KLAUS SCHÖNITZER

GALAPAGOS PLANTS

The cover shows Lecocarpus pinnatifidus *and* Scalesia villosa *on Punta Cormorant, Floreana Island. (Photographed by K. Schönitzer*

Dieses Buch ist meinen Eltern gewidmet, die auf mich gewartet haben, während ich hier in Ecuador war, und meinen Freunden, der Familie Seebass, die mich hier so lieb aufgenommen haben.

Preface

The Galapagos Islands are famous for their unique and tame animals. They are also of considerable historical interest, for it was here that Charles Darwin was first inspired to write his celebrated theory of evolution. Although the animal life is more famous, the flora is just as interesting, to the tourist and scientist alike.

This little booklet is intended to help the interested tourist recognize some of the most common plants of the Galapagos Islands and to give some information about them. Because most tourists see only the vegetation near the coast, I selected only plants which are common at or near the coast (although the highlands are also botanically extremely interesting). In addition, I tried to select plants which can be recognized year-round. Some plants I added more because of their interest than their abundance. I included both endemic and nonendemic plants, and even plants introduced by man. Some genera where the species are not easily distinguishable are described as a group. For other genera I described only one representative species. Anyone who wants to identify a plant precisely or find out more about it should use the "Flora of the Galapagos" by Ira Wiggins and Duncan Porter. The "Flora", as well as "Darwin's Islands" by Ian Thornton, were my main sources for the following discussion.

Please always remember that the Galapagos Islands are a National Park, and that all living things are protected by law. So do not pick any flowers or collect any "souvenirs". Also be very careful not to carry any seeds from the mainland to the islands, or from island to island, as each island has its own special vegetation. Please help to keep the islands just as beautiful as they are now.

Introduction

The climate of the Galapagos is very much influenced by two main oceanic currents. From May until the end of November the cold Humbolt Current, coming from far south, envelops the islands causing a long dry and cool season. During this time the vegetation near the coast is very dry, and the common palo santo tree as well as many shrubs are quite leafless. From December to May a warm current from near Panama reaches the Galapagos. It is often called "El Niño" (= the christ child), because it reaches the Galapagos at about Christmas time. During these months we have the hot and rainy season, when all the islands appear full of green plants. The quantity of rain and the duration of the seasons is extremely variable from year to year and from island to island. The highlands of the larger islands receive considerably more rain year-round Because of the difference in altitude and humidity we can recognize several zones of vegetation.

Right at the coast we have the "Littoral Zone", which is strongly influenced by the salt of the seawater. Here we commonly find the mangroves, as well as the saltbush, ***Sesuvium, Heliotropium curassavicum,*** and ***Atriplex peruviana.*** Further inland up to an elevation of about 100 m, sometimes higher, we find the "Arid Zone", with tree cacti and the abundant palo santo tree. All plants described in this booklet can be found in these two zones. Above 180 - 200 m and after an intermediate "Transition Zone" we find the "Moist" or "Humid Zone". This can be divided into several additional zones, such as the ***"Scalesia*** Zone", with its dense rainforest of ***Scalesia pedunculata, Psidium galapageium,*** and ***Pisonia floribunda*** trees. Also within the Moist Zone is the ***"Miconia Zone",*** with the dominant shrub ***Miconia robinsoniana.*** The summits of the large islands extend above the Moist Zone, and bear a low vegetation, predominantly ferns, grasses, and sedges. This "Fern-Sedge Zone" is usually above 550 m.
(WIGGINS and PORTER 1971).

Today most scientists agree that the Galapagos Islands are truly oceanic islands which emerged from the sea, and never had any land connection with the mainlad. Therefore, most organisms now on the islands originally must have come from the continent. The vegetation of the Galapagos is actually closely related to the flora of the Mexican-West Indies region, and also to the flora of Ecuador and Peru (WIGGINS 1966).

We call the flora of the Galapagos "disharmonic" or "unbalanced", because several groups of plants are very well represented, whereas others are poorly represented or missing. So we have many species of lichens, ferns, sedges, and composites (sunflower family). These are all plants which have good dispersal mechanisms which enabled them to reach the archipelago. Most of these could have come by air, because they have small and light seeds or spores. Many other plants probably floated to the islands, like the Galapagos Cotton (STEPHENS and RICK 1966) or the Red Mangrove. While others arrived aided by birds, like ***Tribulus*** (THORNTON 1971) or ***Cas-tela*** (WIGGINS and PORTER 1971). In general transport by birds seems to be the most important dispersing mechanism for flowering plants (THORNTON 1971). Other groups of plants are lacking in the Galapagos, such as the gymnosperms (= conifers), palms, aroids, and some monocotyledonous families. Others have only a few species, such as the Lythraceae (Loosestrife family), the Melastom family, the Myrtle family, the Onagraceae (Evening primerose family), and the Sapindaceae (Soapberry family). The Scrophulariaceae (Figwort family), Labiatae (Mint family), Acanthaceae, Orchids are also poorly represented, probably because plants of these groups depend very much on insects for pollination. There are only a few pollinating insects in the Galapagos. There are also only a few true forest trees on the Galapagos, because of their poor dispersal mechanisms, as well as difficulties in establishment.

Some plants, like the mangroves, have extremely good dispersal mechanisms. Therefore they come

again and again to the archipelago, and their population in the islands is not really isolated from the mainland. As isolation is necessary for the origin of a new species or subspecies, these plants will not evolve on the islands. Other plants, like many of the composites, colonize the archipelago so seldom that they are in effect isolated, and can in time evolve into another variety (= subspecies) and then into another species. Those species or varieties which occur only in the Galapagos are called "endemic to Galapagos". Those which can also be found elsewhere I will call "nonendemic". Since the plants of the sunflower family are good but not too-good colonizers, we find a very high percentage of endemic species in this family (about 50%). We even find four endemic genera: ***Darwinothamnus, Lecocarpus, Macraea,*** and ***Scalesia.*** 32 % of the 702 species and varieties of vascular plants of Galapagos are endemic. (WIGGINS and PORTER 1971).

It is possible to recognize some trends in the species evolved in Galapagos. One of these is that only a few endemic species have large and attractive blossoms. This is because plants use their blossoms to attract pollinating insects and there are few such insects found on the islands. This trend you can see in the genus ***Cordia.*** The endemic species of ***Cordia*** have small blossoms. The one nonendemic species however, has large flowers. Another trend is that shrubs and weeds become larger, even tree-size. For example, the dominant tree of the ***Scalesia*** zone, ***Scalesia pedunculata*** (a woody sunflower),certainly evolved from a shrub. Another trend is that many of the plants, once established on the islands, reduce their originally good dispersal mechanisms. A good dispersal mechanism was necessary on the continent and enabled the plants to arrive in Galapagos. But on an island a too-good dispersal wastes seeds. This trend can also be seen in the woody sunflowers ***(Scalesia).*** (CARLQUIST 1965)

There is a separation not only between the mainland and the archipelago, but also between the different islands. The more remote an island is, the more its plants are separated from plants of other islands. Certain species occur only on one or a few of the islands, such as ***Lecocarpus pinnatifidus,*** which grows on Floreana Island only. Because of the separation of the different islands, it also happened that singe plants, once arrived on the archipelago, evolved into different species on different islands, as has ***Lecocarpus.*** Thus it is possible that less than 100 successful arrivals were enough to produce all the 228 endemic plants in Galapagos (THORNTON 1971). The endemic genus ***Scalesia*** certainly evolved from only one successfull colonization. By separation on different islands, separate evolution, and re-invasion, 11 species were created. This whole process we can call "archipelago evolution" or "adaptive radiation". Other examples of archipelago evolution in Galapagos can be seen within the genera ***Mollugo, Alternanthera,*** and ***Chamaesyce*** (HOWELL 1933 a, b; WEBSTER 1970). The famous Darwin's finches are the best-known example of this process in Galapagos animals.

Unfortunately the Galapagos are no longer really untouched by man. So we find almost 80 species of plants on the islands which have been introduced by man and now grow wild. This represents about 11% of all species and varieties of the Galapagos! For example, the introduced tree Guava ***(Psidium guajava)*** forms large forests in San Cristobal, replacing the original plants. Other indigenous plant communties are attacked or endangered! by introduced animals like goats, which devastated the original vegetation of Pinta Island and are a serious problem on several other islands (ECKHARDT 1972; ELIASSON 1968). Fortunately programs of the Galapagos National Park Service and the Charles Darwin Research Station are now under way to combat these grave threats to the islands.

The Galapagos are still beautiful and unique for both tourists and scientists. Help to keep them this way for future generations by being conservation-minded. Finally, I wish you a most pleasant trip in "Las Islas Encantadas".

How to use this book

Note the basic characteristics of the plant you want to identify, eg: does it have a single trunk, spines? does it grow higher than 1 m? does it form mats? etc.
Then look in the corresponding section below, and fit your specimen into one of the groups.
The numbers refer to the numbers of the drawings and descriptions.
Using these drawings and descriptions you should have no trouble making your identification.

Groups of plants according to physical characteristics

A Cacti:

Opuntia *1,*
Jasminocereus *2,*
Brachycereus *3,*

B Low shrubs or herbs, procumbent, often forming mats:

Tribulus *4,*
Heliotropium *5,*
Sesuvium *6,*
Cacabus *7,*
Atriplex *8,*

Lycopersicon *9,*
Coldenia *10,*

C Low shrubs or herbs, erect, forming little bushes, up to 1 m maximum:
Atriplex *8,*
Lycopersicon *9,*
Coldenia *10,*
Chamaesyce *11,*
Polygala *12,*
Alternanthera *13,*

D Shrubs, *higher* than 1 m, not tree shaped, without spines:
Alternanthera *13,*
Cryptocarpus *14,*
Gossypium *15,*
Lantana *16,*
Clerodendrum *17,*
Waltheria *18,*
Scalesia *24,*
Cordia *25,*
Maytenus *26,*

(See also the mangroves:
33, 34, 35, 36,)

E Shrubs, growing higher than 1 m, not tree shaped, with spines or spinelike twigs:
Lycium *19,*
Grabowskia *20,*
Castela *21,*
Scutia *22,*
Acacia *30,*
Prosopis *31,*
Parkinsonea *32,*

F Trees or tree shaped shrubs, having a single trunk, sometimes quite small, without spines:
Lecocarpus *23,*
Scalesia *24,*
Cordia *25,*
Maytenus *26,*
Croton *27,*
Bursera *28,*
Hippomane *29,*

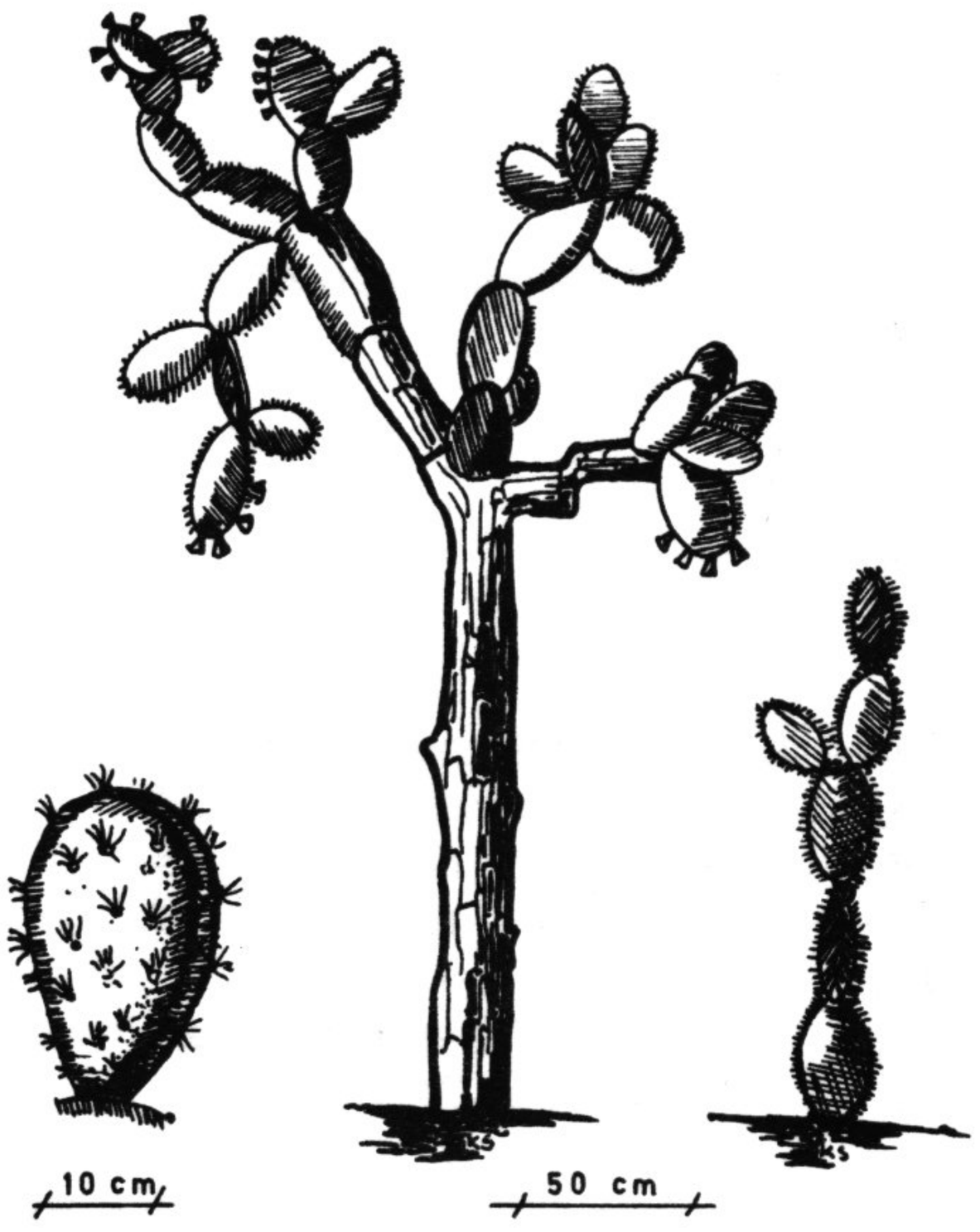
(see also the mangroves:
33, 34, 35, 36,)

G Trees with spines:
Acacia *30,*
Prosopis *31,*
Parkinsonea *32,*

H Mangroves (trees or shrubs, growing near or in the saltwater):
Rhizophora *33,*
Laguncularia *34,*
Avicennia *35,*
Conocarpus *36,*

(see also Maytenus 26,)

I Vines:
Passiflora *37,*
Cuscuta *38,*



Genus Opuntia

Family: Cactaceae
English common names: Prickly Pear, Opuntia
Spanish common names: Tuna

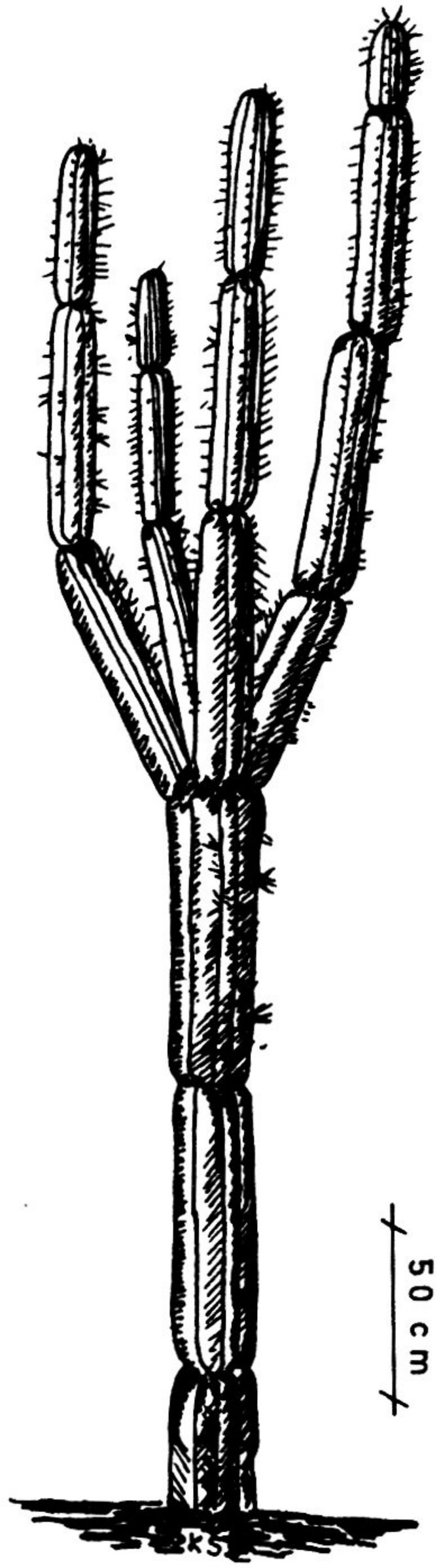
We have in the Galapagos 6 species of Opuntias with altogether 13 varieties.

> ***They all have flat pads, spines in groups, yellow flowers and greenish, edible "Prickly Pear" fruits. Most of them are able to form trees, with a trunk, which is spiny when young, but loses its spines and then has a reddish bark.***

The highest Opuntia trees are ***O. echios*** var. ***gigantea,*** which can reach 12 meters. These can be seen around the village of Puerto Ayora on St. Cruz Island.

The treeshape and the trunk are considered to be a protection against the giant tortoises and the land iguanas, which both feed on cactus pads. The species ***O. helleri,*** which occurs on the northern isles of Culpepper, Tower, Marchena, and Wenman, is usually shrubby, quite low, often forming thickets, and has only weak spines. On these islands there were never any tortoises or land iguanas. On the other hand, it was recently suggested by G.K. Arp that the tree shape of the Prickly Pears is a result of competition with the surrounding vegetation for light, because cacti need much light. In the Galapagos, Opuntias do tend to be just a bit highter than the surrounding vegetation. It seems to me that both theories might be right to a certain degree: The tree shape itself may be a protection against the reptiles, while the size of the tree is caused by the surrounding vegetation. (DAWSON 1966; ARP 1973)

All Opuntias of the Galapagos are endemic.



Jasminocereus thouarsii

Family: Cactaceae
English common name: Candelabra Cactus
Spanish common names: Cacto esbelto, tuna

Large, candelabra-like, greenish, compound of cylindrical parts with ribs, and spines along them. Reddish fruits.

Jasminocereus is an endemic genus, which consists of one species only This species varies considerably, and is divided into 3 varieties. It might be related to ***Monvillea maritima,*** a slender, more clambering species from coastal Ecuador. (WIGGINS 1966 DAWSON 1962).

The fruits are edible, very good for marmalade.

20 cm

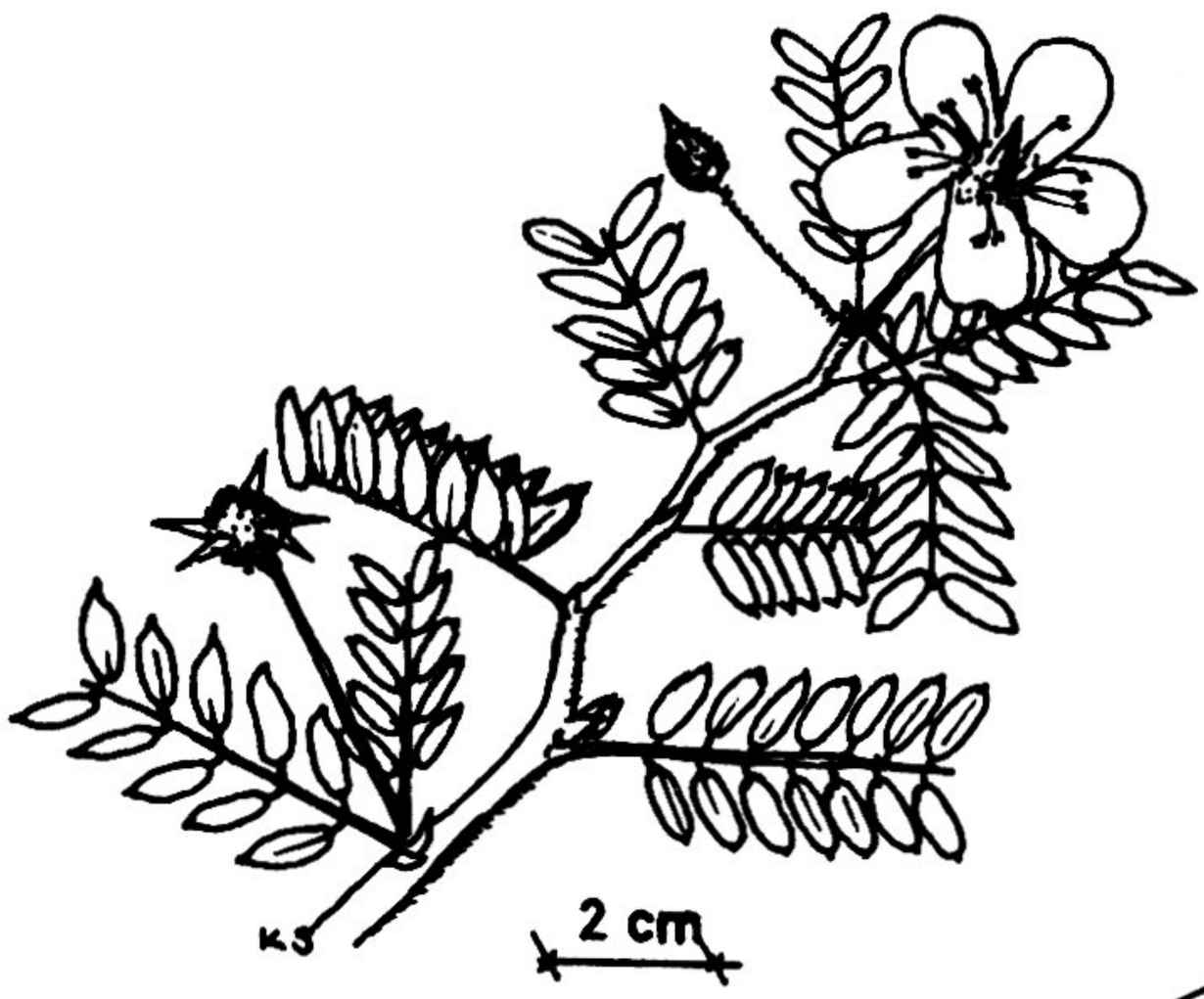
Brachycereus nesioticus

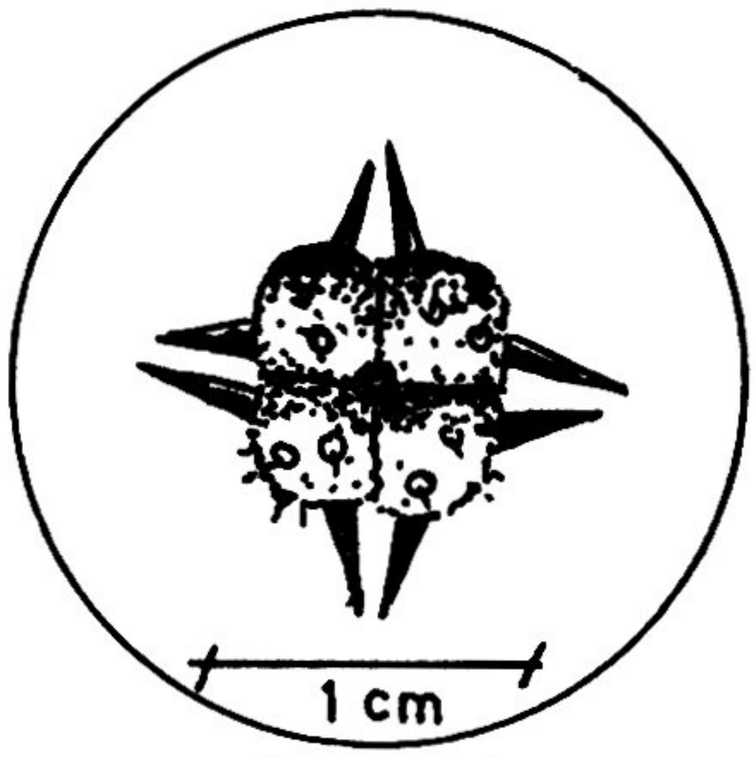
Family: Cactaceae
English common name: Lava Cactus
Spanish common name: Cactus de lava

Small columns, usually in groups, with very numerous spines, yellow or brownish.

Grows on bare lava, thus is able to colonize recent lava flows.

B. nesioticus is an endemic species, and the only member of its genus. It is probably the latest arrival of the Galapagos cacti, and may be related to ***Armatocereus cartwrightianus,*** a large candelabra-like cactus which is very abundant on coastal Ecuador.
(WIGGINS 1966, DAWSON 1962).





spiny seed

Tribulus cistoides

Family: Zygophyliaceae
English common names: Puncture Vine, Caltrop, Goat's Head
Spanish common names: Abrojo, Cacho de Chivo

Low perennial herb, leaves and leaflets more or less covered with hairs, sometimes greyish, usually green. Brigth yellow flowers. Fruits hard with spines, very well known and noticed by all those who walk barefoot on the Galapagos.

Nonendemic. A native to the Old World, now pantropical. Distributed apparently by the feet of seabirds, to which the seeds adhere (WIGGINS and PORTER 1971).

Less common in the Galapagos is the similar *T. terrestris,* which has smaller flowers, and is annual.

Heliotropium curassavicum

Family: Boraginaceae
English common names: Heliotrope, Scorpionsweed

Perennial, low dense mats. Leaves greyish or bluish green. Little white flowers on tips of twigs, shaped like a tail of a scorpion (English common name).

Nonendemic. This weed has spread very much on the Galapagos during the last years.

We have 4 more species of ***Heliotropium*** on the Galapagos, which all have similar flowers.

Genus Sesuvium

Family: Aizoaceae

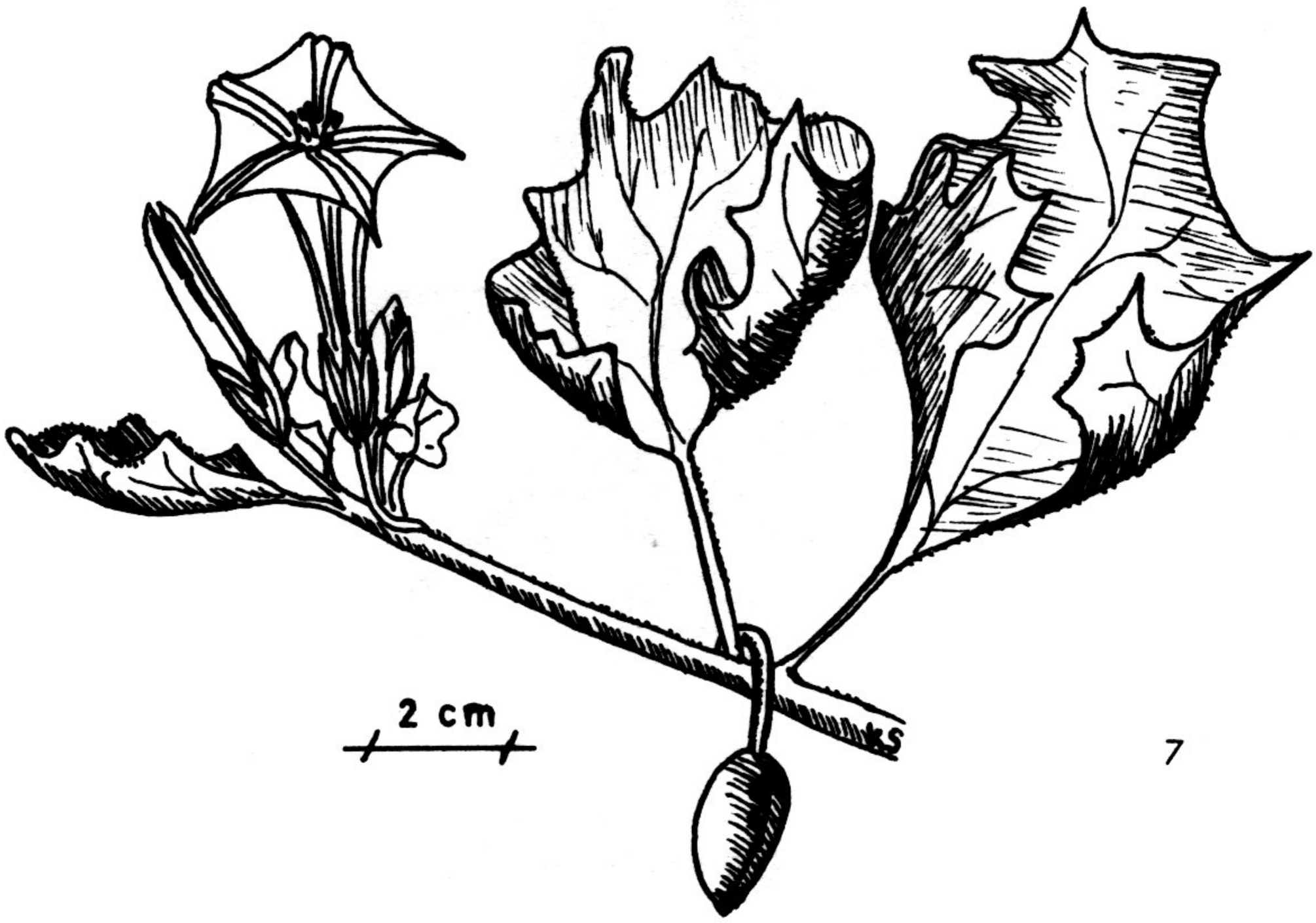
Perennial herbs, very succulent (fleshy), with various colouration, fryeyellowish to green to bright red.

We have two species of this genus in the Galapagos:

S. portulacastrum (Flowers with purplish calyces. Nonendemic.)

S. edmonstonei (Flowers with white calyces. Endemic.)

The latter species is very attractive on South Plaza Island, where, especially at the end of the dry season, it forms bright red mats.

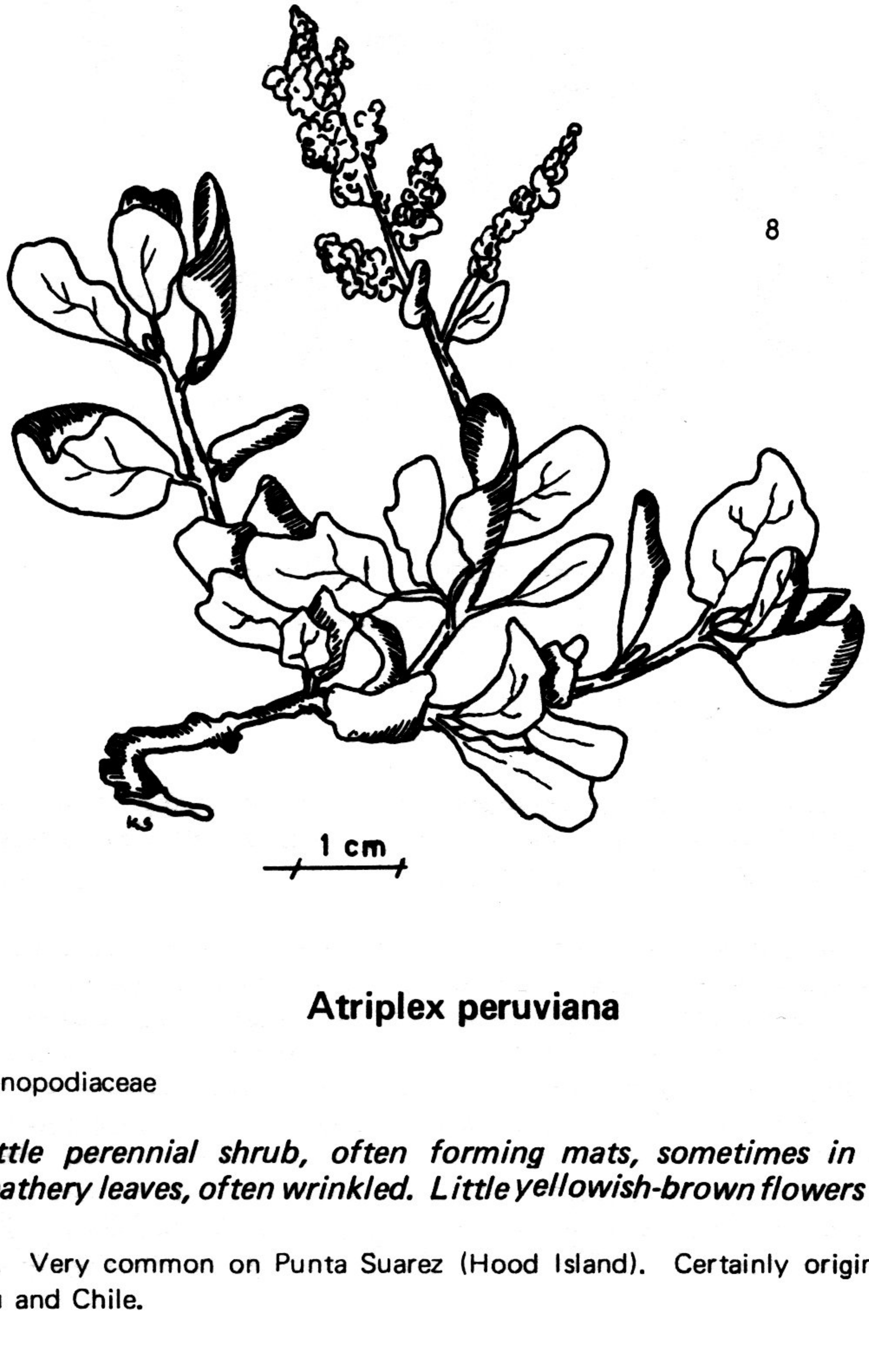


Cacabus miersii

Family: Solanaceae

Annual herb, often forming mats, often very sticky, and covered with hairs. Fairly large trumpet-shaped whitish flowers.

This species is nonendemic, and occurs also in Peru, from where it probably came with the aid of the Humboldt current.

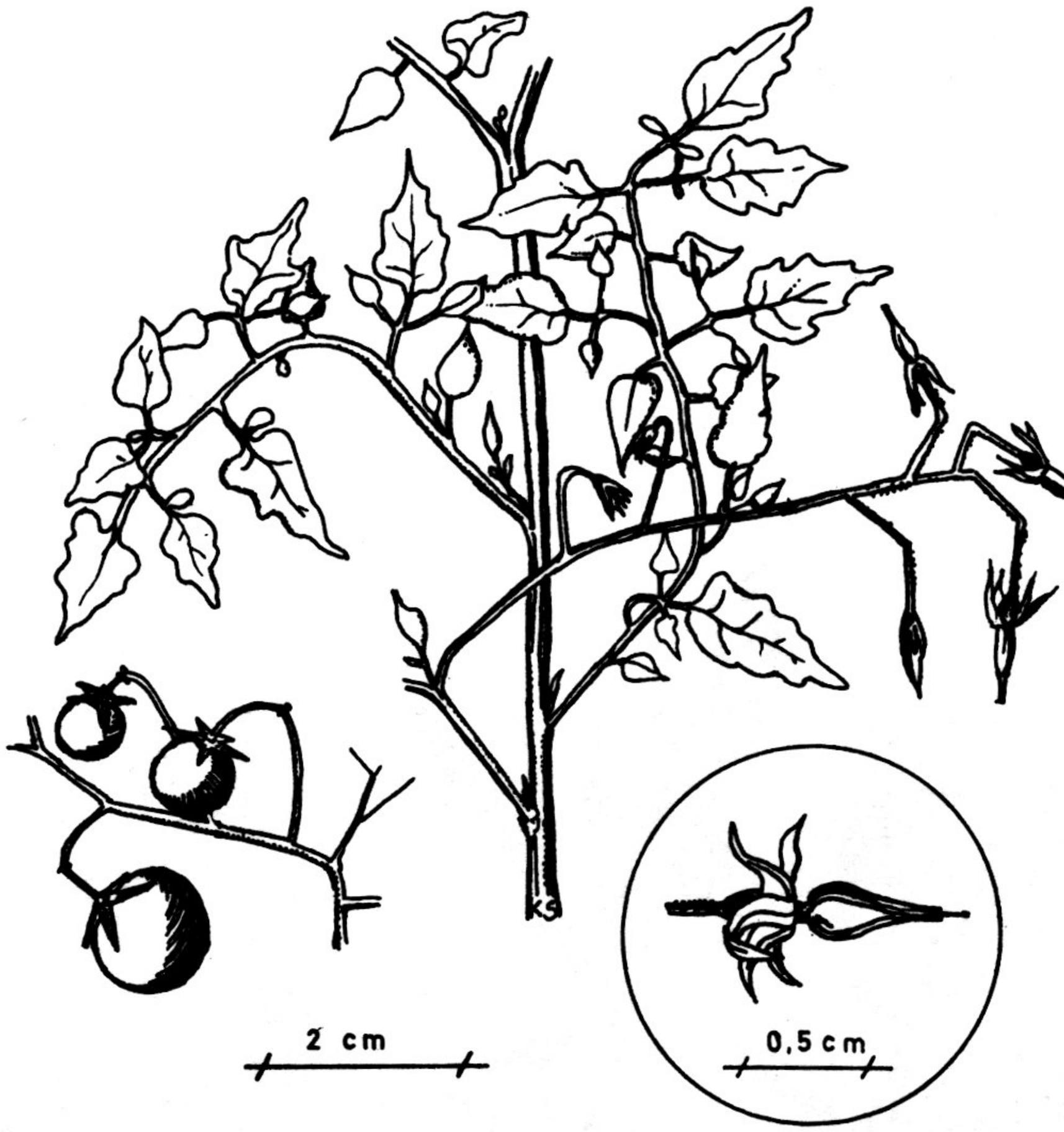


Atriplex peruviana

Family: Chenopodiaceae

Little perennial shrub, often forming mats, sometimes in little bushes. Leathery leaves, often wrinkled. Little yellowish-brown flowers in clusters.

Nonendemic. Very common on Punta Suarez (Hood Island). Certainly originating from the coast of Peru and Chile.



Lycopersicon cheesmanii
(= Lycopersicum)

Family: Solanaceae
English common name: Galapagos Tomato
Spanish common names: Tomatillo, tomate silvestre

Low herb, with creeping branches and many twigs, leaves compound or pinnatifid. All parts covered with little hairs. Bright yellow flowers. Fruits little greenish or yellow tomatoes.

This endemic tomato is quite different from any other tomato. It varies considerably within the species. There are quite different populations, but each population is very uniform. This situation occurs because ***L. cheesmanii*** is highly autogamous even under natural conditions, which means the single flower pollinates itself. Therefore there is no exchange of genes between the plants. The attractive flowers are very seldom visited by pollinating insects. It may even happen that different variations grow side by side without interbreeding. The seeds of this tomato have a very thick coat, so that only a very small percentage of them germinate unless they are eaten (e.g. by a giant tortoise). After the seeds pass through the digestive system of a tortoise (taking about two to four weeks), they then have a much higher germination rate, and they are also distributed. The rate of germination increases even more after passing through the intestines of a mockingbird. (RICK 1966).

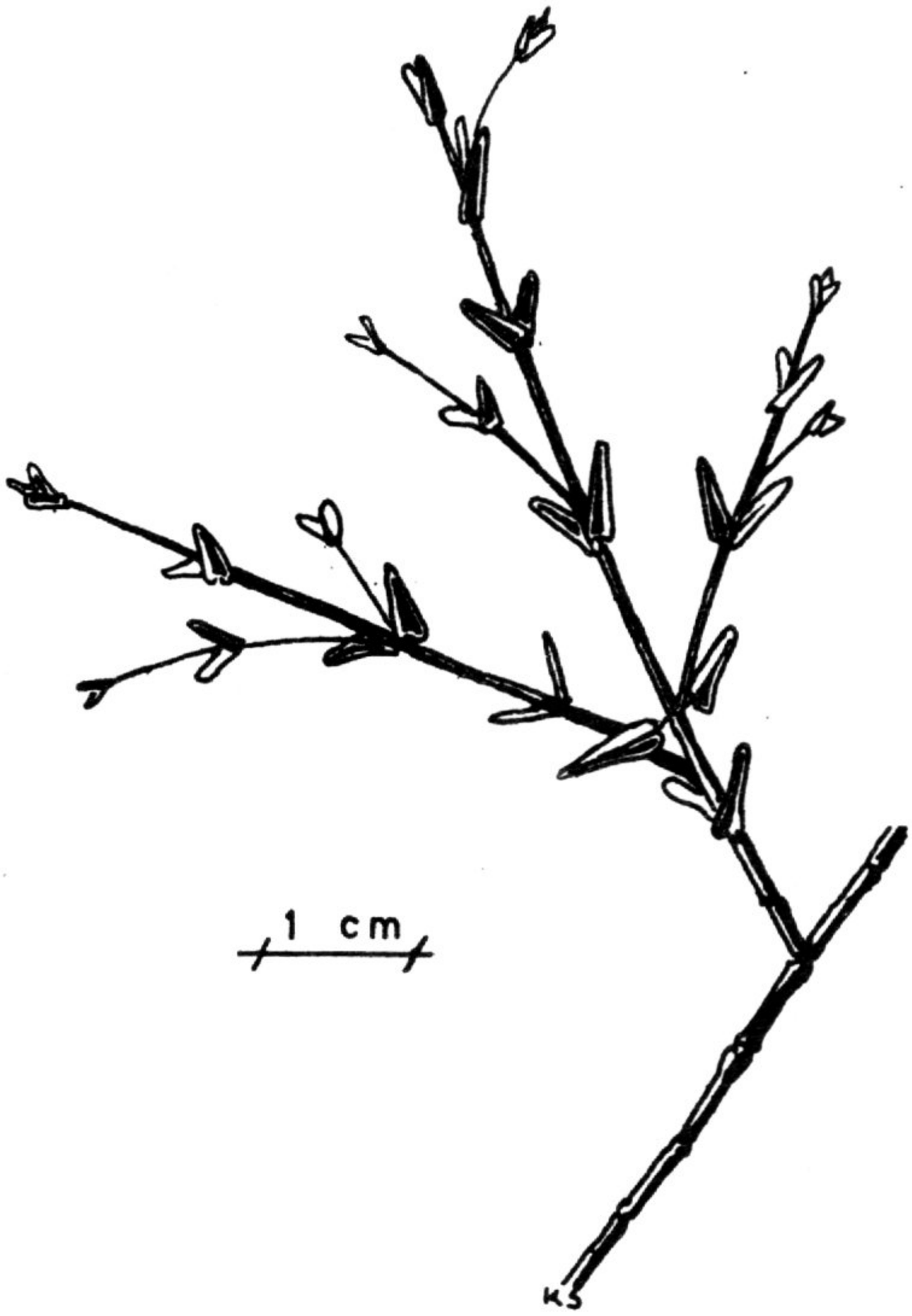
Genus Coldenia

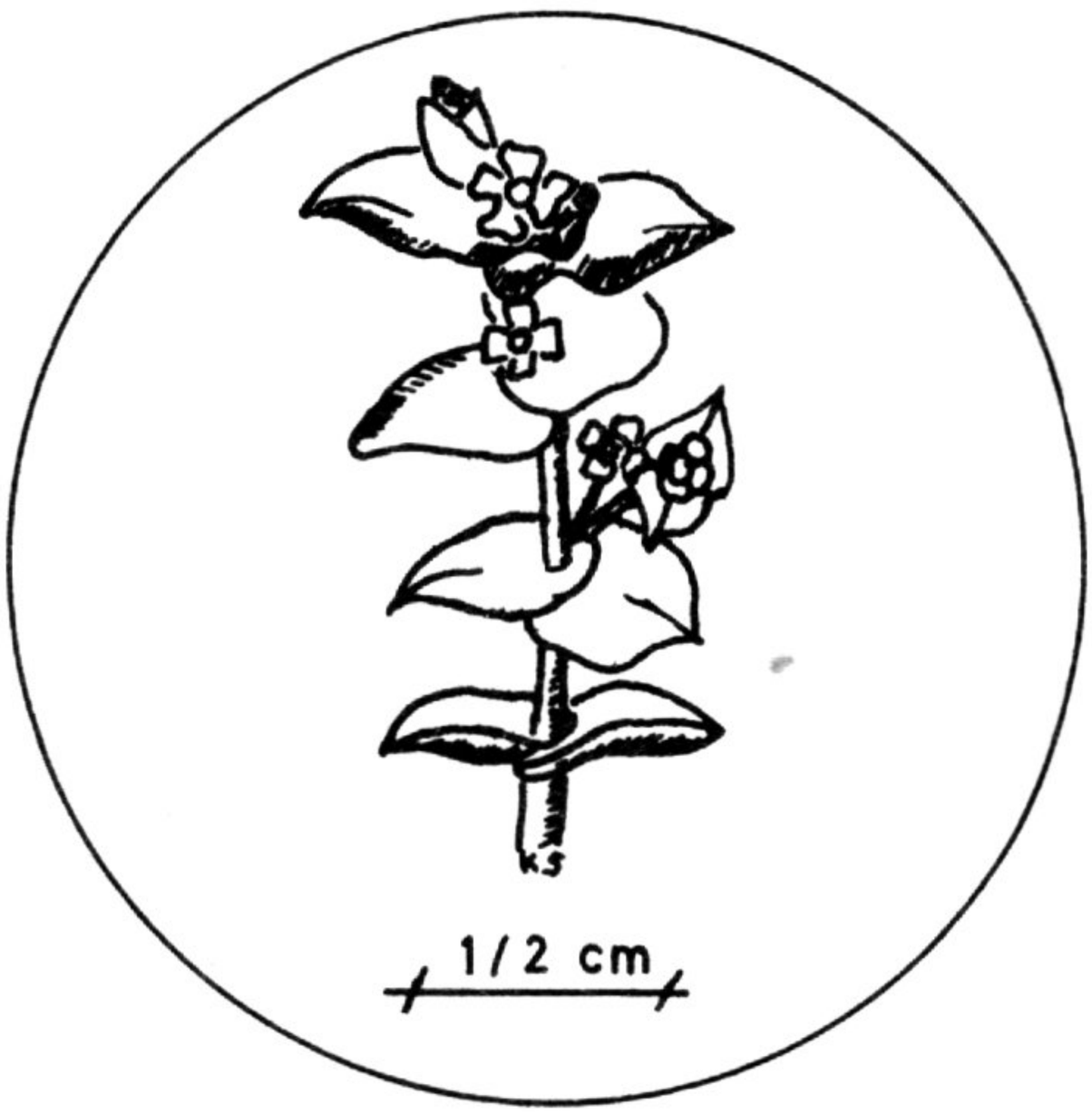
Family: Boraginaceae

Low herbs, often as inconspicuous grey mats or little grey bushes. Usually grey, during the rainy season more or less green. Small leaves, usually covered with little whitish hairs. Tiny white flowers.

These plants are especially adapted to grow on dry ashfields or on sand. The little whitish hairs which cover the leaves are a protection against the hot sun.

We find in the Galapagos 4 endemic species of this genus. The ***Coldenia*** shrubs are very attractive on Bartholomè Island, where we find two species, the lower ***C. darwinii*** and the larger shrubs of ***C. nesiotica.***





Genus Chamaesyce

Family: Euphorbiaceae

There are 10 species of ***Chamaesyce*** recorded from the Galapagos. The different species look quite different, are herbs or shrubs, have a milky sap (latex) in all parts, opposite leaves, and tiny flowers.

Chamaesyce punctulata

Little shrub, small narrow leaves. Stems reddish, with swollen nodes. Tiny white flowers. Especially during the dry season typically red bushes.

Endemic. Very common on South James Bay, James Island, also on Tagus Cove, Isabella Island.

Chamaesyce amplexicaulis

Little green shrub, deeply heart-shaped leaves, enveloping stem. Tiny white flowers.

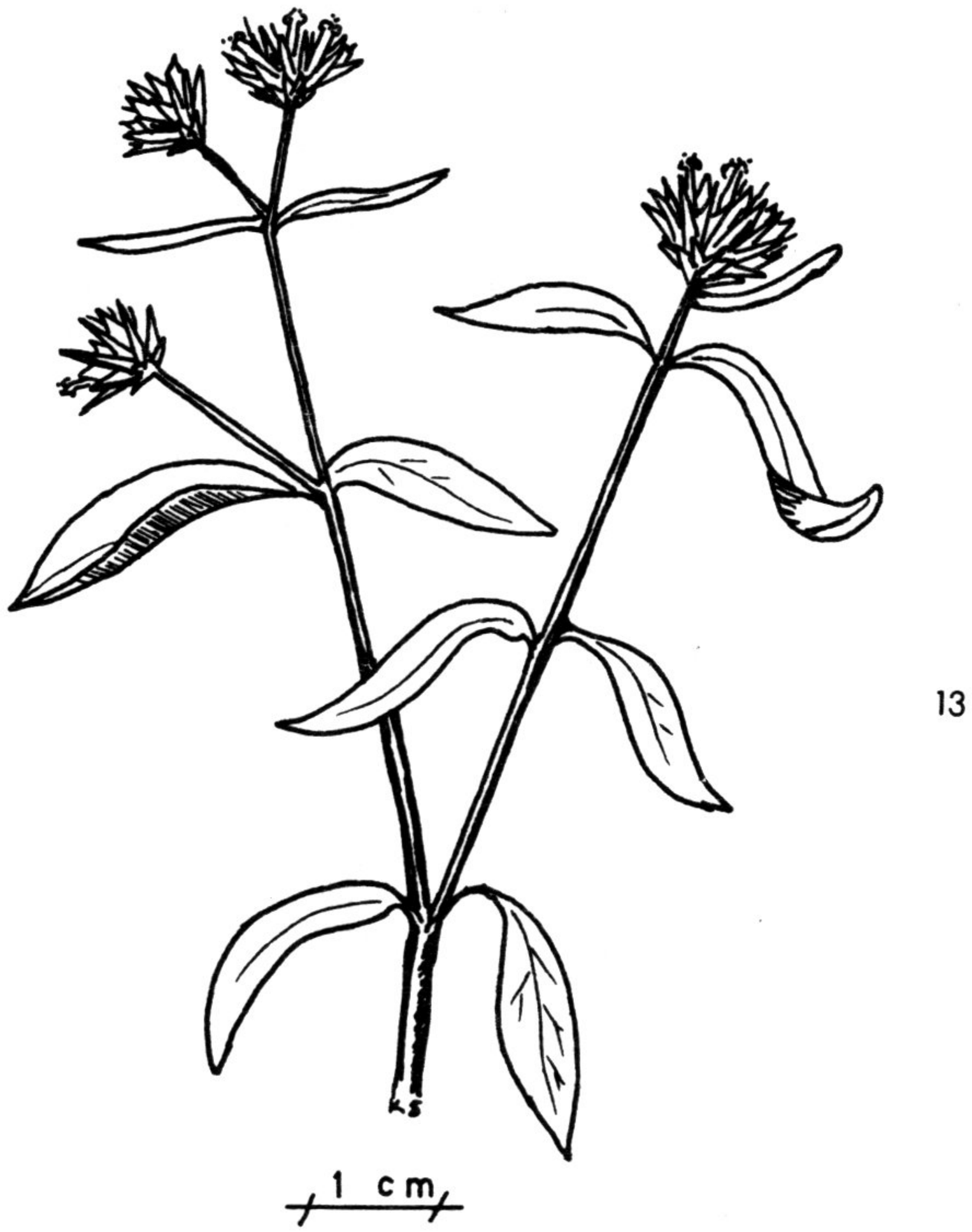
Endemic. On Bartolomé accompanying the grey ***Coldenia*** shrubs, also common e.g. on Tower Island.

Genus Polygala

Family: Polygalaceae
English common name: Galapagos Milkwort

Little green leaves. Stems appear golden yellowish. Little white flowers in clusters on tops of branches.

We have 3 species of ***Polygala*** in the Galapagos which look quite similar. Two of them occur in two varieties, all are endemic and seem to have evolved from one original species.



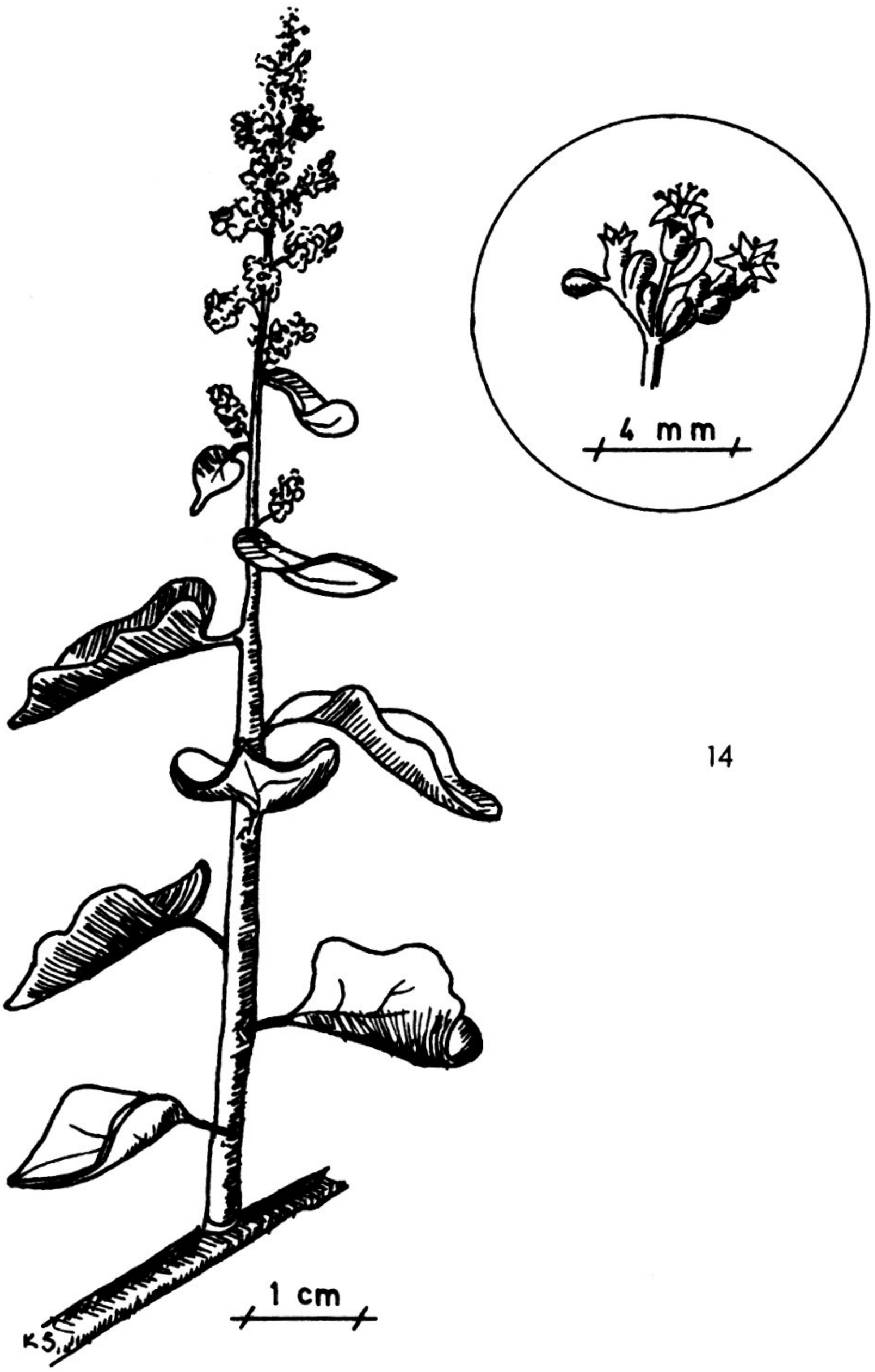
Alternanthera echinocephala

Family: Amaranthaceae

Shrub. Leaves during the dry season usually narrow, during the wet season often broadly ellyptic. White flowers in terminal heads.

A. echinocephala is nonendemic, occurs also in Peru.

We find in the Galapagos 10 species of ***Alternanthera,*** most of them endemic. ***A. echinocephala*** is the most common of this genus. ***A. filifolia*** occurs in 7 variations one of which ***(filifolia)*** is common around the Charles Darwin Research Station, Sta. Cruz Island.



Cryptocarpus pyriformis

Family: Nyctaginaceae
English common name: Saltbush
Spanish common name: Monte salado

Bush, with often very long hanging branches, sometimes forming thickets. Green all year round. Leaves fleshy, usually bent. The inconspicuous yellowish green flowers are often found in very long clusters.

Nonendemic, most common shore-bush on the Galapagos, also on the coast of Ecuador and Peru.

The latin species name (pyriform) refers to the more or less pear-shaped flower and fruit. The English and Spanish common names refer to the salty taste of the leaves.

Gossypium barbadense var. darwinii

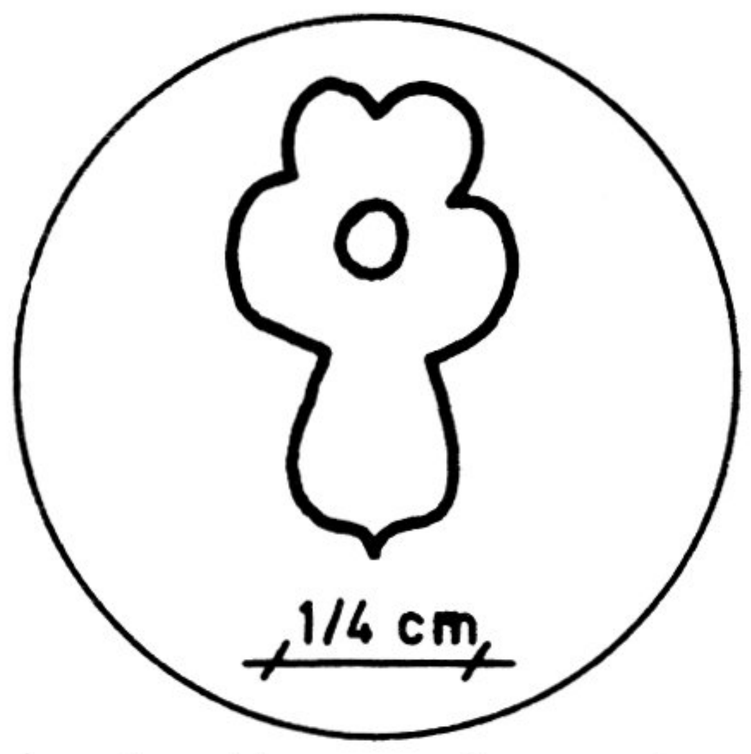
Family: Malvaceae
English common name: Galapagos Cotton
Spanish common name: Algodón

Shrub. Twigs and leaves with dark spots. Leaves usually three lobed, sometimes unlobed. Large yellow single flowers, inside the calyx purple markings. The largest indigenous flowers of the Galapagos. Fruits are capsules, with white lint (cotton).

In the Galapagos we find also one óther species of cotton: ***G. klotzschianum,*** which is much less common, and has usually mainly unlobed leaves. The much more common ***G. b. darwinii*** occurs only in scattered stands, as on Tagus Cove, Isabella Island, and varies very much in size and form of leaves, capsules and lint. This plant is considered to be a variety of the cultivated ***G. barbadense,*** or may be even its own species ***(G. darwinii)*** (HARLAND 1939, HUTCHINSON 1947).

The seeds of ***G. b. darwinii*** are very buoyant and resistant to seawater (STEPHENS 1958), so they probably floated from the South-American coast (Peru) via the Humboldt current to the Galapagos. The seeds might have even reached the Galapagos several times, which could be the cause of its great variability. (STEPHENS and RICK 1966).

On Floreana Island and San Cristóbal Island some of those plants were cultivated by the settlers. Darwin's Finches often use the lint of the cotton for nestbuilding (LACK 1947).



single flower from top

Lantana peduncularis

Family: Verbenaceae

Bush with very slender stems and branches. Rather thin leaves which occur only during the wet season. White flowers, compound in heads.

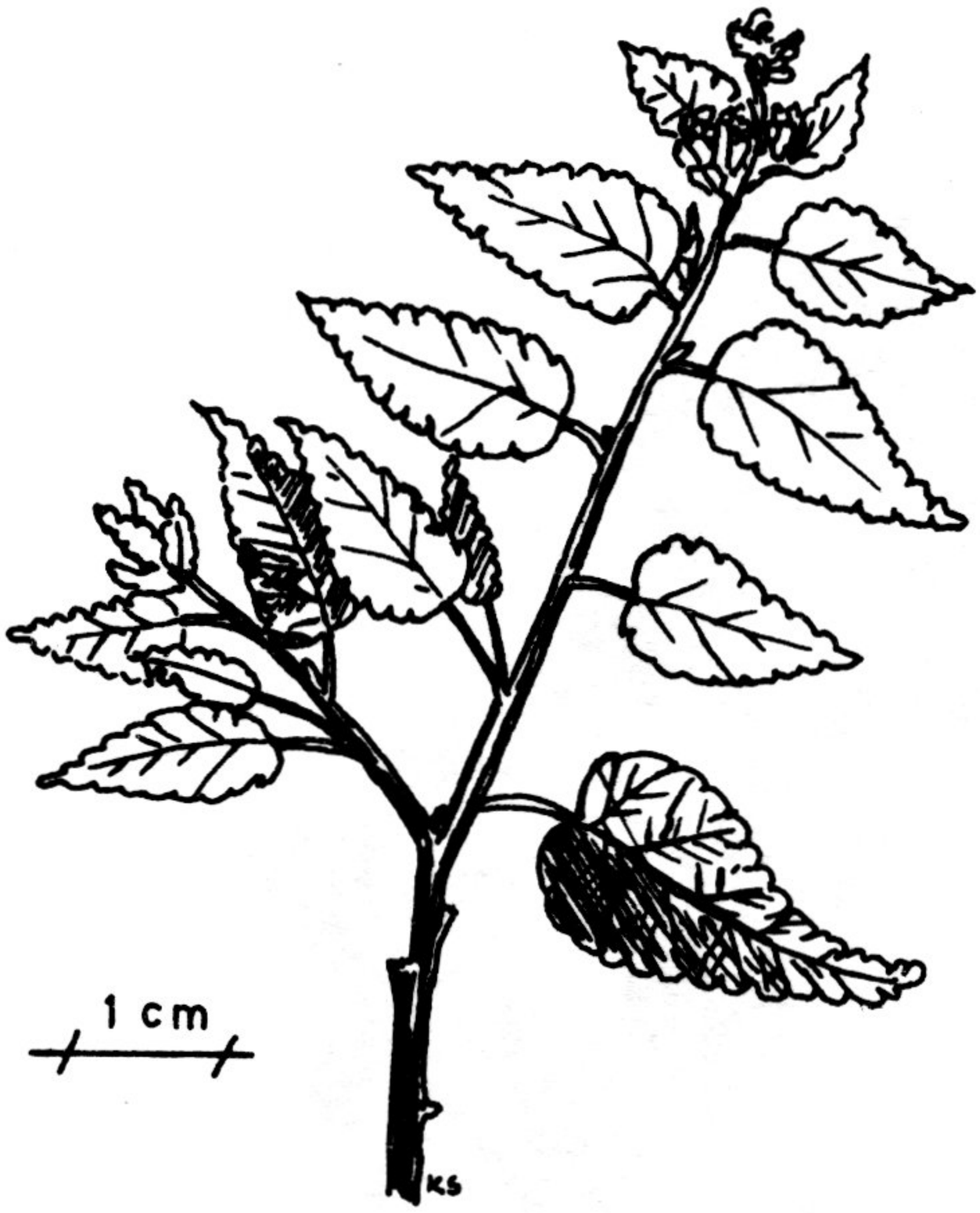
Endemic. We have two variations: var. ***peduncularis*** which is most common, and var. ***macrophylla*** with very large leafblades, up to 7 cm long. This species has its closest relative, ***L. svensonii,*** in coastal Ecuador and Peru (WIGGINS and PORTER 1971).

Clerodendrum molle

Family: Verbenaceae
Spanish common name: Rodilla de caballo

Shrub, slender twigs with nodes. The underside of the leaves is a lighter shade of green than the upper surface. White trumpet-shaped flowers, often in small clusters.

The flowers of this nonendemic plant are especially adapted to be pollinated by moths, which have a proboscis long enough to reach the nectar at the base of the long calyx. The only bee found on the Galapagos, ***Xylocopa darwinii,*** often bites through the coralla base, to reach the nectar with its short tongue. (THORNTON 1971).



Waltheria ovata

Family: Sterculiaceae

Shrub. Stems conspicuously dark. Leaves with prominent veins beneath. Little yellow flowers in small groups.

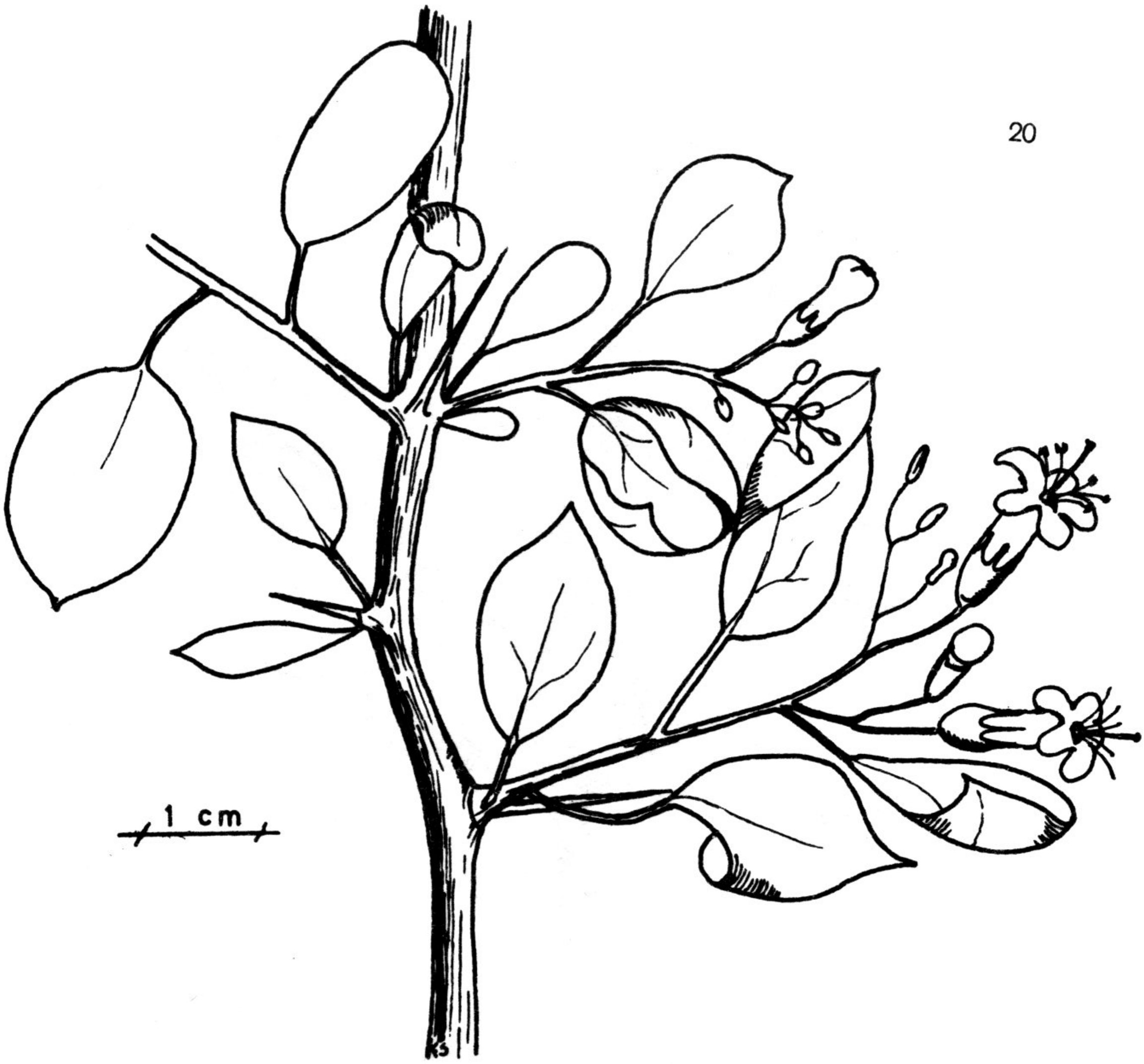
This nonendemic plant is also found in Peru, where it usually has large leaves. In the Galapagos the leaf-size varies greatly, and we find near the coast the small-leaved form. This phenomenon, that plants near the coast in the Galapagos have small leaves, is called "dwarfing". We can also find it on the *Croton* trees. (SVENSON 1946).

Lycium minimum

Family: Solanaceae

Shrub with slender branches, and spine-like twigs. Club-shaped leaves, often in clusters up to 5. During the dry season usually without leaves. Little white flowers. Tiny red-orange berries as fruits.

Endemic. (see *Grabowskia).*



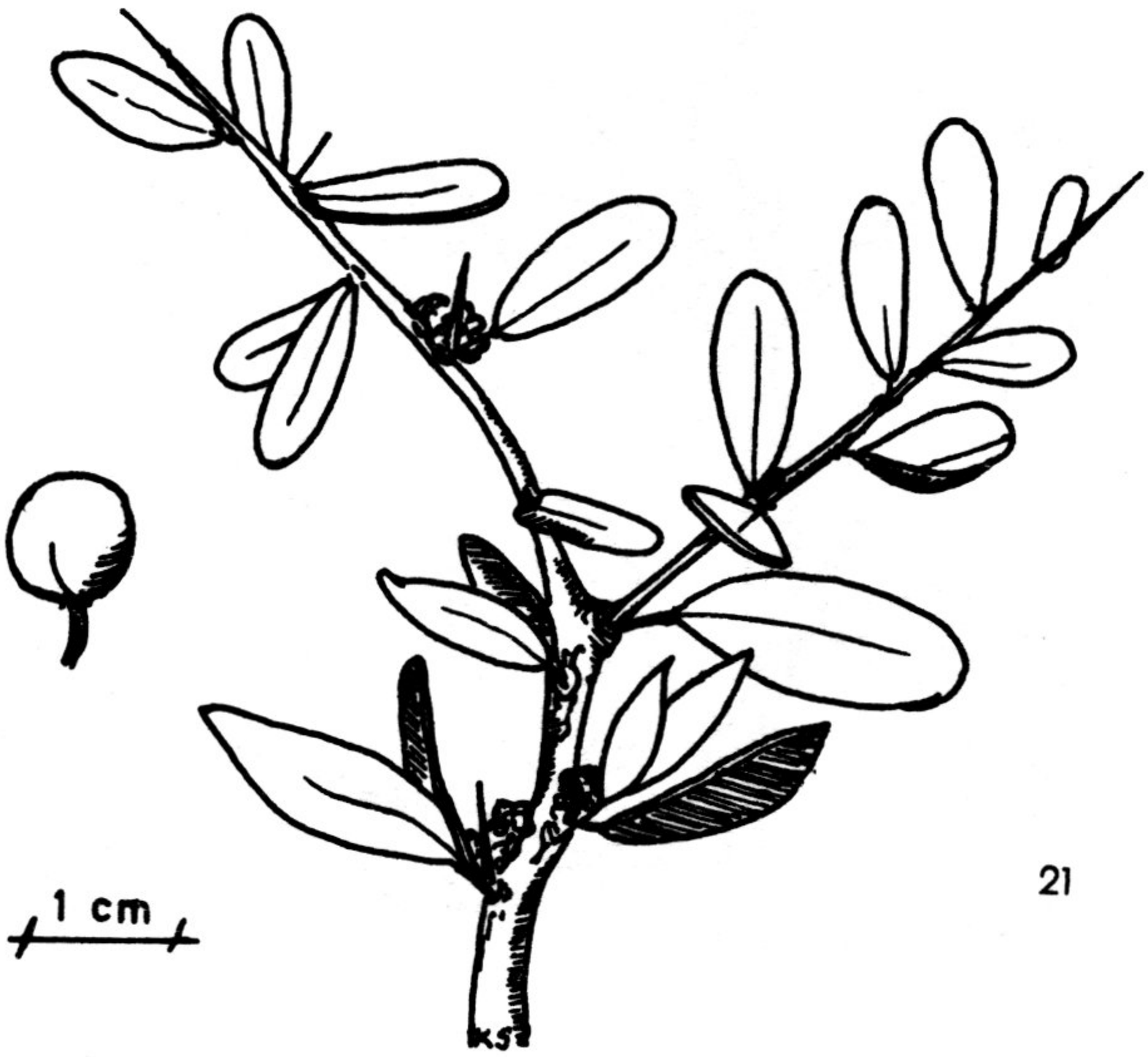
Grabowskia boerhaaviaefolia

Family: Solanaceae

Shrub. Stiff branches with spines, young twigs whitish, later reddish brown. Light green leaves. During the dry season usually without leaves. Flowers white, solitary or in little clusters, Blue-black berries.

Nonendemic, occurs also in Peru.

Lycium minimum and ***Grabowskia boerhaaviaefolia*** are the most common bushes on Punta Suarez, Hood Island, where they are conspicuously covered by lichens during the dry season.



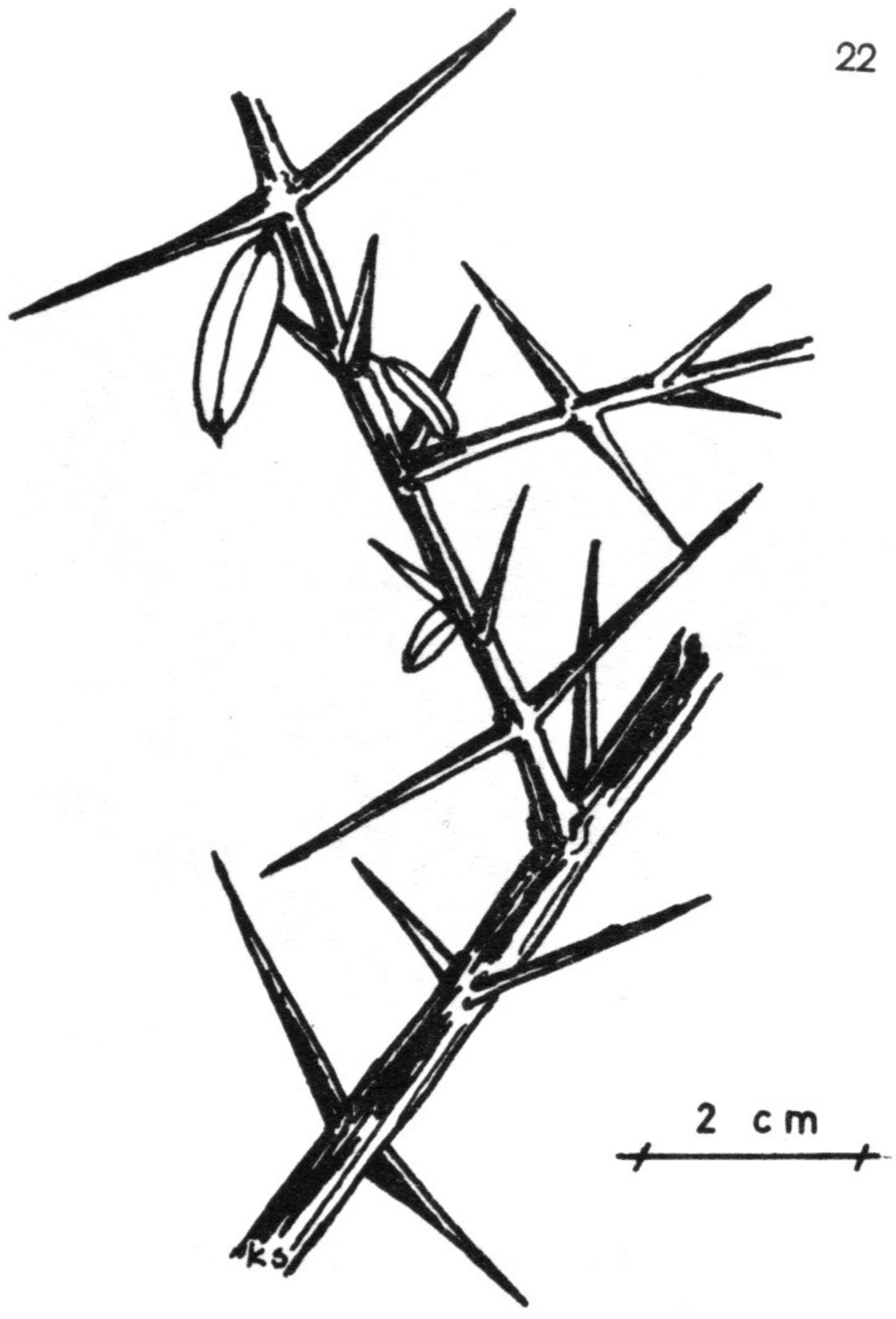
Castela galapageia

Family: Simaroubaceae
Spanish common name: Amargo

Shrub. Densely branched, often spiny. Leaves often in clusters of up to 5, above darker green than underneath. At base of leaves usually litle red dots (= buds). Flowers in little clusters or alone, small, red or yellow. Bright red fruits. This shrub is green almost all year round.

Endemic. It is the only species of this genus in the Galapagos. It might be, that the ancestor of this species was brought by birds, which eat the red fruits and might have transported the seeds in their intestines to the Galapagos. There is a closely related species *(C. erecta,* two variations) found in the West Indies, adjacent South America and Texas to Mexico. (CRONQUIST 1945).

The Spanish common name means "bitter", because of the extremely bitter fruits.



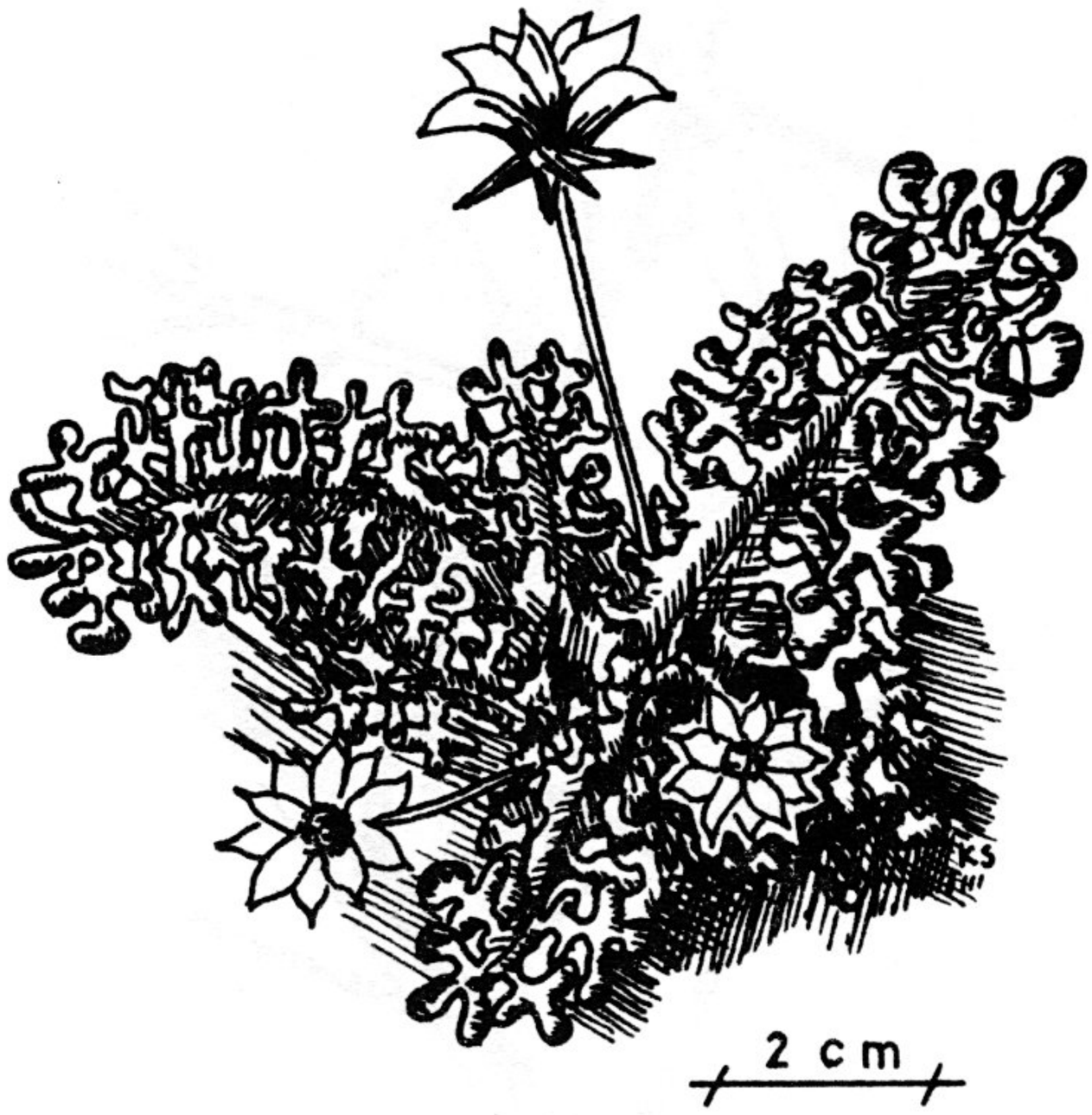
Scutia pauciflora

Family: Rhamnaceae

Very spiny shrub. Spines green, usually with brown tip. Often almost without leaves, those usually small, at base of spines. Often forms inpenetrable thickets. Dark red or brown fruits.

Nonendemic, also found on the coast of Ecuador.

The fruits can be eaten, though very sour. They are eaten by some species of Darwin's Finches, and the Broad-billed Flycatcher (WIGGNS and PORTER 1971).



Lecocarpus pinnatifidus

Family: Compositae

Erect shrub, with a single stem, tree-shaped, usually no more than 2 m high. Deeply lobed leaves. Bright attractive yellow flowers. Green and with flowers almost all year round. A pioneer on dry ashfields.

This species is most common on Punta Cormorant, Floreana Island.

The genus ***Lecocarpus*** is endemic to the Galapagos and consists of three closely related species. One of them is found mainly on Hood Island ***(L. lecocarpoides),*** another is restricted to San Cristóbal Island ***(L. leptolobus),*** and the third one ***(L. pinnatifidus)*** is only found on Floreana Island. Those three islands are the south-eastern islands of the archipelago. It seems obvious that those three species have a common origin. They are an example of island speciation within the archipelago, which is more common on the remote islands than on the central ones.

Genus Scalesia

Family: Compositae
English common name: Woody Sunflower
Spanish common name: Lechoso

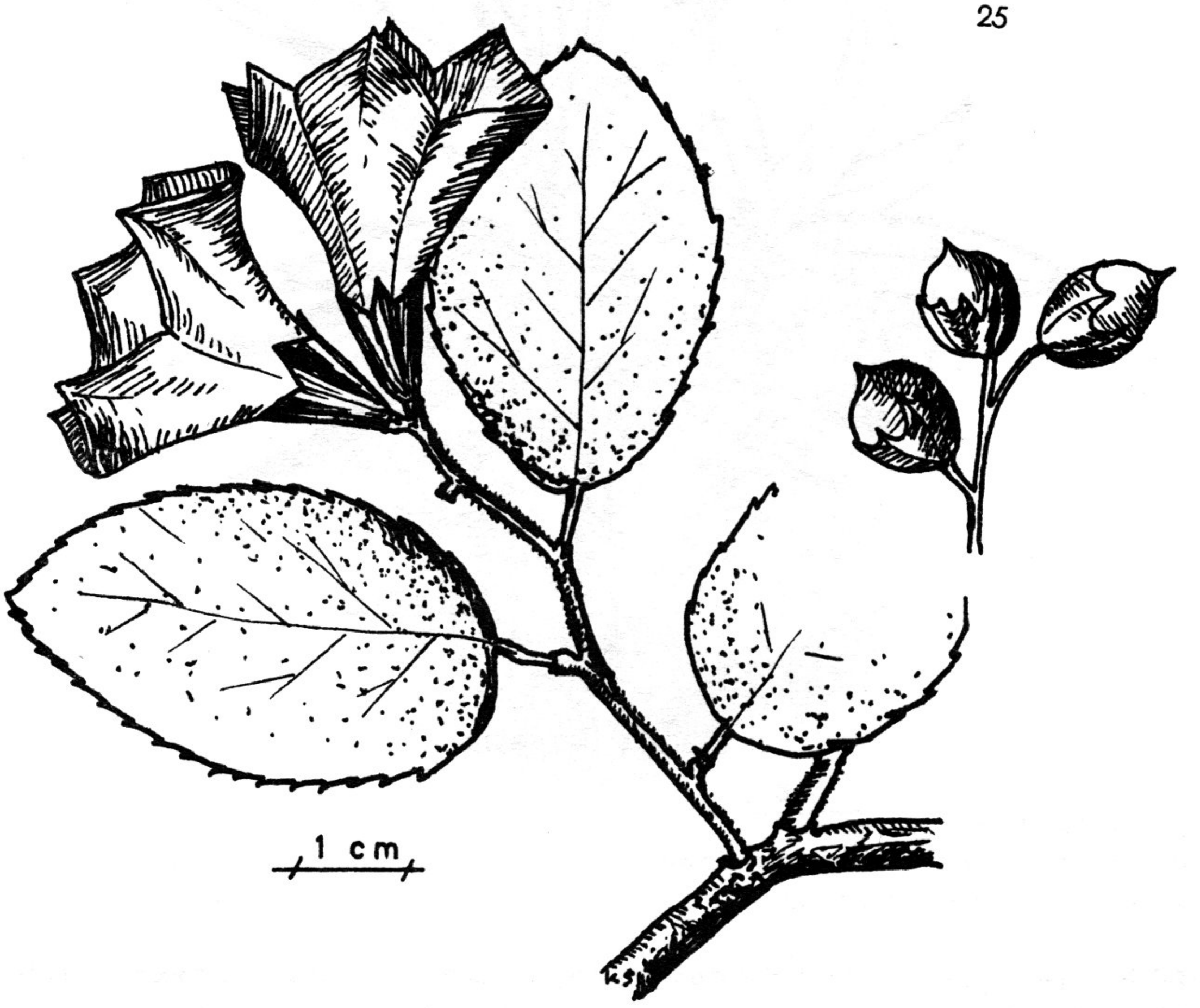
Scalesia is a genus endemic to the Galapagos Islands with more than 10 species. This very interesting genus shows us many typical phenomena for Galapagos plants, such as intensive archipelago evolution, reduction of dispersal ability and evolution into trees. (See introduction). Unfortunately some species of this genus are endangered, like on James Island, because of the introduced goats.

Scalesia stewartii

Shrub or very small tree, leaves mostly in clusters at the ends of twigs, beneath dead leaves from previous seasons. Twigs and leaves with white hairs. Flowers in single white heads at the ends of twigs.

This species is restricted to Bartholomè Island and eastern James Island.

On Punta Cormorant, Floreana Island we find ***S. villosa*** (illustrated on cover!) at the Charles Darwin Research Station we find ***S. affinis.***



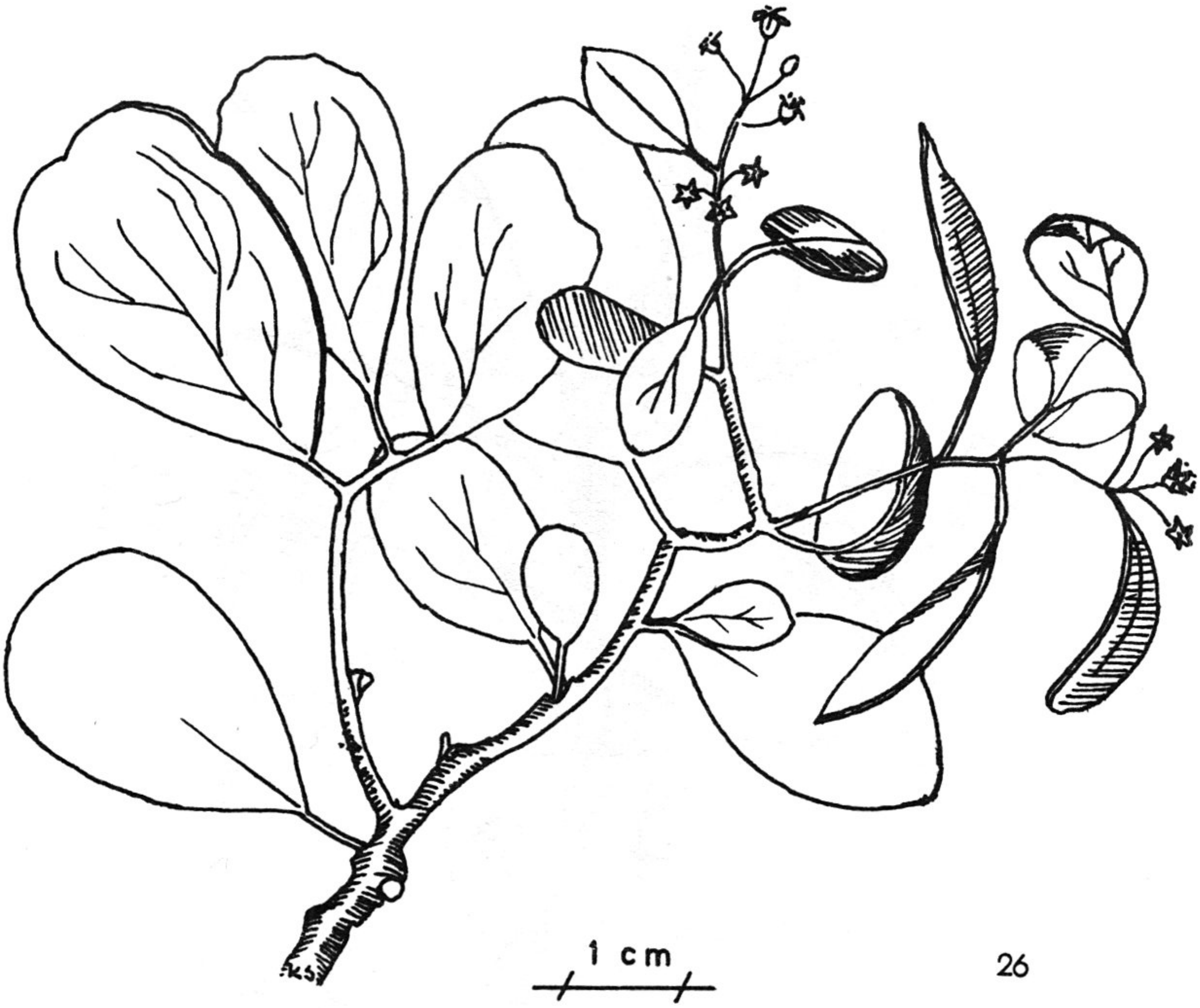
Cordia lutea

Family: Boraginaceae
Spanish common name: Muyuyo

Shrub, bush, or small tree. Numerous hairy twigs, with light grey bark. Leaves also hairy. Large bright yellow trumpet-shaped flowers.

C. lutea is nonendemic, it occurs also in Peru and the Marquesas Islands and is very common in coastal Ecuador.

There are 4 more species of ***Cordia*** found in the Galapagos, which are all endemic. These have much smaller flowers, which is a trend typical of endemic Galapagos plants. (See also introduction).



1 cm

Maytenus octogona

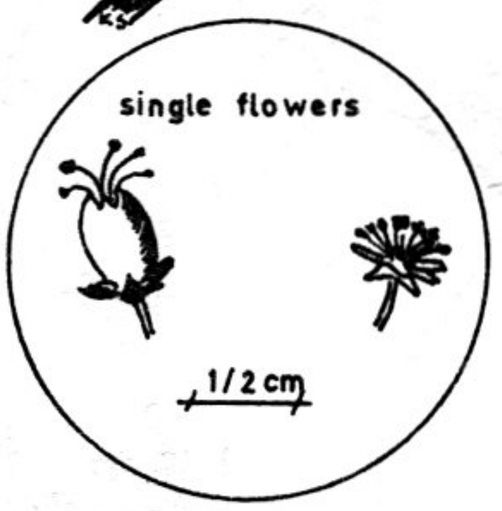
Family: Celastraceae

Spanish common names: Arayan, rompe ollas

Shrub or tree. Fissured bark, dark-grey, sometimes whitish. Leaves membranaceous when young, usually rather thick fleshy. Tiny inconspicuous green flowers. Fruits are capsules, which open into three sections, and have red berries inside.

Nonendemic, also along coastal Ecuador, Peru, and Chile.

The leaves of ***M. octogona*** are usually vertical, to expose only a minimum of surface to the strong sun.



Croton scouleri

Family: Euphorbiaceae
Spanish common name: Chala

Shrub or small tree, with pale bark, with many small twigs, leaves clustered near tips of twigs. Small inconspicuous flowers in groups on the tops of twigs.

This plant shows unusually high variation. Near the coast we find it with narrow lanceolate leaves (" forma ***macraei***") and further inland the same species has large broad leaves ***("grandifolius").*** We find similar variation in the size of the leaves of ***Waltheria ovata.*** The seeds of ***Croton scouleri*** also vary considerably. This species is divided into 4 or more variations and even different forms ("formas"). It is called a "polytypic species". It is closely related to ***C. rivinifolius*** from the Ecuadorian mainland. (WEBSTER 1970).

Croton scouleri is dioecious, that is, single plants either have male or female flowers. As dioecious plants usually depend on pollinating insects —which are few in the Galapagos— this is the only common dioecious plant on the archipelago. It is pollinated by a little moth at twilight. (LINSLEY 1966, RICK 1966).

C. scouleri is especially noticed by anyone who walks through arid zone vegetation, because its sap leaves permanent brownish stains on clothing. These stains have the interesting property of becoming darker with each subsequent washing!

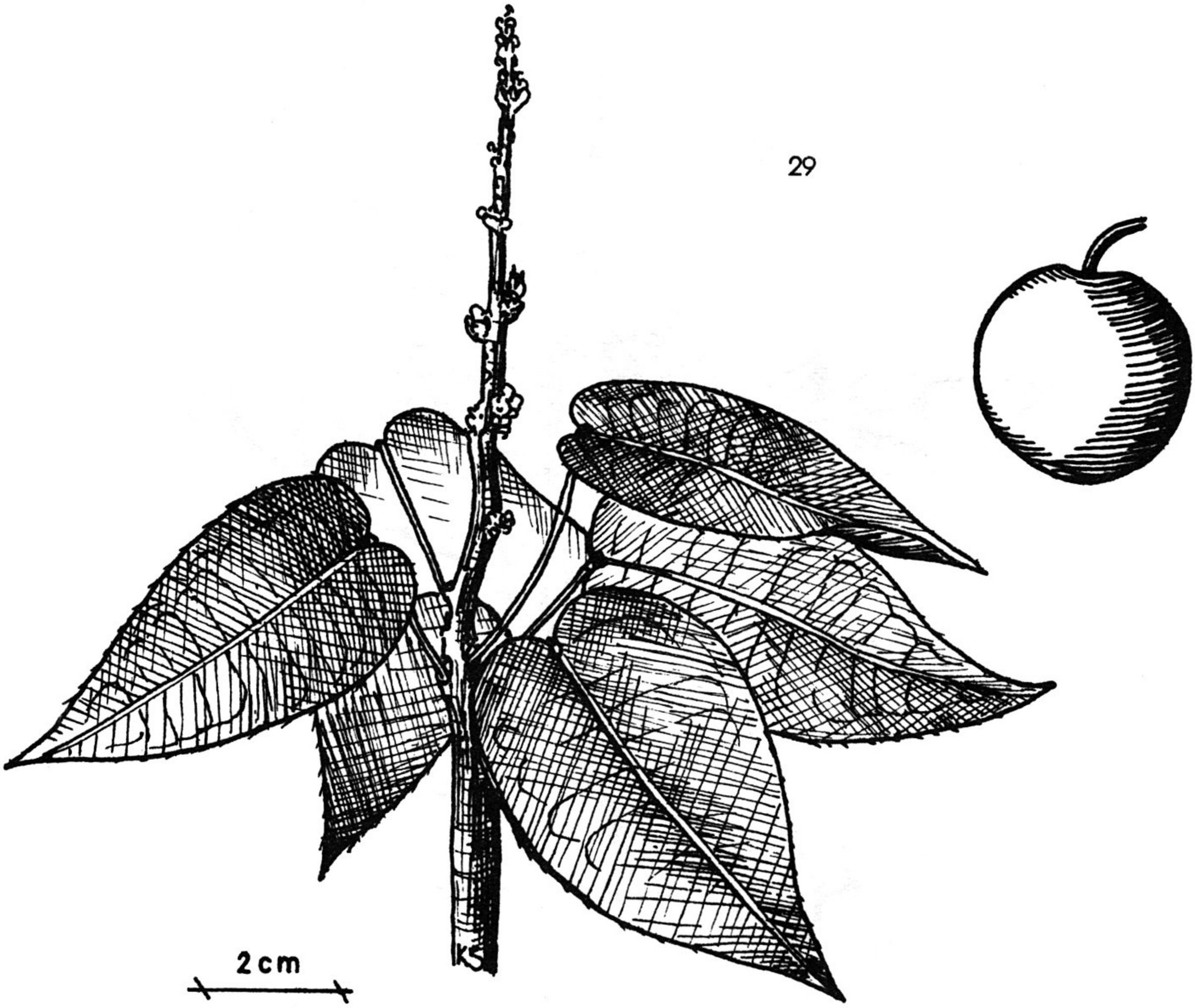
Bursera graveolens

Family: Burseraceae
Spanish common name: Palo santo

Rather small tree, extremely abundant. Stems and branches grey to white, often covered with white lichens. Has no thin twigs. Only during the wet season with leaves, these are compound, in clusters at tips of branches. Small greenish flowers. Hard brown fruits.

There are two species of ***Bursera*** in the Galapagos, which look quite similar and are closely related. The nonendemic ***B. graveolens*** is very abundant on most of the islands, the other species ***B. malacophylla,*** which is probaly endemic, occurs only on Baltra and North Seymour Island. On the central island Duncan none of both species occurs, though Duncan seems to have suitable conditions for the palo santo tree and is surrounded by islands which bear them.

The Spanish common name neans "holy stick", and refers to the aromatic odour of the fresh wood. The smoke of burning palo santo trees is used to repell insects. (VALVERDE 1967).



Hippomane mancinella

Family: Euphorbiaceae
Spanish common name: Manzanillo

Tree with latex in all parts. Rather dark green leaves, withconspicuous light midvein. Tiny flowers on a spike. Fruits like little green apples.

Caution: This plant has a poisonous latex (=milky sap) and apple-like poisonous fruits. The poison causes severe dermatitis; no part of the plant is safe to touch.

Nonendemic. Common in Florida and the Caribean. However unreported on the coast of Ecuador and Peru. (WIGGINS and PORTER 1971).

The Spanish common name means"little apple" and refers to the fruits.

Acacia rorudiana

Genus Acacia

Family: Leguminosae
Spanish common name: Algarrobo

The Acacias of Galapagos have all straight paired thorns, compound leaves with small paired leaflets, yellow or orange flowers, which form little balls, and beanshaped fruits (legumes).

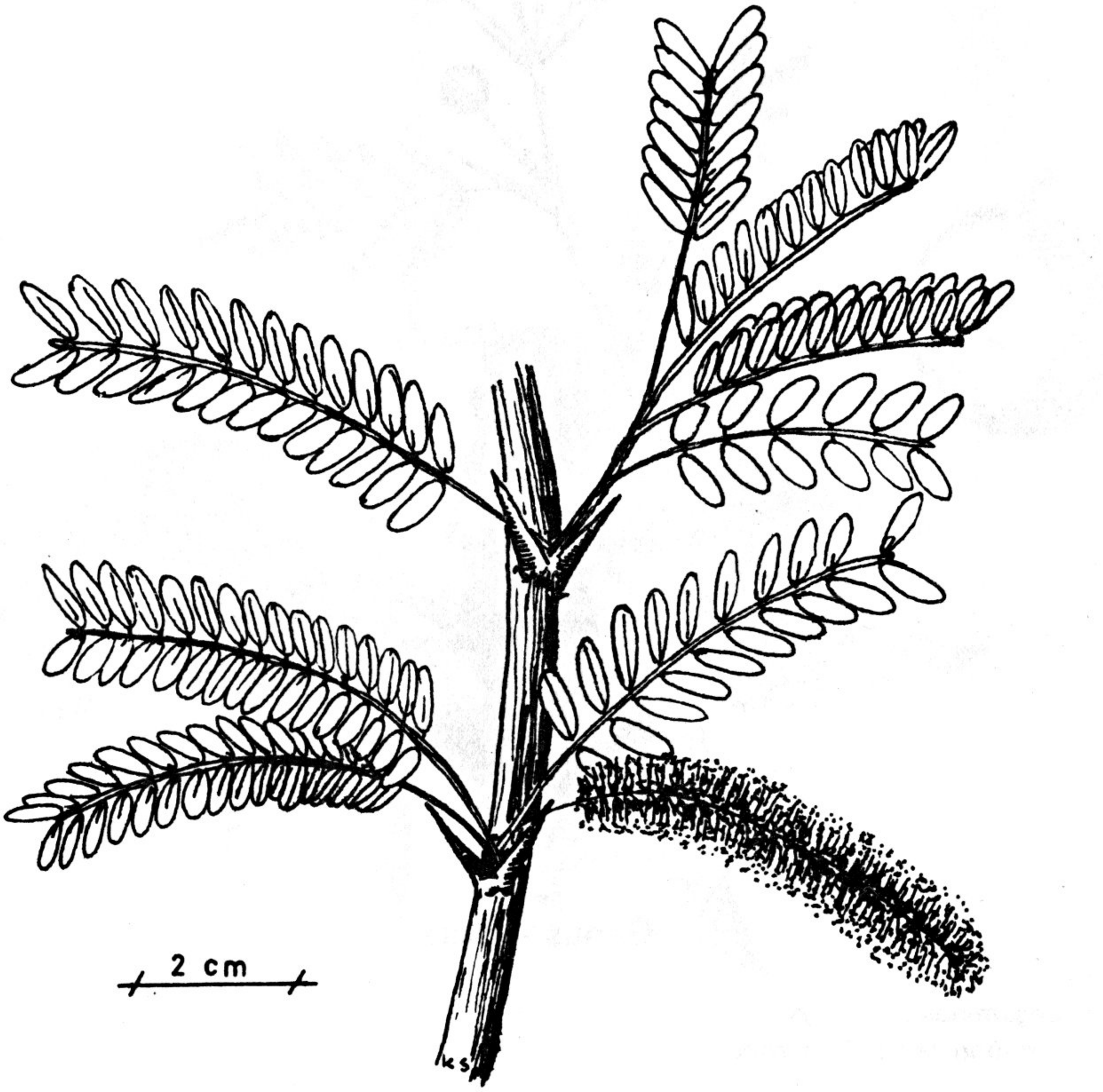
The genus ***Acacia*** is represented in the Galapagos by 4 species, which are all nonendemic.

Acacia rorudiana has very fine pinnate leaves, with leaflets less than 1 mm long. It is very common on Tagus Cove, Isabella Island. (See drawing).

Acacia insulae-iacobi has leaves and twigs similar to those of ***Prosopis juliflora,*** but the flowers are grouped into balls instead of cylinders.

Acacia macracantha is most common in South James Bay, James Island. Its leaflets are 1 to 3 mm long.

Acacia nilotica is only found on St. Cruz Island. (See drawing).



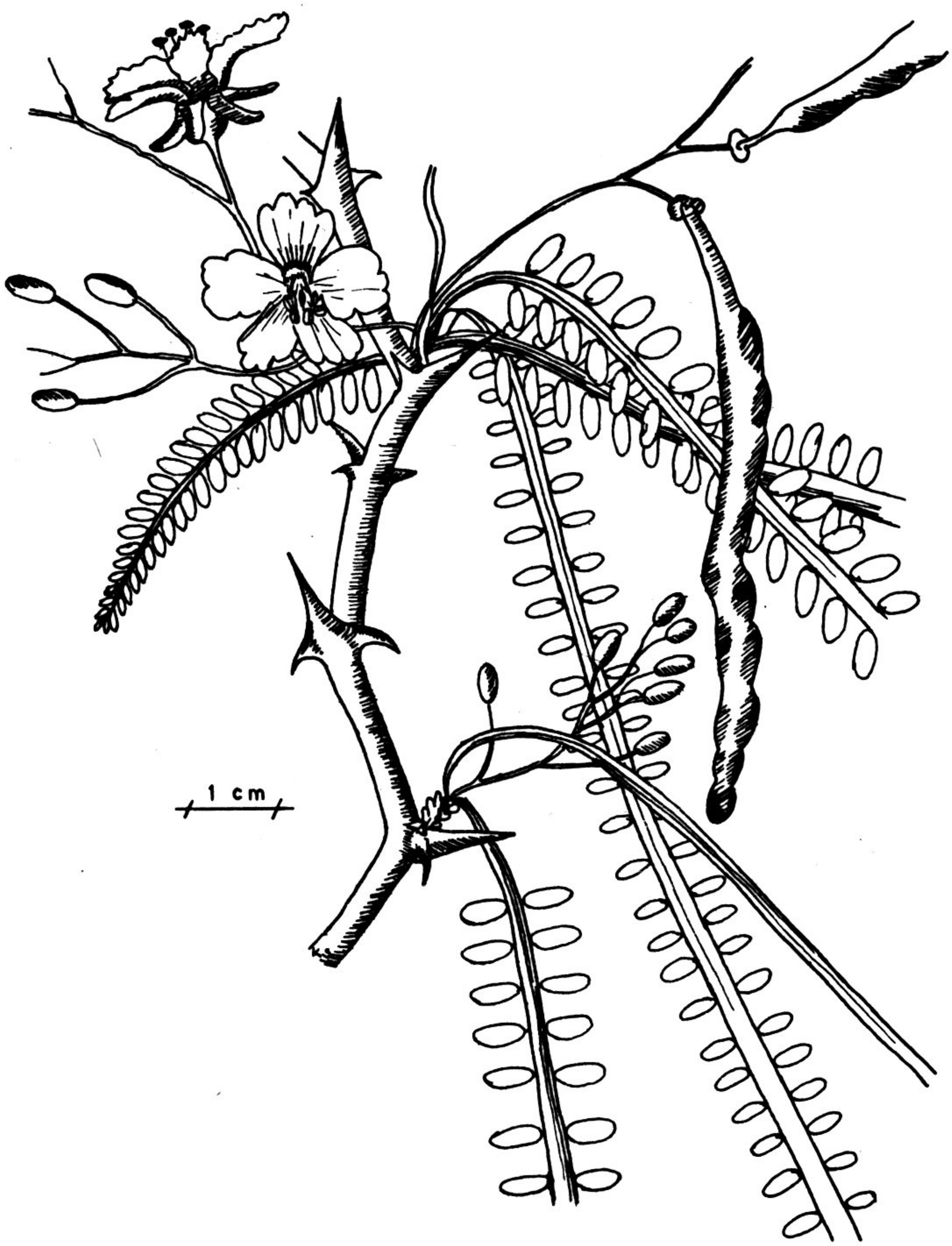
Prosopis juliflora

Family: Leguminosae
Spanish common name: Algarrobo

Tree or shrub, spiny, compound leaves. Yellowish flowers, forming a cylinder. Pods (= legumes) similar to the ones of Parkinsonea aculeata.

This plant can hardly be distinguished from Acacia insulae-iacobi, if you do not see the flowers. Acacias have flowers in small yellow balls.

Nonendemic. ***P. juliflora*** originates from Mexico, West Indies, and northern South Ameriea. It probably reached the Galapagos several times from different sources. (WIGGINS and PORTER 1971).

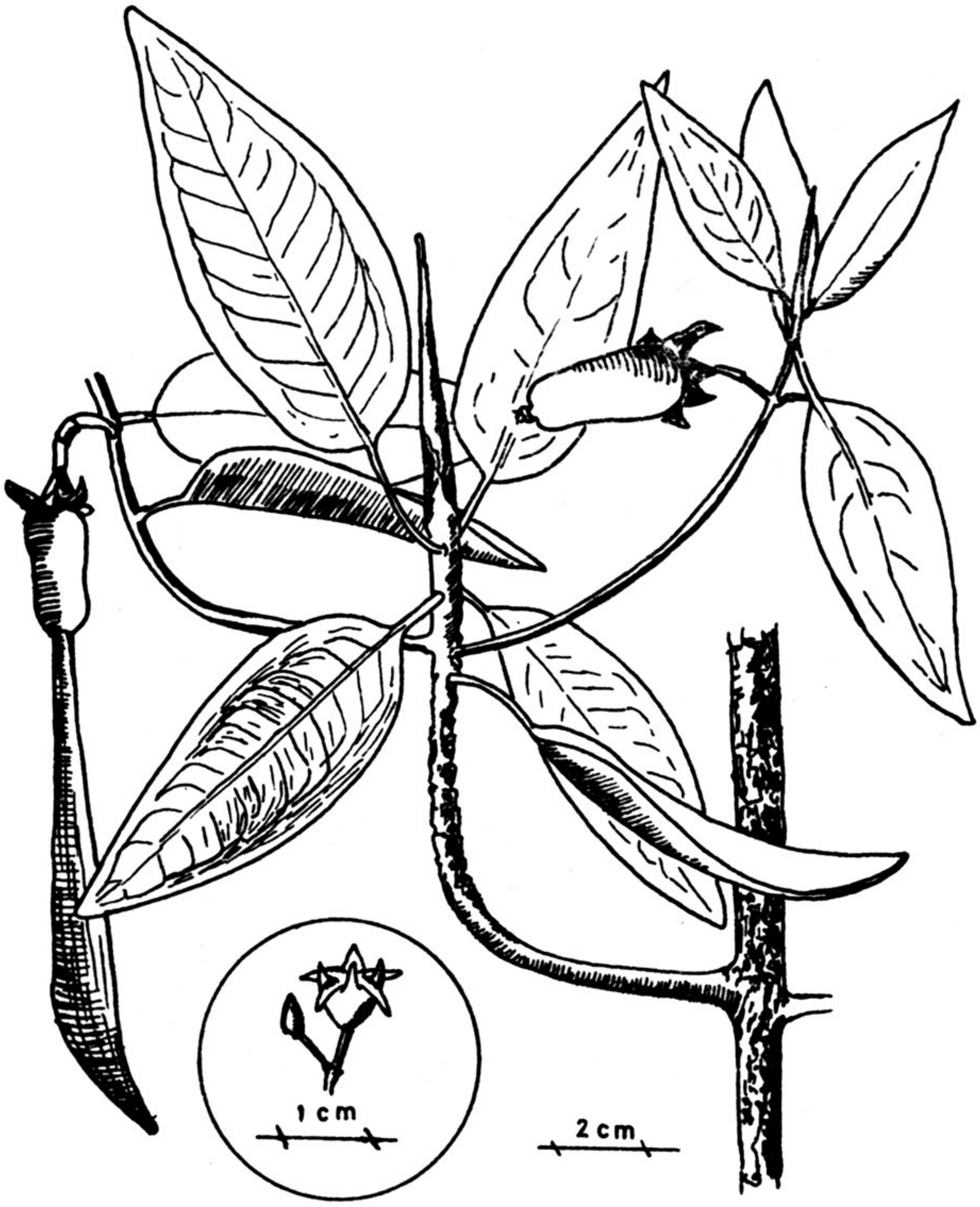


Parkinsonea aculeata

Family: Leguminosae
Spanish common name: Uña de gato

Tree or shrub. Thin blue-green or yellow-bark, brown when old, With many strongly hooked spines. Very long, typically hanging, compound leaves with a green midrib and very small opposite leaflets, which are sometimes missing. Attractive yellow flowers, usually found in little groups. Always one petal larger than the others, and partly red. Fruits bean-shaped pods (= legumes).

Nonedemic. Widely distributed in subtropical America. Very abundant on Baltra Island.



Rhizophora mangle

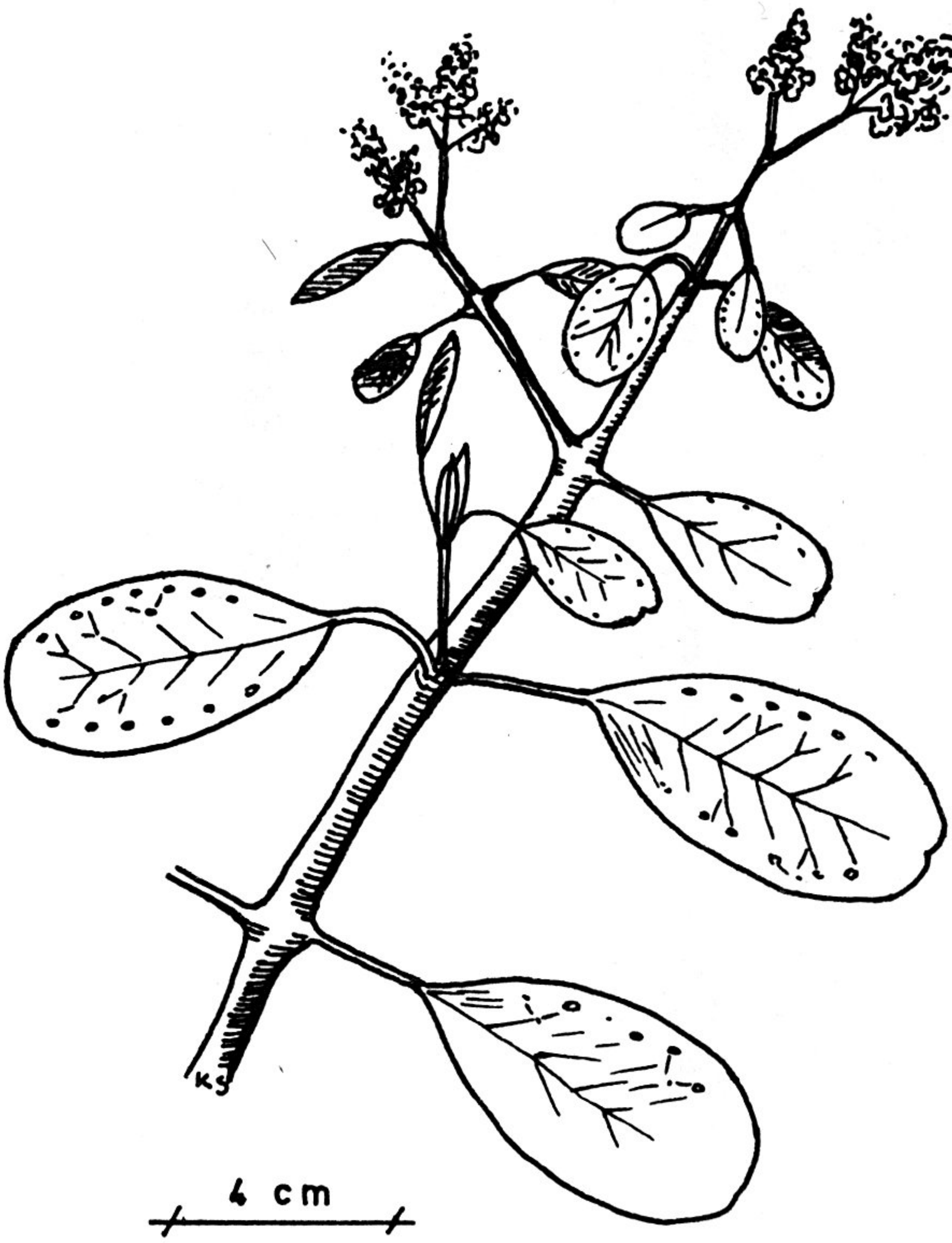
Family: Rhizophoraceae
English common name: Red Mangrove
Spanish common name: Mangle rojo

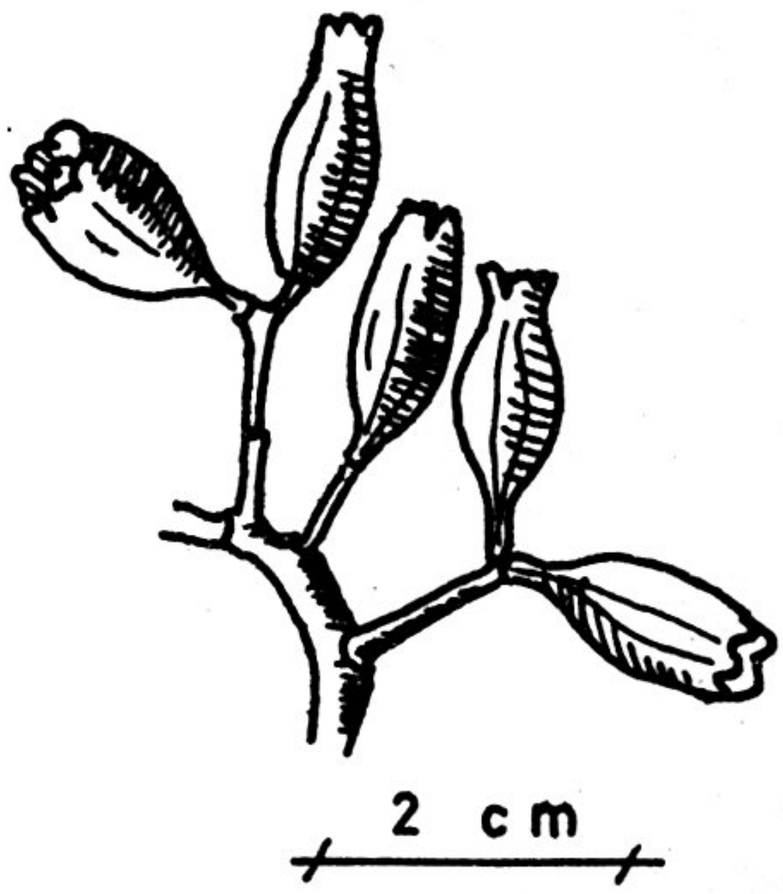
Shrub or tree, standing on stilt-roots (prop-roots). Reddish twigs. Relatively long fleshy leaves, dark-green above, light-green beneath. Whitish single flowers

The seedling, which grows out of the fruit while still hanging on the twig, reaches a length of about 20 cm before it falls down. Then it can float long distances in the sea. This is an extremely good dispersal mechanism, by which this species probably reached the Galapagos.

Nonendemic, widely distributed around the tropics. Forming thickets on Punta Espinoza, Fernandina Island.

The wood of ***R. mangle*** is very hard and does not rot for a long time (VALVERDE 1967).



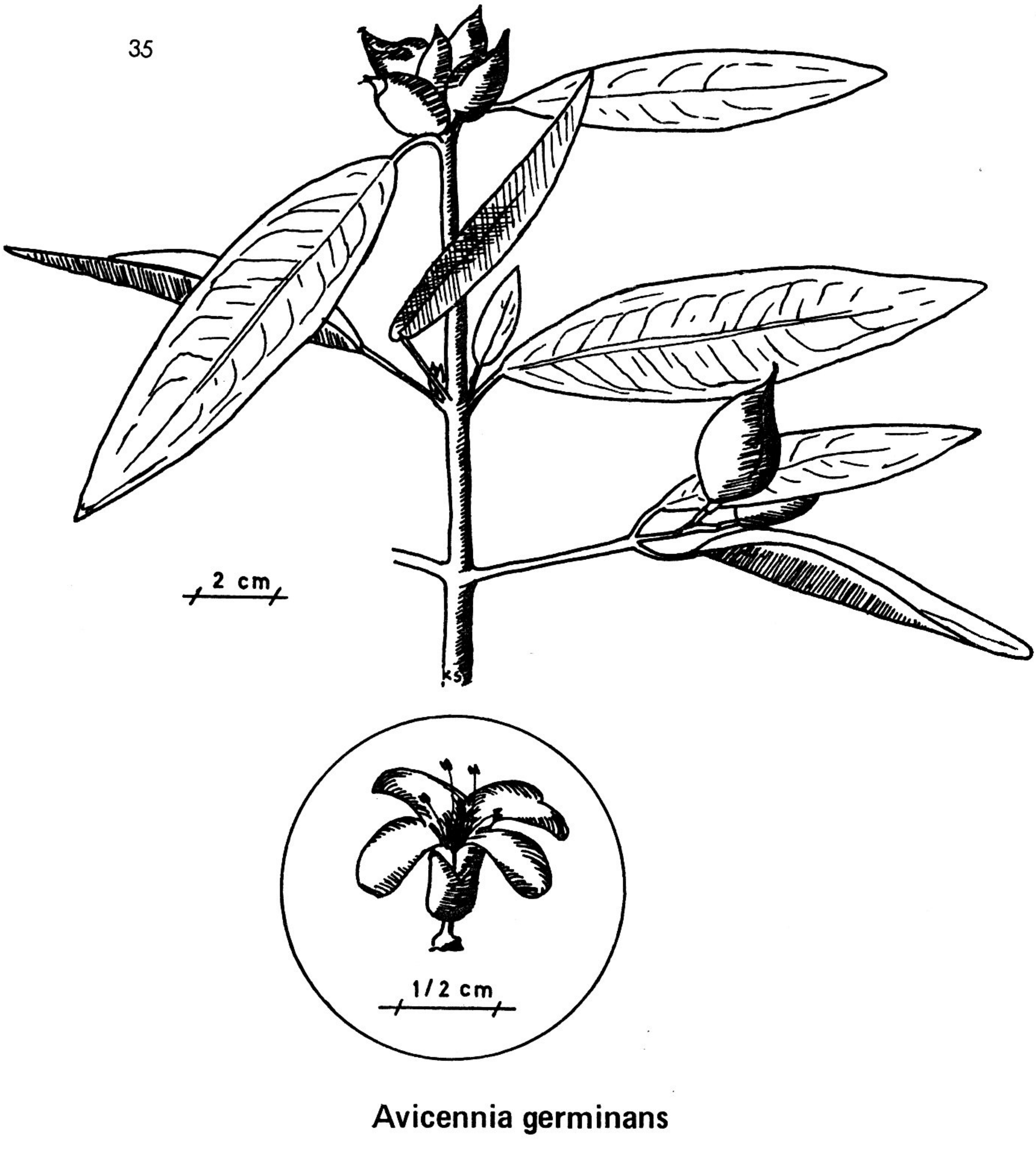


Laguncularia racemosa

Family: Combretaceae
English common name: White Mangrove
Spanish common names: Mangle blanco, mangle amarillo

Shrub or small tree. Young twigs reddish-brown, later brown; old twigs often grey to whitish. Leaves with typical dots (holes) beneath. Flowers whitish, inconspicuous, clusters. Fruits grey-green.

Nonendemic, occurs along the shores of tropical America.

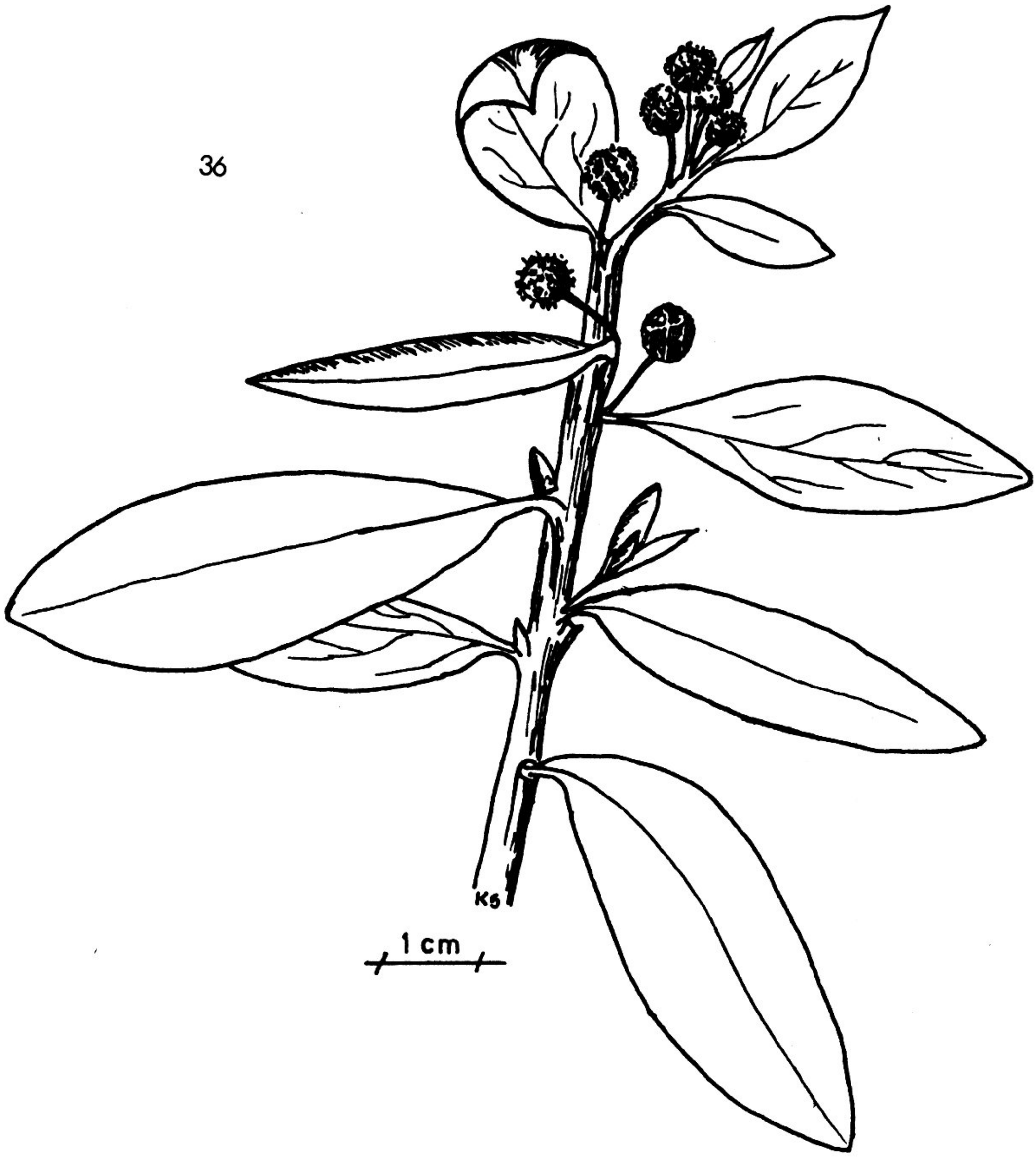


Avicennia germinans

Family: Avincenniaceae
English common name: Black Mangrove
Spanish common name: Jeli de tierra

Shrub or tree. Often with many pneumatophores (vertical pieces of roots reaching above the water-level). Slender brownish twigs. Leaves long, dark or greyish green. White flowers in dense clusters. Characteristic, asymetrical yellowish to brown fruits.

Nonendemic, common on the coasts of tropical America.

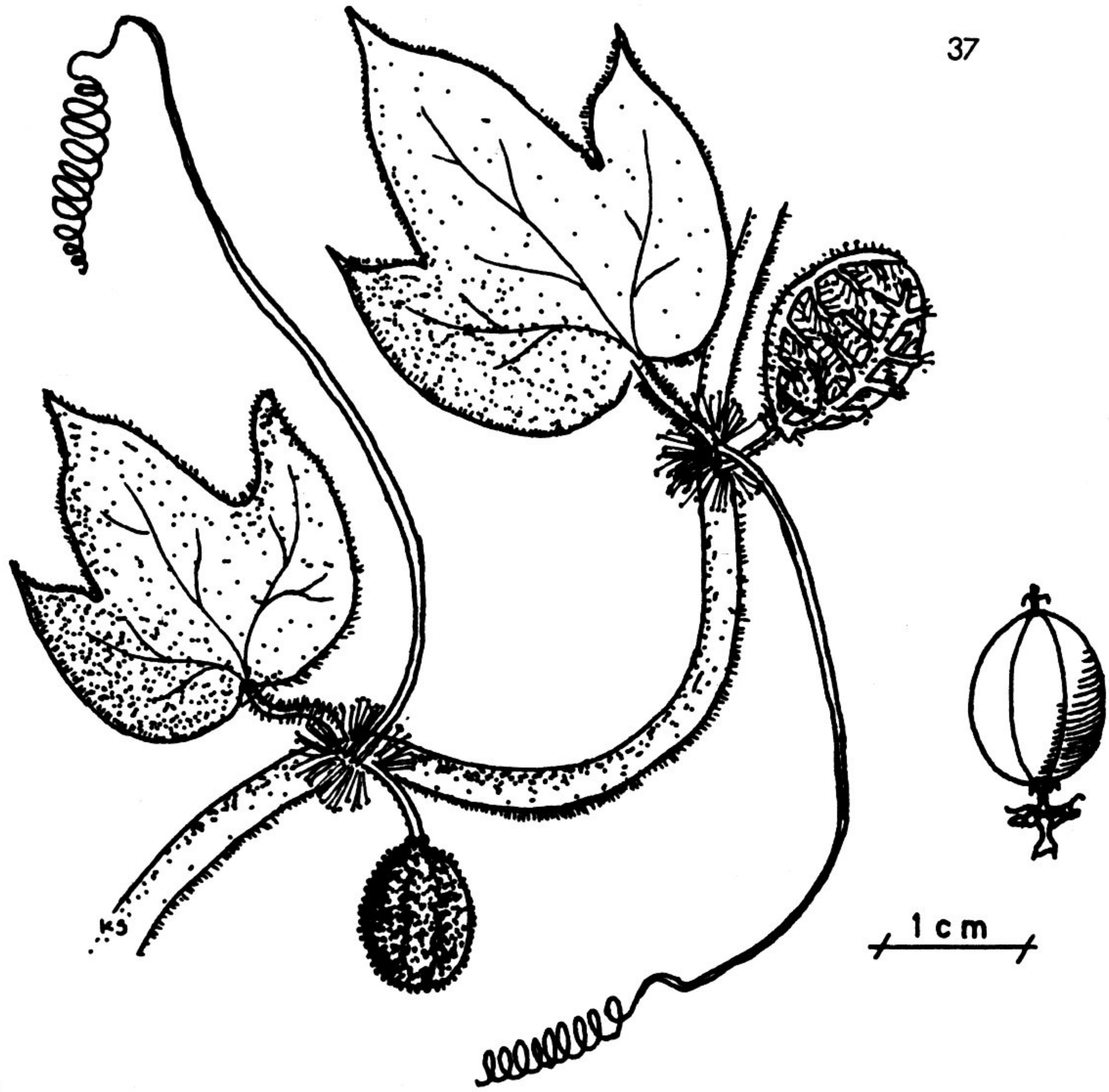


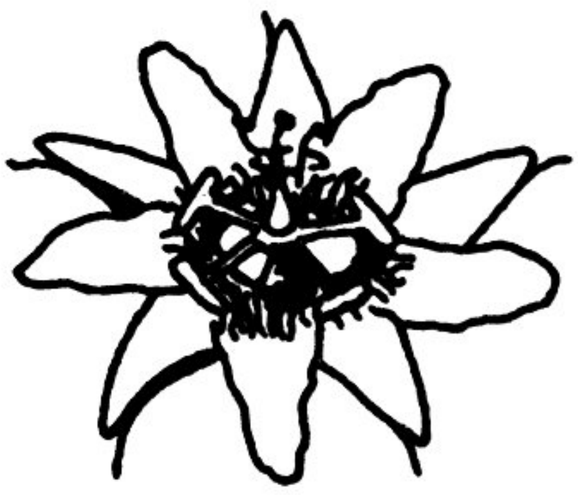
Conocarpus erecta

Family: Combretaceae
English common name: Button Mangrove
Spanish common names: Jeli de agua, mangle jeli, mangle prieta

Shrub or tree. Twigs brown or reddish. Leaves rather ligth green, smaller than the ones of the other mangroves in Galapagos. Inconspicuous flowers, aggregated in "buttons" (small bowls). Also fruits bowlshaped, reddish brown.

Nonendemic, common along the tropical American coast. Very common on Espumilla Beach, James Island.





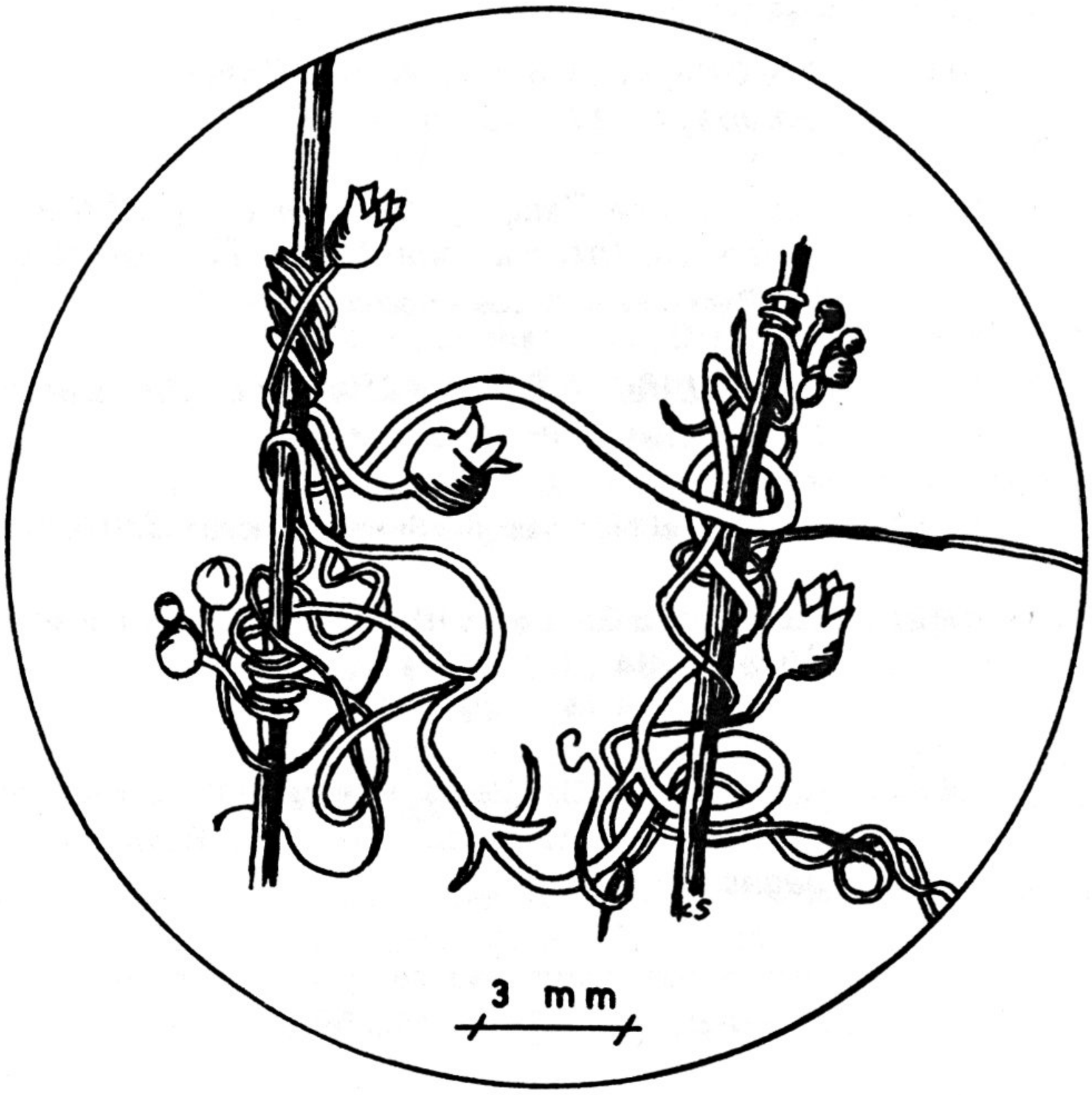
Passiflora foetida var. galapagensis

Family: Passifloraceae
English common name: Passionflower
Spanish common name: Vedocas

Vine, climbing over trees, shrubs, or rocks. Stems and leaves covered with relatively long hairs. Attractive white flowers. Characteristic fruits, when immature in a net of fine sticky articulate leaves, later orange.

Endemic variation. Common on Punta Cormorant, Floreana Island and around Puerto Ayora, St. Cruz Island.

The fruits are edible; the inner pulp can be sucked out, and tastes very good.



Genus Cuscuta

Family: Convolvulaceae
English common names: Dodder, Witche's Hair, Love Vine

Parasitic plants, forming yellow or orange webs on top of other plants, often on top of Chamaesyce punctulata. Tiny flowers. No real leaves.

There are two species of ***Cuscuta*** in the Galapagos, ***(C. acuta*** and ***C. gymnocarpa),*** both of which may be endemic.

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Books of general interest with good bibliographies.

Acknowlegements

This booklet was written while I was working as a guide for GALAPAGOS CRUISES. I wish to thank all the passengers who helped me with encouragement, suggestions, and questions, especially Professor W.E. Niles and Professor D.C. Holliman, who provided me with helpful literature.

I am indebted to the staff of the Charles Darwin Research Station on St. Cruz, especially Debby and David Clark, who encouraged me and corrected my manuscript. H. Adsersen loaned me a dried specimen of ***Lycopersicon*** for the drawing. I also want to thank my colleagues, most of all Walter Cruz for his invaluable help especially with the Spanish common names.

I am also deeply indebted to my friends, the Seebass family for the unselfish use of their home, where I did most of the writing and all the drawings.

Finally I want to give special thanks to METROPOLITAN TOURING, most of all to Eduardo Proaño and Francisco Salazar, who made possible the publication of this booklet.

This booklet is contribution No. 172 of the Charles Darwin Foundation.

Index of the genera described.

The numbers refer to the numbers of the drawings and descriptions.

Index of the English and Spanish common names.

The numbers refer to the numbers of the drawings and descriptions.