2. Plant armed, a tree or vine; leaves 3-foliolate; flowers white to red or orange, but not, or only particolored, yellow.
3. Shrubby, climbing vine; petals white or cream, undulate-cripsed; flowers to c.28 cm 2. *Camoensia*
3. Tree; petals pink to red or orange, not crisped; flowers to 7 cm 7. *Erythrina*
1. Leaves pinnate with 2 or more pairs of leaflets.
 4. Vine; flowers solitary, blue 3. *Clitoria*
 4. Tree or shrub; flowers in fascicles, racemes or panicles, not blue.
5. Fruit orbicular, surrounded by a wide and flat wing, laterally beaked; petals crisped, yellow or orange 9. *Pterocarpus*
5. Fruit linear or oblong (rarely an ovoid drupe), not winged or laterally beaked; petals without crisped margin, white, pink, purplish or red.

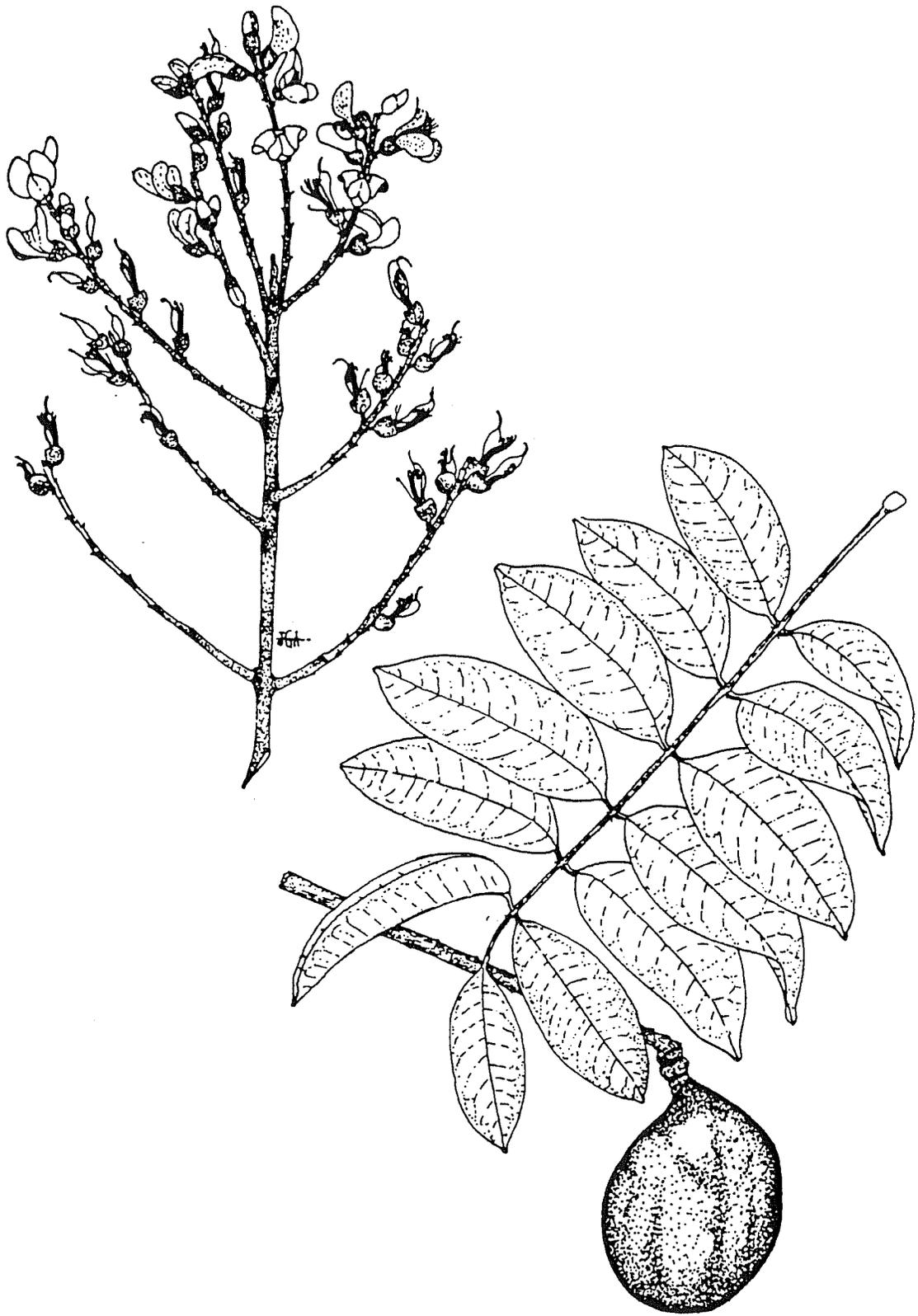


Fig. 103. *Andira inermis* (Fabaceae).

- 6. Flowers large, the longest petals c.4-11 cm; leaves even-pinnate (without a terminal unpaired leaflet).
- 7. Flowers in fascicles, red, the keel 4 cm; fruit to 10 cm 10. *Sabinea*
- 7. Flowers in racemes, pink or whitish, the keel 6-11 cm; fruit to 50 cm 11. *Sesbania*
 - 6. Flowers smaller, 0.6-1.2 cm; leaves odd-pinnate (with a terminal unpaired leaflet).
 - 8. Fruit an ovoid drupe 1. *Andira*
 - 8. Fruit a linear to narrowly oblong legume, not drupe-like.
- 9. Flowers purplish-pink; fruit dehiscent 8. *Gliricidia*
- 9. Flowers white; fruit indehiscent.
 - 10. Stamens 9; petals c.6 mm; leaflets to 5 cm 5. *Dalbergia*
 - 10. Stamens 10; petals c.1.2 cm; leaflets to 12.5 cm 6. *Derris*

Cajanus cajan (Linnaeus) Huth, the edible-seeded PIGEON PEA, is an unarmed African shrub to 3 m with leaves 3-foliolate; it is infrequently grown as an ornamental in private gardens in French Guiana (de Granville, 1985A).

1. *Andira* Jussieu

Unarmed, evergreen trees. Leaves alternate, petiolate, odd-pinnate, 1-pinnate. Inflorescence a terminal panicle. Flowers papilionaceous; sepals united in an entire or 5-toothed tube; keel petals free. Stamens 10, with 1 free and 9 united by the filaments in a tube. Fruit an indehiscent drupe; seed 1, large.

1. *Andira inermis* (W. Wright) Humboldt, Bonpland & Kunth ex DeCandolle, *Nova Genera et Species Plantarum* 6: 385 (1824). BATSEED, KORARO (Guyana); DRASBOS RODE KABBES, KOERAROE, KORARE, LEBIKJABISI, REDIKABISI, RODE KABBES (Surinam); CABBAGE BARK TREE. Tree to 18 (-30) m; bark reputedly poisonous. Leaves odd-pinnate, with 4 -7 pairs of leaflets; leaflets ovate-lanceolate to elliptic-oblong, glabrous, to 12.5 x 4 cm. Inflorescence densely flowered, to 30 cm; rachis tomentose. Calyx pilose; petals pink or purplish, the standard petal c.1 cm. Fruit stipitate, ovoid, ellipsoid or subglobose, to 4 x 3.5 cm; seed poisonous.

Range: West Indies and Bahia Honda Key, Florida; Mexico to Brazil, including the three Guianas; West Africa. Grown as an ornamental in Georgetown, Guyana.

The ragged bark emits an odor of boiled cabbage when bruised, hence the common name "cabbage bark tree".

2. *Camoensia* Welwitsch ex Bentham & Hooker fil.

Evergreen, shrubby, high-climbing vines; stipules thorn-like. Leaves alternate, petiolate, trifoliolate. Inflorescence an axillary raceme. Flowers papilionaceous, 5-merous; sepals 5, clawed, undulate-crisped, the standard petal much larger than the other petals; keel petals free. Stamens 10, free. Fruit broadly linear, flat; seeds few to numerous.

1. *Camoensia maxima* Welwitsch ex Bentham, *Transactions of the Linnean Society of London* 25: 302 (1866). Climbing, shrubby vine; buds, petioles, calyx-tube and fruit

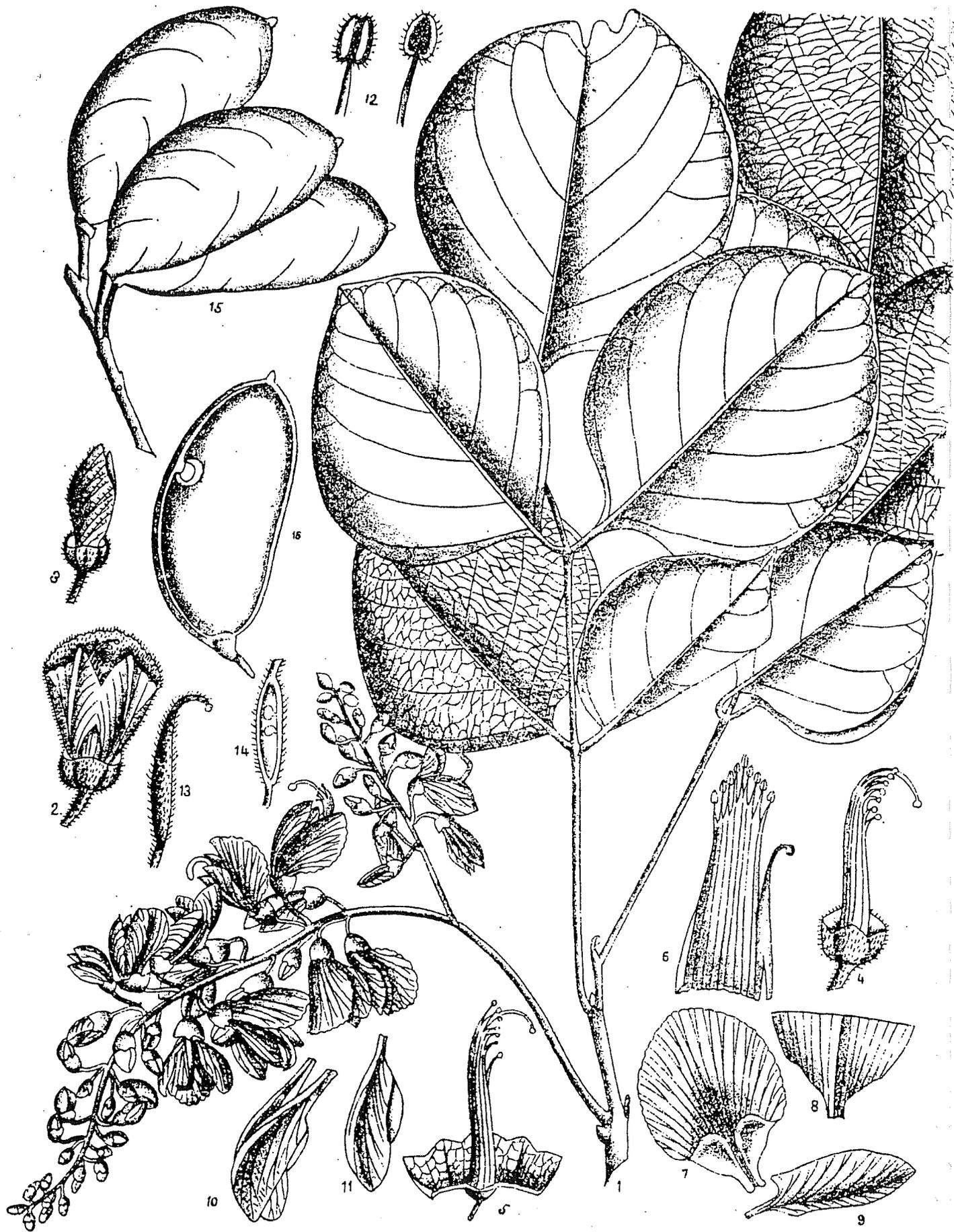


Fig. 104. *Derris indica* (Fabaceae).

pubescent. Leaflets obovate-oblong, acuminate, to 15 cm. Inflorescence 6- to 18-flowered. Calyx-tube 15-18 cm, with reddish hairs. Petals white or cream, with fluted blade and frilled margin, the standard petal with golden yellow rim; standard to 10 x 10 cm; other petals to 2.5 x 2.5 cm. Fruit to 20 x 4 cm, with reddish hairs; seeds 3-4. (undulate - crisp)

Range: Equatorial Guinea, Zaire, Angola. Grown as an ornamental in Surinam since 1923 (Ostendorf, 1962).

C. maxima reputedly bears the largest individual flowers (28 cm long) of any leguminous plant species. The genus name commemorates Luis Vaz de Camoens (1524-1580), famous Portuguese poet whose epic *Lusiads* involve a voyage of Vasco da Gama around Africa to India; Camoens died a victim of the Great Plague in Lisbon.

3. *Clitoria* Linnaeus

Unarmed, evergreen, perennial herbs, shrubs, climbing vines, or trees. Leaves alternate, petiolate, odd-pinnate; leaflets stipellate. Inflorescence an axillary raceme, or a solitary, axillary flower. Flowers papilionaceous, inverted (resupinate, the standard petal lowermost), pedicellate, 5-merous; sepals 5, united in a 5-toothed tube; standard petal enlarged, emarginate; wing petals slightly fused to the keel; keel incurved, distally pouched. Stamens 10, all united, or 9 united and 1 free. Fruit flat, linear, dehiscent; seeds compressed or globose.

1. *Clitoria ternatea* Linnaeus, *Species Plantarum* 753 (1753). KEMBANG TELANG (Surinamese Malayan); BUTTERFLY PEA. Twining vine up to 4.5 m. Leaves odd-pinnate, with 2-3 (-4) pairs of leaflets; leaflets oblong, elliptical or ovate, silky-puberulent beneath, to 4.5 x 2 cm. Inflorescence a solitary flower; pedicel jointed at the middle. Petals blue, with white veins and pale yellow area at the base; standard petal to 6 cm. Ovary pubescent. Stamens 9 united and 1 free. Fruit to 13 x 1 cm; seeds 5-12.

Range: Origin uncertain; probably tropical Africa or Asia. Grown as an ornamental in the Promenade Gardens and Botanic Gardens, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and in French Guiana (Lemee, 1952).

Literature: Fantz, P.R. 1979. The butterfly pea of Ternate. *Fairchild Tropical Garden Bulletin* 34(3): 13-16.

4. *Crotalaria* Linnaeus

Unarmed, annual or perennial herbs, or shrubs. Leaves alternate, 1-pinnate or simple, usually stipulate. Inflorescence a terminal or axillary raceme. Flowers papilionaceous, 5-merous; sepals united below in a 2-lipped, 5-lobed tube; standard petal with 2 auricles at the base; keel curved, beaked. Stamens 10; filaments united, alternating long and short. Style strongly curved. Fruit dehiscent, inflated, linear or oblong; seeds few to numerous.

1. *Crotalaria retusa* Linnaeus, *Species Plantarum* 715 (1753). JOKOMAN SIRI (Surinam); RATTLEBOX. Annual subshrub to 1.2 m. Leaves simple, sessile, oblanceolate, obtuse, to 8 x 2.5 cm. Inflorescence a terminal, erect, many-flowered raceme.

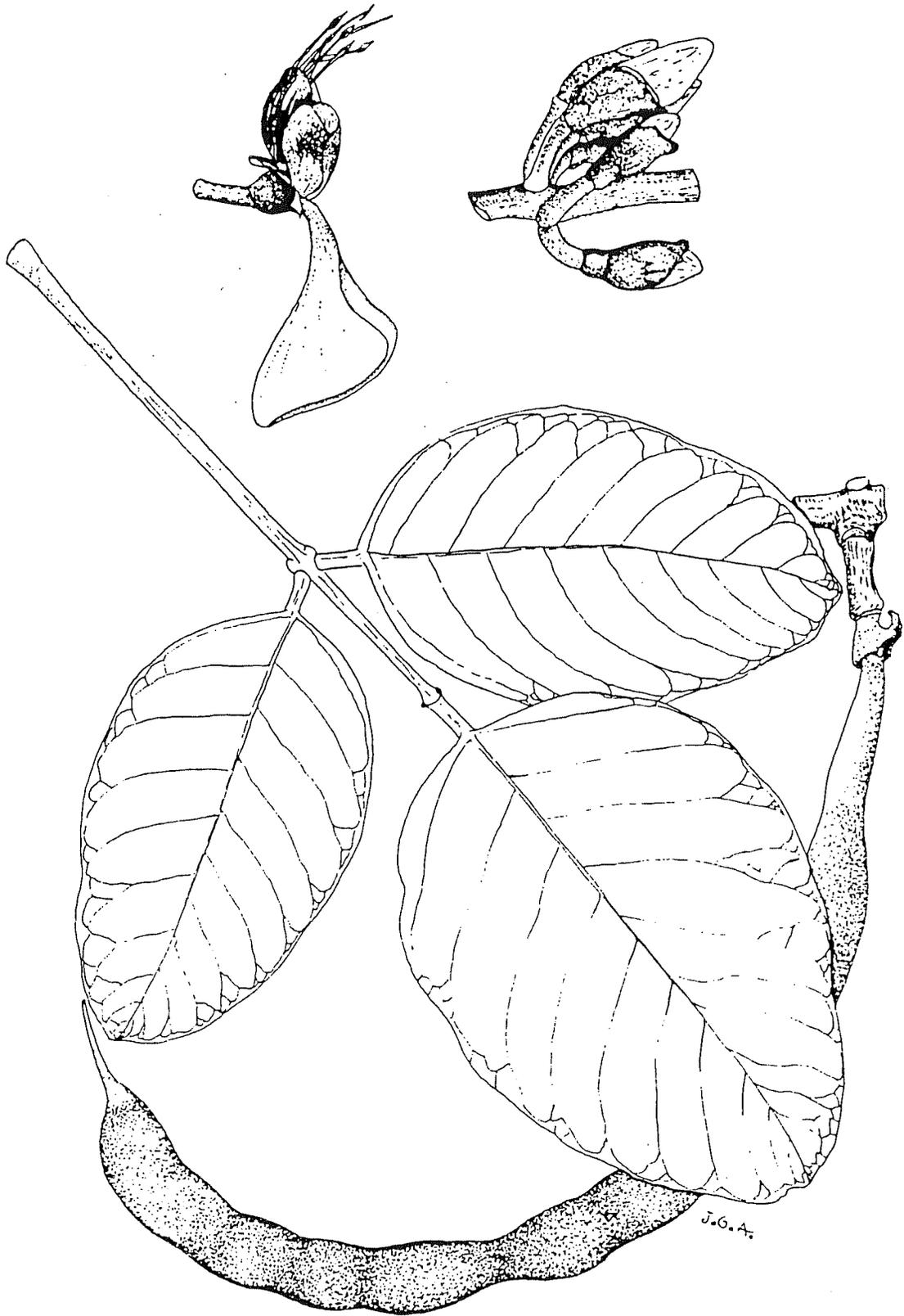


Fig. 105. *Erythrina fusca* (Fabaceae).

Calyx 2-lipped, the upper lip 2-lobed, the lower lip 3-lobed, with acute to acuminate apices. Petals sulphur yellow or yellowish-red; standard petal with brown markings and brown splotch on back, to 2.5 cm. Fruit linear-oblong, to c.4 x 1 cm; seeds numerous, curved, black.

Range: Tropical Asia; pantropically naturalized, including in the three Guianas. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982); cultivated as a cover crop in Guyana in the 1930's.

5. *Dalbergia* Linnaeus fil.

Unarmed deciduous trees or climbing shrubs. Leaves alternate, odd-pinnate, 1-pinnate; leaflets alternate. Inflorescence an axillary or terminal panicle, cyme or raceme. Flowers papilionaceous, 5-merous; sepals united in a tube. Stamens 9-10; filaments all united in a tube which may be split in 1 or 2 places, or 9 filaments united and 1 free. Fruit indehiscent, flat; seeds few.

1. *Dalbergia latifolia* Roxburgh, *Plants of the Coast of Coromandel* 2: 7, t.113 (1799). INDIAN ROSEWOOD. Deciduous tree to 30 m, often smaller. Leaves odd-pinnate, with 1-3 pairs of leaflets; leaflets elliptical, to 5 cm. Inflorescence an axillary panicle. Petals white, c.6 mm. Stamens 9. Fruit lanceolate; seeds 1-4.

Range: India. Grown as an ornamental in the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

Recommended by the National Academy of Sciences (Rosewood section, pp.231-238, 1979) as suitable for increased cultivation as a luxury timber.

6. *Derris* Loureiro

Unarmed lianas and deciduous or evergreen trees. Leaves alternate, petiolate, odd-pinnate, 1-pinnate. Inflorescence an axillary panicle or raceme. Flowers papilionaceous; sepals united in a 5-lobed tube; keel petals free or united at the apex. Stamens 10, all united by the filaments, or 1 free. Fruit indehiscent, woody, flattened; seed one.

1. *Derris indica* (Lamarck) S.S.R. Bennet, *Journal of the Bombay Natural History Society* 68(1): 303 (1971). (Synonyms: *Pongamia glabra* Ventenat, *P. pinnata* (Linnaeus) Pierre). PONGAM, POONGA-OIL TREE. Deciduous or semideciduous tree to 8 (-21) m. Leaves with 2-3 pairs of leaflets; leaflets ovate or elliptical, to 12.5 cm. Inflorescence an axillary panicle, to 12.5 cm. Petals white, tinged with pink; standard petal with paired auricles at base, c.1.2 cm; keel petals united at the apex. Stamens united by the filaments, with one stamen free at base and connate above. Fruit broadly oblong, to 5 x 2.5 cm; seed flat, oily, poisonous when ingested.

Range: India to Thailand. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (*Index Seminum*, 1982).

This species is recommended for intensified utilization as a firewood crop (National

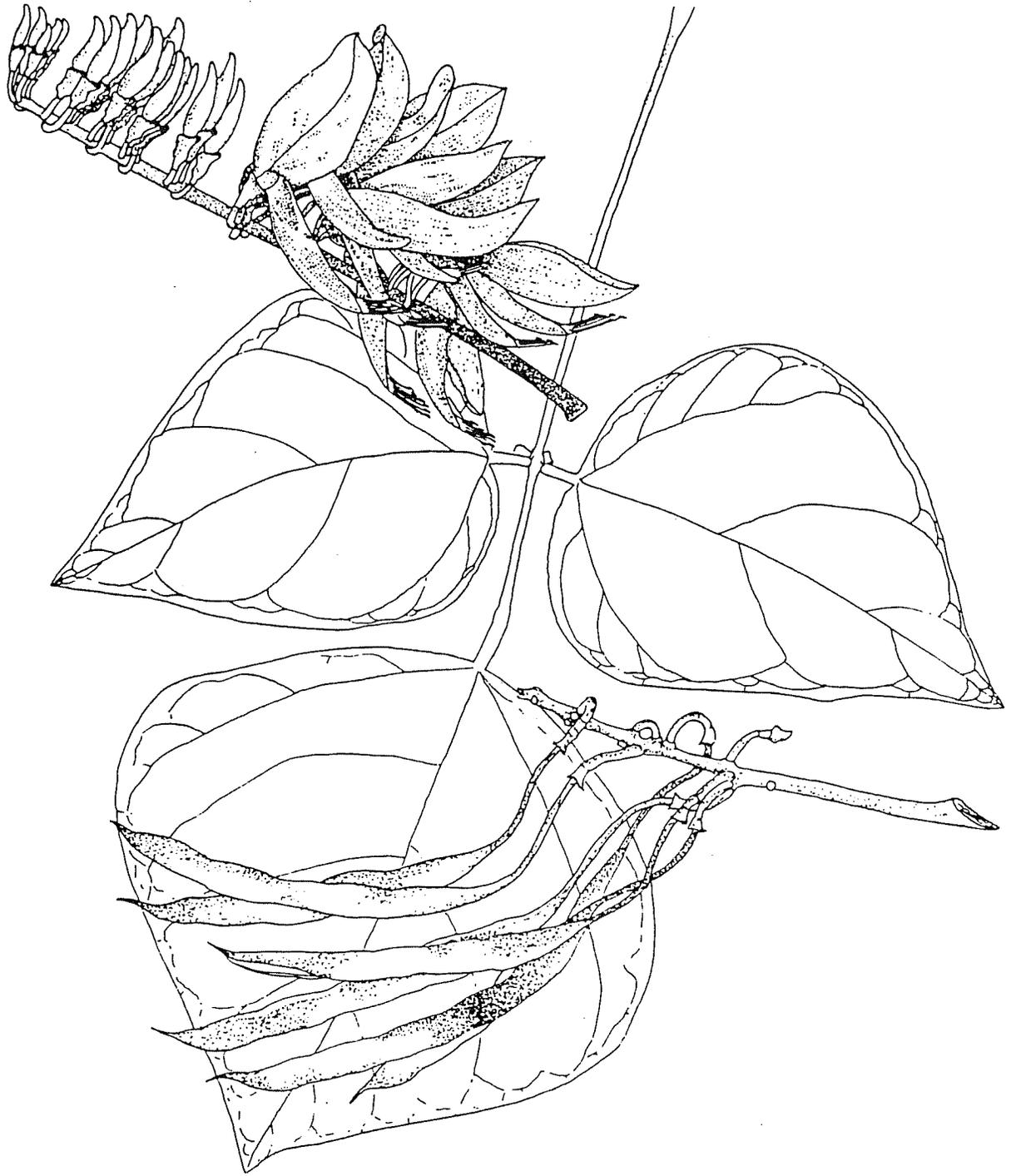


Fig. 106. *Erythrina poeppigiana* (Fabaceae).

7. *Erythrina* Linnaeus

Armed, usually deciduous, trees, shrubs or perennial herbs; poisonous. Leaves alternate, petiolate, pinnately 3-foliolate. Inflorescence a terminal or axillary raceme, rarely a solitary flower. Flowers papilionaceous, zygomorphic, 5-merous; calyx of 5 united sepals, the tube campanulate and 5-toothed, or spathaceous and often split to the base; standard petal folded to enclose the other floral structures, or spread to expose them; keel petals free or united, much smaller than the standard. Stamens 10; filaments all united, or 9 united and 1 free. Fruit flat to nearly cylindrical, not constricted between the seeds, or constricted between them (torulose); seeds 1-numerous.

Literature: Krukoff, B.A. 1939. The American species of *Erythrina*. *Brittonia* 3(2): 205-337. Krukoff, B.A. and R.C. Barneby. 1974. Conspectus of species of the genus *Erythrina*. *Lloydia* 37(3): 332-459. Lucas, S.A. and W.L. Theobald. 1982. Observations of flowering behavior in selected species of *Erythrina* in cultivation in Hawaii. *Allertonia* 3(1): 85-119, +32 color photos. McClintock, E. 1982. *Erythrina*s cultivated in California. *Allertonia* 3(1): 139-154.

Key to Species

1. Corolla not concolorous (standard orange or salmon, wings yellow below and red above, keel pale yellow); leaves glaucous (distinctly whitish and paler) beneath; seeds with black markings upon a dark background color; standard petal rhombic-ovate 1. *E. fusca*
1. Corolla concolorous (petals all the same color); leaves not glaucous beneath; seeds without black markings, sometimes with black line on red background color; standard petal ovate, obovate or elliptical, but not rhombic-ovate.
 2. Leaves variegated with yellow veins 3. *E. variegata*
 2. Leaves green, not variegated.
3. Stipules large, cup-like; petals orange; keel petals united; calyx campanulate, puberulous; seeds brown 2. *E. poeppigiana*
3. Stipules not large and cup-like; petals scarlet-red; keel petals free; calyx spathaceous, split down to base, stellate-tomentose; seeds red with a black line 4. *E. velutina*

1. *Erythrina fusca* Loureiro, *Flora Cochinchinensis* 427 (1790). (Synonym: *E. glauca* Willdenow). KOFFIMAMA (Surinam); SAND COKER, ORONOQUE, ORONOKO, COCK TREE (Guyana); SWAMP IMMORTELLE. Spiny tree to 15 (-24) m. Leaflets glaucous beneath; terminal leaflet to 15 cm. Calyx campanulate, puberulous, c.1 cm long in open flower. Standard petal orange or salmon-pink, to 7 cm; wings yellow below, red above; keel pale yellow, the petals united. Fruit somewhat woody, to 30 cm; seeds dark brown or blackish, with black markings.

Range: West Indies; Central and South America, including the three Guianas; India, Asia and Pacific Islands. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; in the Cultuurtuin, Paramaribo (Teunissen & Lande, 1980) and as a shade tree in Surinam (Ostendorf, 1962); and at Kourou and Cayenne, French Guiana (Lemee, 1952).

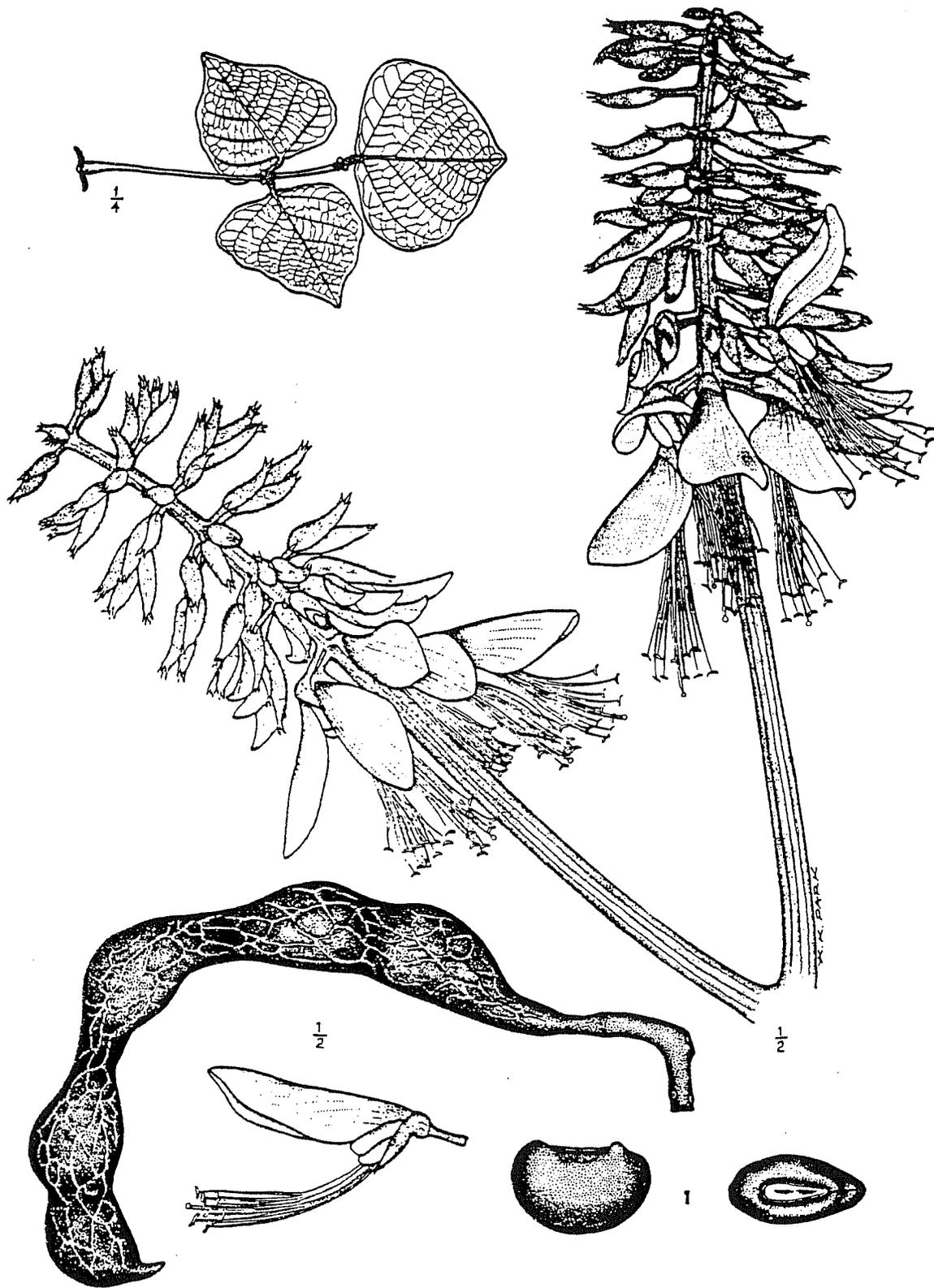


Fig. 107. *Erythrina variegata* var. *orientalis* f. *picta* (Fabaceae).

Literature: Morton, E.S. 1979. Effective pollination of *Erythrina fusca* by the orchard oriole (*Icterus spurius*): coevolved behavioral manipulation? *Annals of the Missouri Botanical Garden* 66(3): 482-489.

A hybrid cross between *E. fusca* and *E. suberosa* Roxburgh, the latter a species of India and Southeast Asia, was performed at the Botanic Gardens, Georgetown, Guyana in 1900. It resulted in a tree which has been named *E. x vlissingensis* Waby ex Krukoff & Barneby (Krukoff & Barneby, 1974). Vlissingen is a former estate upon which the Botanic Gardens, Georgetown, Guyana is partially situated.

2. *Erythrina poeppigiana* (Walpers) O.F. Cook, *United States Department of Agriculture, Division of Botany, Bulletin* 25: 57 (1901). MOUNTAIN IMMORTELLE. Spiny tree to 22 m. Stipules large, cup-like. Terminal leaflet to 19 cm. Calyx campanulate, puberulous, c.1 cm long in open flower. Petals bright orange; standard petal to c.6.3 cm; keel petals united. Fruit papery, to 13 cm; seeds brown, without markings.

Range: Western South America. Grown as a shade tree in Surinam (Krukoff, 1939; Ostendorf, 1962), including in the Cultuurtuin, Paramaribo (Teunissen & Lande, 1980).

A yellow-flowered variant of this species is occasionally observed in Venezuela; it is named f. *redmondii* Steyermark & Lasser; cf. *Phytologia* 48(4): 286 (1981).

3. *Erythrina variegata* Linnaeus, *Herbarium Amboinense* 10 (1754), var. *orientalis* (Linnaeus) Merrill, *Interpretation of Rumphius's Herbarium Amboinense* 276 (1917), f. *picta* (Linnaeus) Maheshwari, *Bulletin of the Botanical Survey of India* 3(1): 47 (1961). (Synonyms: *E. picta* Linnaeus; *E. indica* Lamarck, var. *picta* (Linnaeus) Blatter & Millard). VERT ET JAUNE (French Guiana); INDIAN CORAL TREE. Spiny tree to 18 m. Leaves variegated. Terminal leaflet to 15 cm. Calyx spathaceous, split down the base, stellate-tomentose, more than 2 cm long. Petals scarlet-red; standard petal to c.7 cm; keel petals free. Fruit torulose, to 30 cm; seeds reddish-brown.

Range: Tanzania to India, Asia, Australia and the Pacific Islands (var. *orientalis*). Forma *picta* is grown as a roadside garden ornamental in Georgetown and elsewhere in Guyana; on grounds of CELOS buildings at Leysweg, on hotel and University grounds, in a garden near Bougainvillstraat, and in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam; and in the Jardin Botanique and on hotel grounds in Cayenne, French Guiana.

Literature: Maheshwari, J.K. 1961. Taxonomic notes on the Indian coral tree. *Bulletin of the Botanical Survey of India* 3(1): 45-48. McClintock, E. 1953. The cultivated species of *Erythrina*. *Baileya* 1(3): 53-58.

4. *Erythrina velutina* Willdenow, *Gesellschaft Naturforschender Freunde Westphalens neue Schriften* 3: 426 (1801). Spiny tree to 9 m. Terminal leaflet to 16 cm. Calyx spathaceous, split down to base, stellate-tomentose, more than 2 cm. Petals scarlet red, varying to orange-red; standard petal to 5.5 cm; keel petals free. Fruit papery, to 13 cm; seeds red with a black line from the hilum.

Range: West Indies; northwestern South America to Brazil. Grown as an ornamental in



Fig. 108. *Pterocarpus indicus* (Fabaceae).