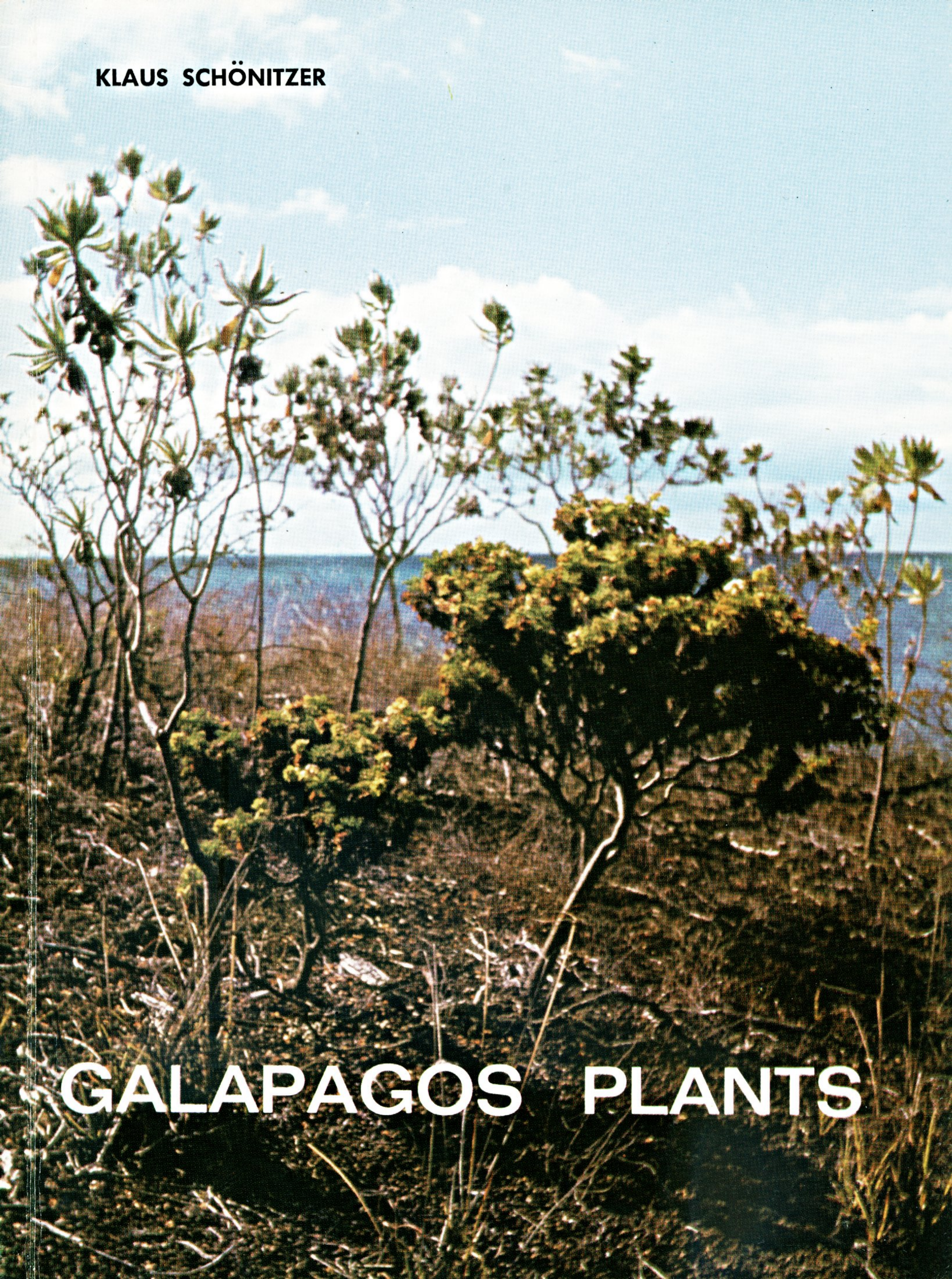
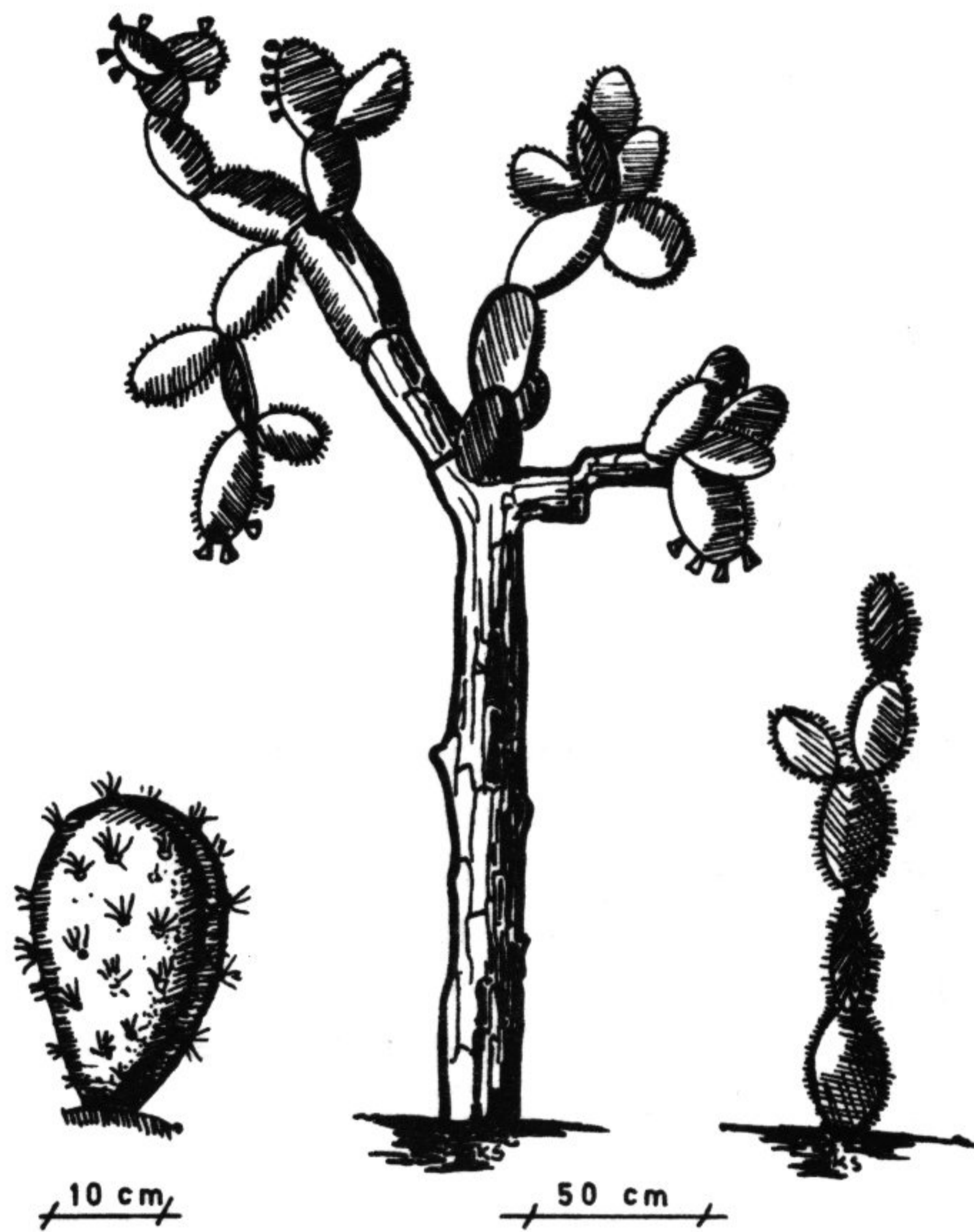


**KLAUS SCHÖNITZER**



# **GALAPAGOS PLANTS**



## Genus Opuntia

Family: Cactaceae

English common names: Prickly Pear, Opuntia

Spanish common names: Tuna

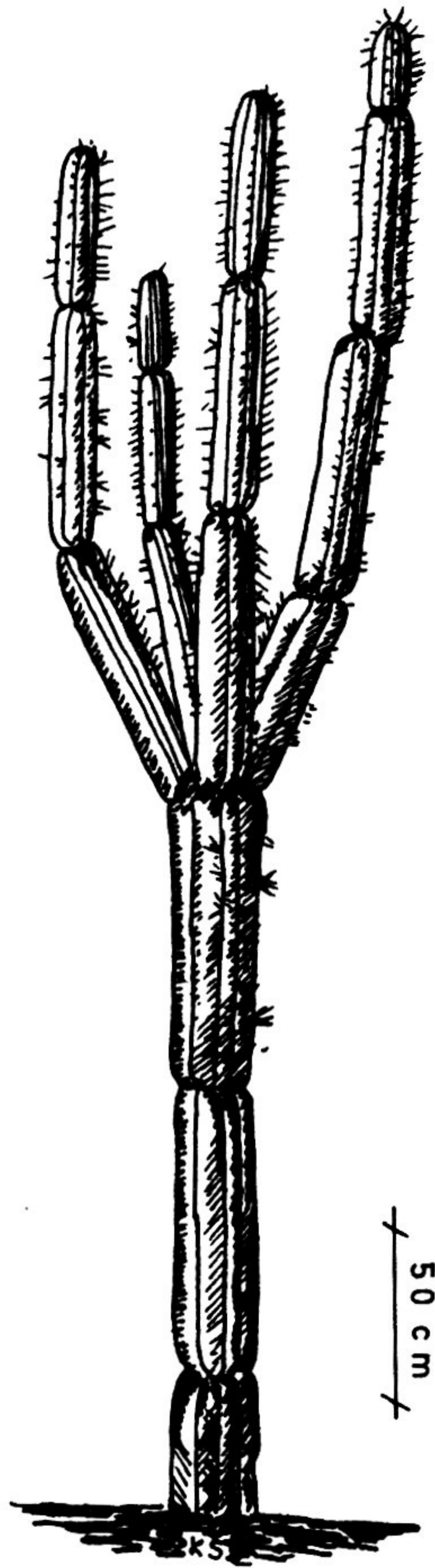
We have in the Galapagos 6 species of Opuntias with altogether 13 varieties.

*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 higher 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.



2

## **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.



3

### **Brachycereus nesioticus**

Family: Cactaceae

English common name: Lava Cactus

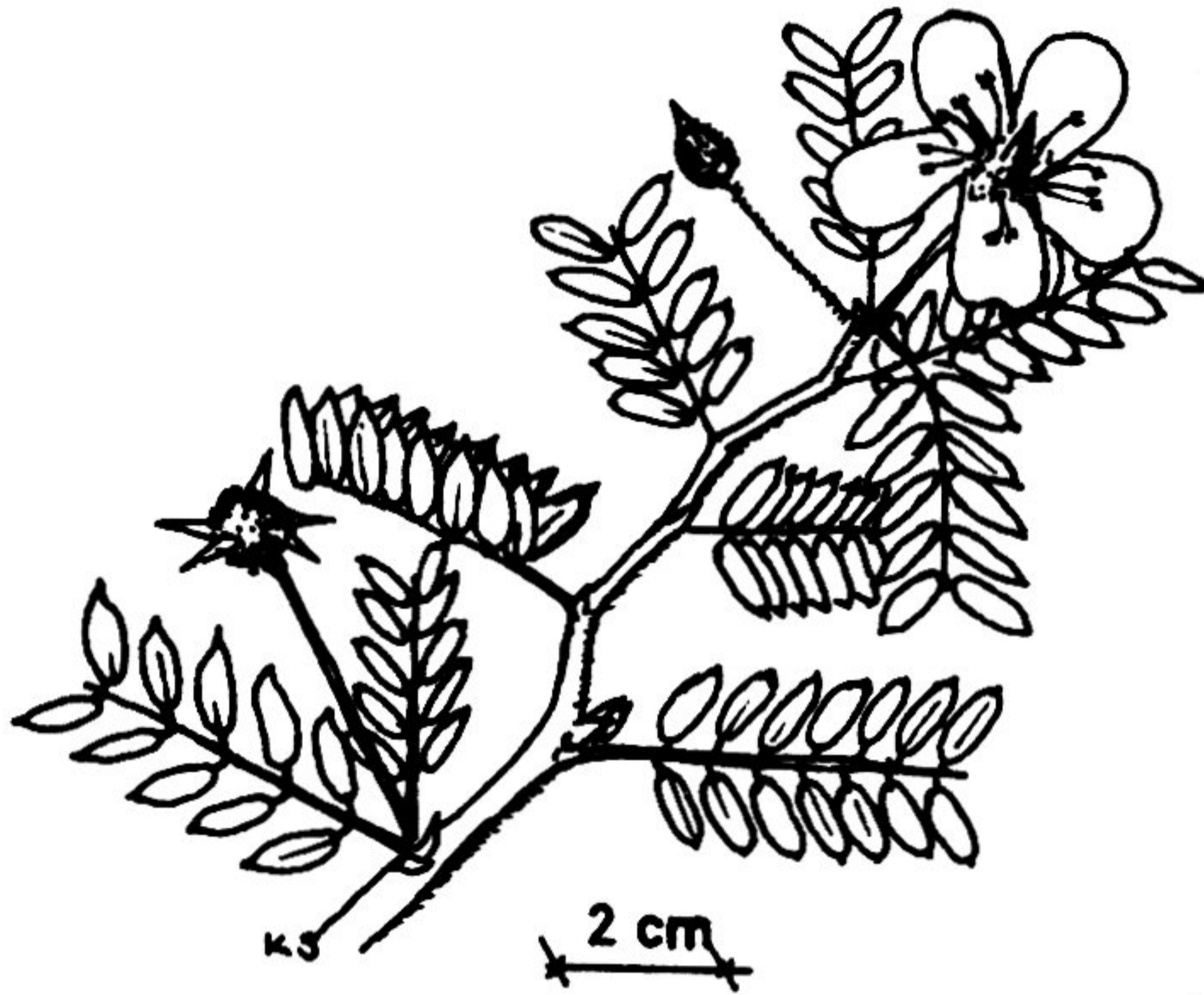
Spanish common name: Cactus de lava

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

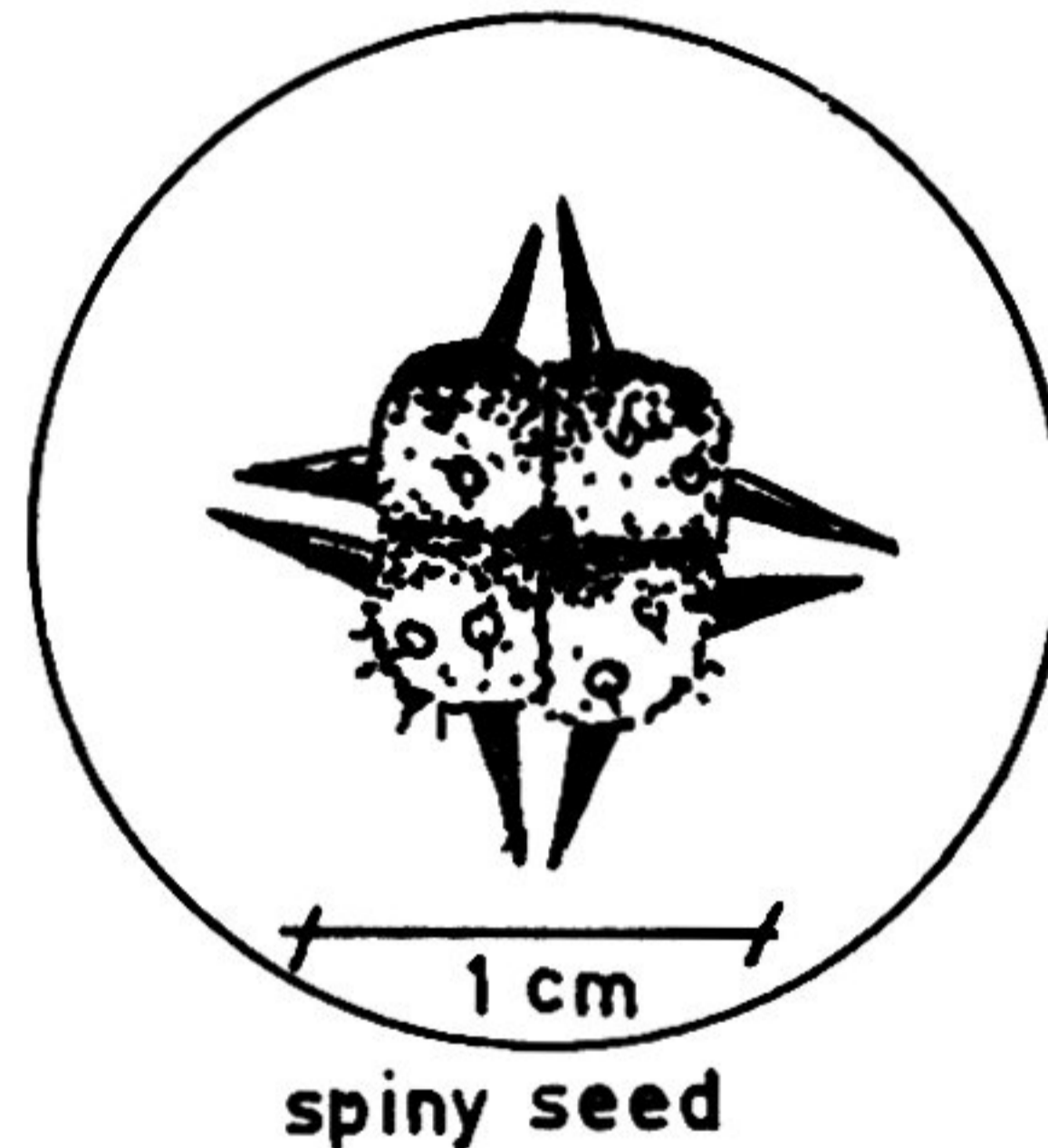
Grows on bare lava, thus is able to colonize recent lava flows.

*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).



4



## Tribulus terrestris

Family: Zygophyllaceae

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. Bright 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.



6

## Genus *Sesuvium*

Family: Aizoaceae

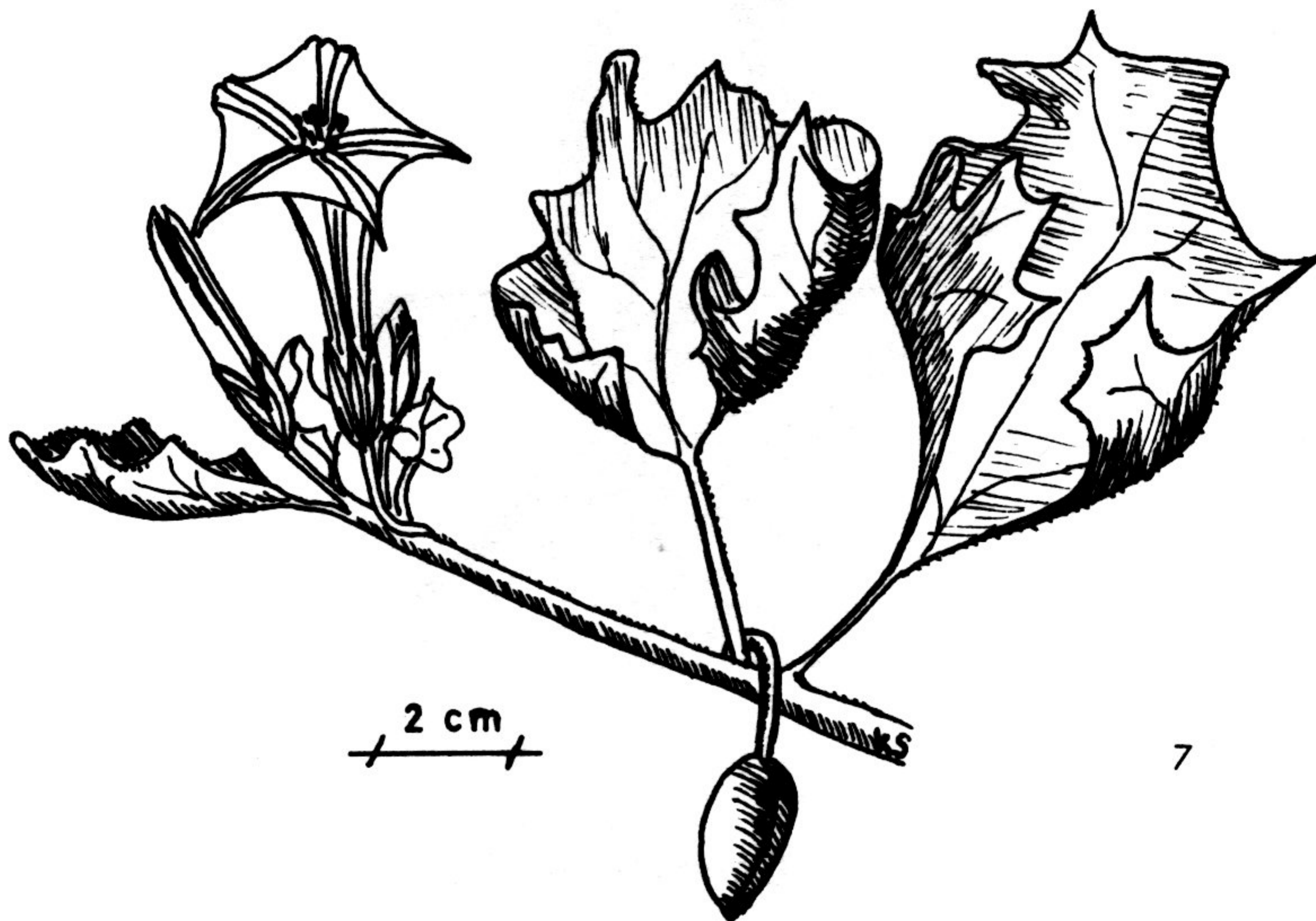
*Perennial herbs, very succulent (fleshy), with various colouration, from yellowish to green to bright red.*

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.



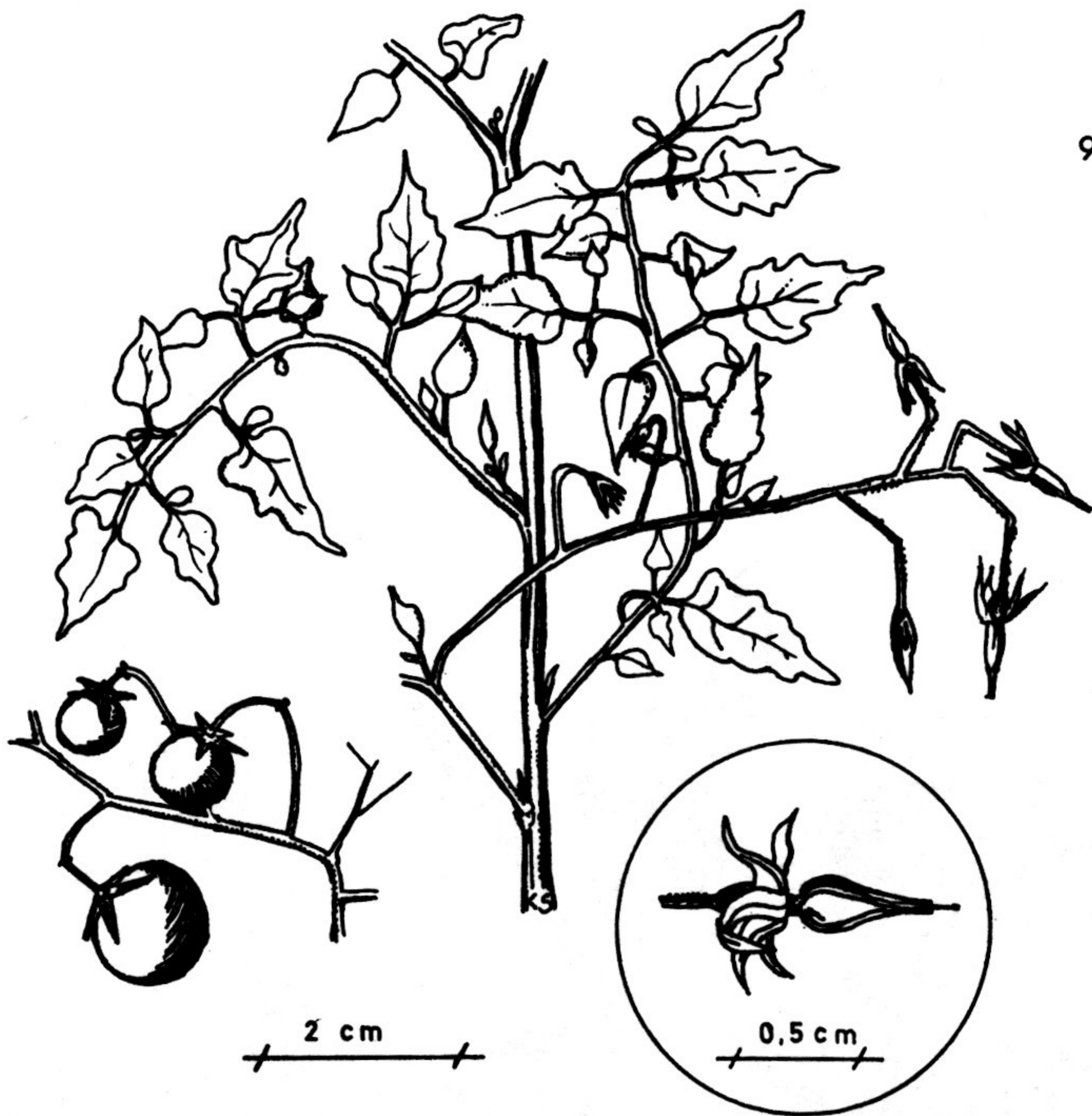


**Atriplex peruviana**

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).



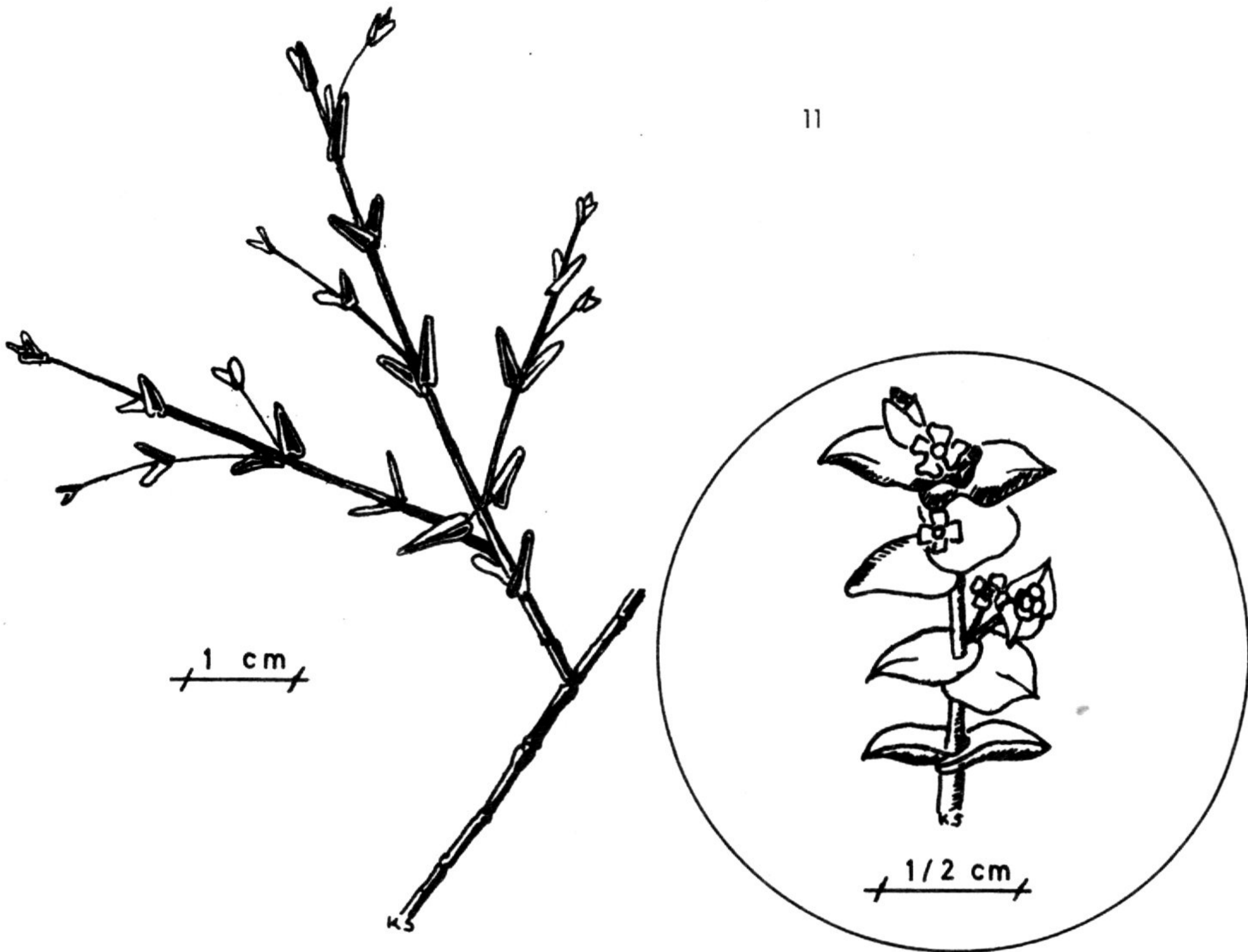
## Genus Coldenia

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.



12

## 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.



13

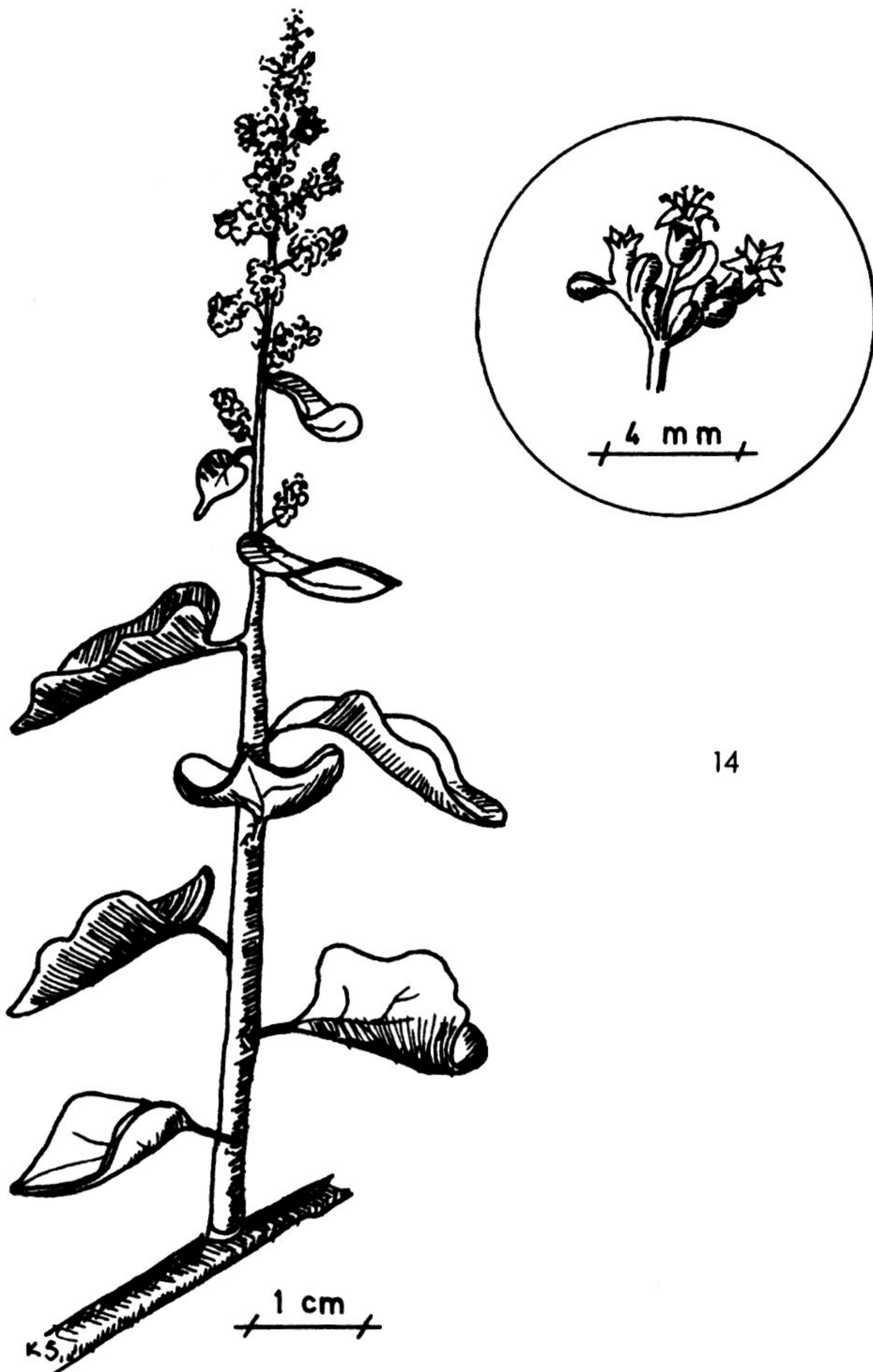
### ***Alternanthera echinocephala***

Family: Amaranthaceae

*Shrub. Leaves during the dry season usually narrow, during the wet season often broadly elliptic. 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.



14

### **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

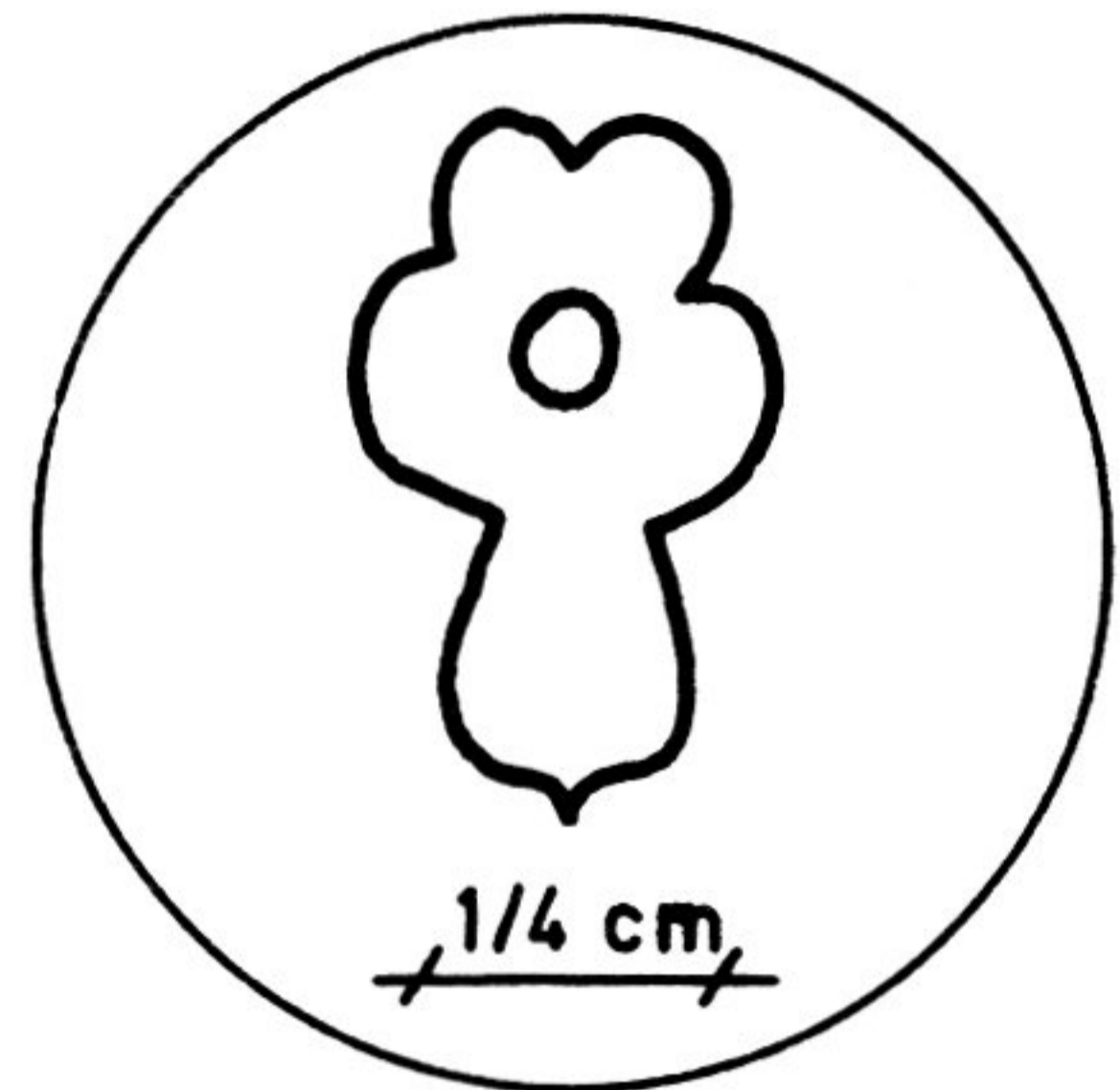
*Shrub. Twigs and leaves with dark spots. Leaves usually three lobed, sometimes unlobed. Large yellow single flowers, inside the calyx purple markings. The largest indigenous flowers of the Galapagos. Fruits are capsules, with white lint (cotton).*

In the Galapagos we find also one other 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).



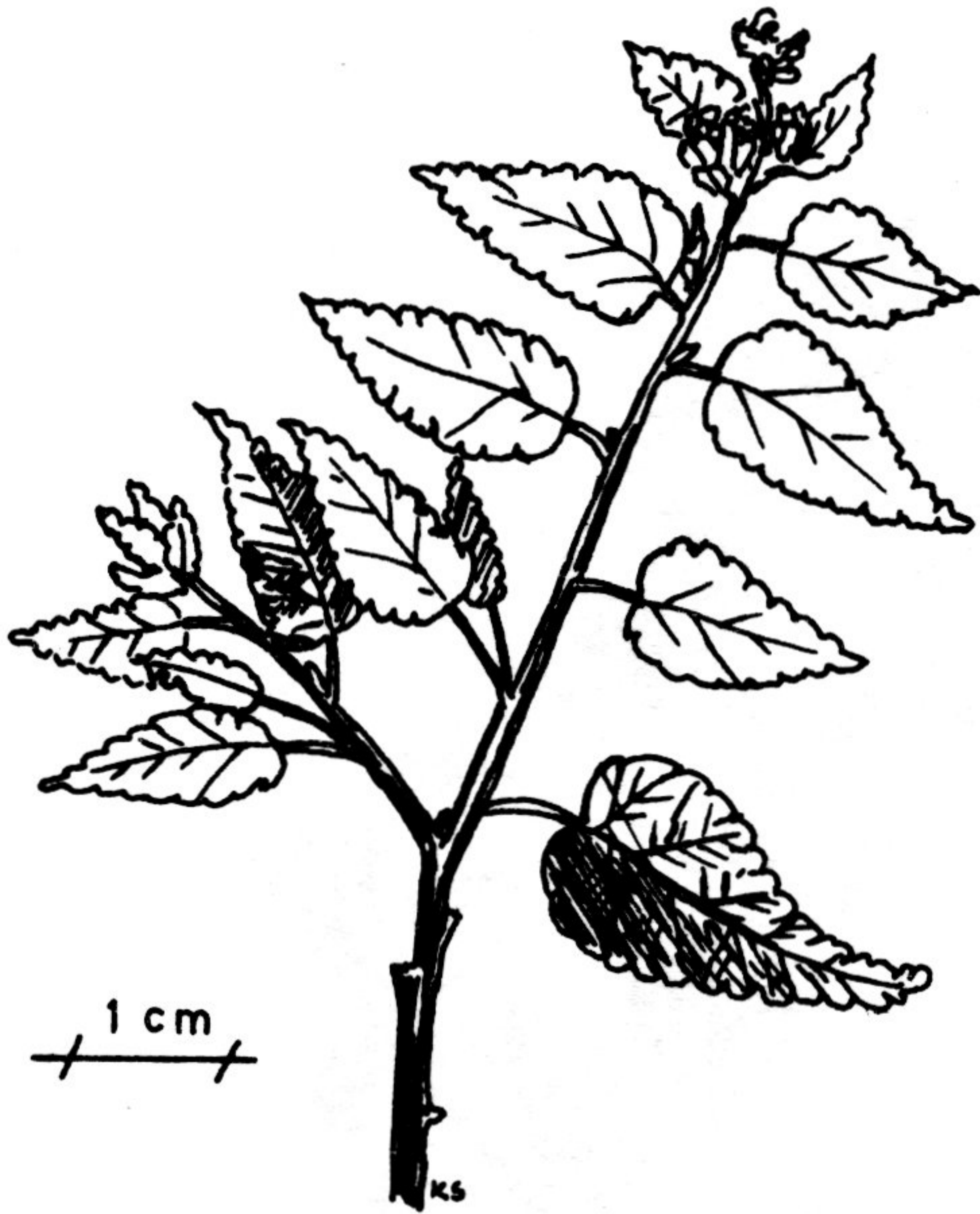
### **Clerodendrum molle**

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 corolla base, to reach the nectar with its short tongue. (THORNTON 1971).



18



### **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).

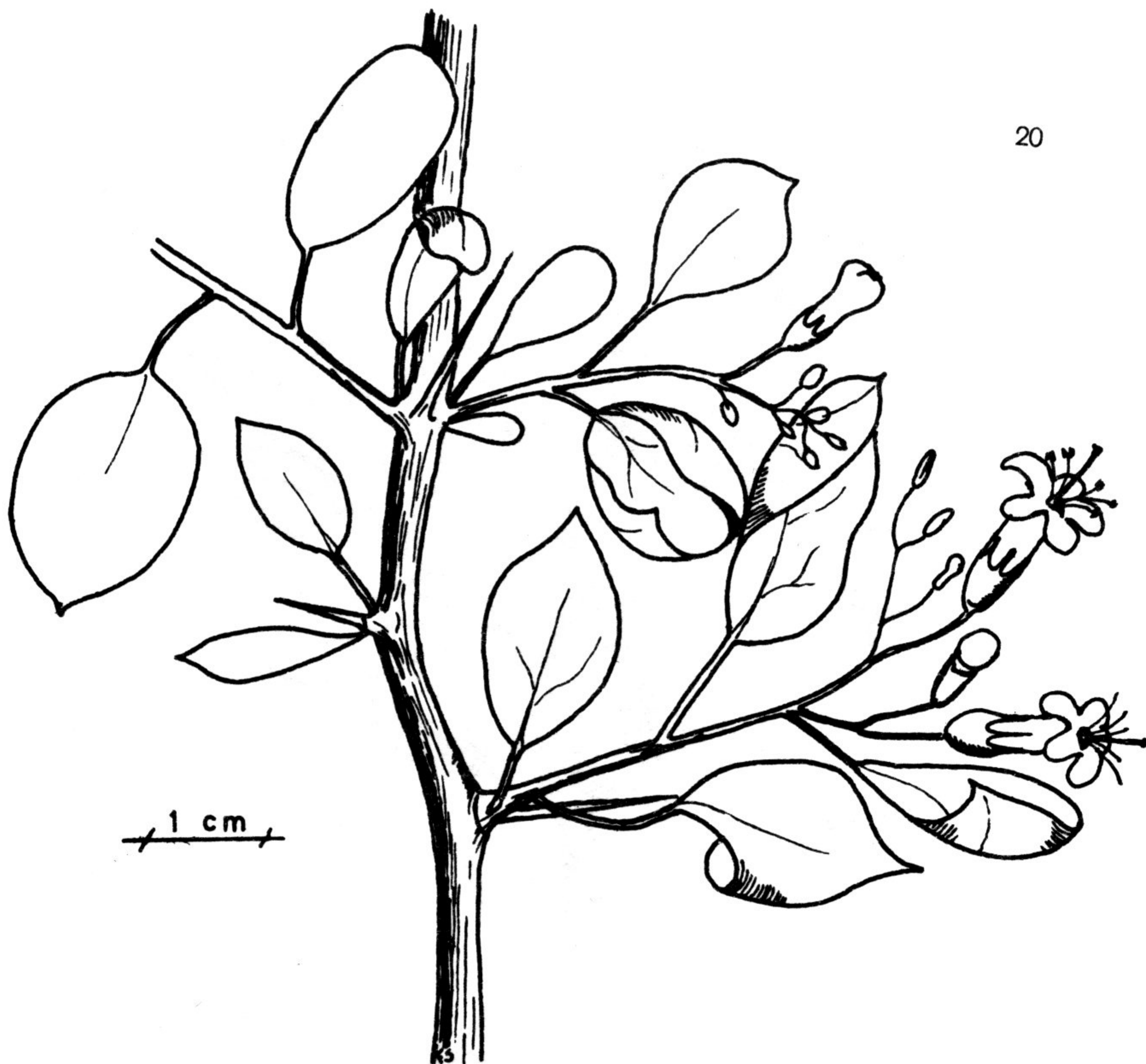


### **Lycium minimum**

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*).



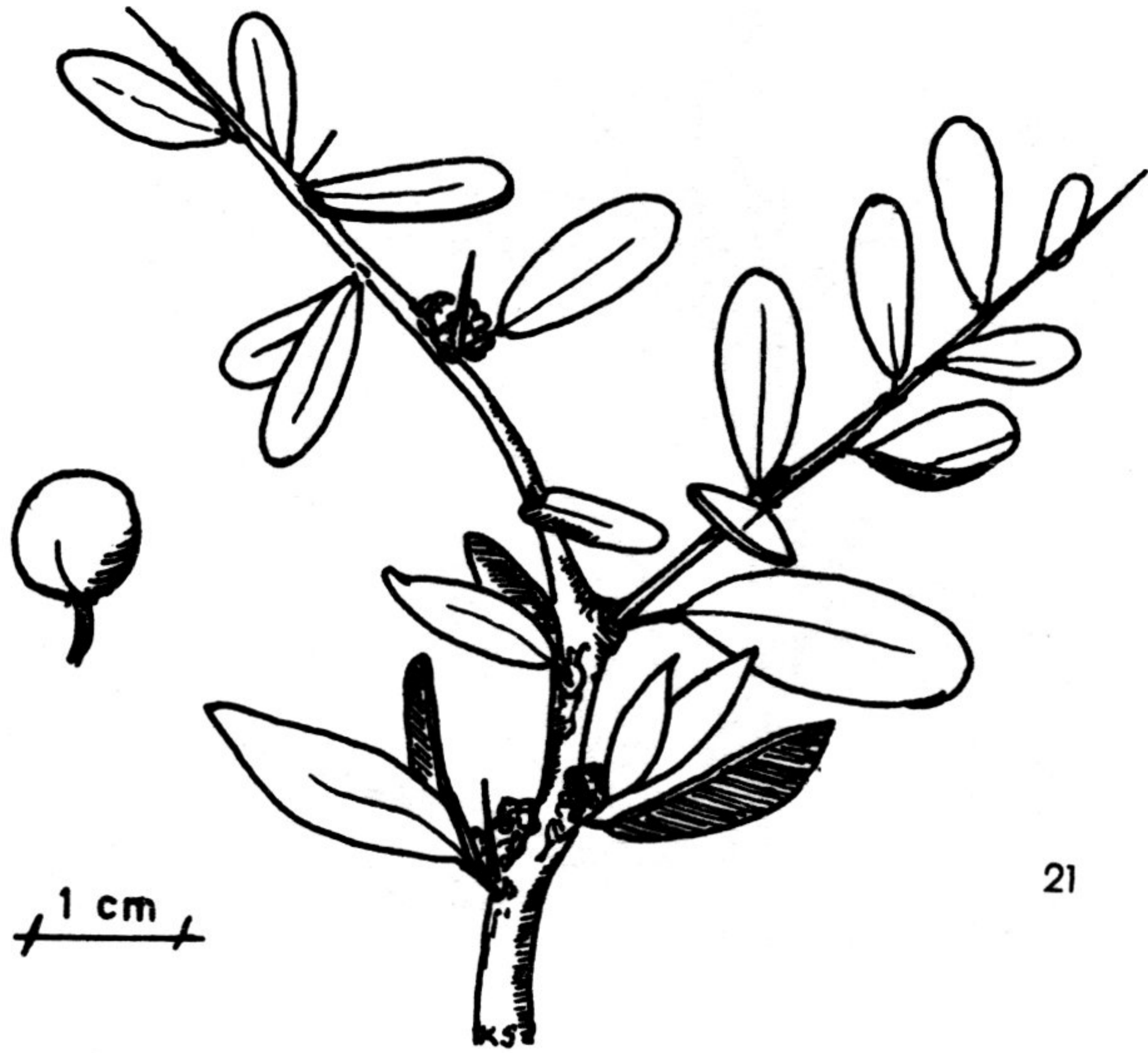
### **Grabowskia boerhaaviaefolia**

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**

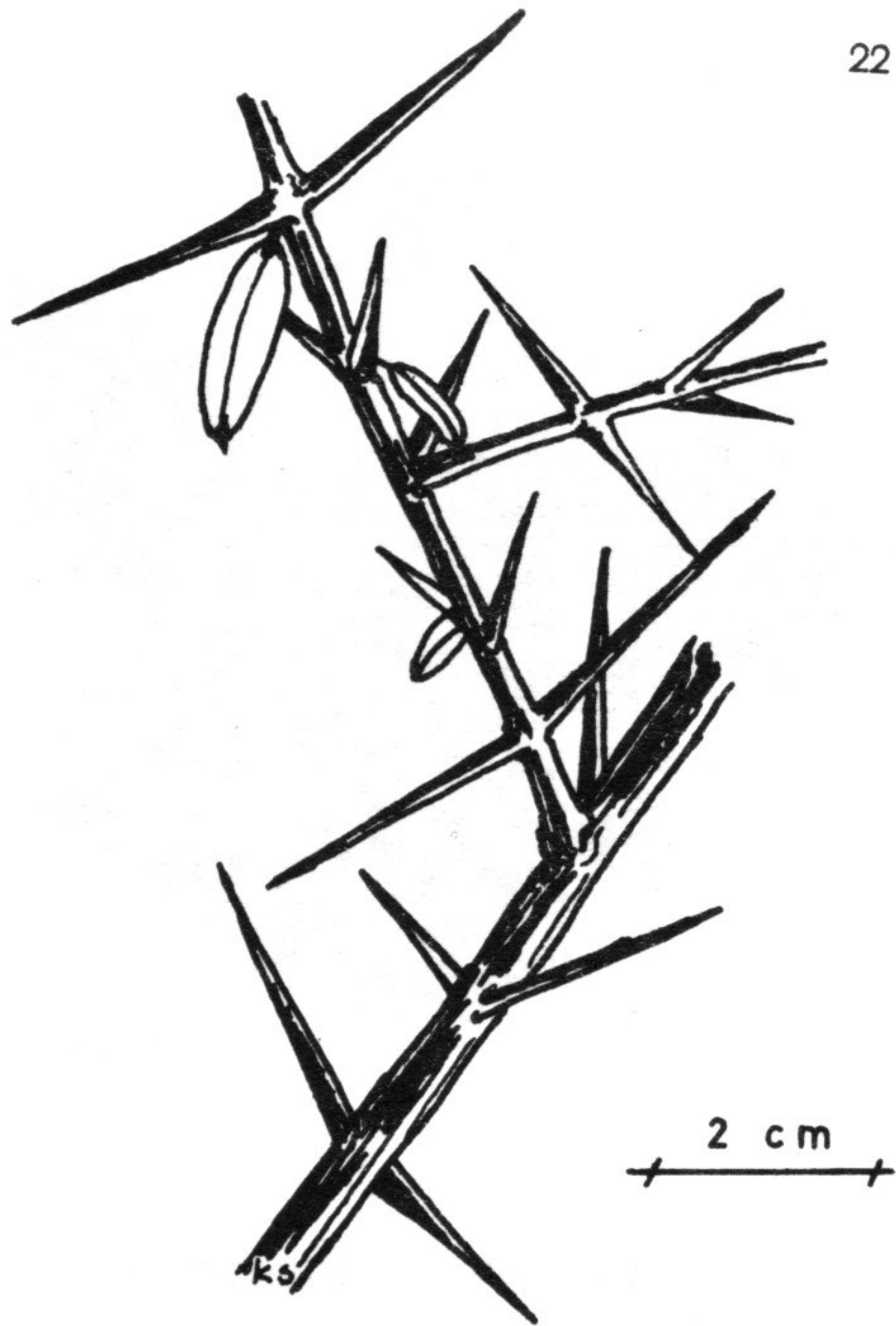
Family: Simaroubaceae

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 little 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.



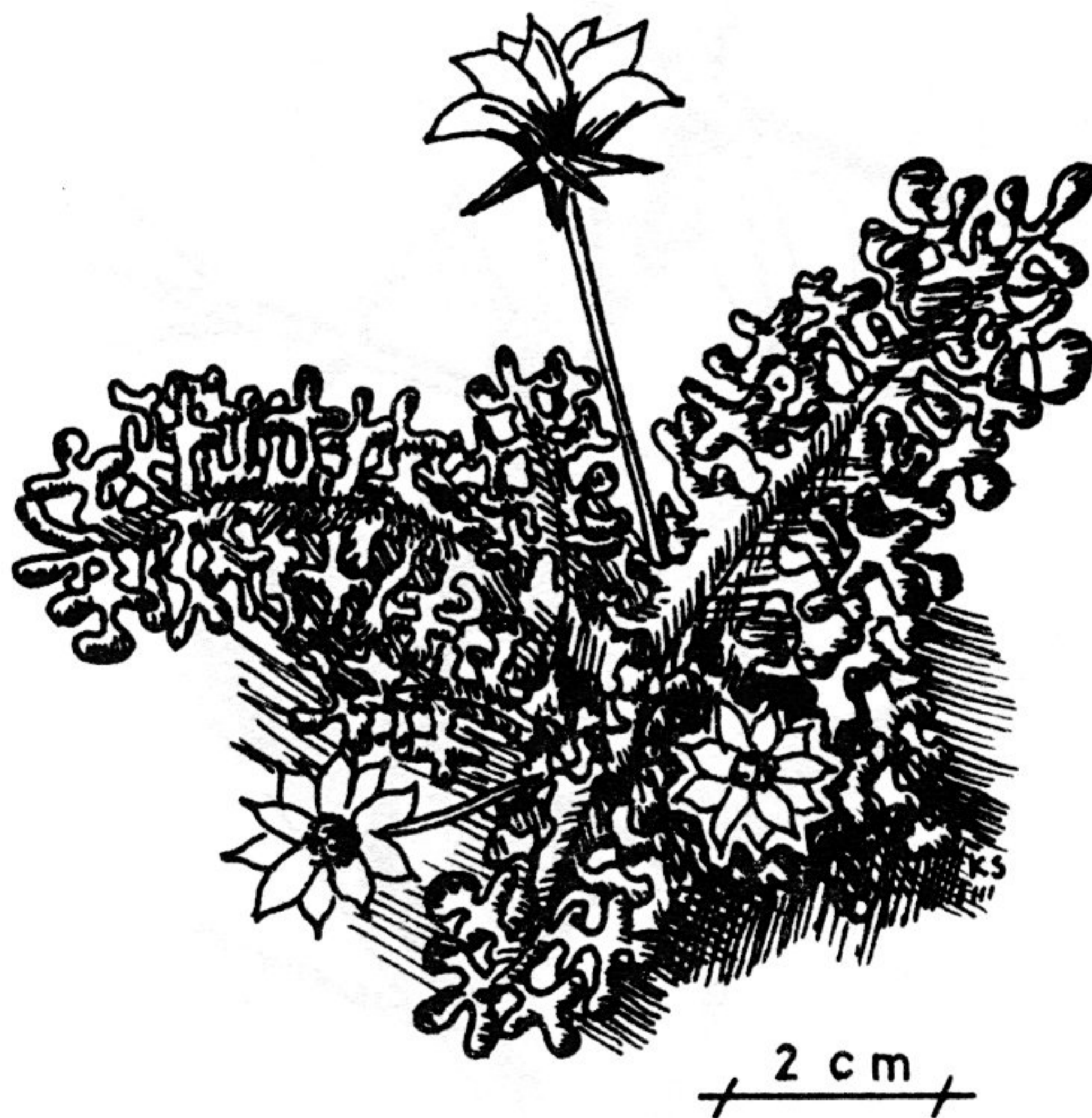
### **Scutia pauciflora**

Family: Rhamnaceae

*Very spiny shrub. Spines green, usually with brown tip. Often almost without leaves, those usually small, at base of spines. Often forms impenetrable 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

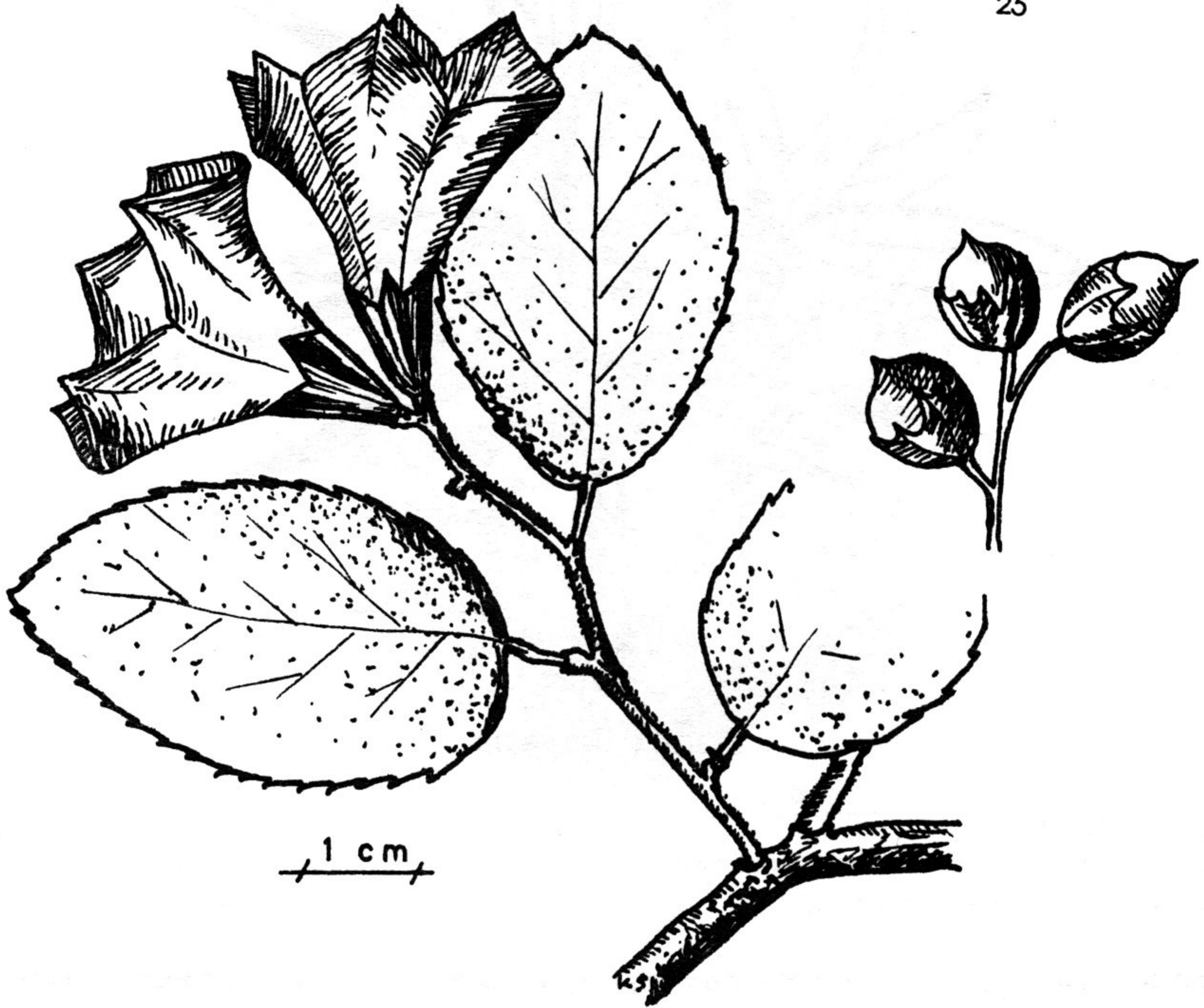
*Scalesia* is a genus endemic to the Galapagos Islands with more than 10 species. This very interesting genus shows us many typical phenomena for Galapagos plants, such as intensive archipelago evolution, reduction of dispersal ability and evolution into trees. (See introduction). Unfortunately some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

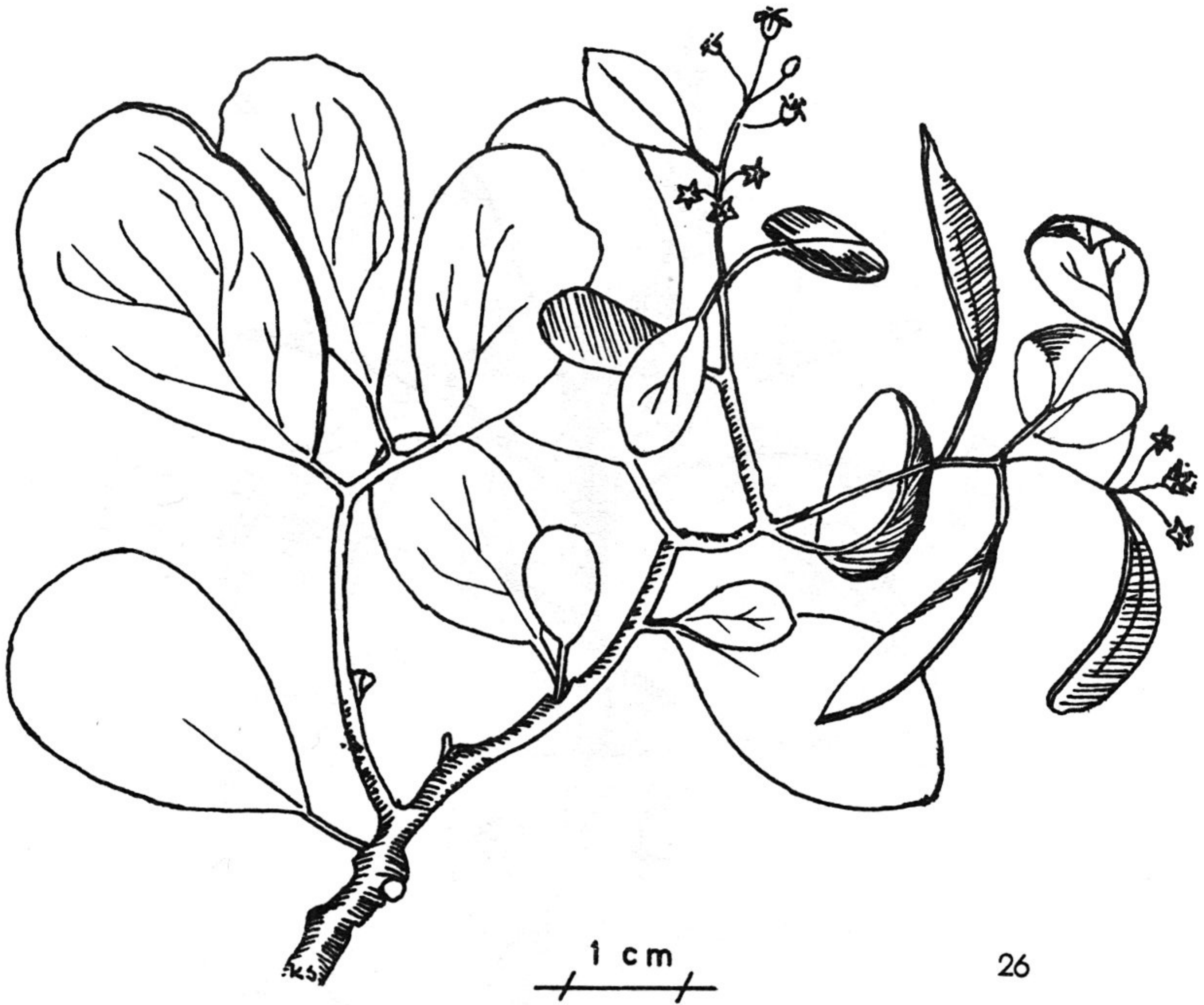
Family: Boraginaceae

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).



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### Maytenus octogona

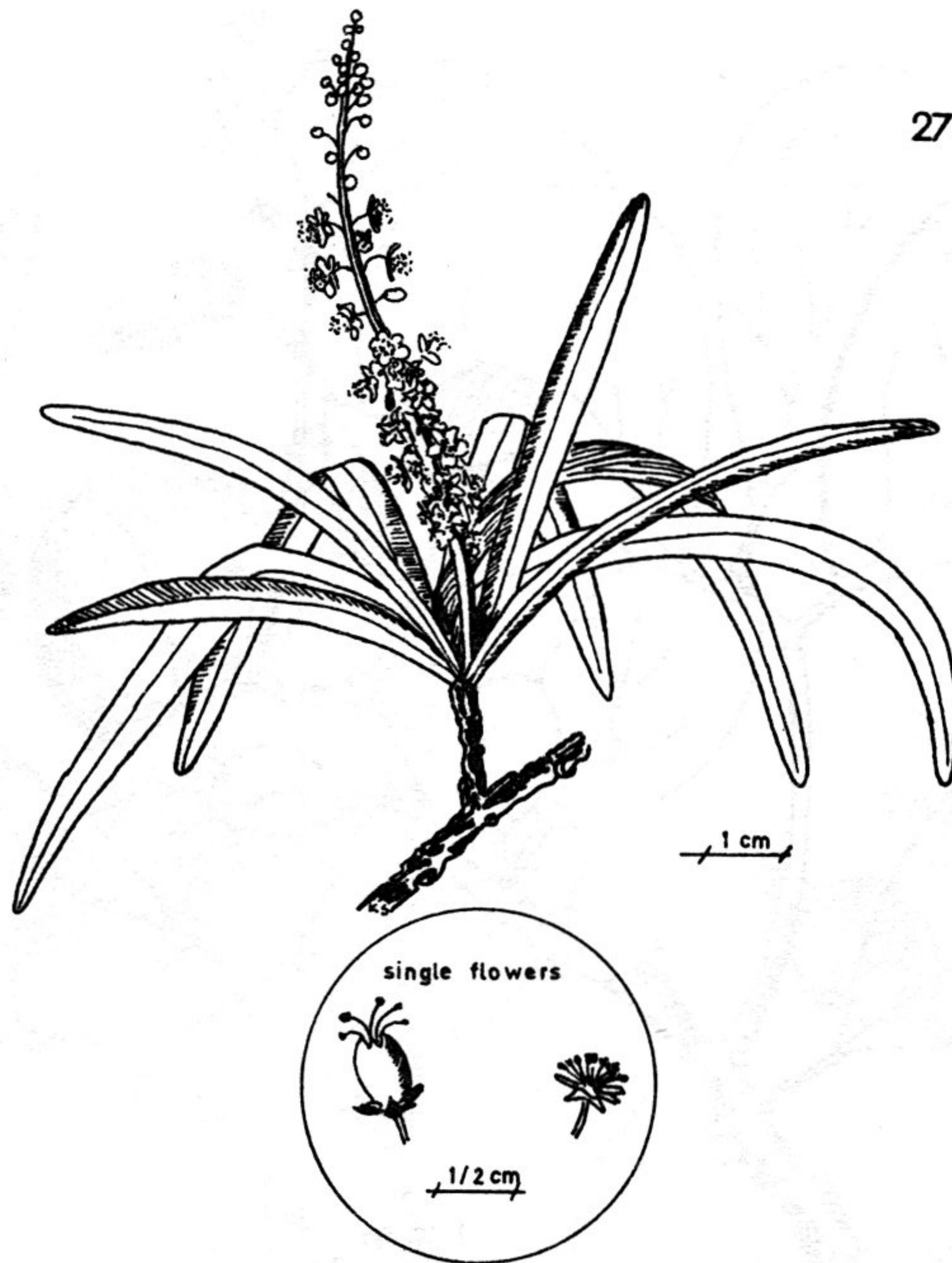
Family: Celastraceae

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. rivini-folius* 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**

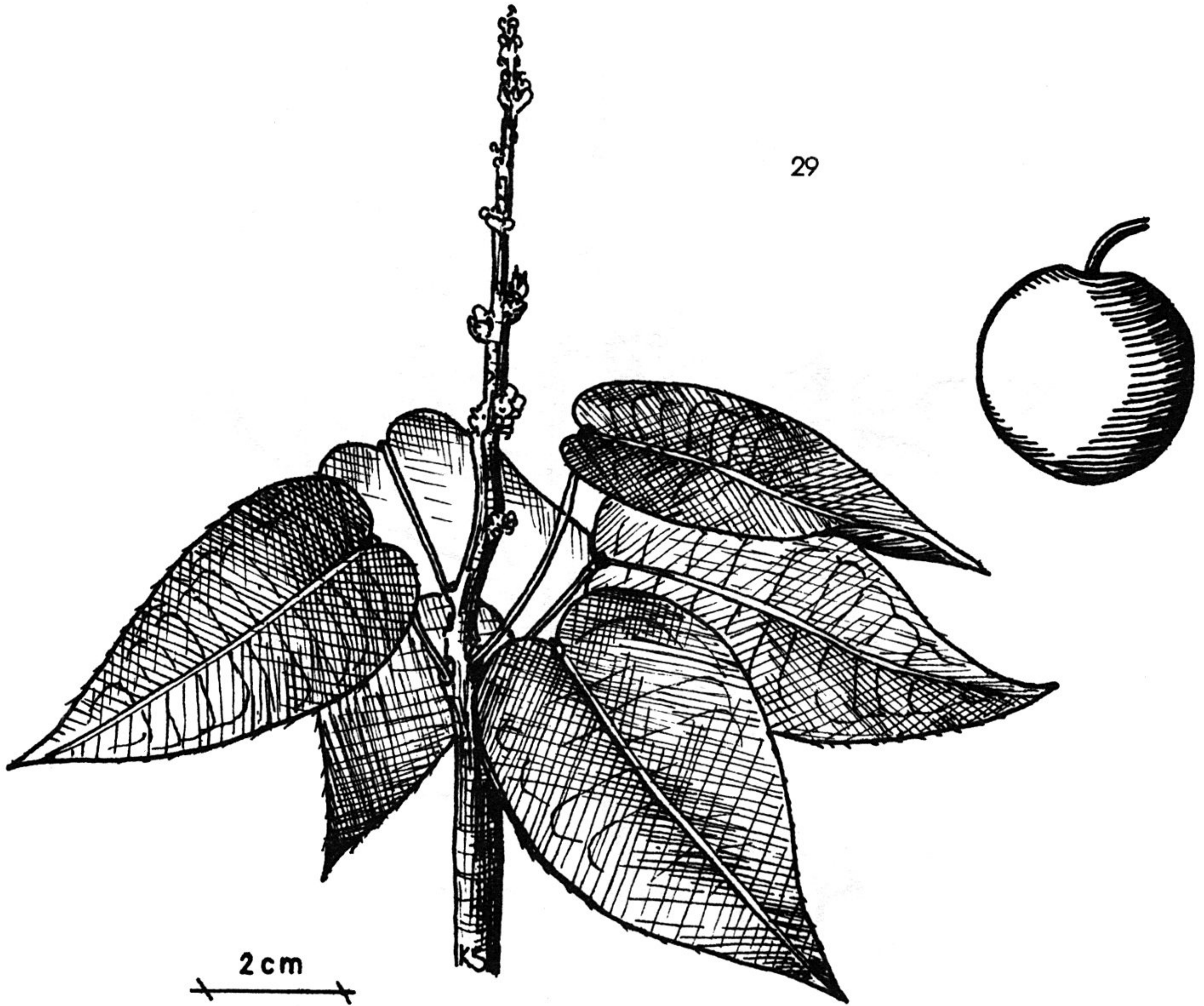
Family: Burseraceae

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 probably 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 means "holy stick", and refers to the aromatic odour of the fresh wood. The smoke of burning palo santo trees is used to repel insects. (VALVERDE 1967).



### **Hippomane mancinella**

Family: Euphorbiaceae

Spanish common name: Manzanillo

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

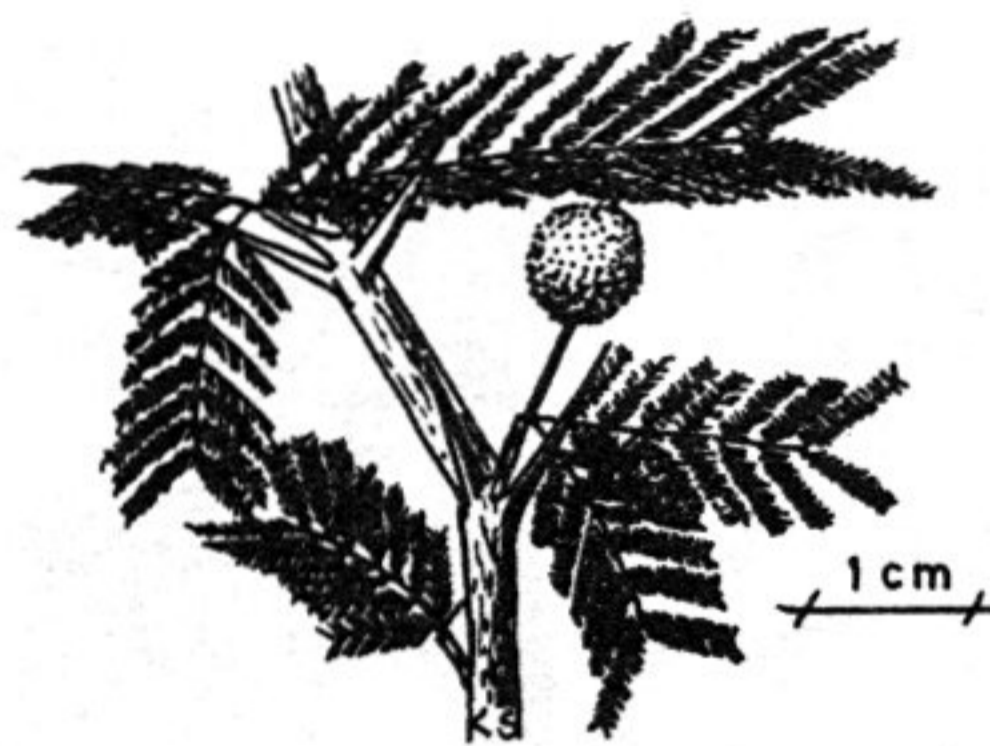
**Caution:** *This plant has a poisonous latex (=milky sap) and apple-like poisonous fruits. The poison causes severe dermatitis; no part of the plant is safe to touch.*

Nonendemic. Common in Florida and the Caribbean. 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).*

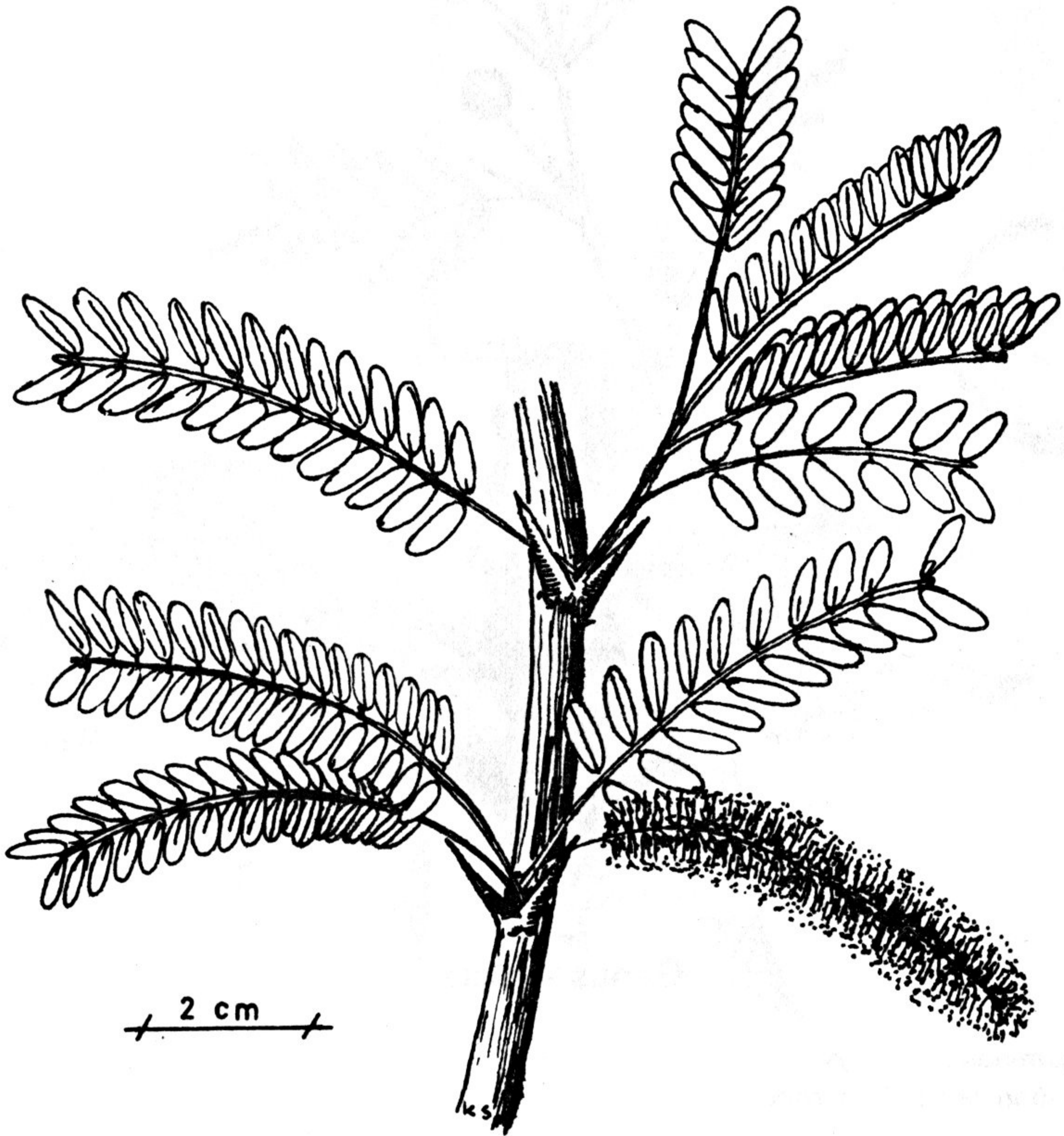
The genus *Acacia* is represented in the Galapagos by 4 species, which are all nonendemic.

*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).



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### **Prosopis juliflora**

Family: Leguminosae

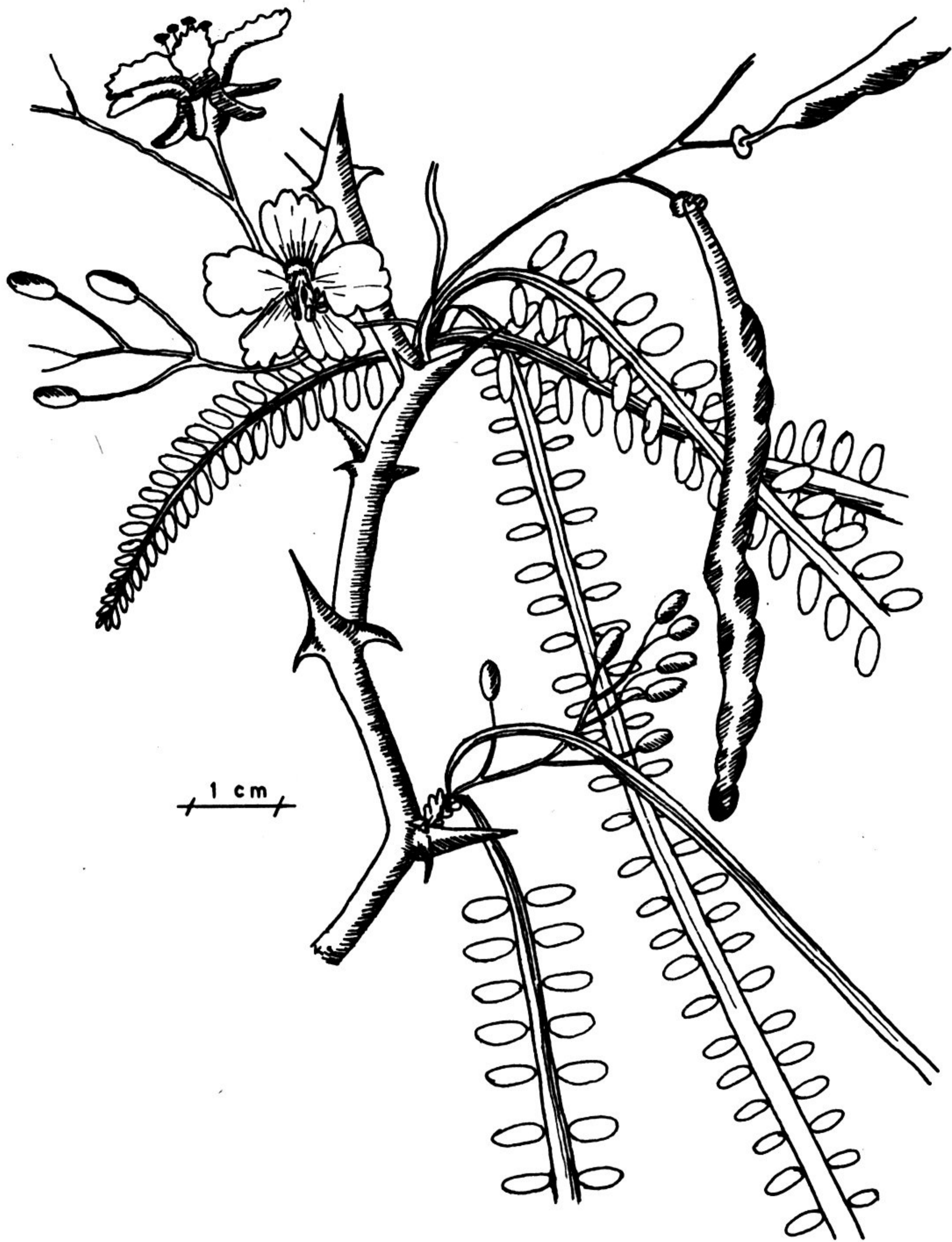
Spanish common name: Algarrobo

*Tree or shrub, spiny, compound leaves. Yellowish flowers, forming a cylinder. Pods (= legumes) similar to the ones of Parkinsonia 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 America. It probably reached the Galapagos several times from different sources. (WIGGINS and PORTER 1971).





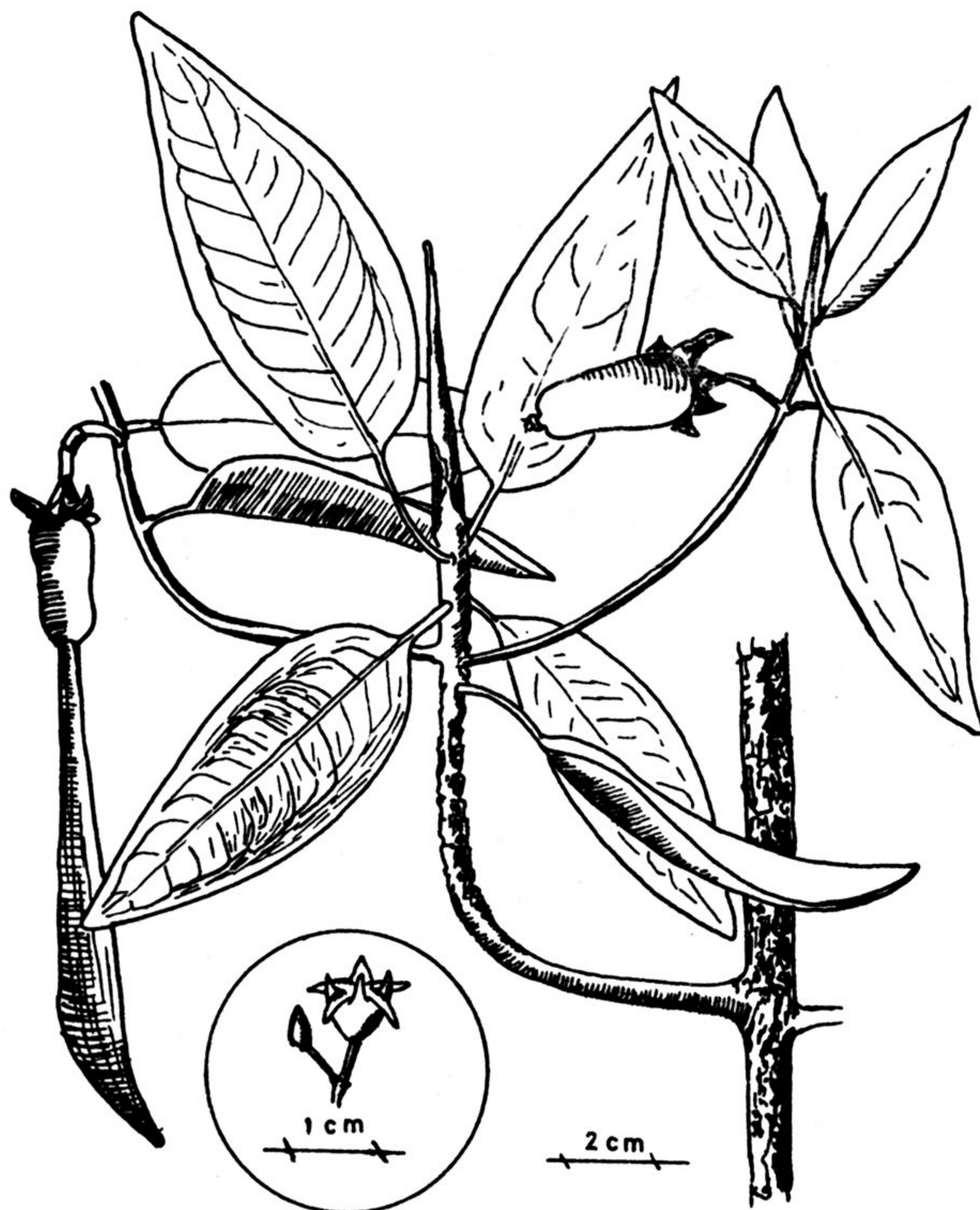
### **Parkinsonia aculeata**

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

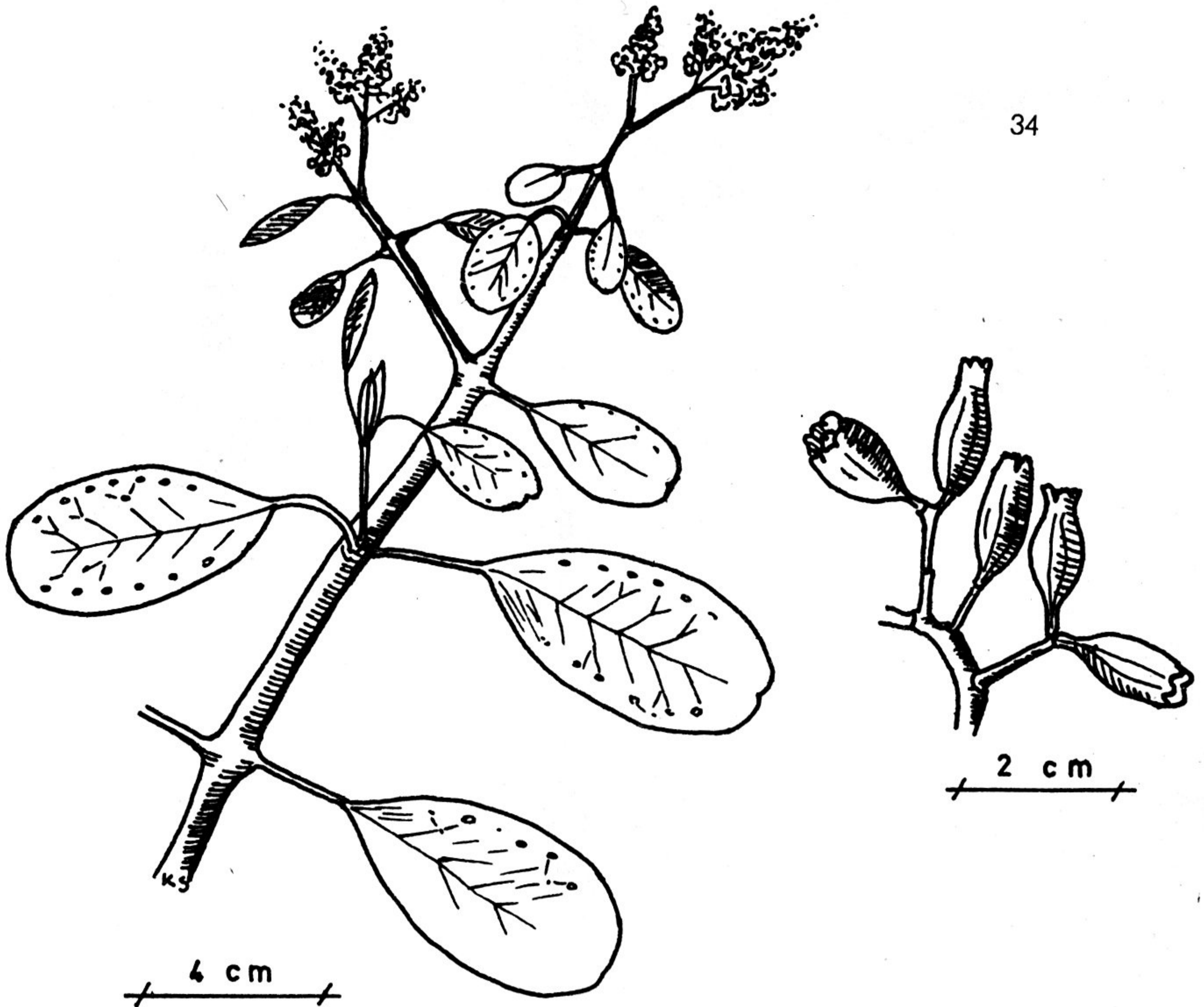
Spanish common name: Mangle rojo

***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**

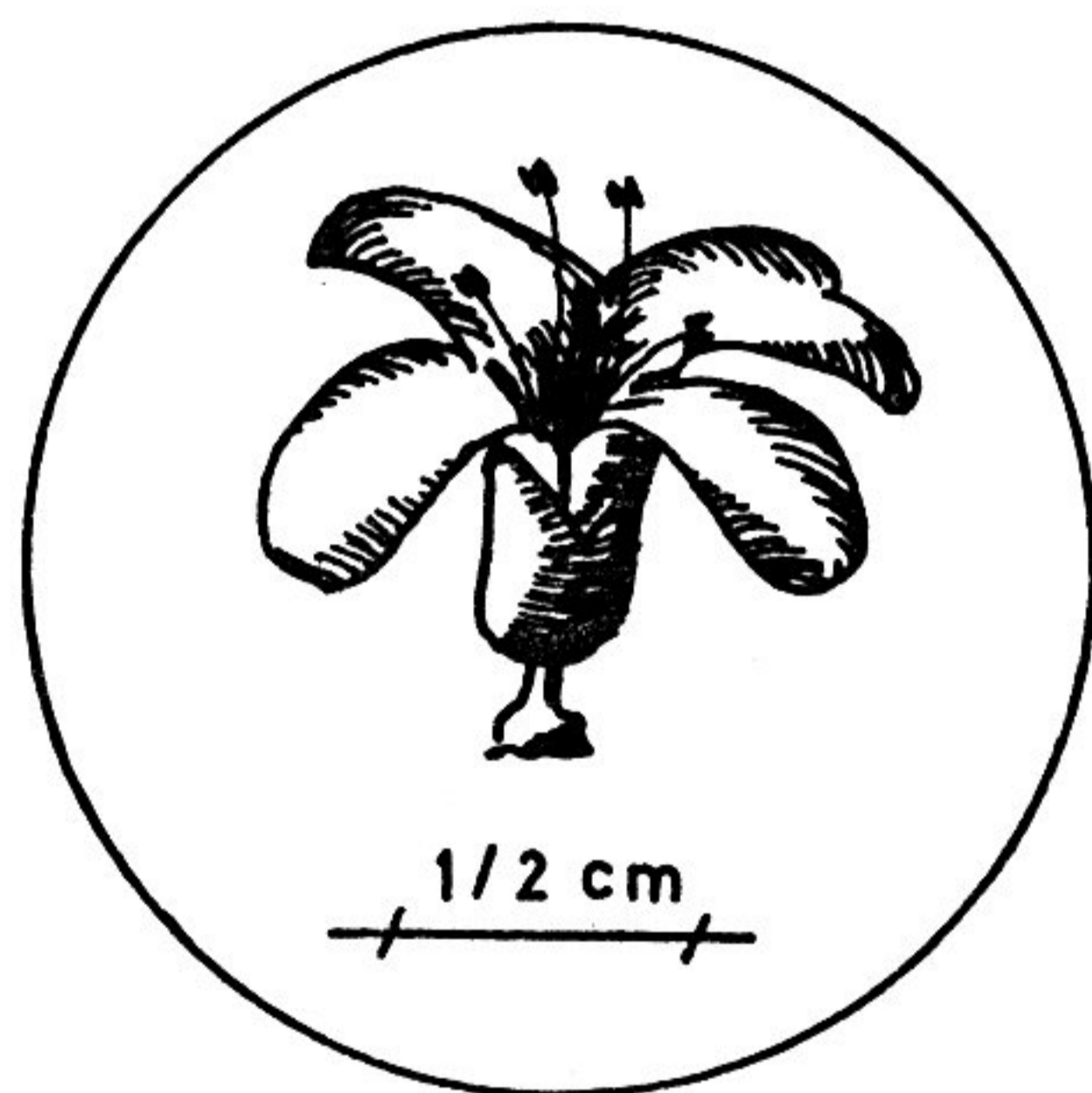
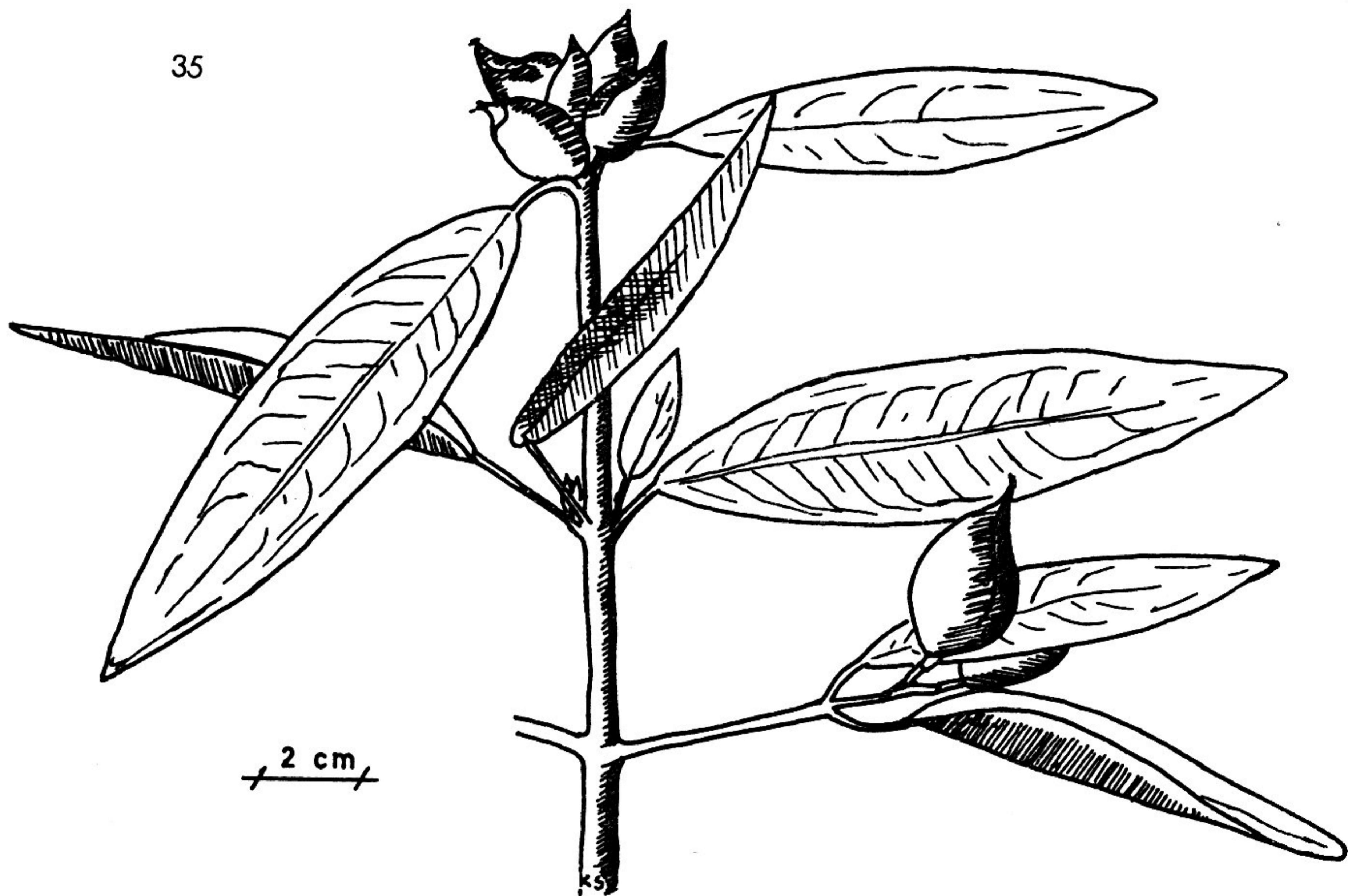
Family: Combretaceae

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**

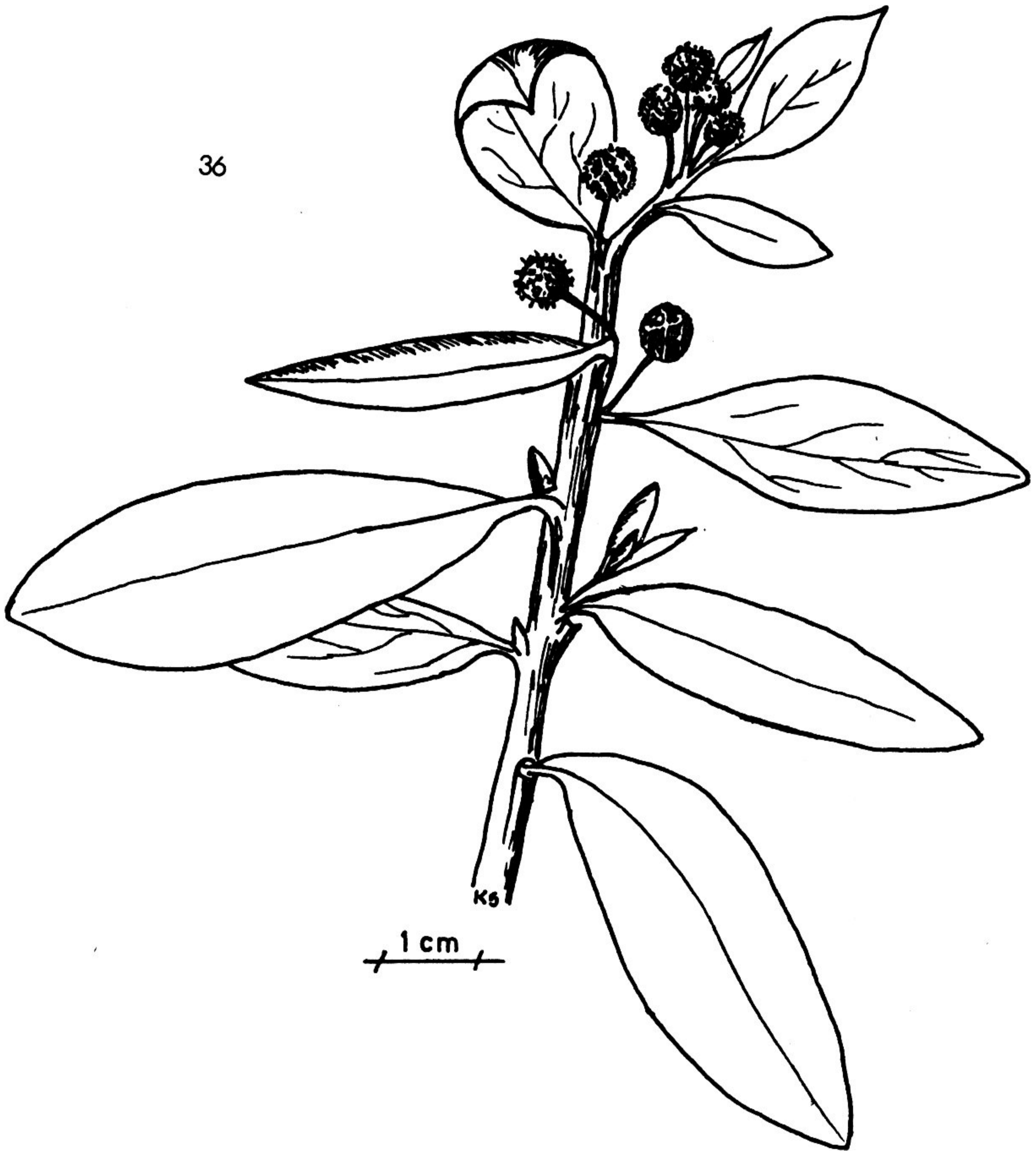
Family: Avicenniaceae

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, asymmetrical yellowish to brown fruits.*

Nonendemic, common on the coasts of tropical America.



### **Conocarpus erecta**

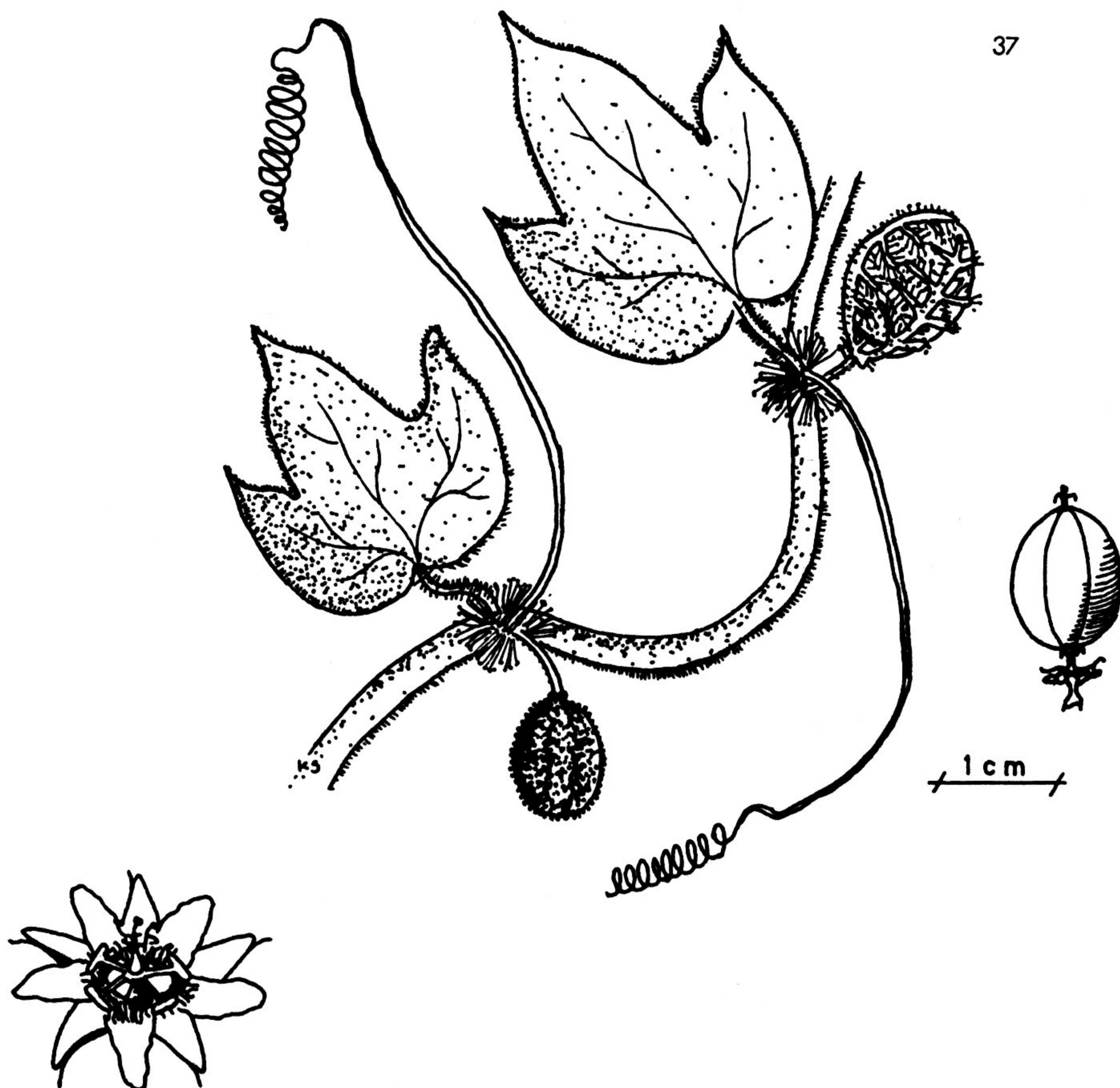
Family: Combretaceae

English common name: Button Mangrove

Spanish common names: Jeli de agua, mangle jeli, mangle prieta

*Shrub or tree. Twigs brown or reddish. Leaves rather light 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

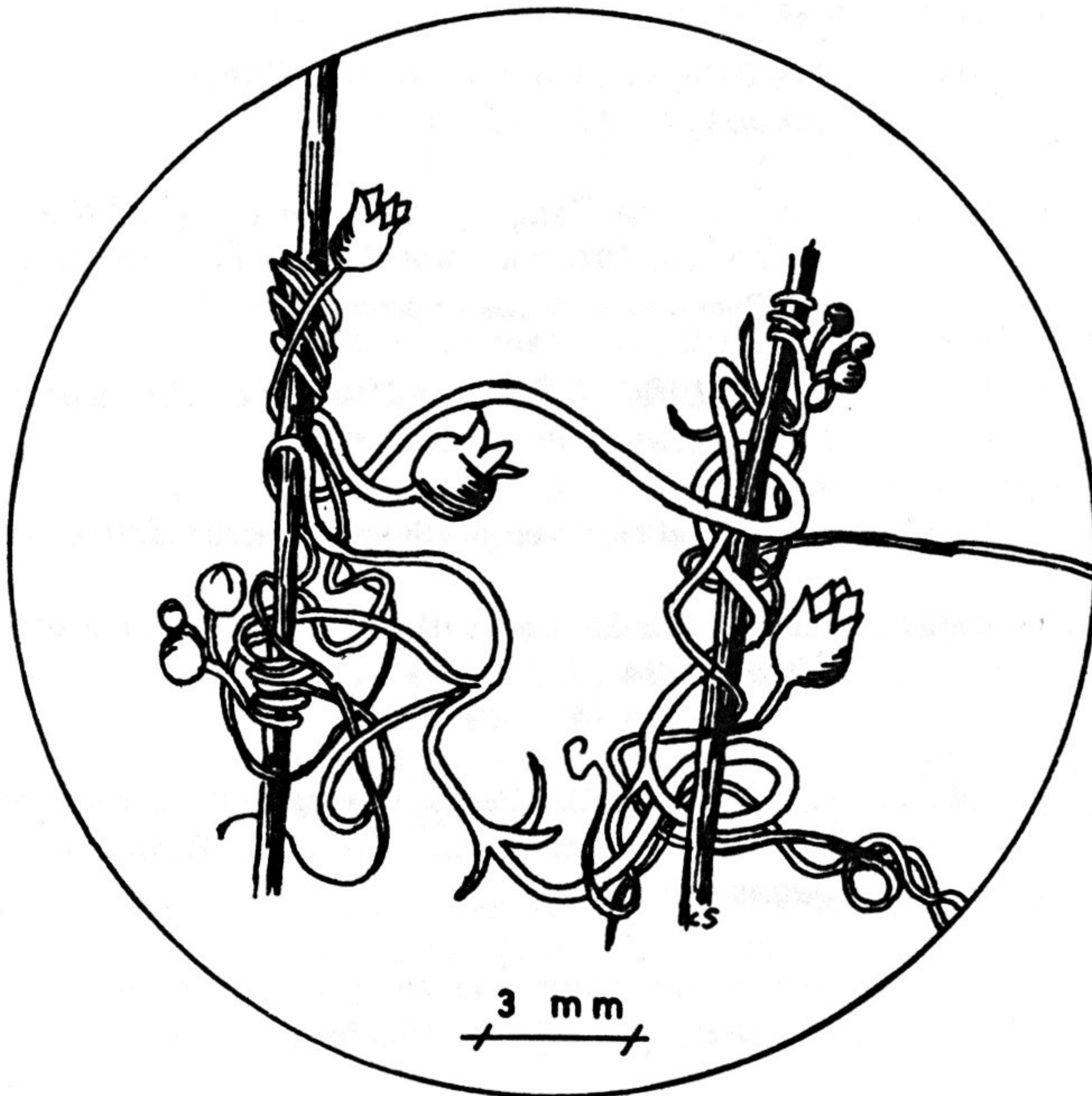
English common name: Passionflower

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.