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A REVISION OF ROUREA SUBGENUS ROUREA (CONNARACEAE)

by

ENRIQUE FORERO

A dissertation submitted to the Graduate Faculty in Biology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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Abstract

A REVISION OF ROUREA SUBGENUS ROUREA (CONNARACEAE)

by

Enrique Forero

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The genus Rourea Aublet, a member of the angiosperm family Connaraceae R. Brown, is pantropical in distribution, and occurs in forested as well as open areas in America, Africa, Southeast Asia and Australia. This work deals primarily with the American species of Rourea subgenus Rourea (sensu Leenhouts, 1958).

The nomenclatorial history of Rourea sensu lato is surveyed and a table of the most important historical interpretations of the genus and of related genera is presented. The relationships among the five American genera (Bernardinia, Cnestidium, Connarus, Pseudoconnarus and Rourea) are also discussed, and keys for their recognition both in flowering and fruiting stages are given.

Palynological information, as well as information on stomatal patterns and petiole anatomy is included, with reference not only to species of Rourea but also to selected species belonging to the other four American genera. Morphology is treated in considerable detail both as to vege-

tative and reproductive features. Distribution and ecology are also discussed in detail. Some possible evolutionary trends within the genus in the American tropics are proposed.

A revised sectional classification of the American species of Rourea is proposed and two sections are described as new: Section Cordatae and Section Multifoliolatae. Forty-two species and twenty-one varieties are treated, and the following new taxa are described: Rourea accrescens, R. araguaensis, R. bahiensis, R. omissa, R. paraensis, R. prancei, R. psammophila, R. cuspidata var multijuga, R. glabra var jamaicensis, R. grosourdyana var glaberrima, R. neglecta var brevipes, R. sprucei var rondoniense and R. sprucei var subcoriacea.

Keys to the American sections, species and varieties of Rourea subgenus Rourea are provided. The study is documented by citation of representative collections of more than 4000 herbarium specimens borrowed from twenty-two herbaria.

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The new taxa and new combinations included in the following pages indicate my intent for future publication; their appearance in this thesis is not intended to constitute formal publication under the International Code of Botanical Nomenclature.

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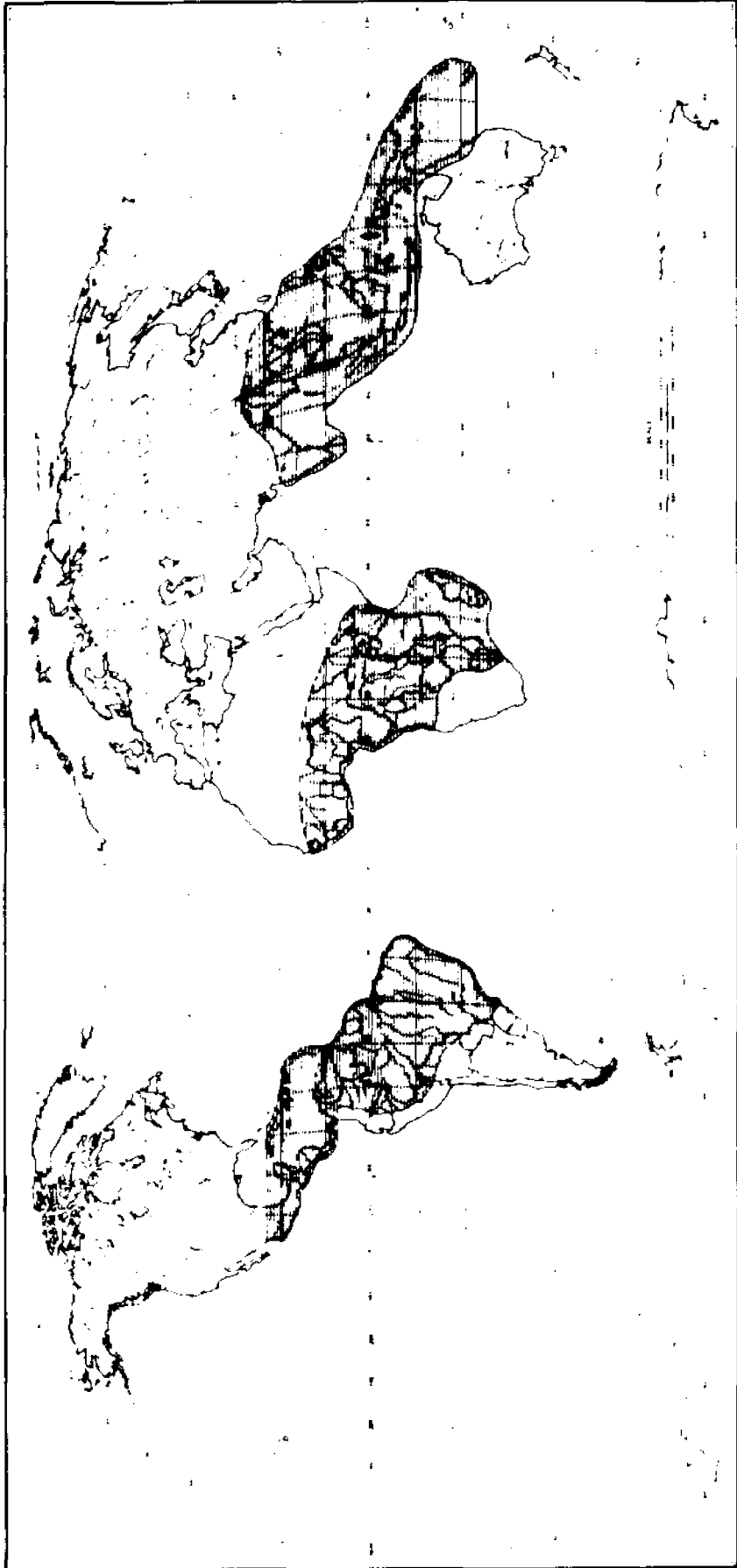
## INTRODUCTION

The genus Rourea Aublet, a member of the family Connaraceae R. Brown, is pantropical in distribution (Fig. 1). In the most recent work on the family by Leenhouts (1958b) it was divided into several subgenera and sections. These are generally equivalent to groups of species which are treated as genera by Schellenberg (1938) in the latest monograph of the family (a discussion of this difference of opinion follows under "History of the genus"). Following the scheme of Leenhouts, the species which are treated in the present revision belong to the genus Rourea subgenus Rourea.

The reason for undertaking this revision is that Schellenberg's out-of-date monograph has long been inadequate for the determination of existing material. Some of his keys do not work, and the species described since 1938 have rendered his keys obsolete. A considerable number of discrepancies have been found between the characters used in the keys and those given in the individual descriptions of the species. In addition, the recent collections from Brazilian Amazonia and the Planalto of Central Brazil have helped to elucidate some taxonomic problems in several species.

The opinion has been expressed by some botanists, either

Fig. 1. Geographic distribution of the genus Rourea. Old World ranges from Schellenberg (1938) and Leenhouts (1958b)



in writing (e.g., Leenhouts) or in personal discussions, that Schellenberg's specific (and generic) concepts are much too narrow. However, most of the species included in his monograph are also accepted here. So, this assumption to me seems unfounded at the specific level. Schellenberg included 32 species, 2 varieties and 2 formae in his monograph. Nine new species have been described since then. In the present study 42 species and 21 varieties are included. Of these, 7 species and 6 varieties are described as new. Most of the synonymy prior to 1938 was worked out by Schellenberg and is accepted, with few exceptions, in the present account.

During the course of this study I visited the Amazon region of Brazil to collect and observe a few of the species. The New York Botanical Garden borrowed for my study more than 4000 herbarium specimens (representing about 750 collections) from 22 herbaria, which accounted for all but two of the types.

The delimitation of the taxa was made on the basis of morphological, ecological and geographical information. Anatomical and palynological data were also gathered but offered little or no help in the separation of species or sections. They seem to be useful in the recognition of genera within the family, but more critical examination of a larger amount of material will be necessary before this assumption can be accepted or rejected. No data on chromosome numbers were accumulated for this revision.

## HISTORY OF THE GENUS

The genus Rourea was proposed by Aublet in 1775 to accommodate the single species R. frutescens. The name Rourea may be derived from the French word "Rourelle" or from the name of the town of Houra near Cayenne, French Guiana. Schellenberg (1938) wrote "Derivatio nominis desideratur," apparently without realizing that the name of that locality appears in some of the specimens studied by Aublet.

The first known reference to a plant belonging to this genus was made by Hermann (1717) in "Museum Zeylanicum." The Asiatic vernacular names Kalawael and Kiridiwael appeared in that publication, but according to Leenhouts (1958a,b) only one, Kiridiwael, refers to a species of Rourea i.e., R. minor (Gaertn.) Leenhouts. The other is a species of Derris. Both names, however, were cited by Linnaeus in 1747 accompanying the description of his genus Santaloides which was apparently based on Kiridiwael (fide Leenhouts). The name Santaloides is not validly published since it was published before 1753 and was never validated by Linnaeus. In 1891 O. Kuntze used it as Santalodes. As was later shown by Hemslay & Bullock (1956), this is an illegitimate name because Kuntze cited Rourea Aublet (1775) as a synonym.

Adanson (1763) described the genus Kalawael, using it in the same sense in which Linnaeus had used Santaloides, and

citing this genus and Kiridiwael as synonyms. Leenhouts (1958a) proposed that Rourea Aublet (1775) should be conserved against Kalawael Adanson (1763) because no binomial has been published under the name Kalawael since it was proposed by Adanson. Furthermore, "Kalawael" is a well known vernacular name for a species of Derris (Leguminosae) from Ceylon, and Rourea is a large well-known pantropic genus. The acceptance of Kalawael would also require a large number of nomenclatural changes without any useful purpose. Rourea was accepted for conservation by an international botanical congress in 1964, and appears in the conserved list in the current (1966) edition of the International Code of Botanical Nomenclature.

From 1775 to 1824, mention of Rourea was restricted to listings of generic names (Scopoli, 1777; Jussieu, 1789; Hedwig, 1806; Kunth, 1824) and to the publication of illegitimate new names, such as Robergia by Schreber (1789) and Malbrancia by Necker (1790).

The second species to be published was the morphologically variable and geographically widespread R. glabra H.B.K. (1825), based on a Humboldt collection from Venezuela. In the same year Rourea was reduced to synonymy under Connarus by DeCandolle (1825).

Planchon (1850) included Rourea in his tribe Connareae, as a distinct genus, subdivided into two sections: Dalbergioideae and Mimosoideae. He divided section Dalbergioideae into two groups: Americanae (including the nine species then known), and Gerontogaeae (including the Old World species of

the section). All the species listed under section Mimosoideae were from the Old World. The same classification was used by Walpers (1852).

Baillon (1869) recognized three sections within the genus: Euroourea, Byrsocarpus and Bernardinia. He thus reduced to synonymy the genera Byrsocarpus Schum. and Thonn. and Bernardinia Planch. Byrsocarpus is an Old World genus, accepted by some and rejected by others. Bernardinia, an American genus, is considered by me as a separate genus until further evidence can be gathered to support either its inclusion in Rourea or its standing as a different genus.

The first revision bringing together information on a number of American species was Baker's treatment of Connaraceae in Martius' *Flora Brasiliensis* (1871). Baker recognized four American genera in the family: Bernardinia, Cnestidium Planch., Rourea and Connarus L. In Rourea he described six new species, bringing the total of the then known species to twelve. Baker's study consisted of extensive descriptions of the twelve species, a key and some illustrations, as well as the descriptions of several new varieties. Of the twelve species only one, R. macrophylla Baker, has been removed from the genus; it is now placed in the more recently described genus Pseudoconnarus Radlk. The other eleven species have been generally accepted by more recent workers, and some of his varieties have been elevated to specific rank by other authors (e.g., R. glabra H.B.K. var amazonica Baker = R. amazonica (Baker) Radlk. p.p.; R. glabra H.B.K. var coriacea Baker = R. neglecta Schellenberg).

The South American genus Eichleria (Oxalidaceae), described by Progel (1877), was shown by Kuhlmann (1934) to be a synonym of Rourea.

Radlkofer (1886) accompanied his anatomical notes on the Connaraceae with a taxonomic account of Connarus and Rourea. He described several species, made several nomenclatural changes, and divided the American species of Rourea into two sections: Mimosoideae, with one species, R. martiana Baker, and Dalbergioideae, including the rest of the species known to him. Further discussion of the sectional organization of the genus is included under "Sectional Relationships."

E. Gilg's treatment of the Connaraceae for Engler's Pflanzenfamilien (1894) added little to the knowledge of Rourea and followed closely Planchon's subdivision into Dalbergioideae and Mimosoideae.

Schellenberg (1910) placed Rourea in the subfamily Connaroideae Planchon, tribe Roureeae Schellenberg, subtribe Roureinae Schellenberg. He accepted Byrsocarpus and Santaloides as separate genera, while considering Jaundea Gilg as a subgenus of Byrsocarpus. At the same time he included Bernardinia in subfamily Connaroideae, tribe Roureeae, subtribe Age-laeinae Schellenberg.

The most complete treatment of the family as a whole, and obviously of the genus Rourea, is that of Schellenberg (1938) in "Pflanzenreich". He accepted as distinct the following genera of the Rourea complex: Byrsocarpus, Santaloides, Santaloidella, Jaundea, Bernardinia and Rourea, but his criteria for differentiating genera are generally considered to

be far too restricted.

These narrow generic concepts were rejected by Leenhouts (1958b) in a revision of the Malaysian species. He preferred to consider as synonyms of Rourea all of the other genera above, except the American genus Bernardinia, which is not mentioned in his work. According to Leenhouts, the genus Rourea should be subdivided into three subgenera: Jaundea (including Jaundea and Byrsocarpus), Rourea (including Rourea and Santaloidella) and Palliatus (including Santaloides). I consider this new arrangement of the genus by Leenhouts more acceptable, based on the literature available and on a limited knowledge of the Old World Connaraceae. A more critical appreciation of relationships will have to await further study of the other species and genera within the family.

The most recent generic account of the Connaraceae is that of Hutchinson (1964), in which he accepts Schellenberg's genera but not his tribal definitions or his phylogenetic concepts.

In addition to the important works cited above, a number of other authors have treated the American Rourea, usually on a restricted regional basis, with little or no change in generic circumscription or nomenclature. The most important of these works are: Grisebach's Flora of the British West Indian Islands (1864); Hemsley's Biologia Australi-Americana, Botany (1879-1888); Britton's Connaraceae in North American Flora (1908); Urban's Symbolae Antillanae (1908); Steyermark's Connaraceae in Flora of Perú (1938); Lanjouw's Connaraceae in Flora of Suriname (1940), and Woodson's Connaraceae in Flora of Panama (1950).

## GENERIC RELATIONSHIPS

Five genera of Connaraceae occur in America. These are Bernardinia, Cnestidium, Connarus, Pseudoconnarus, and Rourea. Although some authors (e.g., DeCandolle 1825, 1826) have considered some of the above genera as subdivisions of Connarus or of other genera, they have been accepted as separate entities by the majority of taxonomists (Table 2, page 86).

Connarus can be easily separated from the other four American genera by the stipitate ovary and fruit, by the solitary ovary, and the punctuations or glands present in the petals and/or sepals of many species.

Cnestidium has traditionally been separated from the other genera by the valvate sepals, the vestigial endosperm, and small fruiting calyx. It can be readily recognized by the densely hairy fruits and inflorescence.

Pseudoconnarus is distinguished from the rest by the copious endosperm, the constantly trifoliolate leaves, and the papillose lower surface of the leaflets. Papillose leaflets are also found in Rourea, but in that genus they are associated with more numerous leaflets. Trifoliolate leaves are present in the other genera but they are never papillose. In Connarus, Rourea, and Bernardinia the seeds lack endosperm. There is a vestigial endosperm in Cnestidium.

The genera Bernardinia and Rourea are morphologically similar and therefore more difficult to separate. Baillon (1869) treated Bernardinia as a synonym of Rourea. Bernardinia is retained here as a separate genus because it possesses a reclinate, caducous fruiting calyx with free, imbricate sepals, whereas Rourea has, for the most part, an ascending, persistent and accrescent fruiting calyx with imbricate sepals. Bernardinia has more than one mature fruit per flower, while Rourea flowers produce only one mature follicle (very rarely two). The flowers are produced before, or approximately at the same time as the young leaves in Bernardinia, while they are produced after the appearance of leaves in Rourea. This character, used by many workers e.g., Schellenberg (1938), Steyermark (1938), Hutchinson (1964), has been found useful in distinguishing the two genera in the herbarium.

Rourea was considered by Schellenberg (1938) as a member of the tribe Connareae, but its closest relatives are in tribe Byrsocarpeae Schellenberg. Schellenberg's tribe Connareae is a very artificial one. It groups together three genera (Rourea, Connarus, and Cnestidium) that differ greatly in such characters as presence or absence of endosperm, type of flowering and fruiting calyx, and number of carpels in flowering stage.

In 1910 Schellenberg divided his subfamily Connaroideae into two tribes, Roureeae and Connareae and placed Rourea in subtribe Roureinae (tribe Roureeae), together with Byrsocarpus and Santaloides, while Bernardinia, Pseudoconnarus and Cnestidium were placed in the subtribe Agelaeinae (tribe Roureeae).

Although he kept Bernardinia in a different subtribe from Hourea, this approach is more valid and gives a better picture of the true relationships among the different American genera.

The most important characters to separate the American genera of Connaraceae are summarized in Table 1.

TABLE I  
MORPHOLOGICAL COMPARISON AMONG THE AMERICAN GENERA OF COMMARACEAE

	Bernardinia	Cnestidium	Connarus	Pseudocconnarus	hourea
Sepals	Imbricate	Valvate to narrowly imbricate	Imbricate	Imbricate	Imbricate
Glands on petals	Absent	Absent	Present	Absent	Absent
Glands at apex of connective	Absent	Absent	Present	Absent	Absent
Carpels at flowering stage	5	5	1	5	5
Time of production of flowers	Before or at same time with leaves	After leaves	After leaves	After leaves	After leaves
Follicles maturing (in most cases)	Several	One	One	Several	One
Fruit	Sessile	Sessile	Stipitate	Stipitate	Sessile
Endosperm	Absent	Vestigial	Absent	Present	Absent
Fruiting calyx	Reclinate, not accrescent	Not accrescent	Not accrescent	Not accrescent	accrescent (mostly ascending)
Leaflets	Imparipinnate (usually more than 3)	Imparipinnate (usually more than 3)	Imparipinnate (usually more than 3, rarely 1 or 3)	Constantly trifoliate	Imparipinnate (rarely one)
Leaflet lower surface	Papillae absent	Papillae absent	Papillae absent	Papillae present	Papillae absent or present
Type of stomata	Paracytic or Rubiaceous	"Encircled"	Actinocytic ("encircled")	Actinocytic ("encircled")	Paracytic or Rubiaceous
Petiole anatomy	Ring-like	Ring-like	Ring with included bundle	Ring-like? or ring with included bundle	Ring-like

KEYS TO THE AMERICAN GENERA OF CONNARACEAE

1.- Key based mainly on flowering material

1. Carpel solitary at flowering stage; petals glandulose.

Connarus.

1. Carpels 5 at flowering stage; petals eglandulose.

2. Sepals valvate or only narrowly imbricate; inflorescence (and fruit) densely pilose.

Cnestidium.

2. Sepals imbricate; inflorescence and fruit usually glabrous or villous but not densely pilose.

3. Ovary stipitate; leaves consistently trifoliolate; leaflets papillose below.

Pseudoconnarus.

3. Ovary sessile; leaves uni-, tri-, or multifoliolate; leaflets usually without papillae (when papillae present, then leaflets more than 5, i.e., Rourea spp.).

4. Flowers produced before or approximately at the same time as the leaves; fruiting calyx reclinate and more or less caducous.

Bernardinia.

4. Flowers produced after the leaves; fruiting calyx ascending, usually accrescent.

Rourea.

2.- Key based mainly on fruiting material

1. Follicle solitary at maturity.

2. Fruiting calyx accrescent.

Hourea.

2. Fruiting calyx not accrescent.

3. Endosperm absent; sepals imbricate.

Connarus.

3. Endosperm present but scanty; sepals valvate  
or only narrowly imbricate.

Cnestidium.

1. Follicles several at maturity.

4. Endosperm copious; leaves trifoliolate, the leaflets  
papillose below; flowers produced after the leaves.

Pseudoconnarus.

4. Endosperm absent; leaves imparipinnate, the leaflets  
lacking papillae below; flowers produced before or  
approximately at the same time as the leaves.

Bernardinia.

## MORPHOLOGICAL AND ANATOMICAL CONSIDERATIONS

### 1. Habit

The species belonging to the genus Rourea subgenus Rourea are all woody, ranging from shrubs to small trees and woody vines, with the twigs sometimes twining. When woody vines, they sometimes reach the top of tall trees, up to 30 m or more, and have for that reason been mistaken for trees by some collectors (collectors' notes read occasionally "tree 20 m tall"). Most of the species from the forests of Central and South America are woody vines, while most of those from the Planalto and other areas of Brazil, south and east of the limits of the Amazon region, are shrubs or small trees (Fig. 18A).

### 2. Wood anatomy<sup>1</sup>

The following description of stem structure is based on accounts published by Solereder (1908), Schellenberg (1938),

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<sup>1</sup>A detailed anatomical study of the Connaraceae is being undertaken by Dr. William C. Dickison, University of North Carolina, Chapel Hill. For this reason, original information on wood or leaf anatomy (except petiole) has not been gathered for the present study.

and Metcalf and Chalk (1965): The cork arises in the sub-epidermis, and is composed of cells with fairly wide lumina; the pericycle contains a composite and continuous ring of sclerenchyma; the primary cortex contains mucilage cavities, apparently formed from cells with mucilaginous membranes (R. induta Planch.); the xylem is a continuous cylinder traversed by narrow rays; the rays are 1-2-seriate, about 19 per mm, and the cells are square or upright; the vessels are medium-sized (less than  $200\mu$ ), with round lumina and, for the most part, solitary; the perforations of the vessels are simple; the fibres are simple-pitted, septate and usually with moderately thin walls. Included (interxylary) phloem of the "concentric" type has been found in one species of Rourea (R. pulchella Planch.) from Malaya, with successive layers of xylem and phloem separated by bands of conjunctive tissue containing numerous layers of stone cells. Wood parenchyma is little developed or absent.

### 3. Stems and branchlets

The stems are usually terete, very rarely slightly angular towards the end of the branchlets. In about half the species the lenticels are quite conspicuous, while in the other half they are either inconspicuous or absent. Striate branchlets may be present in some species, but this is not a constant character in the American species.

#### 4. Pubescence

The pubescence of different portions of the plant has been found to be very useful in the differentiation of species and even groups of species within sections. In order to obtain some uniformity in the terminology used for the several types of pubescence that occur in the subgenus, I have followed Lawrence (1960). Both glandular and nonglandular hairs are found in Rourea, and pubescence of some kind occurs in many species in the calyx, inflorescence, leaflets, petiole, rachis and branchlets. The leaflet hairs may be appressed to the lower surface or they may be erect or curly. They may be confined to the lower surface or may be found on the upper surface as well. Pubescence of the upper surface occurs in a few species (Fig. 2).

The corolla is always glabrous. The calyx may be villous, puberulous or glabrous. When glabrous, the sepals are, in most cases, barbate or have ciliate margins; nonglandular hairs are usually colorless but may be ferruginous in some species. Glandular hairs are present in a few species in which they occur on the calyx, rachis of the inflorescence and even on leaflets. They are usually spherical-headed and the head is in most cases reddish.

#### 5. Leaves

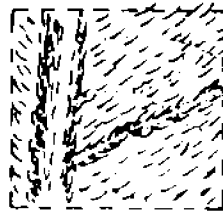
The leaves are mostly multijugate, with a few species showing unifoliolate leaves apparently in some branches only.

Fig. 2. Pubescence types in leaflets of Rourea spp. x5.

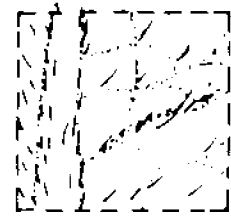
A. R. induta var induta. B. R. frutescens. C. R. sprucei  
var sprucei. D. R. sprucei var subcoriacea. E. R. sprucei  
var rondoniense. F. R. krukovi. G. R. latifoliolata. H.  
R. gracilis.



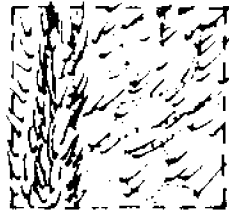
A



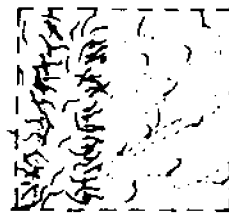
B



C



D



E



F



G



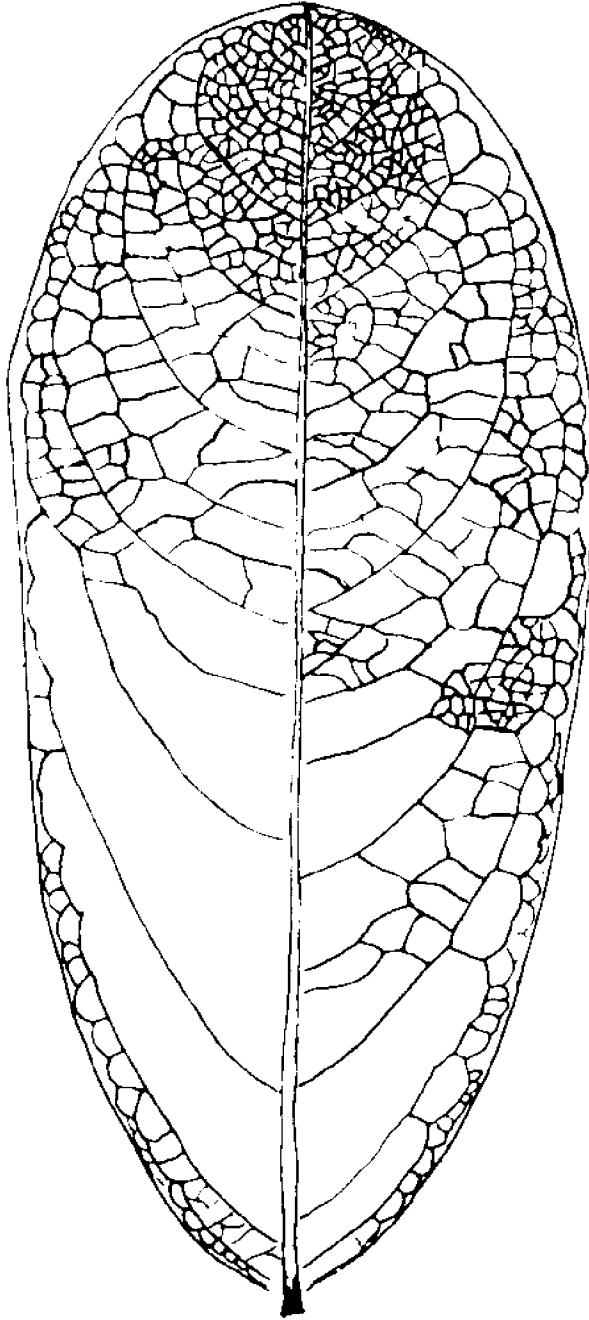
H

Most species have between three and seven leaflets, rarely more than seven, and very rarely up to fifteen. The leaflets in these species are usually longer than 3 cm. Section Multi-foliolatae includes all the species with eleven to thirty-three leaflets (which are usually less than 3 cm long), the only exception being R. tenuis which has 3-5 leaflets. Size and shape of leaflets, as well as leaflet base and apex have proved useful as taxonomic characters in several instances. The presence of papillae on the lower surface of the leaflets is also a helpful taxonomic character.

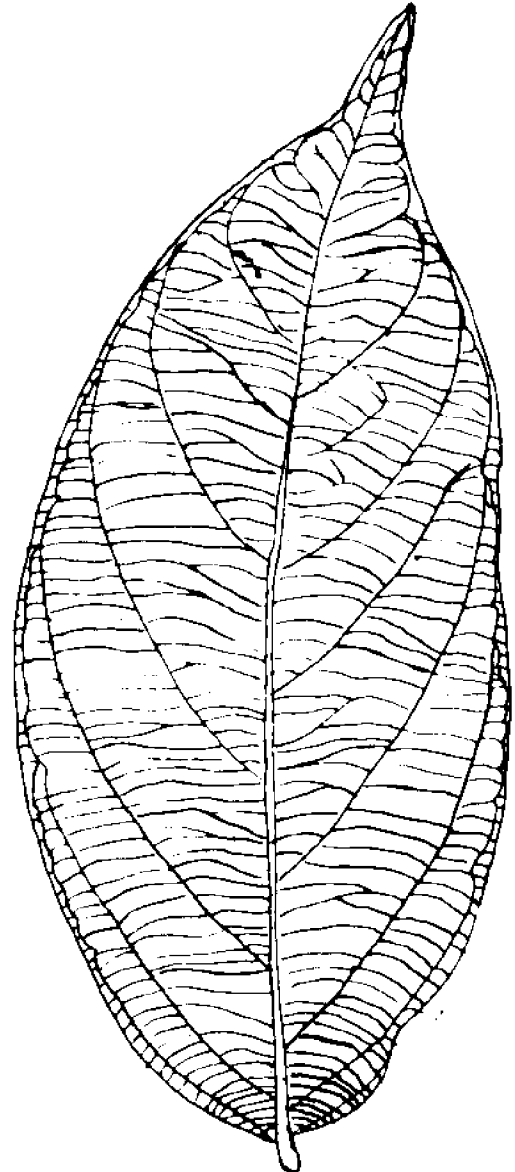
Vesture and texture are useful as taxonomic characters, although texture is somewhat difficult to define except on a comparative basis. I have avoided the use of this character when it has been difficult to assess accurately, and only the term "coriaceous" has been used constantly, as opposed to all other texture types (i.e., chartaceous, rigid-chartaceous, subcoriaceous, membranaceous).

Venation patterns are also useful in separating species. Two basic types of venation are present: transverse and reticulate (Fig. 3). In the so called "transverse" venation, veinlets are produced at right angles (or nearly right angles) to the midrib and the lateral veins. The veinlets are also parallel to each other. Transverse venation occurs, for example, in R. camptoneura, R. accrescens and R. pubescens. Reticulate venation of the usual type occurs in most of the species. The venation of the upper surface may be impressed, plane, or prominulous. These different types have been used

Fig. 3. Venation patterns in leaflets of Rourea spp. A. Reticulate, R. surinamensis. B. Transverse, R. camptoneura.



A



B

with good results in the present treatment to separate species. The angle formed by the lateral veins and the midrib is not a useful character, and the same is true for the anastomosing of the veins near the margin.

## 6. Stomata

Stomatal patterns have been used recently in several taxonomic studies. Following the plastic imprint technique outlined by Sinclair and Dunn (1961), stomatal patterns were studied in representative specimens of a large number of species of Rourea and in a few species of the other American genera.

It was found that Rourea possesses the "rubiaceous" type (Figs. 4, 5, 6, 7, 8) as defined by Vesque (1889) and Metcalf and Chalk (1965). It is also called "paracytic" by Metcalf and Chalk (1965) and Van Cotthem (1970), i.e., the type in which the stoma is accompanied on either side by subsidiary cells parallel to the long axis of the pore and guard cells. Stomata of the "rubiaceous" type also occur in Bernardinia (Fig. 9A).

In Cnestidium the stomata are surrounded, and partially covered, by three small cells (Fig. 9B). In Connarus (Fig. 10A) the stomata have a large and widely opened front cavity, and are surrounded by 5 or 6 cells of similar size ("encircled" stomata). The stomata in Pseudoconnarus have been repeatedly reported as "encircled." This needs further study,

Fig. 4. Stomatal patterns on lower epidermis of leaflets of Rourea spp. A. R. martiana, Martius 1675. B. R. induta, Irwin 10881.

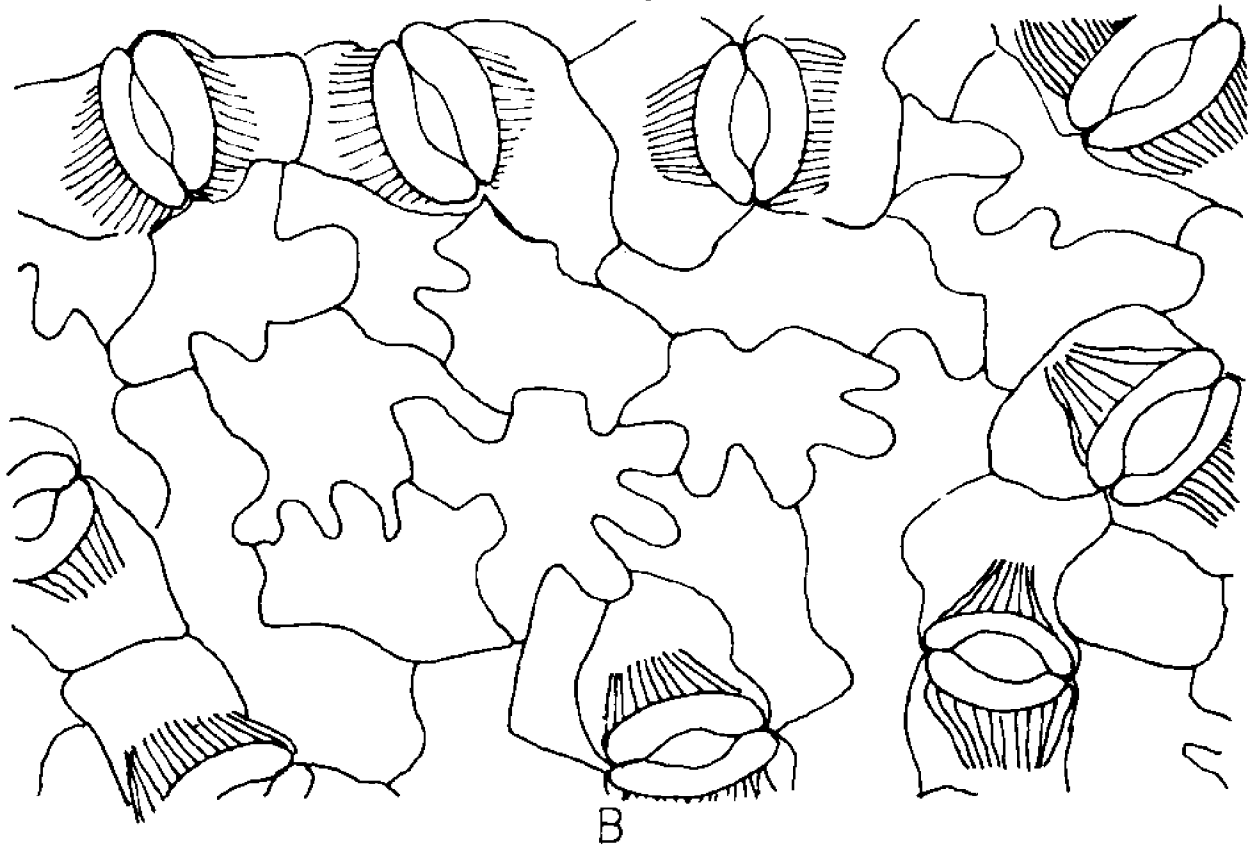
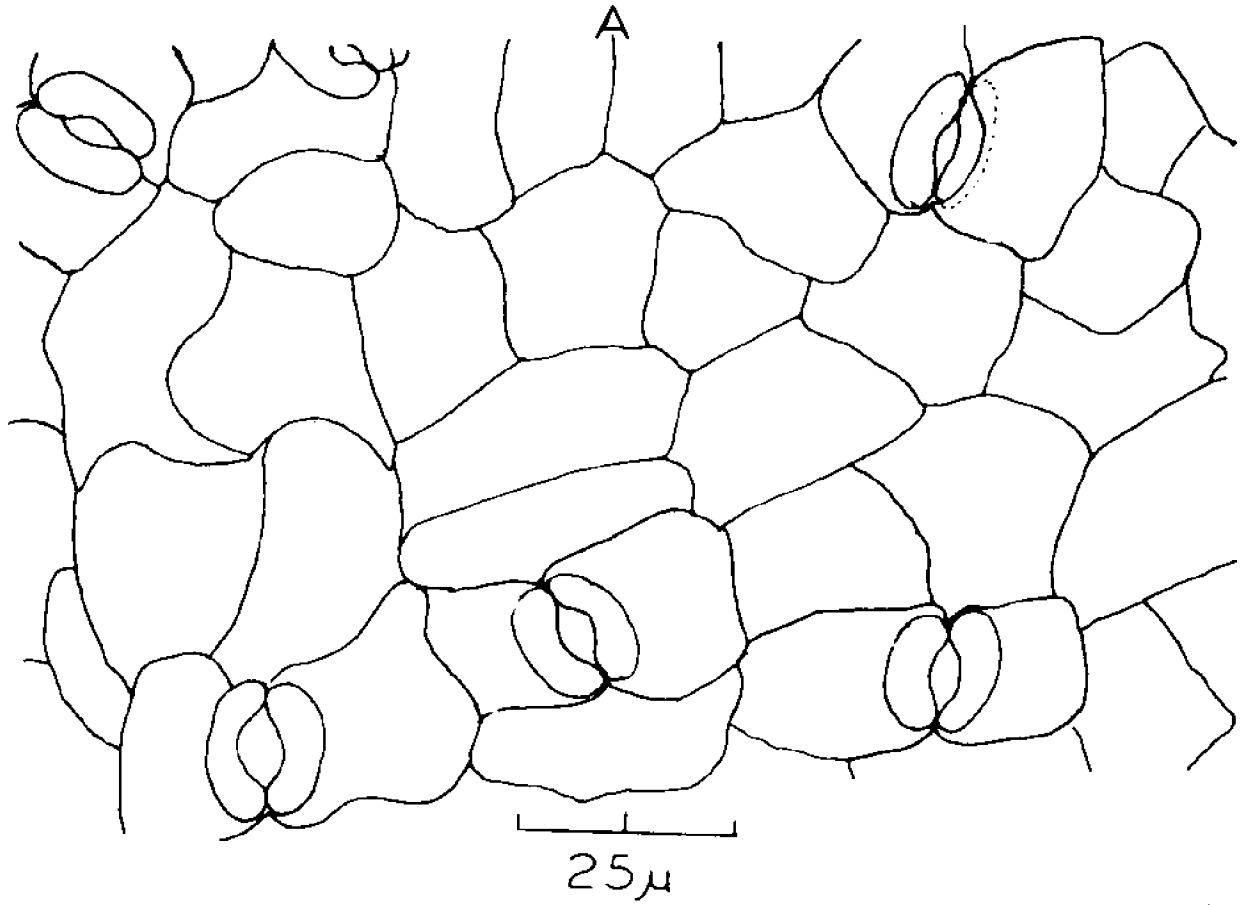
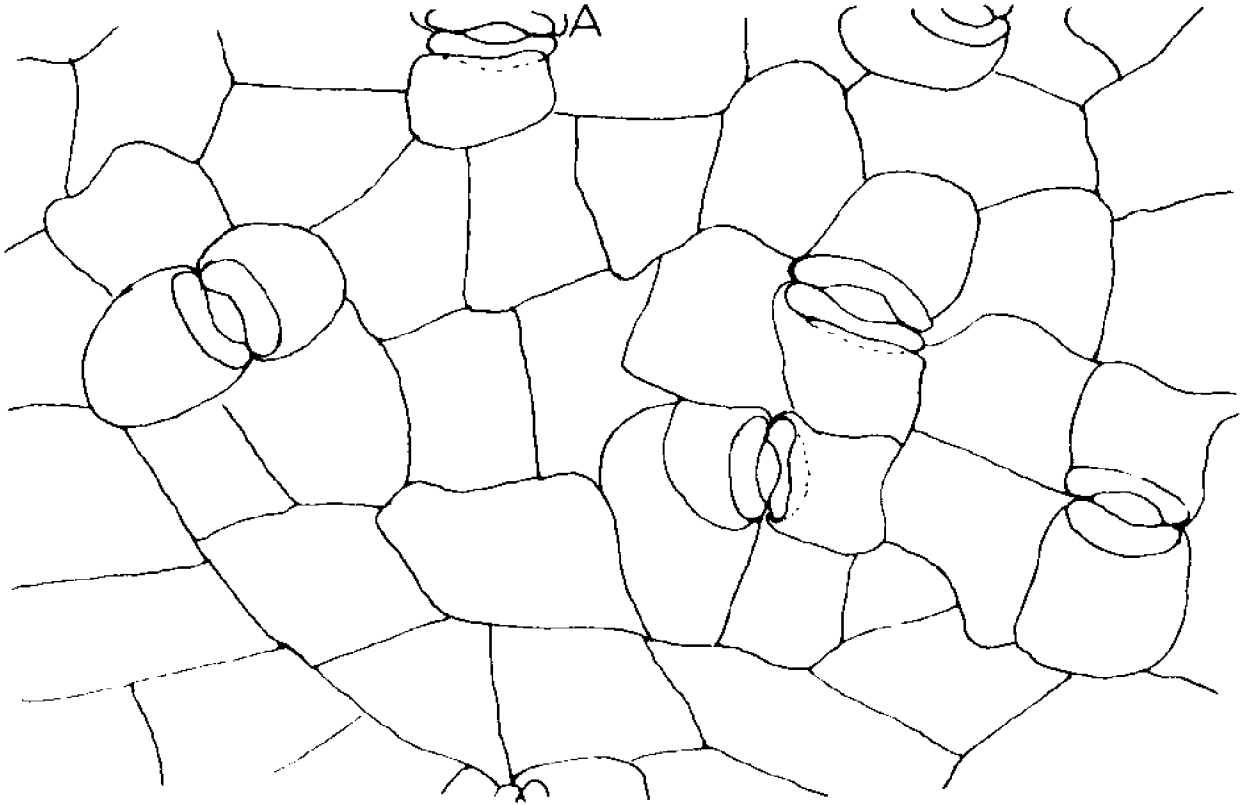
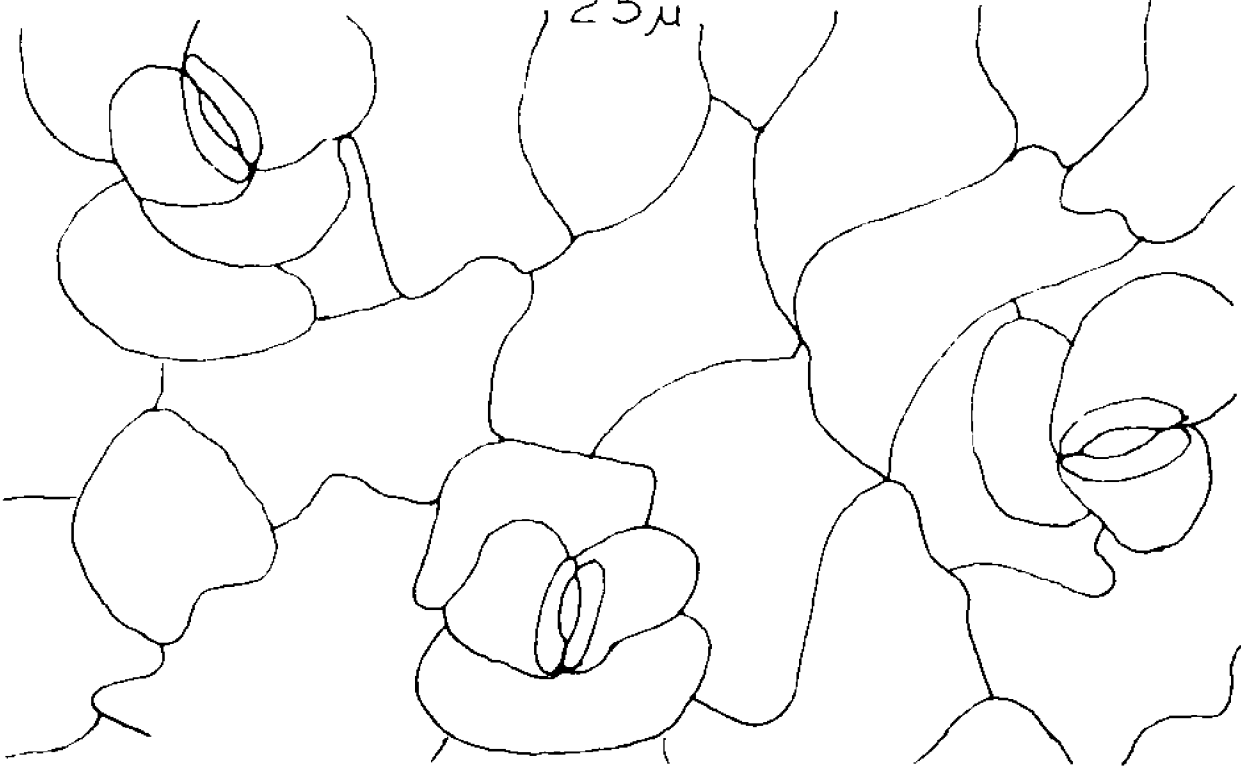


Fig. 5. Stomatal patterns on lower epidermis of leaflets of Rourea spp. A. R. revoluta var glabra, Appun 1835a. B. R. glabra, Hahn s.n.



25  $\mu$



B

Fig. 6. Stomatal patterns on lower epidermis of leaflets of Rourea spp. A. R. glabra var floribunda, Feddema 1980. B. R. surinamensis, Abbott 2107.

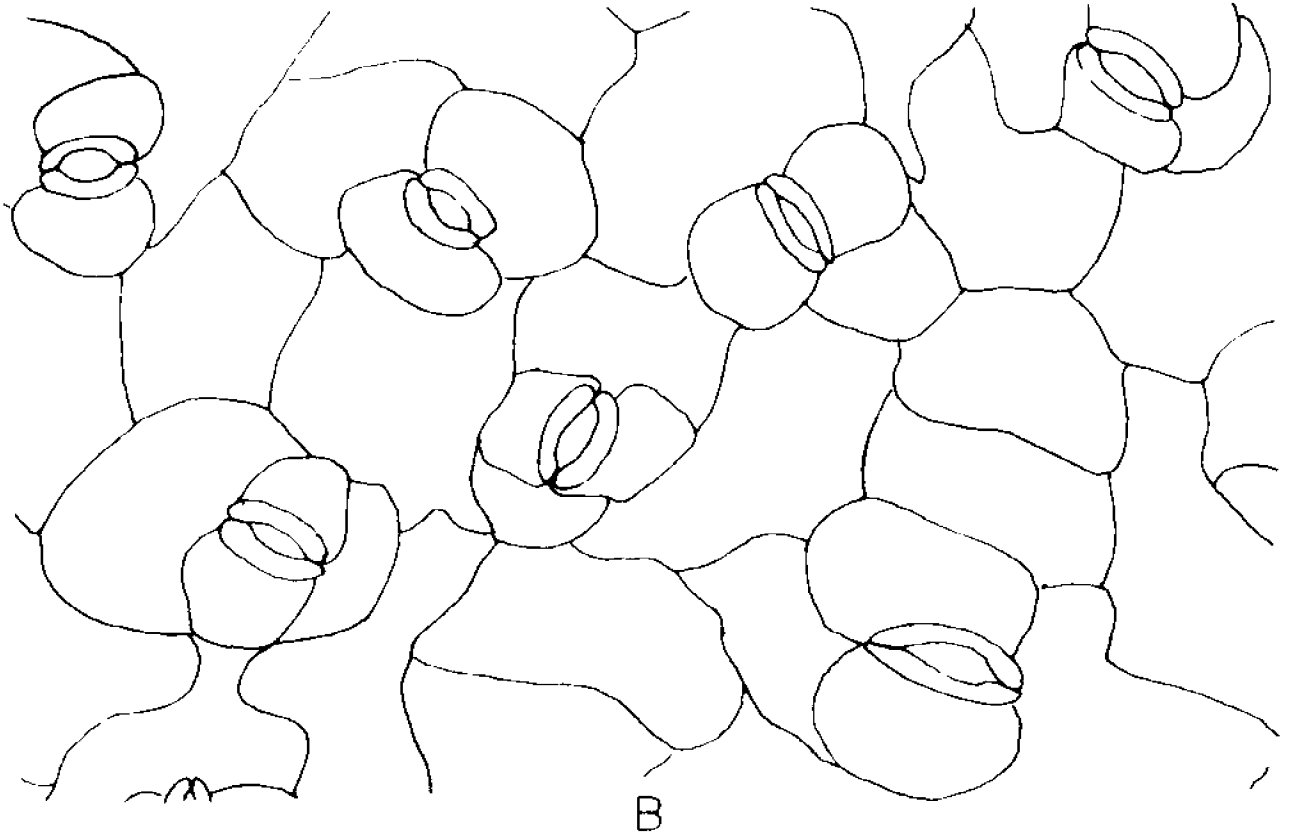
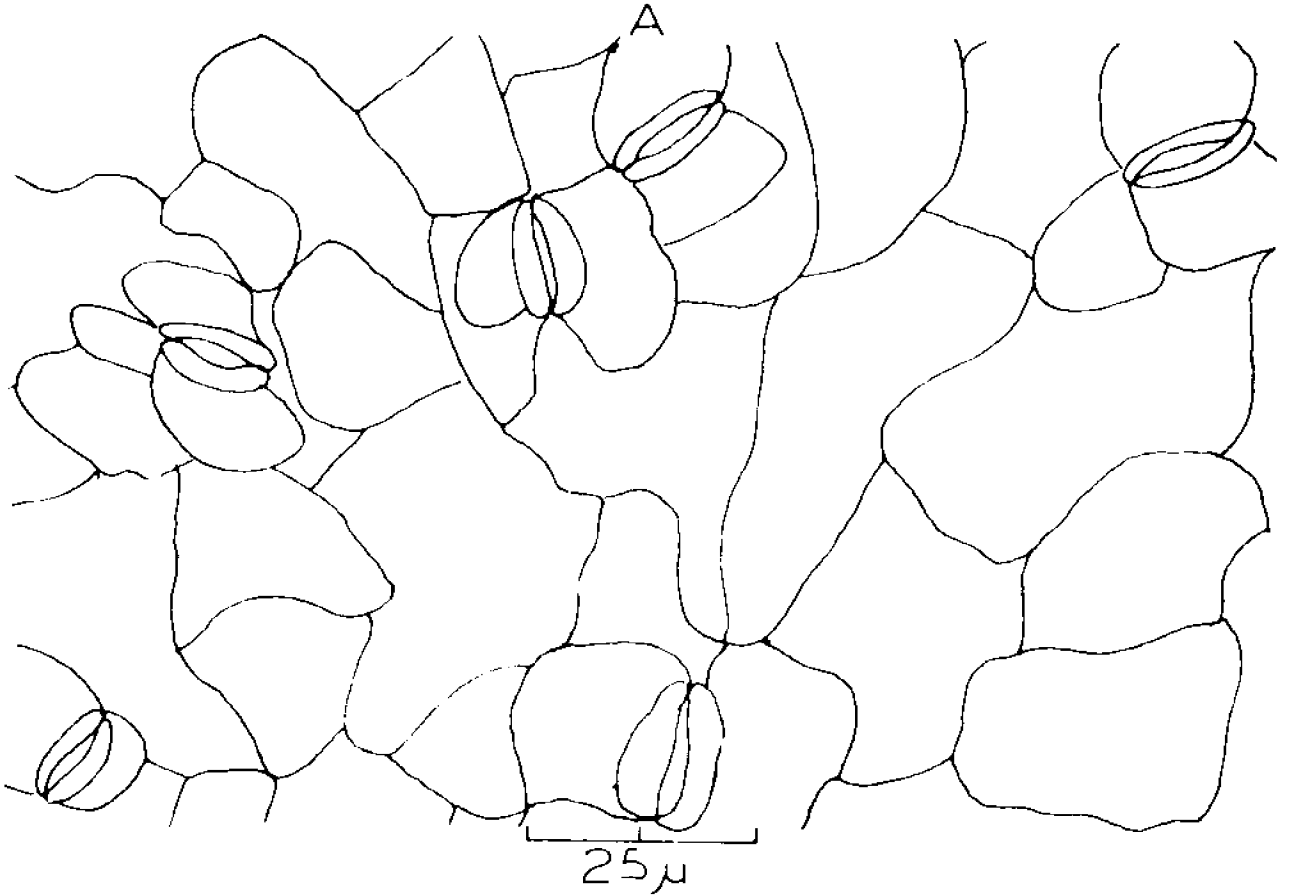
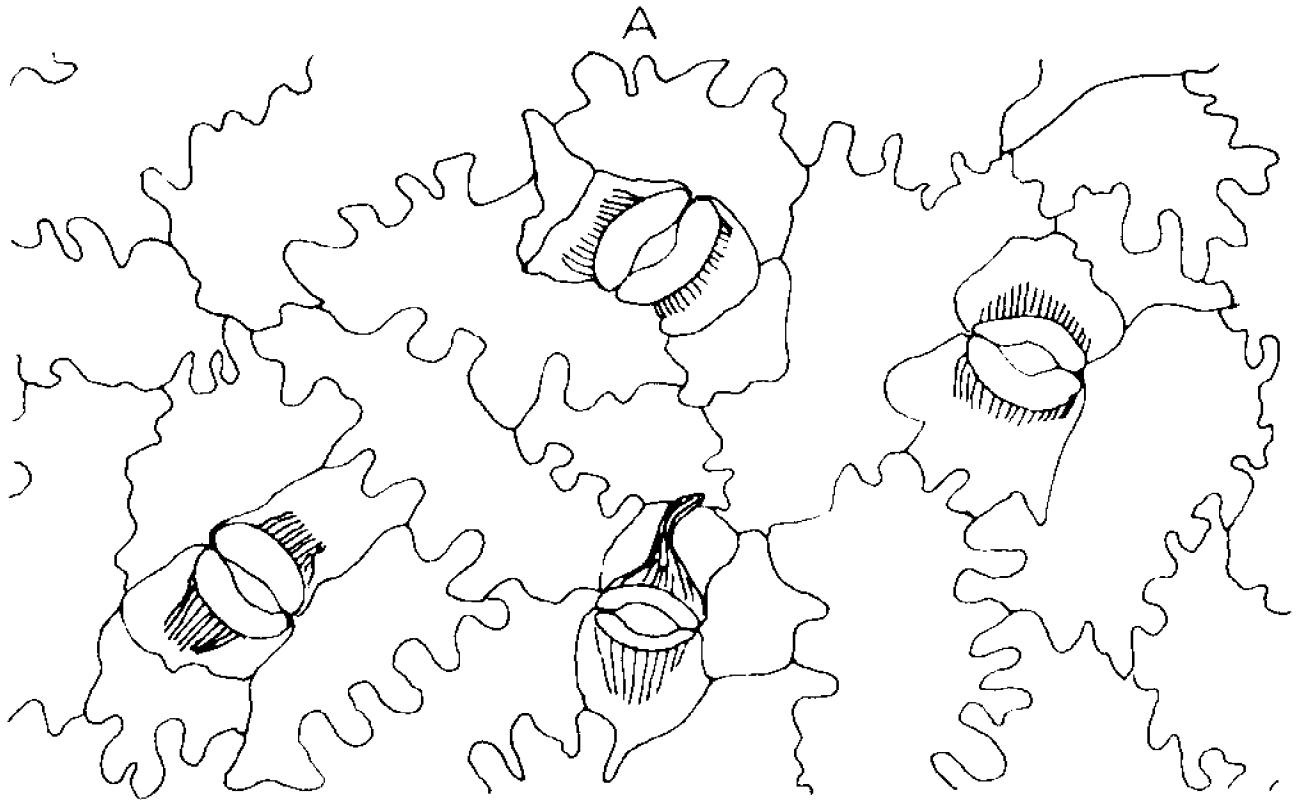
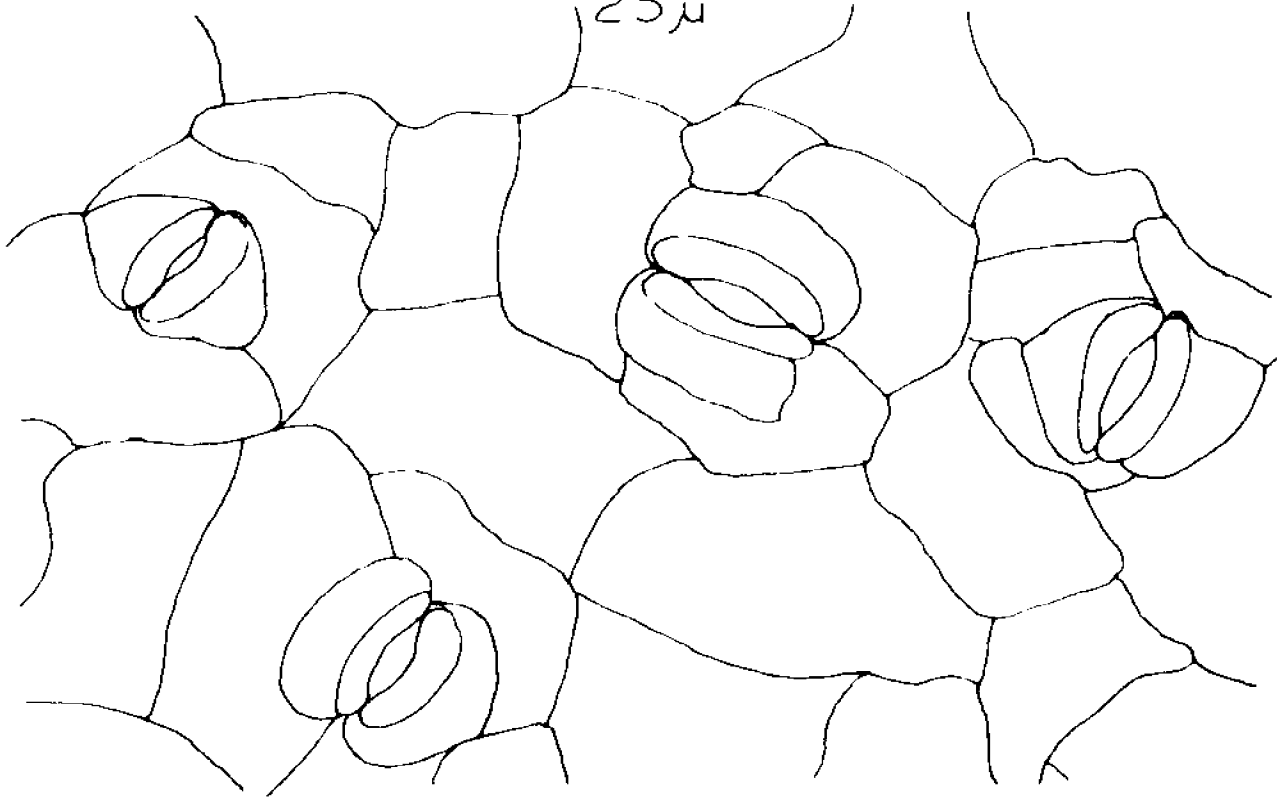


Fig. 7. Stomatal patterns on lower epidermis of leaflets of Rourea spp. A. R. cuspidata, Spruce 1901. B. R. adenophora, Pittier 3380.

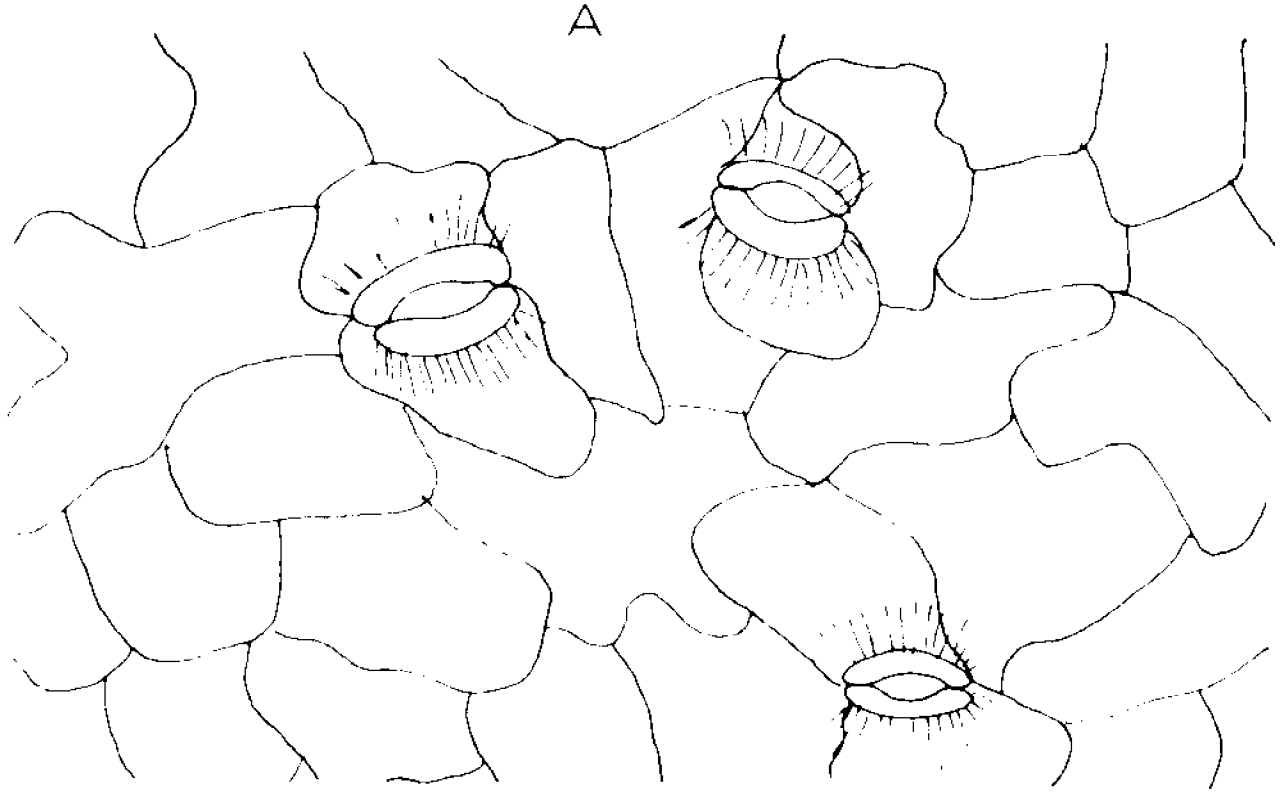


25  $\mu$

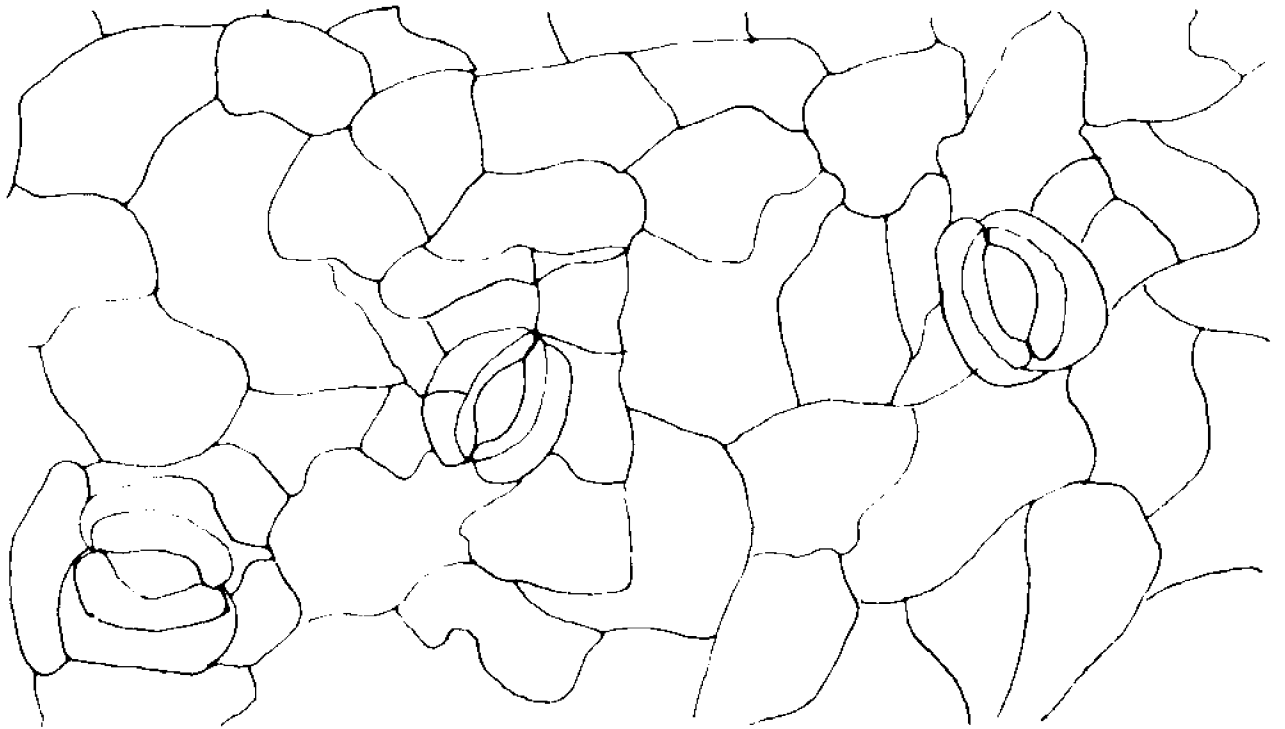


B

Fig. 8. Stomatal patterns on lower epidermis of leaflets of Rourea spp. A. R. latifoliolata, Allen and Allen 5242. B. R. suerrensis, Standley 19630.



25  $\mu$



B

Fig. 9. Stomatal patterns on lower epidermis of leaflets of Bernardinia and Cnestidium. A. Bernardinia comans, Mexia 4141. B. Cnestidium rufescens, Pennell 4103.

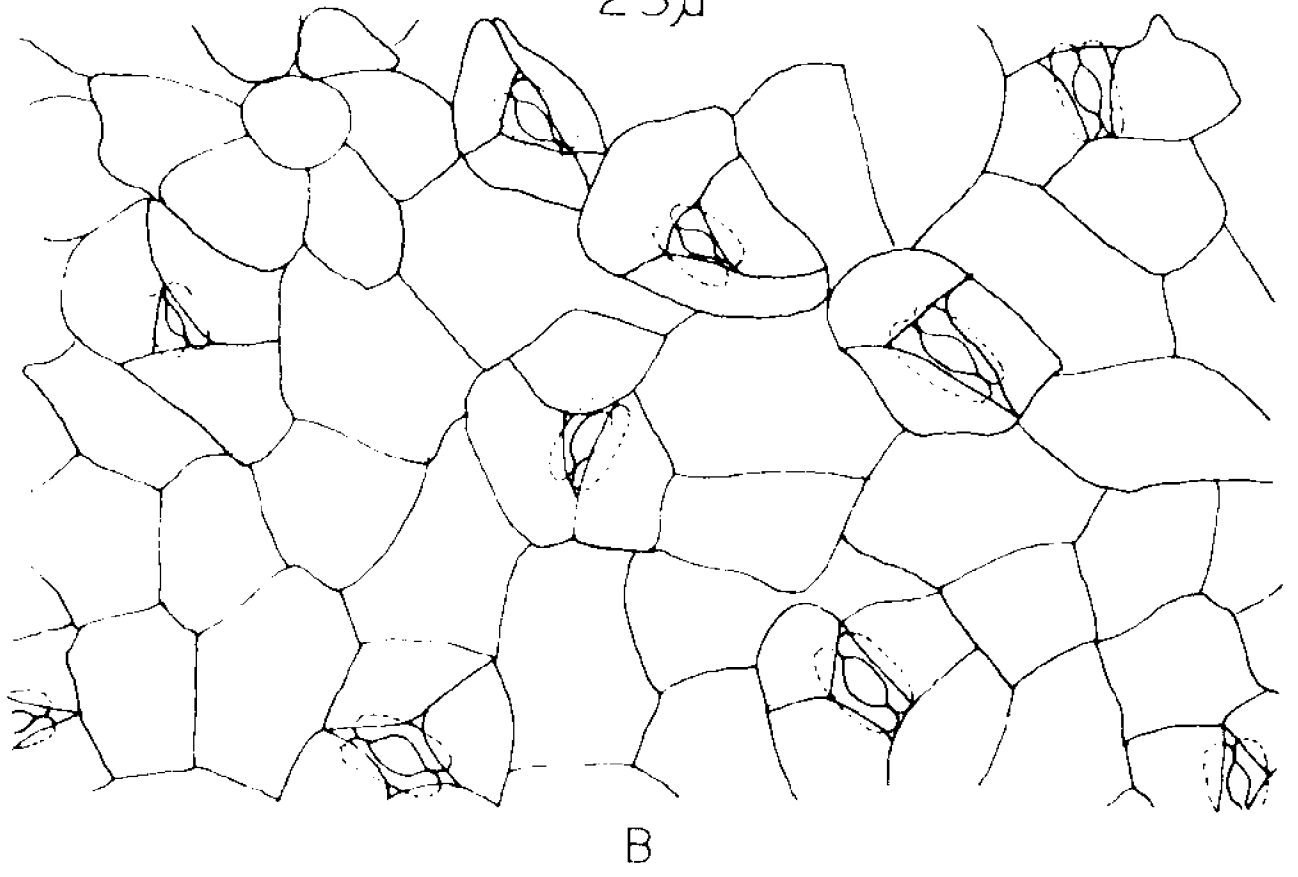
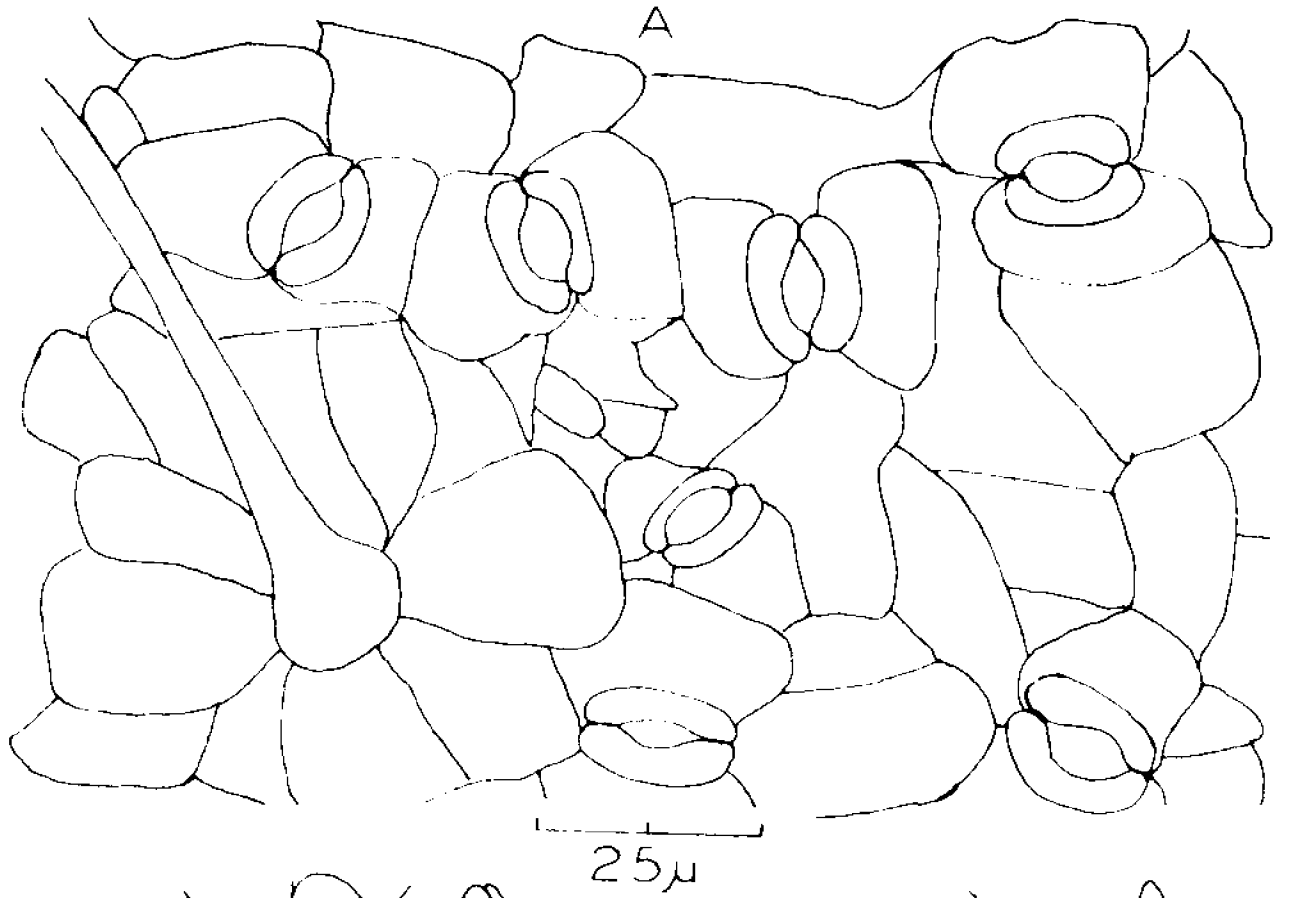
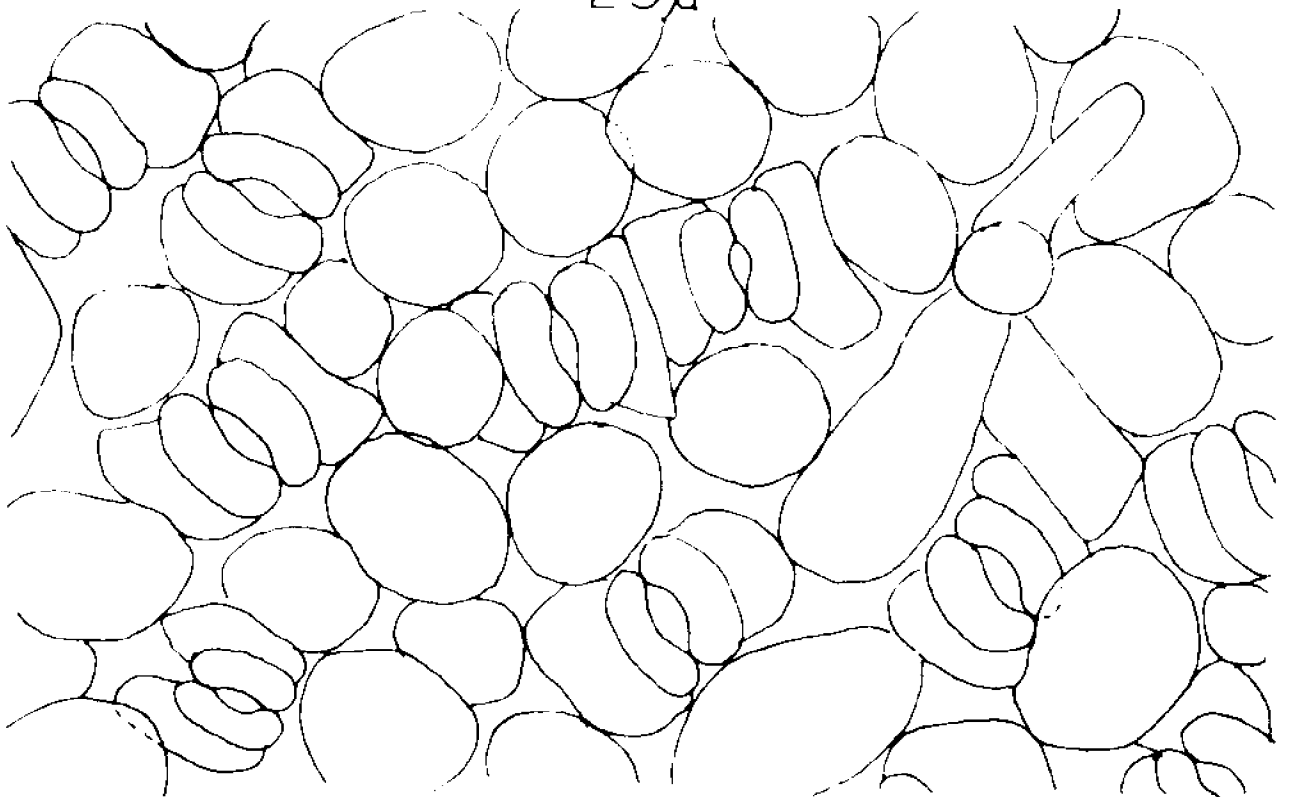
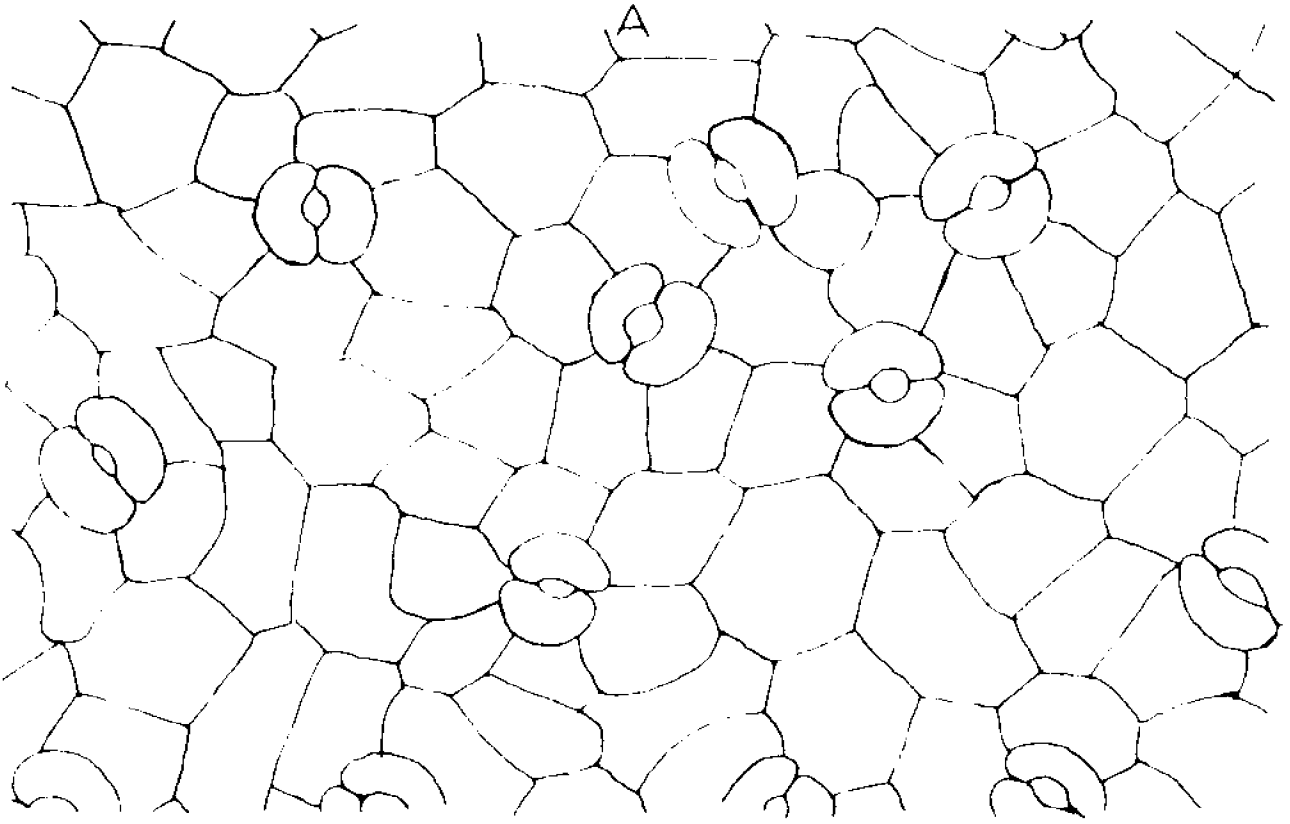


Fig. 10. Stomatal patterns on lower epidermis of leaflets of Connarus and Pseudoconnarus. A. Connarus suberosus, France 58449. B. Pseudoconnarus macrophyllus, France 4659. (The circles represent the papillae).



B

for I found that there are two apparently non-papillose cells parallel to the long axis of the guard cells and the pore, and that the papillose cells surrounding the stomata are not regularly placed around it and are of variable size (Fig. 10B).

The stomata are confined to the lower surface of the leaflets in Rourea. The same is true for the other four American genera and indeed for the rest of the family, the only exceptions occurring in a few species of Connarus where scattered stomata may be present on the upper surface.

In addition to the stomatal patterns, the epidermal cell outline has been used in some taxonomic works. The epidermal cell outline on the lower surface of the leaflets of Rourea may be curved or undulate, and the undulation when present, is  $\Omega$ -shaped. There does not seem to be a correlation between habitat and type of epidermal cell outline in the sense expressed by Stace (1965); both curved and undulate types are found in forest habitats. Neither the stomatal pattern nor the epidermal cell outline yielded useful taxonomic characters at the specific level.

## 7. Leaf anatomy

The epidermis is papillose on the lower surface of the leaflets in a few species (e.g., R. krukovii Steyermark, R. revoluta Planch.); large mucilaginous cells are present in many species; the epidermis is 2-3-layered in R. frutescens Aubl., R. glabra H.B.K., R. revoluta Planch., R. camptoneura

Radlk., and R. pubescens Radlk.; the additional layers appear through the formation of division walls parallel to the leaf surface. The mesophyll includes solitary stone cells above and below the midrib. Sclerosed elements have been found on the inside of the lower epidermis of R. ligulata Baker.

### 8. Petioles

Petiole length is variable in Rourea. Some species, especially in section Multifoliolatae, have short petioles, sometimes only up to 1 cm long. In cross section, the petioles are terete. The petiolules are usually short (0.01-0.5 cm long) inactive pulvinules. These characters are of no taxonomic importance.

Petiolar sections were prepared for most species of Rourea and for some representative species of Connarus, Pseudoconnarus, Bernardinia and Cnestidium (Figs. 11, 12, 13), following the technique outlined by Watari (1934) and used with modifications by Irwin (1964) and Grear (1970). As has been the case with Irwin's studies in Cassia and Grear's revision of Eriosema, no staining was necessary because the vascular structures contrast clearly with the cortical parenchyma. Cross sections were prepared in most cases from the pulvinus, the mid-petiolar region, and the first nodule.

In Rourea it was found that while there are three vascular traces at the base of the pulvinus they soon, even within the limits of the pulvinus, become one bundle, ring-

Fig. 11. Petiolar cross sections of Bernardinia, Connarus and Cnestidium. x 25. Solid black; Xylem; dotted; Phloem; lined; Collenchyma. A - C. Bernardinia comans, Pires and Black 3242. A. Pulvinus. B. Mid-petiole. C. First nodule. D. Connarus suberosus, Irwin 17642. Pulvinus. E - G. Connarus suberosus, B. W. 167. E. Mid-petiole. F. Just below first nodule. G. First nodule. H - J. Cnestidium rufescens, Pennell 4103. H. Mid-petiole. J. First nodule.

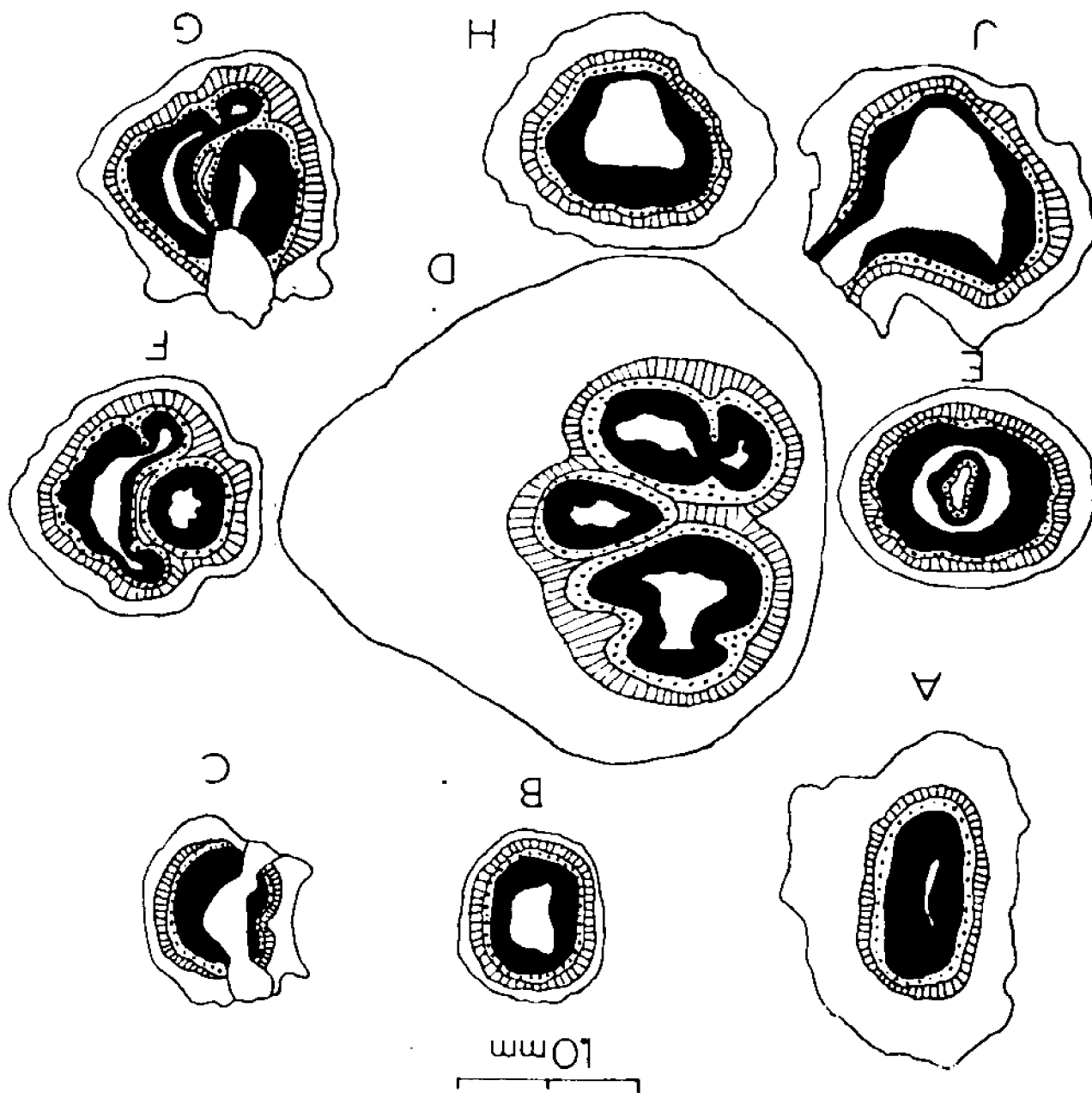
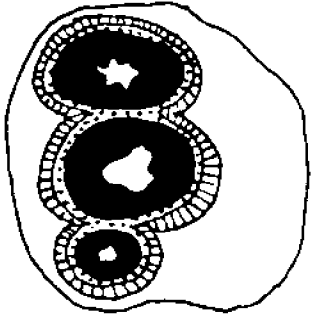
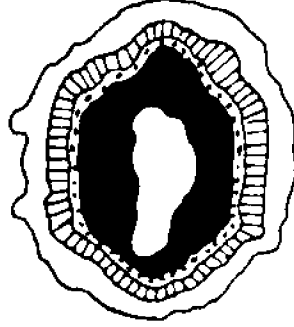


Fig. 12. Petiolar cross sections of Pseudoconnarus and Rourea. A - C. Rourea induta, Riedel s.n. A. Pulvinus. B. Mid petiole. C. First nodule. D - F. Pseudoconnarus macrophyllus, Prance 4659. D. Pulvinus. E. Mid-petiole. F. First nodule. G - J. Rourea adenophora, Allen 887. G. Pulvinus. H. Mid-petiole. J. Just below first nodule.

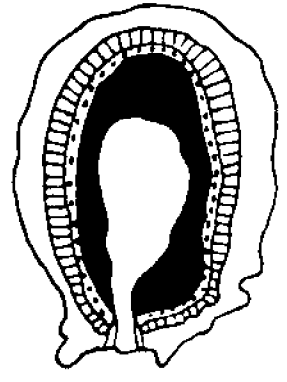
1.0mm



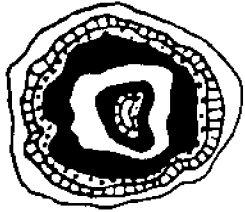
A



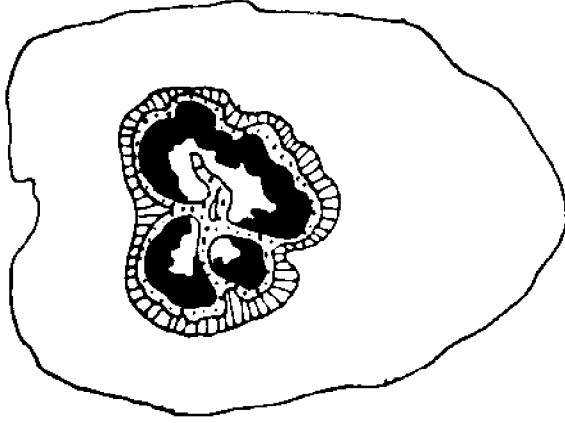
B



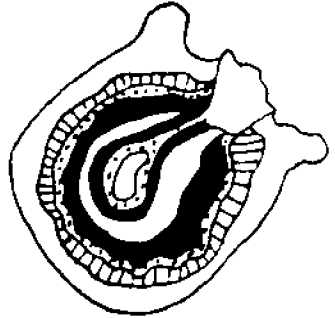
C



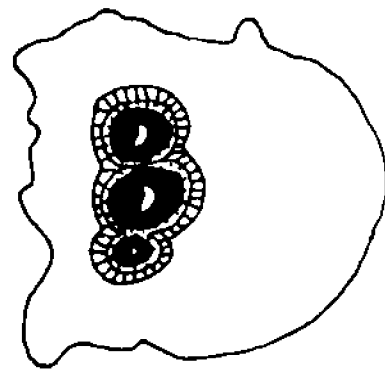
E



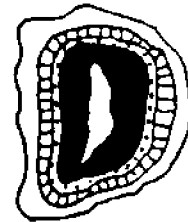
D



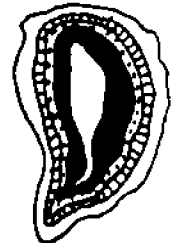
F



G

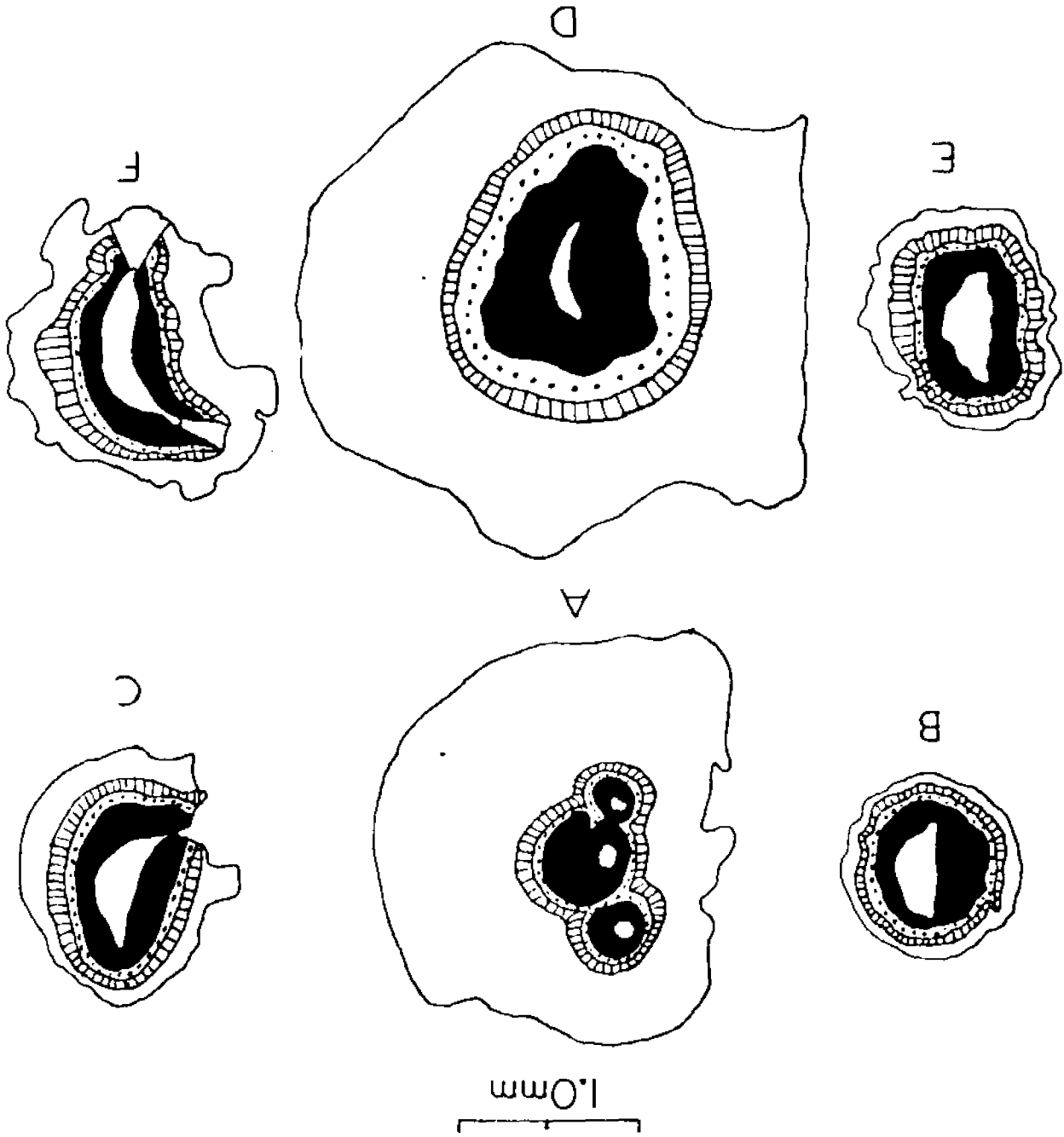


H



J

Fig. 13. Petiolar cross sections of Rourea spp. A - C. R. glabra, Schipp 104. A. Pulvinus. B. Mid-petiole. C. First nodule. D - E. R. frutescens, Maguire 22910. D. Pulvinus. E. Mid-petiole. F. First nodule.



like in appearance, and occupying most of the interior of the petiole. The petiolar anatomy in Bernardinia and Cnestidium is similar. In Connarus, the traces fuse to form a ring with one medullary (included) bundle. The anatomy of the petiole in Pseudoconnarus is variable, with two types present in the material examined: A Connarus-like structure with one ring and one included bundle, and a Rourea-like structure with one ring. This, however, differs from Rourea in that the center is star-shaped and not circular. Extensive comparative anatomical studies would be necessary before any definitive conclusions could be made concerning the importance of vascular structure of the petiole in generic differentiation. The vascular structure of the petiole is the same in all the american species of Rourea and is not of value for specific characters.

## 9. Inflorescences

The inflorescences in Rourea are mostly panicles, but are reduced in some species, and become pseudo-umbellate or even racemoid. Dense, many-flowered inflorescences and lax, few-flowered ones are found. Their position is axillary, pseudo-terminal or terminal. The length of peduncle and rachis is variable and can only be used with extreme caution when differentiating closely related species. In some species the inflorescences are produced in short branchlets but this, again, is a reliable taxonomic character only in a few cases.

Bracts are always found at the base of the inflorescence. Reduced leaves are clearly distinguishable at the base of short inflorescences in some species. Leenhouts (1958b) calls attention to the fact that bracts in fasciculate inflorescences may be placed similarly to stipules and can be confused with them. Bracteoles are also found in all species. As differentiation among the several shapes and sizes of bracts and bracteoles recognized by Schellenberg (1938) is uncertain, I have avoided the use of this character in the present treatment.

#### 10. Flowers

Flower structure and size are fairly uniform. However, extreme variations in dimension are of taxonomic value in discriminating between some species. The flowers rarely exceed 0.5 cm in length. They are almost always white, but have been reported in a few cases to be yellowish or white-cream. Scented flowers have been recorded in collectors' notes on several occasions. The flowers are actinomorphic and pentamerous.

The corolla is glabrous. The petals vary and may be oblong, oblong-lanceolate, lanceolate, etc. This is a poor taxonomic character because of overlapping and variations according to age in some instances. In most cases the apex is obtuse, but there are a few species with an emarginate apex (e.g., R. schippii). The petals are rarely joined just above

their base and then only for a short portion. In most cases they are free. (Fig. 18E).

The calyx is about half as long as the corolla in most species but may be almost as long or very short. The sepals vary in shape from orbicular to ovate or oblong-lanceolate. They should be used with extreme caution as a character when differentiating species. A character that has been reported as good for differentiating the genus is the peculiar way in which, shortly after anthesis, the sepals form a slender cone with a tuft of petals protruding from the apex. I have observed this in several specimens but it is only infrequently present in herbarium specimens. The calyx elements are pubescent, or almost completely glabrous. When the outer surface of the sepals is glabrous, their apex and/or margins have hairs. The inner surface of the sepals is more or less pubescent in all species. Texture of the sepals may also vary and ranges from membranaceous to coriaceous, and from perfectly smooth to striate. (Fig. 18B,C,D).

There are ten stamens. The five stamens opposite the petals are shorter than the five opposite the sepals. The ten stamens are joined at the base in a short tube which is less than half of one millimeter to one millimeter long or slightly longer. The filaments are filiform or occasionally thickened, and glabrous. The anthers are globose and, only rarely, subcordate. They are no more than 0.7 mm in diameter, and dorsifixed (Fig. 18F).

The 5 pistils are free, sessile, and heterotristylous. The styles are slender, covered with hairs up to the upper

half or only at the base. The stigmata are two-lobed, capitate or more or less flattened. The ovaries are lanate-pilose or only pubescent, and contain two ovules which are nearly basal, collateral and orthotropous (Fig. 18G, H).

#### 11. Pollen

The pollen grains were prepared by Erdtman's procedure (1966), with some slight modifications. The pollen material was collected from herbarium specimens. Slides were prepared not only for Rourea species, but also for representative species of Bernardinia, Cnestidium, Connarus and Pseudoconnarus. The terminology used to describe the grains is that of Erdtman (1966).

In the five genera, the pollen grains are isopolar, 3-colpate, circular (in most species) or more or less triangular (cf. R. grosourdyana) in polar view, and with a reticulate sculpturing of the exine (Figs. 14, 15, 16, 17).

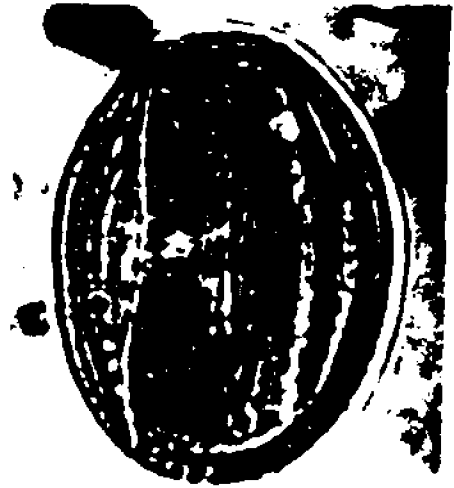
To illustrate the characteristics of the pollen grains in equatorial view, I list below the variations in length of both the polar (P) and equatorial (E) axes, the shape of the grains as defined by the ratio  $P/E \times 100$ , and their size. One species of each section of Rourea subgenus Rourea is included, as well as one species of each of the other four American genera. The measurements given are for a grain of approximately average size:

Fig. 14. Pollen grains. A and B. Bernardinia comans,  
Mexia 5045, polar and equatorial views. C and D. Cnestidium  
rufescens, Smith 880, polar and equatorial views. E and F.  
Pseudoconnarus macrophyllus, Ducke 1344, polar and  
equatorial views.



A

10μ



B



C

10μ

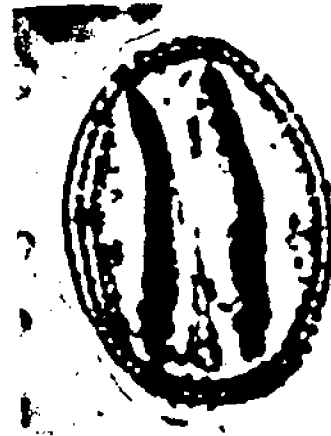


D



E

10μ



F

Fig. 15. Pollen grains. A and B. Connarus angustifolius,  
Silva 57889, polar and equatorial views. C and D. Rourea  
puberula, Martius 1267, polar and equatorial views.



A



B

10μ



C



D

10μ

Fig. 16. Pollen grains. A and B. Hourea adenophora, Pittier 2566, polar and equatorial views showing the reticulate structure of the exine. C and D. R. frutescens, Patris s.n., polar and equatorial views. E and F. R. grosourdyana, France 9563, polar and equatorial views.



A

10μ



B



C

10μ

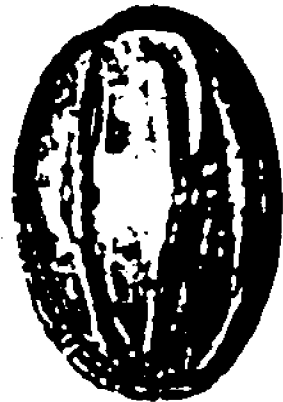


D



E

10μ



F

Fig. 17. Pollen grains. A and B. Hourea induta, Riedel  
s.n., polar and equatorial views. C and D. R. martiana,  
Martius 1625, polar and equatorial views.



A

10μ



B



C

10μ



D

Species	P( $\mu$ )	E( $\mu$ )	100·P/E	Shape	Size
<u>Rourea puberula</u>	32	22	145	Prolate	Medium
<u>Rourea adenophora</u>	23,5	21	111	Prolate Spheroidal	Small
<u>Rourea frutescens</u>	25	20	125	Subprolate	Medium
<u>Rourea induta</u>	32	20	160	Prolate	Medium
<u>Rourea grosourdyana</u>	25	16	150	Prolate	Medium
<u>Rourea martiana</u>	37	27	137	Prolate	Medium
<u>Bernardinia comans</u>	30	22	136	Prolate	Medium
<u>Cnestidium rufescens</u>	26,5	21	126	Subprolate	Medium
<u>Connarus angustifolius</u>	31	26	119	Subprolate	Medium
<u>Pseudoconnarus macrophyllus</u>	26	17	152	Prolate	Medium

From the above comparative list it can be concluded that there is a correlation between length of the polar and equatorial axes and size of the flower; thus, the larger grains are found in R. martiana, which has some of the largest flowers in the genus, as do most members of section Multifoliolatae. Comparatively large pollen grains are also found in R. blanchetiana (polar axis = 28 $\mu$ ) and in R. discolor (polar axis = 35 $\mu$ ). No taxonomically significant differences in size or structure have been detected at the generic level.

## 12. Fruit

There is usually only one fruit because of the abortion of four ovaries. Very rarely two fruits are found on one flower. The pubescence of the fruit was used by Schellenberg (1938) to help differentiate sections. However, this is a variable character, and glabrous fruits as well as fruits covered with some kind of pubescence are found in the same or in closely related species. The fruits are striate lengthwise and display bright colors (red, scarlet, yellow, orange). They are ellipsoid to ovoid, or rarely pyriform when immature, slightly curved or straight, always opening lengthwise by a ventral slit. The fruit calyx is accrescent and persistent. In some species the calyx covers loosely the base or lower half of the fruit, in others it is more or less reflexed. In most species the sepals are imbricate but free for most of their length. In one species, however, they are perfectly anastomosed, forming a tube with five teeth and covering up to two thirds of the mature fruit. The seed is not expelled, but hangs out of the opening, giving the appearance of a papilionaceous flower from a distance (Fig. 18 J, K).

## 13. Seed

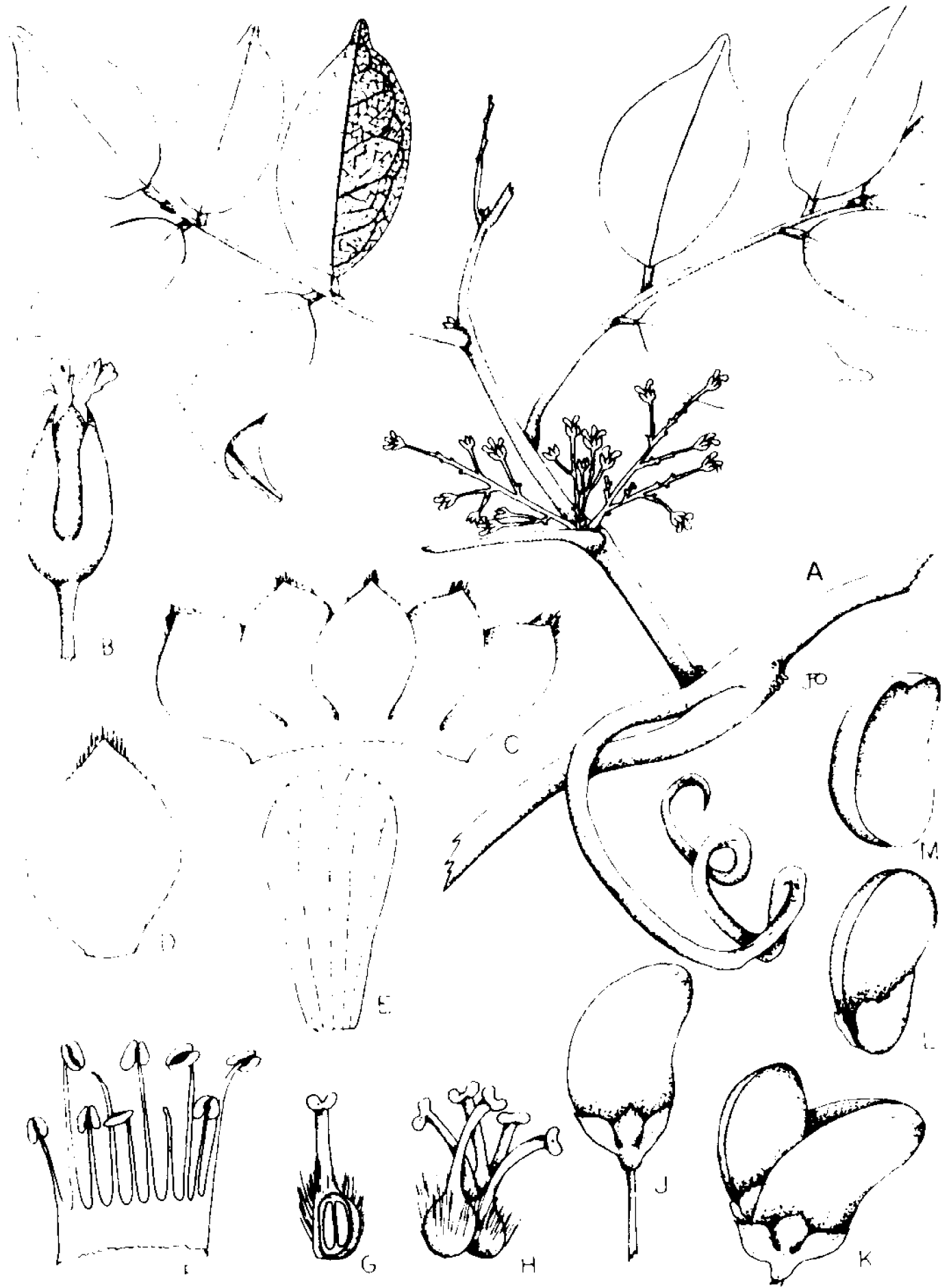
Each fruit contains one mature seed, which is black and usually shiny and smooth. It has a fleshy, yellow, white or orange arilloid. The seeds are elliptic and thick and occupy

most of the interior of the fruit. There is no endosperm.

The fleshy part of the seed has been misinterpreted as a true aril by many workers (e.g., Britton, 1908; Schellenberg, 1938; Steyermark, 1938; Woodson, 1950); this mistake was pointed out by Leenhouts (1958b). A true aril is attached to the hilum or to the funicle. The "arilloid" or false aril found in Rourea is attached to the testa, and does not come into contact with either the hilum or the funicle (Fig. 18 L, M).

The area underneath the arilloid is smooth or has small protuberances. This character can be used in a few instances to help differentiate species (e.g., R. surinamensis and R. neglecta).

Fig. 18. Rourea spp. illustrating vegetative and reproductive structures. A - E and G - M. Rourea glabra. F. R. induta. Magnifications approximate. A. Habit (x 0.4). Lundell 3051. B. Flower just after anthesis (x 5). Chanek 169. C. Calyx (x 8). Gentle 3401. D. Sepal (x 8). Gentle 3401. E. Petal (x 8). Gentle 3401. F. Stamen tube (x 8). Pohl 2359. G. Ovary and pair of ovules (x 8). Gentle 3401. H. Five carpels (x 8). Gentle 3401. J. Fruit (x 2). McVaugh 10193. K. Open fruit and seed (x 2). McVaugh 10193. L. Seed (x 1.5). Moore 2900. M. Open seed showing fissure at apex where embryo is located (x 2). McVaugh 10193.



## DISTRIBUTION AND ECOLOGY

The genus Rourea sensu lato is pantropical. Rourea and Connarus are the only genera within the family with such wide-spread distribution. The following description of distribution and ecology is restricted to the American species of Rourea subgenus Rourea.

Within the American tropics the range of the genus extends from Mexico and Cuba (lat. 23°-24° N, i.e., just below the tropic of Cancer) to the Brazilian state of Santa Catarina (lat. 27° S). Species belonging to Rourea are found throughout the Greater Antilles, and from Mexico through Central America to Colombia, Venezuela, the Guianas, Ecuador, Perú, Bolivia and Brazil as far south as the states of Paraná and Santa Catarina.

The genus Rourea is found in a wide range of lowland habitats. Throughout its range in the Neotropics, species of Rourea are found growing in almost all possible environments below 1000 m altitude. The fact that a large number of the collections made in Amazonia are from river margins can not be taken as an indication of preference for this type of habitat. An equal number of collections have been made from "forest on terra firme," "rain forest," etc. Some species, such as those belonging to section Cordatae, grow better in the sandy soils of the savannas; others, like R. induta, are very common in the cerrados, which are low, wooded savannas

of the Planalto of Central Brazil. Few collections have been made in disturbed areas such as roadsides or secondary forests, indicating a distinct preference for primary areas.

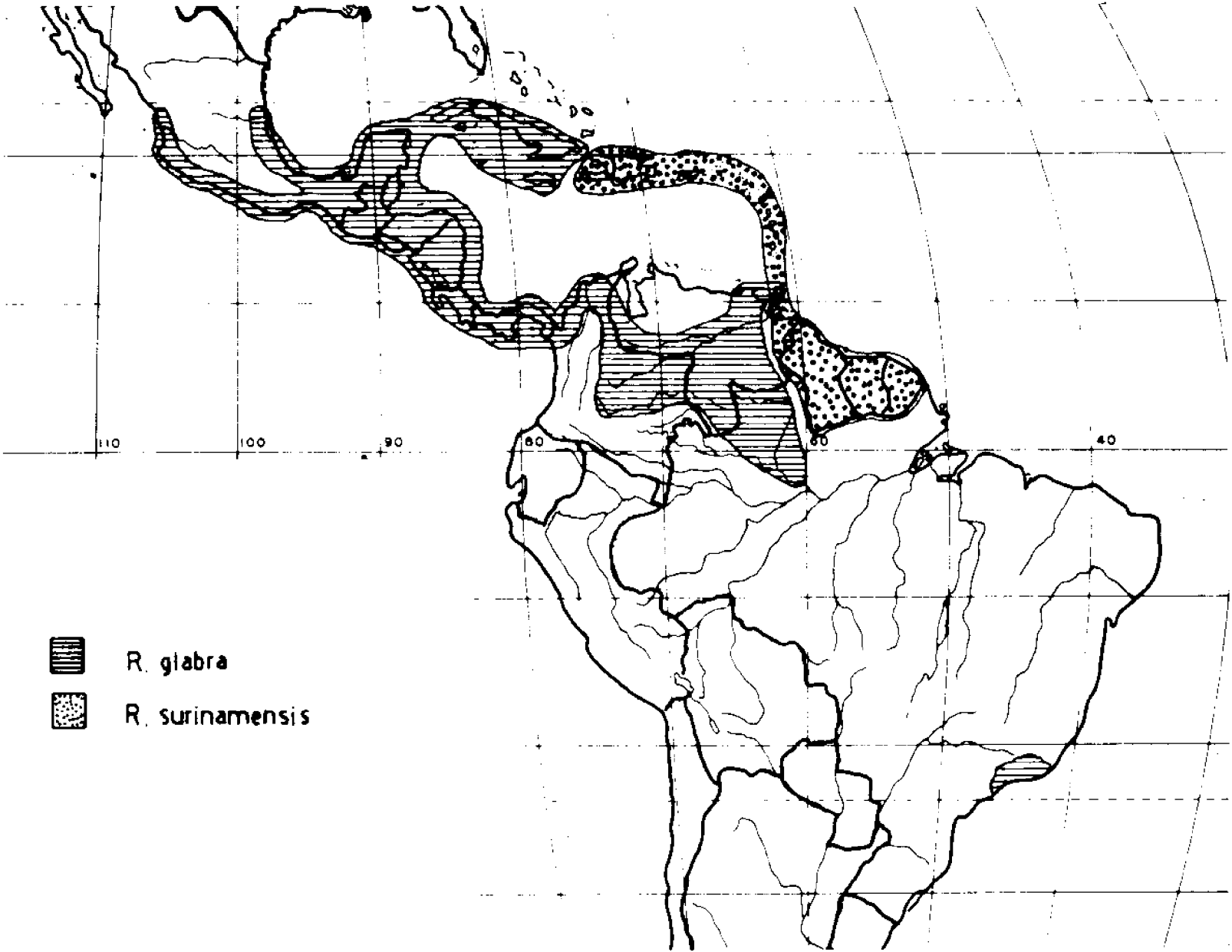
Collections of Rourea have been made from plants growing on serpentine soils, sandy soils, red clay soils, limestone, rocky soils, and lateritic soils. Some species grow mostly on one type of soil but can also be found on other soils. There is no marked tendency of the genus as a whole to grow in a particular kind of soil.

Geographical replacement of species or groups of species occurs throughout the range of the genus. Even R. glabra, the most widespread of the species, is replaced by R. surinamensis in Haiti, Dominican Republic, Puerto Rico and the Lesser Antilles. It is found again in Trinidad, but disappears in most of the Amazon region, the Guianas and the Planalto of Central Brazil, and is re-found in small quantities in the coastal forest of Brazil, in the area of Rio de Janeiro (Fig. 19).

All species in Central America, with the exception of R. glabra, are restricted to that geographic region. Species belonging to section Cordatae are restricted to the savannas or savanna margins of the Guiana shield in Northern Brazil, Guyana and Venezuela, just outside the limits of the superposed Roraima sediments, and of the Amazon forest as delimited by Ducke and Black (1954) (Fig. 20).

The species and varieties of Rourea found in Amazonia generally follow the patterns of distribution implied by Ducke and Black's (1954) subdivision of Amazonia into seven phytogeographic regions (Fig. 21). These are interesting to note

Fig. 19. Map showing distribution of Rourea glabra and R. surinamensis.



*R. glabra*



*R. surinamensis*

Fig. 20. Map showing distribution of Hourea subgenus Hourea section Cordatae, and of R. camptoneura.

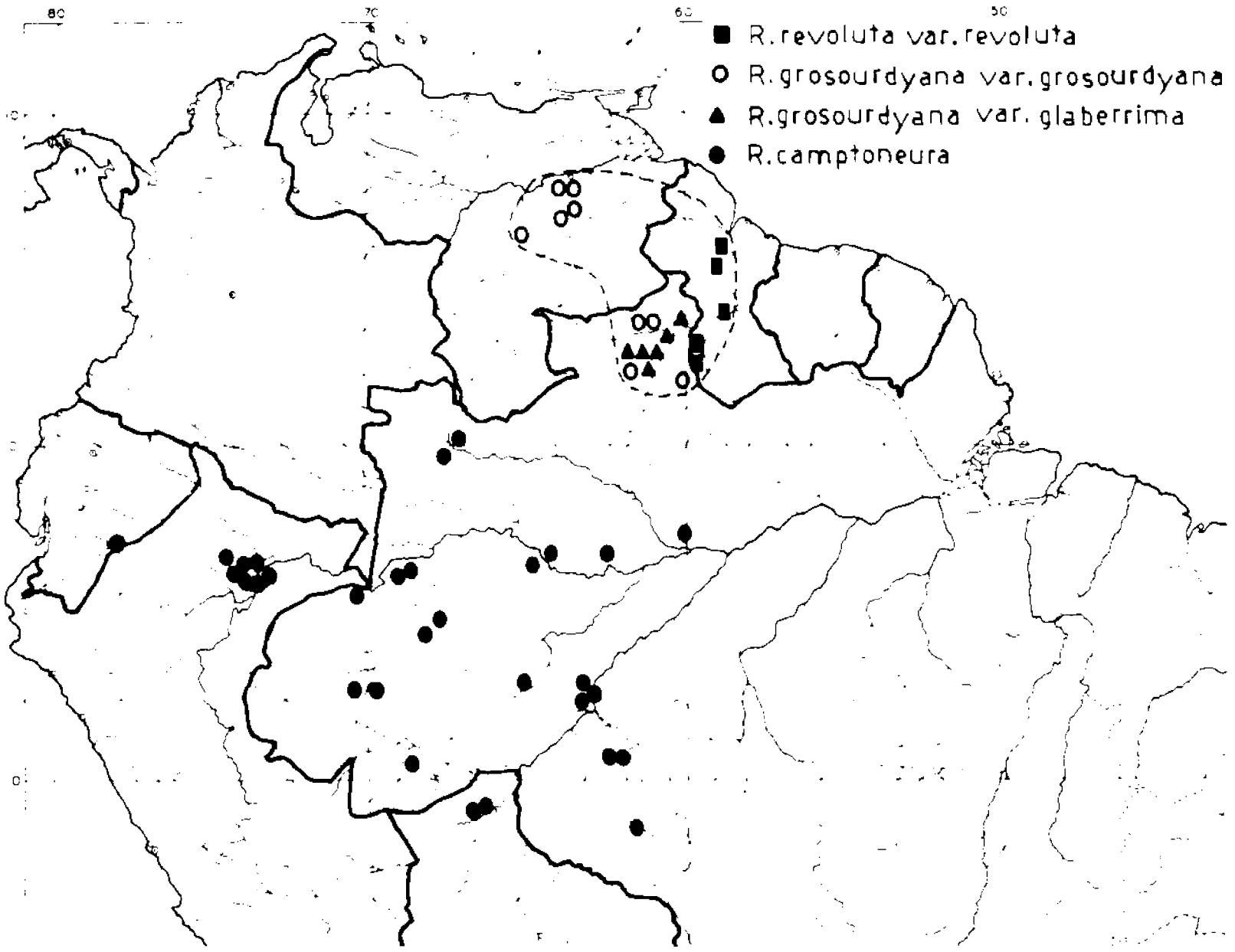
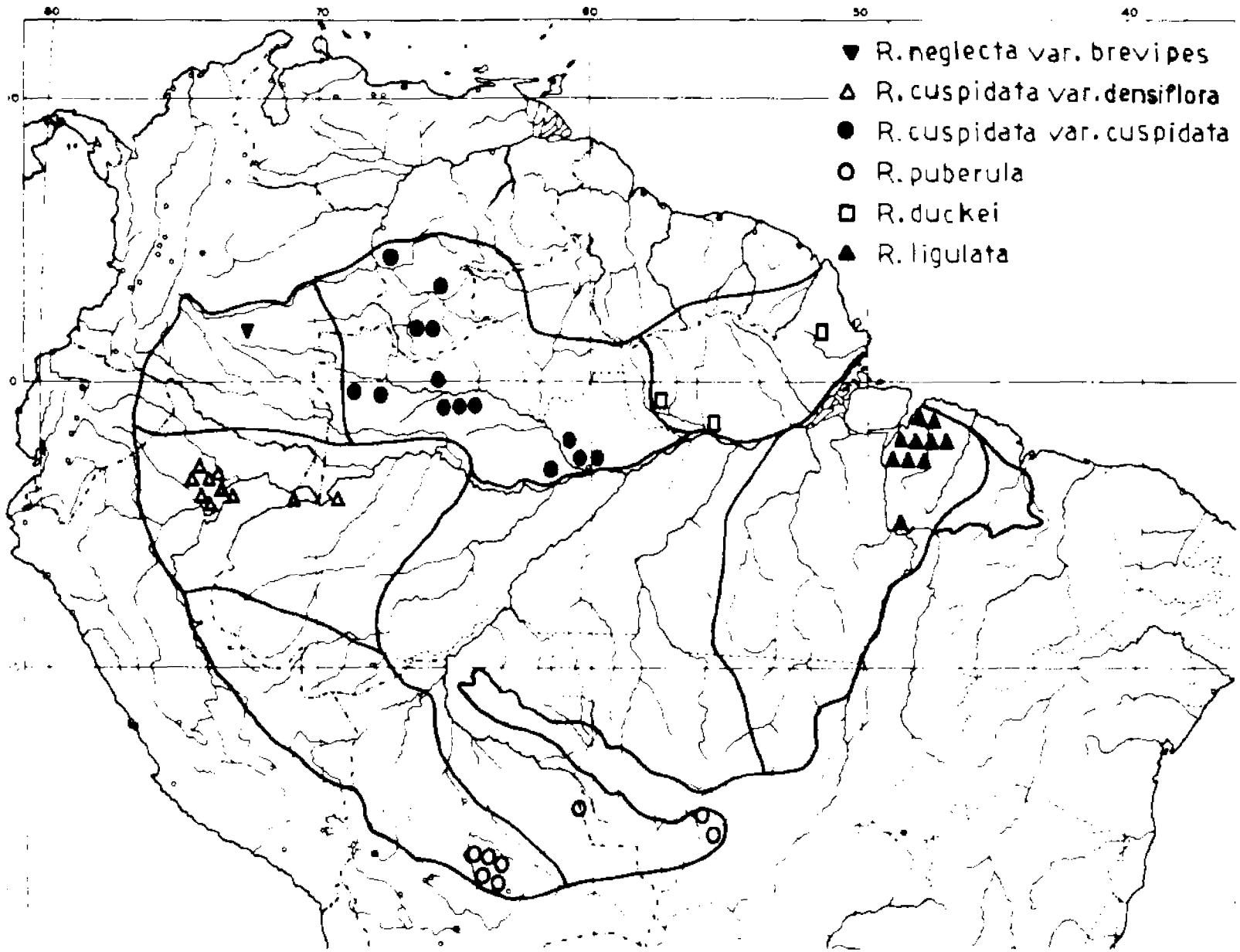


Fig. 21. Map showing the seven phytogeographic regions of Amazonia as defined by Ducke and Black (1954), and the distribution patterns of six taxa of Rourea.



(although they may reflect collections patterns): 1) Rourea neglecta var brevipes is found in the northwestern floristic region. 2) Rourea cuspidata var cuspidata and var pedicellata R. krukovi, R. neglecta var neglecta, and R. sprucei var sprucei occur in the northern floristic region. 3) Rourea kappleri and R. duckei are restricted to the northeastern region. 4) Rourea paraensis, R. ligulata and R. doniana have been collected in the states of Pará and Maranhão, in the southeastern region. 5) In the southern floristic region occur R. puberula and R. cuspidata var multijuga. 6) Rourea puberula is also found in the southwestern floristic region. 7) The western region includes R. cuspidata var densiflora and Rourea omissa. Rourea amazonica, R. camptoneura and R. accrescens are widespread throughout the Amazon region.

Definite distribution patterns can also be observed in other species (Fig. 22). Rourea frutescens and R. pubescens grow in the Guianas and adjacent Venezuela and Trinidad, and in the similar coastal areas of northeastern Brazil. Rourea surinamensis has so far been collected in the Guianas, adjacent Venezuela, and the Antilles from Trinidad to Puerto Rico, but not in other areas.

Rourea induta and the species belonging to section Multifoliolatae are also distributed in a clearly marked area. Section Multifoliolatae (Fig. 23) is found outside the limits of the Amazon region, in the Brazilian states of Bahia, Minas Gerais, Goiás, and Distrito Federal, while R. induta (Fig. 24) is confined to the Planalto of Central Brazil.

Fig. 22. Map showing distribution of seven taxa of Rourea.

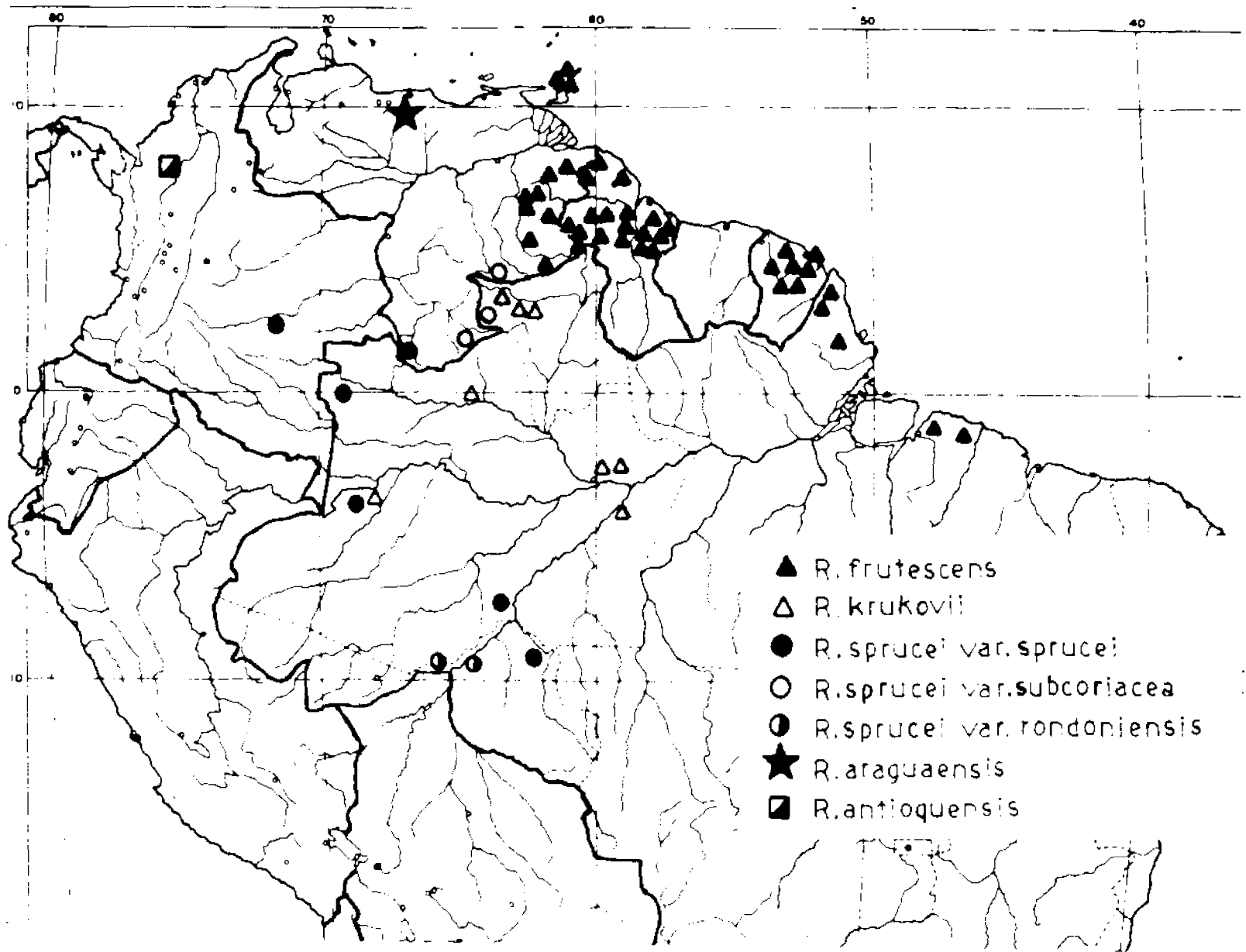


Fig. 23. Map showing distribution of Rourea subgenus Rourea section Multifoliolatae.

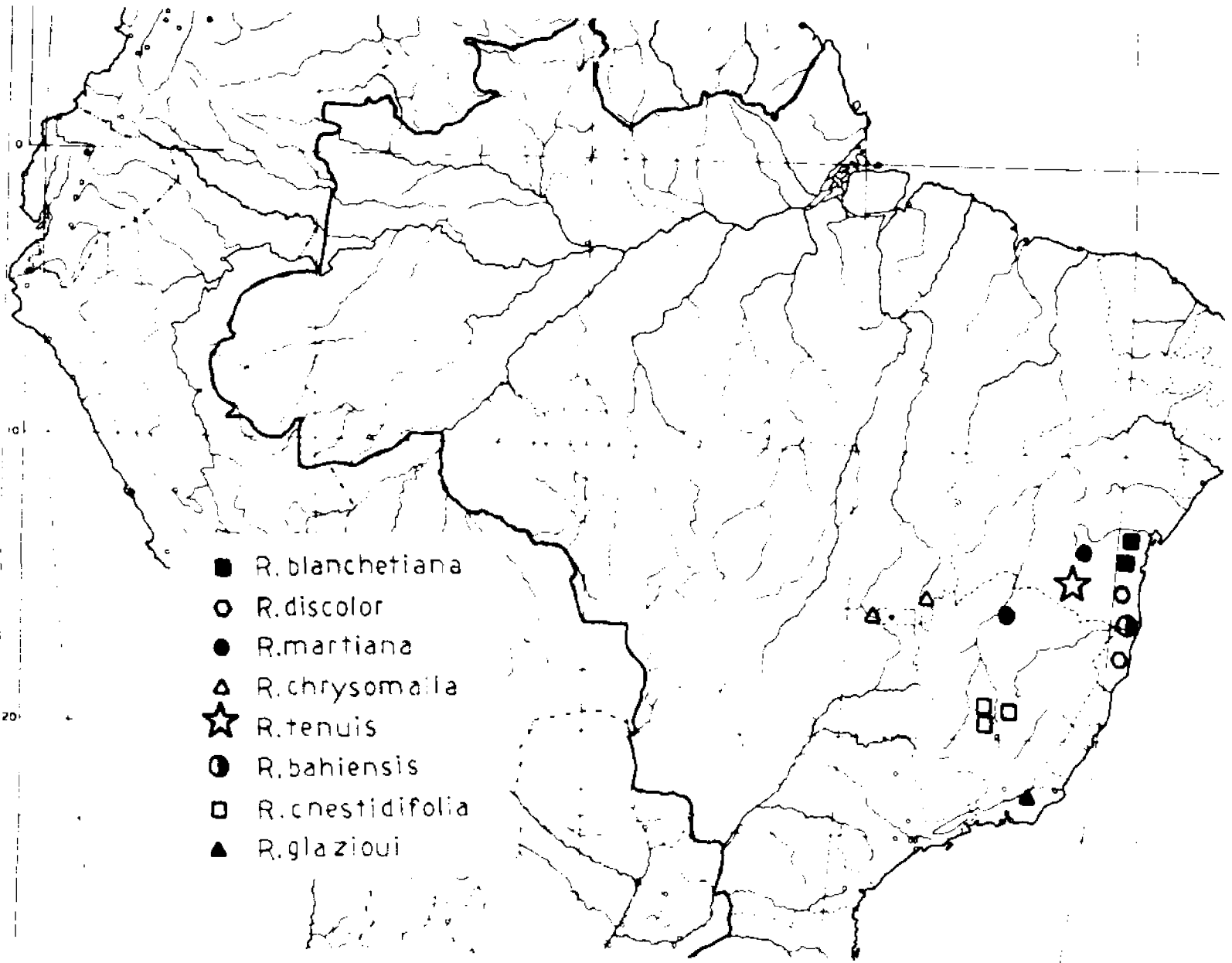
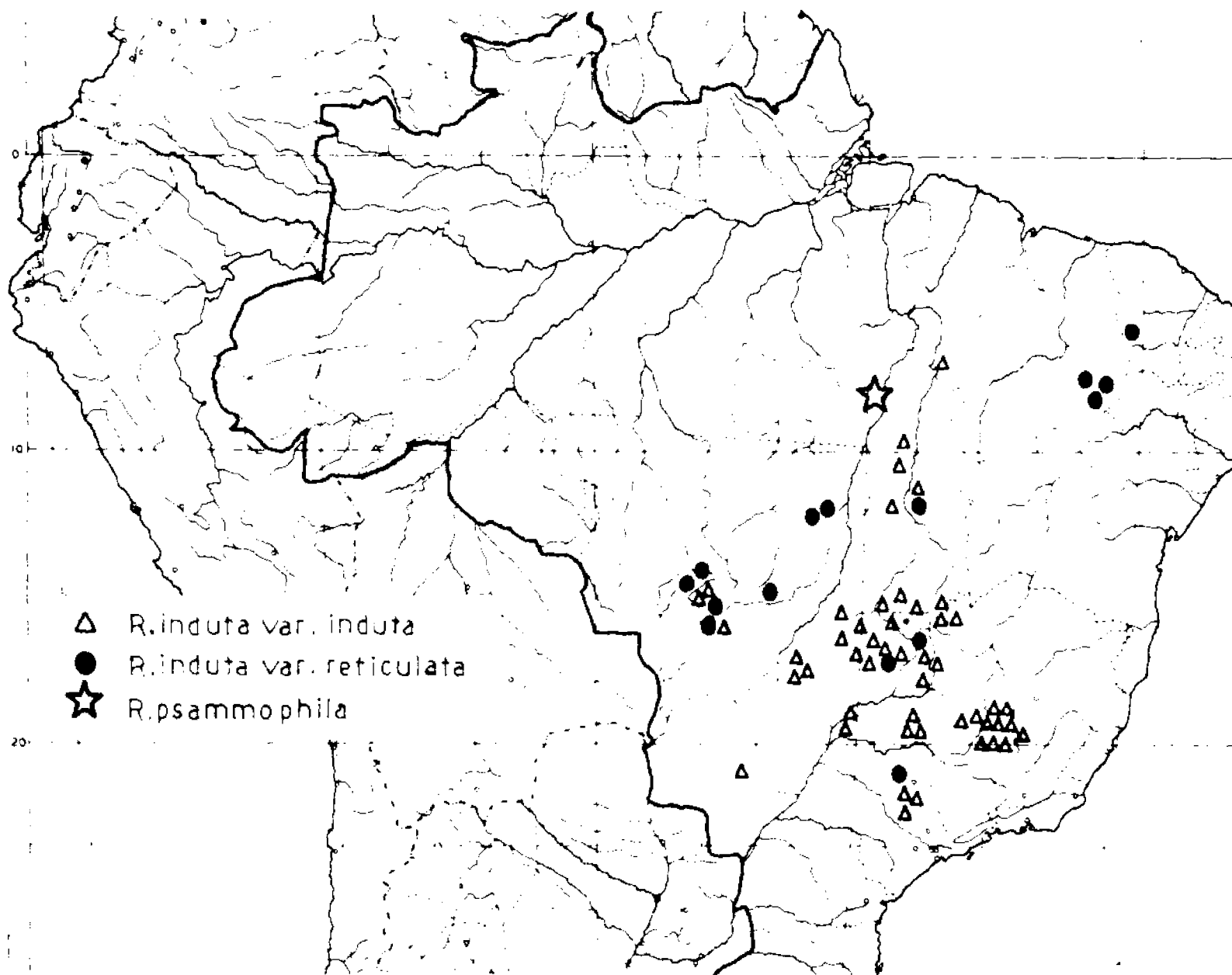


Fig. 24. Map showing distribution of Rourea subgenus Rourea  
section Indutae.



- △ *R. induta* var. *induta*
- *R. induta* var. *reticulata*
- ☆ *R. psammophila*

## USES

The economic value of Rourea species is limited. The seeds and roots of some species (e.g., R. glabra) have been used as a dog poison, which has given rise to the Brazilian vernacular name "mata cachorro." A decoction of the leaves of R. glabra is said to be used as a medicine for sore throat.

The root bark of R. induta has been reported as a medicine for rheumatism, and the stems of the same species are reportedly used to tie up pigs, which has given rise to the Brazilian vernacular name "pau de porco."

A decoction of the roots of some Old World species (e.g., R. rugosa Planchon, from Malaysia) is used as a medicine for stomach-ache and dysentery. The fleshy arilloid of some species is eaten by the natives in certain Old World countries (fide Leenhouts, 1958b).

## SECTIONAL RELATIONSHIPS

The genus was first subdivided into sections by Planchon in 1850. Almost every author who has dealt with the family as a whole has provided a different reorganization of the species. While Planchon accepted Byrsocarpus, Bernardinia and Rourea as different genera and divided the latter in the sections Dalbergioideae and Mimosoideae, Baillon (1869) considered those three genera as sections of Rourea and disregarded completely the sectional division given by Planchon. Radlkofer (1886) went back to Planchon's nomenclature, adding at the same time several species to the section Dalbergioideae and the first American species to the section Mimosoideae (R. martiana Baker). The same classification was used by Gilg (1894).

Schellenberg (1910) rearranged the whole family, and proposed two subfamilies (Connaroideae and Cnestideae) and a number of tribes and subtribes. On that occasion he removed some genera from Planchon's tribe Cnestideae and placed them in his subfamily Connaroideae. He placed Rourea, as well as Byrsocarpus and Santaloides, in tribe Roureeae subtribe Roureinae, and omitted any subdivision of Rourea. In 1938, Schellenberg reorganized the family again. Aside from proposing the subfamilies Connaroideae and Jollydoreae, and placing his earlier subfamily Cnestidoideae under Connaroideae, he abolished his tribe Roureeae with all the subtribes and

proposed four new tribes, retaining only tribe Connareae, and this was very much modified. At the same time Schellenberg subdivided Rourea into four new sections: Adenophorae, Strigosae, Glabrae and Indutae. As a result of his splitting of the genus Rourea into a number of smaller genera, the original sections Dalbergioideae and Mimosoideae of Planchon were removed from Rourea and became subgenera of Santaloides. No citation of these sections is found under Rourea.

The work of Leenhouts (1958b), although of a restricted regional nature, provided a reorganization of Rourea. He considered the genera Byrsocarpus, Jaundea, Santaloides and Santaloidella as synonyms of Rourea. He divided Rourea into three subgenera: Jaundea, Rourea and Palliatus and described two sections under subgenus Palliatus: section Dalbergioideae and section Mimosoideae. He included Schellenberg's Santaloides subgenus Dalbergioideae and subgenus Mimosoideae as synonyms of Rourea subgenus Palliatus section Dalbergioideae, while placing Santaloides subgenus Afrosantaloides as a synonym of Rourea subgenus Palliatus section Afrosantaloides.

He included the genera Byrsocarpus and Jaundea in subgenus Jaundea which he did not subdivide further. Leenhouts did not consider the subdivision of the American species of Rourea. He included them in subgenus Rourea, together with the monotypic African genus Santaloidella.

The previous subdivisions of Rourea, as described here, are summarized in Table 2. I have also included in this table the taxonomic history of the five American genera (Bernardinia, Cnestidium, Connarus, Pseudoconnarus and Rourea)



and of the six genera accepted by Planchon (1850) in the first treatment of the family: Byrsocarpus, Rourea, Bernardinia, Agelaea, Roureopsis, and Conarus.

The American representatives of Rourea, the genus Rourea of Schellenberg, or the American species of the subgenus Rourea of Leenhouts, were last subdivided by Schellenberg (1938) into four sections: Adenophorae, Indutae, Strigosae<sup>1</sup> and Glabrae.

These sections are artificial, as are many of Schellenberg's subdivisions of genera. He distinguished sections Adenophorae and Indutae from sections Rourea and Glabrae on the basis of different types of pubescence of calyx and fruit, i.e., calyx and fruit tomentose-villous vs. calyx minutely pilose or more or less glabrous and fruit glabrescent. This character is very variable, especially in the species belonging to sections Adenophorae and Glabrae. Schellenberg's failure to use other floral characters for the differentiation of sections resulted in artificial sections which are aggregations of quite unrelated species.

A good example is that of R. discolor. This species has very little in common with most of the species belonging to section Glabrae, both in vegetative and flower characters, but was placed by Schellenberg in that section, (because of

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<sup>1</sup>According to Article 22 of the International Code of Botanical Nomenclature (1966), the section of Rourea Aublet subgenus Rourea containing the type of the genus (R. frutescens Aublet) must be called Rourea subgenus Rourea section Rourea and not Rourea subgenus Rourea section Strigosae Schellenberg.

its glabrous leaflets), far apart from more closely related species such as R. blanchetiana, which was considered by him to be a member of section Adenophorae.

Rourea martiana, R. glazioui and R. chrysomalla were placed by Schellenberg in section Adenophorae, together with such unrelated species as R. adenophora and R. pittieri, on the basis of the presence of glandular hairs.

In the present treatment of Rourea, flower characters were particularly useful in delimiting the new section Multi-foliolatae. The most important of these characters are the connate petals and the comparatively long staminal tube. Important vegetative characters are the reduced inflorescence of most species, and the increase in number of leaflets in most species with a correlated decrease in size of individual leaflets.

When I have used vegetative characters to help in the definition of the sections, I have placed much emphasis on their constancy. A good example of one such constant character is the pubescence of the lower surface of the leaflets in section Rourea. In all species of section Rourea, as defined here, there are hairs present on the lower surface of the leaflets. The hairs are appressed, parallel to each other and, in most species and varieties, they are directed towards the margin of the leaflets, and are at the same time roughly parallel to the lateral veins. In a few species the hairs are found only on the midrib. When this is so the hairs are appressed and more dense on the sides of the midrib. Section

Rourea is closely related to section Adenophorae; both of these sections include mainly forest species. Section Rourea is also related to section Cordatae.

I consider the new section Cordatae very natural because it includes species which share several characters, and which grow in the same or very similar habitats. These species are R. revoluta (including R. revoluta var glabra) and R. grosourdyana (including R. grosourdyana var glaberrima). The inflorescence in these two species is produced in short, conspicuously lenticellate, lateral branchlets. The staminal tube is of similar length with that of section Indutae, shorter than that of section Multifoliolatae and longer than the tube in the remaining three sections. The most important vegetative character is the cordate or subcordate base of the leaflets. It is also correlated with the characteristic obovate-oblong shape of the terminal leaflet, with the constantly acute or obtuse apex of the leaflets, and with the very short petiolule. The number of leaflets which is usually seven (rarely five or nine) is also useful in distinguishing the species of this section.

Section Cordatae is related to section Rourea. This relationship is shown by the similar morphological characters found in some species of both sections, as well as by their geographical distribution.

When a taxon ( in this case a genus) is subdivided, the resulting groups are not of necessity equally well delimited, nor are the discontinuities of the same magnitude in every

case. This is the case with section Glabrae, which brings together a group of closely related species. Although it shares a number of characters with other sections, it constitutes a biological entity in itself. The character given in the key, "leaflets glabrous above and below," is the most striking character in the section and has been used here only after careful examination of all the specimens available. It reflects, without doubt, a fixed genetic feature of the species involved. There are, to be sure, some specimens which possess a few scattered hairs on the lower surface of the leaflets but which can be placed in this section on the basis of other correlated characters such as size of flower, length of staminal tube, number of leaflets, etc.

Most of the species belonging to section Glabrae have petals 0.5 cm long or less and a very short staminal tube, which in some species is only 0.01 cm long (the filaments are very rarely free to the base). The calyx is glabrous in most species but may also be glabrescent or puberulous; in many cases it has a ciliate margin and barbate apex. Most of the species have acuminate or cuspidate leaflet apices.

Some of the species belonging to this section resemble those of section Adenophorae but the presence of pubescence on one or both surfaces of the leaflet in section Adenophorae, as well as the presence of glandular hairs, are strong enough characters to distinguish them. Section Glabrae is also related to section Rourea. The most important differences between these two sections are summarized in Table 3.

TABLE 3  
MORPHOLOGICAL DIFFERENCES BETWEEN SECTIONS  
GLABRAE AND ROUREA

	Section <u>Glabrae</u>	Section <u>Rourea</u>
Leaflet number	1-5 (15 in <u>R. glabra</u> var <u>jamaicensis</u> )	(5-) 7 (11 in <u>R. sprucei</u> var <u>rondoniensis</u> )
Terminal leaflet	Elliptic (rarely obovate)	Oblong-obovate (rare- ly elliptic)
Pubescence of la- mina below	Glabrous	Pubescent, the hairs appressed
Pubescence of mid- rib below	Glabrous	Pubescent
Reticulate venation	Faint	Strong
Venation below	Plane or Prominulous	Prominent
Pubescence of rachis and petiole	Glabrous or puberulous	Tomentose, pilose, densely pilose (rarely puberulous)
Pubescence of inflorescence	Glabrous or puberulous	Densely tomentose

Section Glabrae is the most widespread of the sections of Rourea in the American tropics. It contains 16 species and is therefore the largest. This section includes mainly forest species.

In section Indutae Schellenberg, the staminal tube is

usually shorter than that of section Multifoliolatae, of similar length with that of section Cordatae, and longer than that of the remaining sections. The flowers are usually comparatively large, and the petals are 0.6-0.7 cm long. The dense pubescence of the calyx, which usually appears brownish in herbarium specimens, is characteristic of this section. The leaflets are coriaceous or subcoriaceous and may be tomentose or glabrous on both surfaces; the midrib is always tomentose; the venation is reticulate, and prominent in most leaflets.

Section Indutae is intermediate between the forest species and the Planalto species. The relationships of the type species, R. induta, are discussed under "Phylogeny."

SYNOPSIS OF THE AMERICAN SECTIONS OF

ROUREA SUBGENUS ROUREA

1) Rourea Aublet section Glabrae Schellenberg, Pflazenreich  
Heft 103: 205. 1938.

Rourea Aublet section Dalbergioideae subsection Americanae  
Planchon, Linnaea 23: 414. 1850, pro parte.

Lianas. Plants without glandular hairs. Staminal tube less than 0.05 cm long; petals free, c. 0.5 cm long; calyx glabrous, glabrescent or puberulous, the margin sometimes ciliate, the apex sometimes barbate. Leaflets (1-)3-7 (rarely -15), glabrous above and below; the base obtuse, the apex acuminate or cuspidate. Fruit glabrous or with sparse hairs.

Type species: Rourea glabra H.B.K., Nov. Gen. et Sp. 7: 41. 1825.

This section is retained with little change; a few species have been added or withdrawn from it without greatly changing the group. Species belonging to this section are found mainly in forests throughout the neotropical range of the genus.

2) Rourea Aublet section Adenophorae Schellenberg, Pflanzenreich Heft 103: 195. 1938.

Lianas. Staminal tube less than 0.05 cm long; petals free, c. 0.5 cm long; calyx and pedicel pubescent, provided with glandular hairs. Inflorescence paniculate, pubescent, sometimes with glandular hairs. Leaflets 1-5(-7), more than 3 cm long, pubescent above and below, mainly on midrib and veins.

Type species: Rourea adenophora Blake, Bull. Torr. Bot. Club 50(8): 273. 1923.

This section is retained, although it has been considerably altered. The species that have glandular hairs, a short staminal tube, fewer than 9 leaflets (usually 3-7), and leaflets more than 3 cm long, are now included in section Adenophorae. The species belonging to this section occur mainly in forest.

3) Rourea Aublet section Rourea.

Rourea Aublet section Dalbergioideae Planchon subsection Americanae Planchon, Linnaeae 23: 414. 1850, pro parte.

Rourea Aublet section Strigosae Schellenberg, Pflanzenreich Heft 103: 202. 1938.

Lianas. Plants without glandular hairs. Staminal tube less than 0.05 cm long (0.08-0.1 in R. gracilis only); petals free, 0.5 cm long; calyx usually puberulous. Inflorescence paniculate. Leaflets 3-9, more than 3 cm long, glabrous

above, pubescent below; hairs in the majority of species appressed, parallel, mostly directed towards the margin of the leaflets and more or less parallel to the lateral veins (in some species hairs erect); pubescence covering the whole foliolar surface or present only on midrib and veins.

Type species: Rourea frutescens Aublet, Hist. Pl. Guiane 1: 467, tab. 187. 1775.

This section is also maintained, with the addition of a few recently described or new species. The species belonging to this section occur mostly in forest. Represented throughout the range of the genus, this section is most strongly developed in the Amazon and in northern South America, with one species extending into Central America and three in central and southern Brazil.

4) Rourea Aublet section Indutae Schellenberg, Pflanzenreich Heft 103: 199. 1938.

Rourea Aublet section Dalbergioideae Planchon subsection Americanae Planchon, Linnaea 23: 414. 1850, pro parte.

Shrubs or small trees. Plants without glandular hairs. Staminal tube 0.05-0.08 cm long; petals free, 0.6-0.7 cm long. Inflorescence paniculate. Calyx and fruit tomentose or villous, usually appearing brown in herbarium specimens. Leaflets coriaceous or subcoriaceous, tomentose or glabrous above and below; venation reticulate, prominent in most leaflets.

Type species: Rourea induta Planchon, *Linnaea* 23: 417. 1850.

This section is maintained, with the addition of one species. As in the case of section Multifoliolatae, the species belonging to section Indutae are from south and central Brazil, where they are components of the cerrado vegetation.

5) Rourea Aublet section Cordatae Forero, sect. nov.

Rourea Aublet section Dalbergioideae Planchon, *Linnaea* 23: 414. 1850, pro parte.

Rourea Aublet section Glabrae Schellenberg, *Pflanzenreich* Heft 103: 205. 1938, pro parte.

Arbor parva vel liana. Stamina in tubum connata, tubo 0.05-0.08 cm longo, petala libera. Inflorescentia paniculata, in brevis conspicue lenticellatis ramulorum crescentia. Foliola (5-)7(-9), oblongo-ovata, saepe lanceolata, terminalia plerumque obovata-oblonga, apice acuta ver breviter acuminata, base cordata necnon subcordata usque rarior truncata.

Small trees or lianas. Plants without glandular hairs. Staminal tube 0.05-0.08 cm long, petals free. Inflorescence paniculate, produced on short, conspicuously lenticellate lateral branchlets. Leaflets (5-)7(-9), oblong-ovate, often lanceolate, the terminal leaflet usually obovate-oblong, the apex acute or shortly acuminate, the base cordate or subcor-

date, rarely truncate; petiolule 0.01-0.2 cm long.

Type species: Rourea revoluta Planchon, Linnaea 23: 415. 1850.

The species belonging to this section grow in the savannas, savanna margins or islands of forest in savannas in Venezuela, the Brazilian territory of Roraima and adjacent Guyana.

The types of both parts of sections cited as synonyms under section Cordatae fall within the limits of other sections.

6) Rourea Aublet section Multifoliolatae Forero, sect. nov.

Rourea Aublet section Mimosoideae Planchon, Linnaea 23:

420. 1850, pro parte (the American species R. martiana).

Rourea Aublet section Adenophorae Schellenberg, Pflanzenreich Heft 103: 195. 1938, pro parte.

Rourea Aublet section Glabrae Schellenberg, l.c., pro parte.

Frutex, frutex scandens, vel arbor parva. Stamina in tubum alto connata, tubo 0.08-0.15 cm longo; petala (0.6-) 0.8-1.2 cm longa, versus basi connata. Inflorescentia in paniculis radactis, rarior perfecta, interdum pseudoumbellata vel racemiformis. Foliola 11-33(5-16-juga), pubescentia vel glabra, plerumque minus quam 3 cm longa, rarior 5 cm longa; apice plerumque rotundatus; calyce, bractee et inflorescentia cum piliglanduliferi munita vel eglandulosa.

Shrubs, scandent shrubs or small trees. Staminal tube 0.08-0.15 cm long; petals (0.6-)0.8-1.2 cm long, connate near base. Inflorescence a reduced panicle, only rarely perfect, sometimes pseudo-umbellate or racemoid. Leaflets 11-33 (5-16-jugate), pubescent or glabrous, usually less than 3 cm long, rarely up to 5 cm long, the apex usually rounded; glandular hairs present on calyx, bracts and inflorescence, or absent.

Type species: Rourea blanchetiana (Progel) Kuhlmann, Arq. Inst. Biol. Veg. 1: 40, fig. 1. 1934.

The species belonging to this section are from the Planalto of Brazil and adjacent areas (i.e., states of Bahia, Pernambuco, Goiás, Minas Gerais, São Paulo).

The types of all the parts of sections cited above in synonymy, fall within the limits of other sections.

## SPECIFIC AND INFRASPECIFIC CONCEPTS

In the present treatment, the delimitation of taxa has been made on the basis of morphological characters, ecological data and geographical distribution. At the specific level, recognition of separate entities has not proved difficult in the majority of cases. Some species show remarkable homogeneity and can be recognized at a glance and almost without doubt (e.g., R. surinamensis). Other species are morphologically very plastic, and their delimitation and recognition is more difficult (e.g., R. amazonica, R. puberula). In such cases it has been necessary to make use of small technical characters in order to establish differences. The more widespread species show a certain degree of intergradation with other related species (e.g., R. glabra and R. cuspidata; R. cuspidata and R. ligulata; R. amazonica and R. puberula). The same is true for less widely distributed species where they come in contact with others or when they are completely sympatric with them.

The degree of sympatry is high among species belonging to the same section. This is especially true for species growing in the Amazon region, northern South America and Central America. Species belonging to a given section are, for the most part, allopatric with species belonging to other sections. Species growing in southern, central and eastern Brazil are markedly allopatric, and there is a high degree of

endemism. Endemism is also common in Central America. It should be stressed here that this apparent endemism may be due to lack of intensive collection in certain areas.

At the infraspecific level only varieties are considered in this treatment. The term "variety" is used here in the sense of a local or regional segment of a species with a reasonably well defined area and more or less distinct morphology. These varieties show some degree of morphological intergradation, and no clear-cut lines can be drawn between them.

Recognition of infraspecific taxa in widely distributed species (e.g., R. glabra) has proved difficult and only in a few cases has this been possible (e.g., R. glabra var jamai-censis, R. glabra var glabra and R. glabra var floribunda).

At both specific and infraspecific levels, the determination of sterile materials is very difficult, and only approximations can be made to their identity. Either flowers or fruits are required in most cases, and in some species both are necessary.

## PHYLOGENY

Based upon characters such as connate vs free petals, type of inflorescence, length of staminal tube, and leaflet number and size, the American species of Rourea subgenus Rourea can be segregated into two groups: (1) the species belonging to section Multifoliolatae, (2) the species belonging to the remaining five sections. There are three species intermediate between these two groups: Rourea induta, R. gracilis and R. tenuis, all from southern and central Brazil.

There is a clear trend of evolution towards specialization of characters from the forest species to the species growing in more or less open areas such as the Planalto and adjacent regions of Brazil. The characters that show this trend best are:

- a) Reduction of the inflorescence from a congested or lax panicle (in forest species) to a few-flowered panicle or even a pseudo-umbellate or racemoid inflorescence (in section Multifoliolatae).
- b) Petals free (in forest species) to petals basally connate (in section Multifoliolatae).
- c) Staminal tube comparatively short in forest species, to long (c. 0.1 cm) in section Multifoliolatae.
- d) Fewer and larger leaflets in forest species to more numerous, smaller leaflets in section Multifoliolatae.

The intermediate species share characters with both groups. Rourea induta has free petals, medium-sized flowers, stamens joined for 0.05-0.1 cm of their length, and a densely tomentose fruit. Occasionally, reduced leaves occur at the base of short inflorescences. Rourea gracilis, a member of section Rourea and the southernmost species yet found in the genus in America, shares with section Multifoliolatae the long staminal tube and the few-flowered although perfectly paniculate inflorescence. Rourea tenuis, a member of section Multifoliolatae, shares with the other sections the few leaflets (3-5), which are larger than those of any other species in its section. It has, however, connate petals, a long staminal tube, a reduced inflorescence, and glands on the calyx.

The trends of evolution in other areas are not as clear as those outlined for section Multifoliolatae. It is probable that section Cordatae, another section found mostly in open habitats, is an advanced section, which has much in common with some species belonging to section Rourea. The species in section Cordatae have a long staminal tube, but their petals are free and their flowers are of normal size for the genus. This section shares with section Multifoliolatae the cordate or subcordate base of the leaflets and the short petiolule. A tendency towards stabilization of the number of leaflets at seven is also noticeable as opposed to the lower number usually found in forest species.

The center of dispersion of Rourea species (at least in the American tropics) has been the forest habitat, and quite

possibly the Amazon region. It is here and in adjacent forested areas that the largest number of species is found, all sharing the same basic set of characters. The several taxa found in south-central Brazil and in northern Brazil and adjacent Venezuela and Guyana have probably evolved from this original stock. The section Multifoliolatae is made up of species which, so far, appear to be endemic to particular areas.

Possible phylogenetic relationships among the species within each of the six sections will be given in the discussion of some of the taxa.

SYSTEMATIC TREATMENT

Rourea Aublet, Hist. Pl. Guiane 1: 467, tab. 187. 1775.

Santaloides Linné, Fl. Zeyl. 192. 1747, p. maj. p.

Kalawael Adanson, Fam. Pl. 2: 344. 1763.

Robergia Schreber, Gen. 1: 309, no. 387. 1789.

Malbrancia Necker, Elem. Bot. 2: 366, no. 1171. 1790.

Connarus DC. in Prodr. 2: 84. 1825, non Linn.

Byrsocarpus Schum. & Thonn, Kongl. Dansk. Vid. Selsk. Skrift. 4(3): 246. 1827.

Eichleria Progel in Mart. Fl. Bras. 12(2): 518. 1877.

Santalodes Linné ex O. Kuntze, Rev. Gen. Pl. 1: 155. 1891, nom. illegit.

Jaundea Gilg, Notizbl. Berl. - Dahl. 1: 66. 1895.

Santaloidella Schellenberg, Pflanzenreich Heft 103: 118. 1938.

Rourea Aublet subgenus Rourea Leenhouts, Fl. Males. ser. 1, 5 (4): 512. 1958.

Rourea Aublet sect. Dalbergioideae Planchon subsection Americanae Planchon, Linnaea 23: 414. 1850.

Rourea Aublet sect. Mimosoideae Planchon, Linnaea 23: 420. 1850, pro parte.

Santaloidella Schellenberg, Pflanzenreich Heft 103: 118. 1938.

Woody vines or erect shrubs, sometimes small trees. Stems terete, smooth or rarely slightly striate, the twigs often twining. Stipules absent. Leaves imparipinnate, (1-)3-33-foliolate. Leaflets subchartaceous or chartaceous to coriaceous, rarely membranaceous, usually dorsiventral; pubescent or glabrous, with papillae present on lower surface in some species, short-petiolulate or sessile, the petiolule 0.01-0.5 cm long. Inflorescences axillary, pseudoterminal or terminal, paniculate, the panicles perfect or sometimes reduced, lax or congested. Bracts ovate-lanceolate, triangular, or stipitiform, usually small (0.1-0.4 cm long). Bracteoles usually small (0.1-0.2 cm long) and fimbriate. Flowers bisexual, pentamerous. Sepals distinctly imbricate, orbicular or ovate to lanceolate, acute or obtuse, outside and inside pubescent or glabrous, usually ciliate along the margins, the apex often barbate. Petals oblong, oblong-lanceolate or lanceolate, glabrous, rarely more than 0.5 cm long, white or yellowish white. Stamens 10, connate at base, the five opposite the petals distinctly larger than the five opposite the sepals; filaments filiform, glabrous. Anthers dorsifixed, globose, rarely more than 0.5 mm in diameter, uniform, dehiscent longitudinally. Pistils 5, heterostylous, free; ovary sessile, tomentose or pilose-lanate, very rarely glabrescent; style slender, glabrous or pubescent; stigma 2-lobed; ovules 2 per carpel, basal, collateral, erect. Calyx in fruit accrescent, erect or more or less reclined, persistent, coriaceous or subcoriaceous, the lobes long or short. Fruit

1 follicle (very rarely 2) per flower, straight or slightly curved, ellipsoid to ovoid, delicately striate longitudinally, glabrous, glabrescent or densely tomentose, opening by a ventral slit. Seed one per fruit, ovoid, globular, with a fleshy arilloid incompletely covering the basal half, leaving the funicle free; arilloid usually yellow or orange; testa dark, shiny, smooth; endosperm lacking; embryo inverted. (Fig 18A-M).

Type species: Rourea frutescens Aublet, Hist. Pl. Guiane 1: 467, tab. 187. 1775.

KEY TO THE SECTIONS OF ROUREA SUBGENUS ROUREA

1. Leaflets 1-7(-9-15), usually more than 3 cm long,  
the apex cuspidate or acuminate; staminal tube  
(0.01-)0.05-0.08 cm long.

2. Staminal tube 0.01-0.05 cm long; forest lianas.

3. Leaflets glabrous above and below.

Section 1 Glabrae, page 123.

3. Leaflets pubescent above or below, or  
throughout.

4. Calyx and pedicels glandular-pubescent;  
leaflets pubescent above either on midrib  
or on entire laminal surface, pubescent  
below.

Section 2 Adenophorae, page 206.

4. Calyx and pedicels eglandular;  
leaflets glabrous above, pubescent  
below, either on midrib or on whole  
surface.

Section 3 Rourea, page 216.

2. Staminal tube 0.05-0.08 cm; small trees,  
shrubs or woody vines, mainly of savanna and  
cerrado.

5. Calyx tomentose or villous; leaflets  
coriaceous or subcoriaceous; species of the  
Planalto of Central Brazil.

Section 4 Indutae, page 254.

5. Calyx glabrous or glabrescent; leaflets subchartaceous to chartaceous; species of Guyana, adjacent Venezuela and Terr. Roraima, Brazil.

Section 5 Cordatae, page 268.

1. Leaflets 11-33(3-5 in R. tenuis), usually 3 cm long or less, the apex rounded (obtuse); staminal tube 0.08-0.15 cm long.

Section 6 Multifoliolatae, page 280.

KEY TO THE SPECIES AND VARIETIES  
OF SECTION GLABRAE

1. Inflorescence glabrous or glabrescent; sepals barbate at apex and sometimes ciliate on margin; otherwise glabrous.
2. Leaflets plane or only slightly revolute, chartaceous or rigid-chartaceous (rarely subcoriaceous).
3. Venation impressed above (rarely plane).
4. Calyx in fruit appressed to the very base of the fruit or reflexed, the sepals 0.1-0.3 (0.4) cm long, imbricate; fruit characteristically pyriform; leaflets cuspidate (apex (0.5-)0.7-2.5 cm long); rachis of the inflorescence slender.
5. Leaflets (2.5-)4-11 cm long, (1-)1.7-6 cm wide.
6. Leaves 1-(rarely 2-) jugate.
7. Pedicels 0.3-0.5 cm long; petiolules glabrous; leaflets gradually cuspidate.
  - 1a. R. cuspidata var cuspidata.
7. Pedicels 0.7-1 cm long; petiolules puberulous; leaflets sharply cuspidate.
  - 1b. R. cuspidata var pedicellata.

6. Leaves 2-5-jugate.

1d. R. cuspidata var multi-juga.

5. Leaflets (6-)9-25 cm long, (4-)6-12  
cm wide.

1c. R. cuspidata var densiflora.

4. Calyx in fruit appressed to the lower  
half of the fruit; sepals in fruit 0.1-  
0.3(0.4) cm long, very short- or not-  
imbricate; fruit not pyriform; leaflets  
acuminate (acumen 0.5-1 cm long); rachis  
of the inflorescence thick.

2. R. ligulata.

3. Venation prominent or prominulous above.

8. Pedicel 0.25-0.6 cm long, ca 0.5 mm thick;  
inflorescence lax, axillary to pseudo-  
terminal; leaflets rigid-chartaceous;  
apex acuminate (acumen 0.5 cm long) to  
sharply acuminate (acumen 0.7-1.5 cm  
long).

9. Fruits 1-1.5 cm long; leaflets 3-5  
(-7).

3a. R. glabra var glabra.

9. Fruits 1.5-2 cm long; leaflets (7-)  
11-15

3b. R. glabra var jamaicensis.

8. Pedicel 0.1-0.2 cm long, ca 1 mm thick;  
inflorescence dense (multiflorate).

terminal or pseudoterminal; leaflets  
chartaceous, apex short-acuminate  
(acumen 0.2-0.5 cm long).

4. R. gardneriana.

2. Leaflets revolute, coriaceous or rigid-  
coriaceous.

10. Peduncle 0.2-0.6 cm long.

11. Leaflets (unifoliolate-) 1-(very  
rarely 2-) jugate; rigid-coriaceous;  
testa under arilloid smooth; leaf-  
lets acuminate (acumen 0.6-1.5 cm  
long).

5. R. surinamensis.

11. Leaflets (1-)2-3-jugate; coriaceous;  
testa under arilloid sculptured;  
leaflets sharply acuminate (acumen  
1-2.5 cm long).

6a. R. neglecta var neglecta.

10. Peduncle obsolete (-0.1 cm long).

6b. R. neglecta var brevipes.

1. Inflorescence pubescent; sepals in flower  
puberulous, in fruit puberulous or glabrescent.

12. Venation of leaflets reticulate; petals less  
than 0.6 cm long (-0.7 cm long in R. omissa).

13. Leaflets chartaceous or subcoriaceous,  
plane, short- or long-acuminate.

14. Venation of leaflets prominent or

prominulous above.

15. Inflorescence lax, pauciflorate,  
axillary or pseudoterminal.

3c. R. glabra var floribunda.

15. Inflorescence dense, multiflorate,  
terminal.

4. R. gardneriana.

14. Venation of leaflets diffuse or plane  
(rarely prominulous)above.

16. Petals 0.6-0.7 cm long; inflo-  
rescence 7-11 cm long, lax, racemoid,  
i.e., with very short, mostly one-  
to three-flowered, branches.

9. R. omissa.

16. Petals up to 0.5 cm long; in-  
florescence 4-14 cm long, paniculate.

17. Leaflets subcoriaceous; branch-  
lets ferruginous-pubescent  
(species of Suriname and Terr.  
Amapá, Brazil).

7. R. kappleri.

17. Leaflets chartaceous; branch-  
lets glabrescent or cinerous-  
pubescent (species of Amazonia  
and Central Brazil).

18. Inflorescence 7 cm long or  
shorter (rarely 8 cm); ter-

minal leaflet to 11 cm long  
(very rarely longer).

19. Leaflets (2.5-)4-7 cm  
long, 1.5-3.3 cm broad,  
ovate-elliptic or ovate;  
inflorescence up to 4 cm  
long (rarely longer).

10. R. doniana.

19. Leaflets (3.5-)7-12(-15)  
cm long, (3-)3.5-6 cm  
broad, elliptic, rarely  
orbicular or ovate-  
oblong, inflorescence 5-  
11 cm long.

11. R. puberula.

18. Inflorescence (4-)7-14 cm  
long; terminal leaflets  
(4-)8-31 cm long.

20. Calyx lobes in fruit  
imbricate; leaves 1-  
jugate; terminal leaf-  
lets 8-31 cm long,  
usually obovate.

12. R. amazonica.

20. Calyx lobes in fruit  
not imbricate; leaves

2-jugate; terminal leaflets (4-)8-15 cm long; elliptic.

13. R. duckei.

13. Leaflets coriaceous, revolute (at least the base), short-acuminate.

8. H. paraensis.

12. Venation of leaflets transverse, at least on the lower half of the blade; petals 0.7-1 cm long (0.5 cm long in H. accrescens but then calyx in fruit accrescent, forming a long tube).

21. Petals 0.7-1 cm long; sepals in fruit imbricate.

22. Petals 0.8-1 cm long, 0.25 cm broad; species of Amazonia.

14. H. camptoneura.

22. Petals 0.7 cm long, 0.4 cm broad; species of Central America.

15. H. schipplii.

21. Petals 0.5 cm long; sepals in fruit accrescent, forming a tube 0.5-0.9 cm long (calyx lobes 0.15-0.2 cm long).

16. H. accrescens.

KEY TO THE SPECIES OF SECTION ADENOPHORAE

1. Leaflets glabrous above; midrib puberulous to densely tomentose; species of Central America.

2. Petiole, rachis, axes of inflorescence and sepals sparsely pubescent to glabrate; lower side of leaflets glabrous, venation puberulous or sparsely tomentose.

17. R. adenophora.

2. Petiole, rachis, axes of inflorescence and sepals densely griseous-tomentose; lower side of leaflets, especially midrib, tomentose.

18. R. pittieri.

1. Leaflets pubescent above and below; species of Brazil.

19. R. prancei.

KEY TO THE SPECIES AND VARIETIES  
OF SECTION ROUREA

1. Venation of leaflets reticulate.
2. Leaflets chartaceous, rigid-chartaceous or subcoriaceous, without papillae, plane.
3. Pubescence more or less dense, covering entire lower surface of the leaflets.
4. Venation of leaflets prominulous above; pubescence appressed below, the hairs lying parallel to each other, or, when not appressed, then very sparse.
5. Pedicels (0.5-)0.6-0.8 cm long; petals 0.6-0.7 cm long; leaflets cuspidate to subcaudate, the apex (0.5-)1-2 cm long.

22. R. araguaensis.

5. Pedicels 0.1-0.5(-0.6) cm long; petals 0.3-0.5 cm long; leaflets short-acuminate, the acumen 0.3-1.5 cm long.
6. Inflorescence 7-14 cm long; midrib sparsely or densely pubescent above.
7. Leaflets consistently obovate, rarely elliptic, short-acuminate (acumen 0.3 cm long); sepals ovate, densely grey tomentose.

20. R. frutescens.

7. Leaflets elliptic or broadly elliptic, long-acuminate (acumen 0.5-1.5 cm long); sepals sub-orbiculate, puberulous.

21. R. antioquensis.

6. Inflorescence 1-6 cm long; midrib glabrous above.

8. Leaflets chartaceous; acumen acute; pedicel 0.3-0.5(-0.6) cm long.

23a. R. sprucei var sprucei.

8. Leaflets rigid-chartaceous to sub-coriaceous; acumen emarginate; pedicel 0.1(-0.3) cm long.

23b. R. sprucei var subcoriacea.

4. Venation plane or impressed above; pubescence erect, more or less dense.
9. Sepals in fruit oblong-ovate, 0.6 cm long, puberulous.

23c. R. sprucei var rondoniense.

9. Sepals in fruit linear-lanceolate, 0.7 cm long, glabrous.

25. R. pseudospadicea.

3. Pubescence restricted to midrib.
10. Inflorescence 4-6 cm long.

26. R. gracilis.

10. Inflorescence 12-13 cm long.

27. R. laurifolia.

2. Leaflets coriaceous, papillose beneath,  
margin markedly revolute.

28. R. krukovi.

1. Venation of leaflets transverse.

11. Pubescence covering entire lower surface  
of the leaflets.

12. Hairs parallel to each other (and  
roughly to lateral veins), appressed  
(Guianas).

13. Leaflets whitish below, dull  
(hairs white).

24a. R. pubescens var pubescens.

13. Leaflets light brown, shiny below  
(hairs brown).

24b. R. pubescens var spadicea.

12. Hairs erect, dense (Central America).

29. R. latifoliolata.

11. Pubescence restricted to midrib and  
lateral veins of leaflets (Central America).

30. R. suerrensis.

KEY TO THE SPECIES AND VARIETIES  
OF SECTION INDUTAE

1. Leaflets acuminate (acumen 0.2-0.5 cm long), broadly elliptic or ovate; base rounded, equal.

2. Calyx tomentose; reticulation of leaflets prominulous or plane; leaflets densely to sparsely puberulous.

31a. R. induta var induta.

2. Calyx griseo-sericeous; reticulation of leaflets prominent; leaflets puberulous on midrib below.

31b. R. induta var reticulata.

1. Leaflets acute, narrowly elliptic; base usually slightly unequal.

32. R. psammophila.

KEY TO THE SPECIES AND VARIETIES  
OF SECTION CORDATAE

1. Leaflets markedly revolute; papillae well-developed beneath.

2. Leaflets densely pubescent below.

33a. R. revoluta var revoluta.

2. Leaflets glabrous below.

33b. R. revoluta var glabra.

1. Leaflet plane or slightly revolute; papillae poorly developed or absent.

3. Leaflets pubescent below.

34a. R. grosourdyana var grosourdyana.

3. Leaflets glabrous below.

34b. R. grosourdyana var glaberrima.

KEY TO THE SPECIES AND VARIETIES  
OF SECTION MULTIFOLIOLATAE

1. Plants without glandular hairs; leaflets glabrous above and below, 4-12-jugate.
  2. Leaflets papillose and whitish below.

35. R. discolor.
  2. Leaflets without papillae, paler beneath than above but not whitish.

36. R. bahiensis.
1. Plants with glandular hairs on calyx and inflorescence; leaflets pubescent above or below or both, or, if glabrous, then 14-16-jugate.
  3. Leaflets 14-16-jugate, glabrous above and below, the midrib sparsely tomentose below.

37. R. blanchetiana.
  3. Leaflets 1-8-jugate, tomentose above or below or both.
    4. Leaflets 1-2-jugate.

38. R. tenuis.
    4. Leaflets (4-)5-8-jugate.
      5. Inflorescence racemose; fruits sessile; calyx and fruit densely tomentose.

39. R. chrysomalla.

5. Inflorescence a reduced panicle; fruits pedunculate, the peduncule 0.5 cm long; calyx and fruit puberulous.

6. Leaflets (5-)7-13-jugate.

40. R. glazioui.

6. Leaflets 5-6-jugate.

7. Leaflets acute, revolute, 4 times as long as wide, shiny above, the petiolule 0.1 cm long; inflorescences 3-7 cm long.

41. R. cnestidifolia.

7. Leaflets rounded at apex, entire, 2-5 times as long as wide, dull above, short-petiolulate or sessile; inflorescences 2-4 cm long.

42. R. martiana.

SECTION 1 GLABRAE

1. Rourea cuspidata Bentham ex Baker, in Martius, Fl. Brasil. 14(2): 181, fig. 43. 1871.

Scandent shrub or woody vine; branchlets terete, glabrous to sparsely puberulous, inconspicuously lenticellate. Leaves imparipinnate, 1-2-(rarely 5-) jugate, rarely unifoliolate; petiole 1-8 cm long, glabrous to minutely puberulous; rachis 0.7-6 cm long, glabrous. Leaflets 2.5-17(-25) cm long, 1-8 (-12) cm broad, elliptic, oblong-elliptic or obovate, sub-chartaceous, chartaceous or rigid-chartaceous, glabrous above and below, the apex cuspidate or acuminate, the base obtuse or cuneate; petiolule 0.1-0.5 cm long; venation reticulate, impressed (rarely plane) above, prominulous or plane below; lateral veins 4-8 pairs, diverging from midrib at angles of (40°-) 50°-80°, anastomosing more or less clearly near margin. Inflorescence panicle, terminal, rarely axillary or pseudo-terminal, the rachilla 3-6.5(-10) cm long, glabrous or glabrescent; bracts 0.05-0.1 cm long, triangular. Pedicels articulate, (0.2-)0.3-1 cm long above articulation; sepals 0.15-0.3 cm long, 0.1-0.2 cm broad, lanceolate or oblong-elliptic, glabrescent without, puberulous or tomentose within, the apex barbate; petals 0.3-0.5 cm long, 0.1-0.2 cm broad, oblong, oblong-obovate or oblong-elliptic, glabrous, free; stamens 10, five short c. 0.1-0.2 cm long, five long c. 0.2-0.4 cm

long, the tube 0.02-0.05 cm long; anthers globose, 0.05(-0.07) cm in diameter; ovary pilose, c. 0.1 cm long; style glabrous or pubescent, 0.07-0.2 cm long; stigma two-lobed. Fruit 1-1.2 cm long, 0.3 cm wide, glabrous, the immature (and sometimes mature) ones typically pyriform; calyx in fruit 0.4 cm long, reclined or ascending but covering only the base of the fruit, the lobes in fruit 0.3 cm long, slightly or not imbricate, glabrescent. Seed 0.6-0.8 cm long, c. 0.4 cm wide; arilloid 0.2-0.4 cm long; testa under arilloid smooth.

1a. Rourea cuspidata var cuspidata

Rourea cuspidata Benth., in Pl. Spruce, Exsicc. n. 1901.

hourea glabra var parviflora Baker, in Martius, Fl.

Brasil. 14(2): 182. 1871. Type examined (K): Brazil, "ad fluminis Casiquiare, vasiva et Pacimoni." R. Spruce 3273 fl. 1853-4. Isotypes examined (BR, C, F, G, GH, NY, P, RB, W).

Santalodes cuspidatum (Benth. ex Baker) O. Ktze., Rev.

Gen. 1: 155. 1891.

Lectotype examined (K). Brazil, "Secus Rio Negro, Brasiliae septentrionalis inter barra et Barcellos." R. Spruce 1901 fl. Nov 1851. (Lectotype chosen by Schellenberg, 1938). Isotypes examined (C, F, G, GH, M, NY, P, RB, W). Paratypes examined (G, K, M, W): Brazil, Amazonas, "inter Barcellos et San Isabel," R. Spruce 1924 fl. fr. Dec 1851.

Scandent shrub with numerous branches. Leaves 1-2-jugate, rarely unifoliolate; petiole 1-5 cm long, glabrous; rachis 0.7-3 cm long (rarely obsolete), glabrous. Leaflets 2.5-11 cm long, 1-5 cm broad, elliptic, oblong-elliptic or slightly obovate, chartaceous; apex cuspidate, the base obtuse or cuneate; venation impressed above; lateral veins 4-8 pairs. Inflorescence pseudoterminal or terminal, the rachilla 4-6.5 cm long, glabrous or glabrescent. Pedicels articulate, (0.2-) 0.4-0.5 cm long above articulation, glabrescent; sepals 0.15-0.3 cm long, 0.1-0.15 cm broad, lanceolate; petals 0.3-0.5 cm

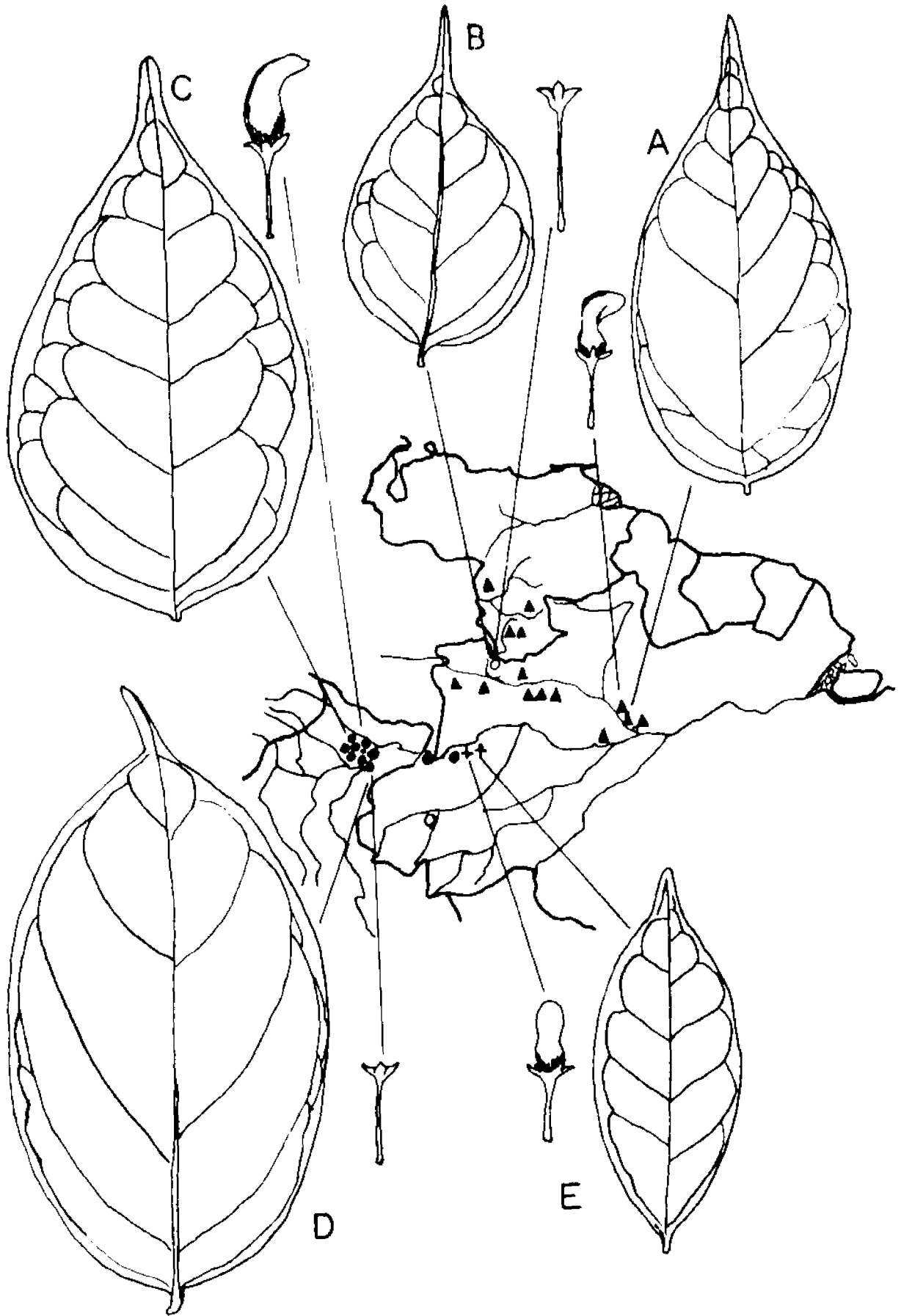
long, 0.1-0.2 cm broad, oblong-obovate, glabrous, free. Fruit when immature (and usually mature) characteristically pyriform, 1 cm long, 0.3 cm wide, glabrous. Seed 0.6 cm long; arilloid 0.2 cm long.

Distribution: Northern Amazonia, in the Brazilian state of Amazonas and adjacent Venezuela. Occurring in forest and at river margins, at altitudes of 50 to 200 m above sea level.

As pointed out elsewhere, R. cuspidata var cuspidata very closely resembles R. ligulata. As is the case in the rest of the varieties of R. cuspidata, the typical variety can be distinguished by the characteristically pyriform immature (and in many occasions mature) fruits, by the more or less reflexed fruiting calyx by the impressed venation of most leaflets. Characters separating var cuspidata from the very similar var pedicellata include the shorter pedicels and the shorter acumen of the leaflets. Some of the differences among the varieties of R. cuspidata are illustrated in the pictorialized distribution map in Fig. 25.

VENEZUELA. Terr. Amazonas: Río Siapa, Río Casiquiare, 5 Apr 1953, B. Maguire & J. J. Wurdack 34854 fl. (GH, NY, S); Río Yatua, Subiendo el Río desde el Cerro Araucana, 1°30' N; 66°5' W, 13 Apr 1970, J. A. Steyermark & G. Bunting 102618 fr. (NY); Delta del Ventuari, Raudal Trapichote, 20 Apr 1942, Ll. Williams 14982 fl. (F, S, VEN); Esmeralda, Alto Orinoco, 14 May 1942, Ll. Williams 15362 fl. (F, US, VEN). BRAZIL. Amazonas: South San António, 29 Feb 1968, R. Boyan 282 fr. (INPA); Solimões, Rio Manacapuru, lago da margem direita, 26 Mar 1967, P. Cavalcante & M. Silva 1787 fr. (F, MG, NY); Manaus, Rio

Fig. 25. Pictorialized distribution map showing some of the differences between the varieties of Rourea cuspidata. A. R. cuspidata var cuspidata . Leaflet (x 1); peduncle, calyx and fruit (x 2). B. R. cuspidata var pedicellata. Leaflet (x 1); pedicel and calyx (x 2). C. R. cuspidata var densiflora. Leaflet (x 0.7); peduncle, calyx and fruit (x 2). D. R. cuspidata var densiflora. Leaflet (x 1); pedicel and calyx (x 2). E. R. cuspidata var multijuga. Leaflet (x 1); peduncle, calyx and immature fruit (x 2).



Tarumã, Cachoeira baixa, 8 Jan 1942, A. Ducke 2171 fl. (GH);  
 Manaus, Igarapé da Cachoeira Grande, 20 May 1938, A. Ducke  
RB25665 fr. (RB); Rio Negro, Tapurocoara, 6 Apr 1947, R. L.  
Frões 22049 fl. (COL, U); Rio Negro, Tapuruquara, 7 Apr 1947,  
J. M. Pires 288 fl. (COL); Rio Negro, Uanarí, próximo de Uaupés  
 (São Gabriel), 31 Oct 1947, J. M. Pires 810 fr. (NY); Rio Tiquié,  
 entre Fátima e Parí, 11 Jun 1962, J. M. Pires & N. T. Silva 7995  
 fl. fr. (UB); Rio Acarí (Acary), 11 Mar 1945, G. Proctor Cooper  
III 10 fr. (NY, US); Rio Urubú, 15 minutos abaixo do repartimen-  
 to, 12 Dec 1956, W. Rodrigues 343 fl. (INPA); Borba, margem do  
 Rio Acarí, Fazenda Piquitã, 21 Mar 1960, W. Rodrigues 1569 fr.  
 (INPA); Manaus, estrada do Paracuúba, 9 May 1961, W. Rodrigues  
& L. Coêlho 2555 fr. (INPA); Manaus, estrada do Aleixo, km 14,  
 Porto Maciã, 23 Apr 1970, W. Rodrigues 8831 fr. (INPA); Region  
 de Manaus, 6 Oct 1958, Schnell 9199 fl. (MG); "Secus Rio Negro,  
 Brasiliae septentrionalis inter Barcellos et San Isabel," Dec  
 1851, R. Spruce 1926 fl. fr. (G); Rio Negro, gapô above Barcellos,  
 Dec 1851, R. Spruce 2036 fl. (K); "Prope Panurê ad Rio Uaupés,"  
 Oct 1852 - Jan 1853, R. Spruce 2432 fr. (C, G, GH, K, P, W).  
 Pará: Tapeirinha, Santarém, 21 Dec 1938, Markgraf 3825 fl. (RB);  
 Fazenda Santo André, Município da Muaná, Ilha de Marajó, 5 Apr  
 1962, B. S. Pena 15 fr. (UB).

1b. Hourea cuspidata var pedicellata Baker, in Martius, Fl. Brasil. 14(2): 181. 1871.

Holotype examined (K): Brazil, "Prope San Gabriel da Cachoeira, ad Rio Negro." R. Spruce 2376 fl. Jan-Aug 1852. Isotypes examined (C, F, G, GH, K, NY, w).

Liana with glabrous branchlets. Leaves 1 (-2)-jugate, rarely unifoliolate; petiole 1-3 cm long, glabrous; rachis 1-4 cm long, glabrous. Leaflets (3.5-)7-12 cm long, (2-)3.5-5 cm broad, elliptic, oblong-elliptic or obovate, subchartaceous, glabrous above and below, the apex sharply cuspidate, the base obtuse; petiolule (0.2-)0.4-0.5 cm long, sparsely puberulous; venation impressed or rarely plane above, prominulous below; lateral veins 5-7(-8) pairs, diverging from midrib at angles of 50°-70°. Inflorescence a very slender terminal panicle, the rachilla 5-6.5 cm long, glabrescent. Pedicels articulate, 0.7-1 cm long above articulation; sepals 0.3 cm long, 0.15 cm broad, lanceolate, glabrescent without, tomentose within, the lobes 0.2 cm long; petals 0.4-0.5 cm long, 0.2 cm broad, glabrous; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long, the tube c. 0.05 cm long; ovary 0.1 cm long; style 0.2 cm long. Fruit unknown.

Distribution: Known thus far only from the area of the Rio Negro and from the Rio Purús, state of Amazonas, Brazil.

Hourea cuspidata var pedicellata can be identified easily by its very long pedicels and by the sharply acuminate leaflets. Important characteristics are also the consistently

trifoliolate leaves and subchartaceous leaflets.

BRAZIL. Amazonas: Bôca do Acre, Rio Purús, behind Bôca do Acre airstrip, north bank of Rio Purús, 20 Sep 1966,  
G. T. Prance, B. S. Pena & E. R. Videcki 2430 fl. (INPA, NY).

1c. Rourea cuspidata var densiflora (Steeyermark) Forero,  
comb. nov.

Rourea densiflora Steeyermark, Publ. Field Mus. Nat.

Hist., Bot. Ser. 13(2): 1122. 1938. Holotype examined (F): Perú, Loreto, Mishuyacu, near Iquitos. G. Klug 796 fl. Jan 1930. Isotypes examined (NY, US),  
synon. nov.

Liana; branchlets glabrous or sparsely puberulous. Leaves 1 (-2)-jugate; petiole 1.5-8 cm long, glabrous; rachis 2-6 cm long, glabrous. Leaflets (6-)9-25 cm long, 4-12 cm broad, elliptic to oblong-elliptic, terminal leaflet always largest; chartaceous, glabrous above and below, the apex acuminate or sharply cuspidate, the base obtuse; petiolule 0.3-0.5 cm long, stout; venation impressed or plane above, prominulous or prominent below; lateral veins 4-7 pairs, ascending, anastomosing near margin. Inflorescence axillary, pseudoterminal or terminal, the rachilla 6-10 cm long, glabrous or glabrescent. Pedicels articulate, 0.5-0.7 cm long; sepals 0.2-0.3 cm long, 0.15-0.2 cm broad, ovate or oblong-elliptic, glabrous or glabrescent without, tomentose within, the margin ciliate, the apex barbate, the lobes 0.25 cm long; petals 0.3-0.4 cm long, 0.15-0.20 cm broad, oblong or oblong-elliptic, glabrous; stamens 10, five short c. 0.2 cm long, five long c. 0.3-0.4 cm long, the tube 0.02-0.05 cm long; anthers globose 0.05-0.07 cm in diameter; ovary c. 0.1 cm long, tomentose; style 0.2-0.3 cm long. Fruit 1-1.1 cm long, recurved, glabrous; calyx in

fruit reflexed, 0.2-0.3 cm long, glabrous. Seed 0.7-0.8 cm<sup>133</sup>  
long, 0.4 cm wide; arilloid smooth, 0.4 cm long; testa under  
arilloid smooth.

Distribution: Western Amazonia, including Perú and  
adjacent Colombia and Brazil. Growing in forests at altitudes  
of 100-150 m.

This variety differs from var cuspidata in the larger  
leaflets and longer pedicels. Characters separating var  
densiflora from var multijuga include the 1-2-jugate leaves,  
much larger leaflets and longer pedicels.

COLOMBIA. Amazonas: Trapecio Amazónico, Loretoyacú  
River, Oct 1945, R. E. Schultes 6684 fr. (COL); Trapecio Ama-  
zónico, Loretoyacú River, Sep 1946, R. E. Schultes & G. A.  
Black 8305 fr. (COL). BRAZIL. Amazonas: Municipality São  
Paulo de Olivença, near Palmares, 11 Sep - 26 Oct 1936, B. A.  
Krukoff 8375 fr. (A, BR, F, G, K, NY, S, U); Bôca do Acre, Rios  
Purús and Acre. Track NNW from Bôca do Acre airstrip, km 1-6,  
North bank of Rio Purús, 22 Sep 1966, G. T. Prance, B. S. Pena,  
J. F. Ramos & E. R. Videcki 2508 fl. (INPA). PERU. Loreto:  
Iquitos, 3-11 Aug 1929, E. P. Killip & A. C. Smith 26979 fr.  
(US); Mishuyacu, near Iquitos, Oct - Nov 1929, G. Klug 231 fl.  
(F, NY, US); Mishuyacu, near Iquitos, Oct - Nov 1929, G. Klug  
343 fl. (F, NY, US); Mishuyacu, near Iquitos, Jan 1930, G. Klug  
801 fl. (F, NY, US); Mishuyacu, near Iquitos, Jan 1930, G. Klug  
805 fl. (F, NY, US); Punchana, near Iquitos, 12 Jul 1929, Ll.  
Williams 1336 fr. (F, US); near Iquitos, 17 Jul 1929, Ll.  
Williams 1513 fr. (F); La Victoria on the Amazon River, 30 Aug  
1929, Ll. Williams 2963 fr. (F); Iquitos, 4 Apr 1930, Ll. Wil-  
liams 8109 fr. (F, G).

id. Rourea cuspidata var multijuga Forero, var nov.

Holotype (NY): Brazil, Amazonas, Municipality São Paulo de Olivença, near Palmares. B. A. Krukoff 8229 fr. 11 Sep-26 Oct 1936. Isotypes (A, BR, F, G, S, U).

A varietate cuspidata foliolis numerosioribus, parvioribus, petiolo ramusculisque minute puberulis differt.

Vine; branchlets minutely puberulous. Leaves imparipinnate, 2-5-jugate; petiole 1-4 cm long, glabrous to minutely puberulous; rachis 2-6 cm long, glabrous. Leaflets 3-7.5 cm long, 1.6-3 cm broad, elliptic, rigid-chartaceous, glabrous above and below, the apex acuminate, the base cuneate; petiolule 0.1-0.2 cm long; venation reticulate, impressed or rarely plane above, plane below; lateral veins 6-7 pairs, diverging from midrib at angles of 60°-80°. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 3.5-7 cm long, glabrous or glabrescent. Flowers unknown. Fruit immature, glabrous; calyx in fruit reflexed, 0.4 cm long, puberulous, the lobes 0.3 cm long.

Distribution: Known only from the type locality in the state of Amazonas, Brazil. Occurring in forest at elevation of c. 100 m.

The reflexed calyx in fruiting stage, the characteristically pyriform fruit and the impressed venation of the leaflets suggest the other varieties of R. cuspidata. However, R. cuspidata var multijuga can be distinguished from

them by the more numerous and smaller leaflets as well as by the pubescence of the petiole.

BRAZIL. Amazonas; Municipality of São Paulo de Olivença, near Palmares, 11 Sep-26 Oct 1936, B. A. Krukoff 8540 fr. (A, BR, F, G, K, NY, S, U).

2. Rourea ligulata Baker, in Martius, Fl. Brasil. 14(2): 181.  
1871.

Rourea glabra var coriacea Baker, in Martius, Fl.

Brasil. 14(2): 182. 1871, pro parte quoad exsiccatam  
Martius s.n. tantum.

Santalodes ligulatum (Baker) O. Kuntze, Rev. Gen. 1:  
155. 1891.

Lectotype examined and selected (P): Brazil, Pará, North  
of Campinha and Largo de Pólvora, W. J. Burchell 9981 fl. fr.  
1828-1830. Isotypes (F, GH, K). Paratypes examined: Brazil,  
Pará, Nazareth near to Rosinha, W. J. Burchell 9628 fr. 1828-  
1830 (GH, K). Brazil, Minas Gerais, Martius s.n. fl. (M).  
Paratype not seen: Brazil, Pará, W. J. Burchell 9449.

Shrub or liana; branchlets terete, glabrous, lenticel-  
late. Leaves imparipinnate, 1-2-jugate, rarely unifoliolate;  
petiole 1-9 cm long, glabrous; rachis 1-4 cm long (rarely ob-  
solete), glabrous. Leaflets 3-15.5 cm long, 1.5-6 cm broad,  
elliptic, chartaceous to subcoriaceous, the upper side dark,  
shiny, glabrous, the lower side usually darker (in herbarium  
specimens), more or less shiny, glabrous, the apex acuminate,  
the base obtuse; petiolule 0.1-0.4 cm long; venation reticu-  
late, impressed above, diffuse or prominulous below; lateral  
veins 5-7(-9) pairs, diverging from midrib at angles of 50°-  
70°. Inflorescence paniculate, axillary to pseudoterminal,

the rachilla (4-)6-12 cm long, glabrous; bracts 0.1 cm long, triangular. Pedicels articulate, 0.3-0.5(-0.6) cm long above articulation; sepals 0.3-0.6 cm long, 0.2 cm broad, oblong-elliptic, the lobes 0.2-0.5 cm long, glabrous without, puberulous within, the apex barbate; petals 0.5 cm long, 0.2 cm broad, glabrous, free; stamens 10, five short c. 0.2-0.5 cm long, five long c. 0.4-0.6 cm long, the tube 0.01-0.02 cm long; anthers globose 0.05 cm in diameter; ovary pilose, c. 0.1 cm long; style sparsely pubescent near base, c. 0.15 cm long; stigma capitate. Fruit 1.3 cm long, 0.5 cm wide, glabrous; calyx in fruit 0.3-0.6 cm long, glabrous, short-imbricate, the lobes 0.2-0.5 cm long. Seed 1 cm long, 0.4 cm wide; arilloid 0.3 cm long; testa under arilloid sculptured.

Distribution: Apparently restricted to the states of Pará and Minas Gerais, Brazil. Occurring in secondary vegetation (capoeira), along roadsides and in forest, near sea level.

Rourea ligulata is one of the floristic components of the southeastern region of Amazonia. Its affinities are with R. cuspidata, which it resembles in the impressed venation and the short-imbricate sepals. Rourea ligulata can be distinguished from R. cuspidata by the thicker and longer rachilla, the usually shorter pedicels, the long calyx lobes which are appressed to the lower half of the fruit, and the usually darker color of the lower surface of the leaflets in herbarium specimens. The impressed venation, as well as the long sepals and calyx lobes of flowers, render this species very distinct.

Schellenberg (1938, p. 215) cited Martius s.n., from the state of Pará (one of the syntypes of Baker's R. glabra var coriacea) as the type of R. ligulata. Baker (1871, p. 181) listed Martius s.n. from Minas Gerais, and Burchell 9449, 9628 and 9981 from Pará, accompanying the original description of R. ligulata. It is not clear why Schellenberg did not select one of these specimens as the type. According to the International Code of Botanical Nomenclature (1966, p. 71), "a lectotype must be chosen from among the elements that were definitely studied by the author up to the time the name of the taxon was published and included in the protologue." Furthermore, the Code states that "if no holotype was designated by the original author and if syntypes exist, one of them must be chosen as the lectotype." Finally, according to the Code (p. 72) the first choice of lectotype must be followed "unless it can be shown that the choice was based upon a misinterpretation of the protologue." Since there is no apparent reason for Schellenberg's choice, I consider it necessary to select a new lectotype for R. ligulata in order to comply with the rules of nomenclature. Burchell 9981 agrees well with the description of this species; it was studied by Baker and cited after his description, bears both flowers and fruits, and comes from the locality from which most of the specimens ascribed to R. ligulata have been collected.

BRAZIL. Pará; Belém, South Woods of IAN, 2 Dec 1942, W. A. Archer 7920 fl. (F, K, NY, S); Belém, IAN, South Woods,

29 Dec 1942, W. A. Archer 8064 fr. (NY, US); Belém, South Woods of IAN, 2 Jan 1943, W. A. Archer 8111 fl. (NY); Belém, South Woods of IAN, 2 Jan 1943, W. A. Archer 8116 fr. (NY); Fordlândia, 6 Jan 1948, G. A. Black 48-2326 fr. (INPA); Soure, 20 Feb 1950, G. A. Black 50-9066 fr. (R); Rio Camará; Ilha do Marajó, Fazenda Gurupatuba, 9 Jul 1950, G. A. Black 50-9936 fl. (US); Rodovia Castanhal-Marapanim, 17 Apr 1962, P. Cavalcante 952 fr. (MG); Santarém, km 61 da estrada para a cachoeira do Palhão no Rio Curuá Una, acampamento do Guaranã, 7 Dec 1966, P. Cavalcante & M. Silva 1615 fl. (MG); Belém, Dec 1901, A. Ducke 2610 fl. (MG); Belém, Murutucú, 6 May 1902, A. Ducke 2632 fl. (MG, RB); Murutucú, 20 Mar 1903, A. Ducke 3311 fr. (MG); Obidões, 2 Jan 1927, A. Ducke RB19715 fl. (RB); Belém, Nov 1906, O. Martins 7315 fr. (MG); "In sylvis ad Pará et Jaguary," w/o date, Martius s.n. fl. (M, W); Mata da Cia. Pirelli, Fazenda Uriboça, Jul 1958, J. M. Pires 6893 fl. fr. (UB); Vicinity of Paragominas, Belém-Brasília Highway, km 161, 28 Aug 1964, G. T. France & N. T. Silva 58933 fr. (F, NY, S); Acajá, Jacarequara, Tapera, 23 Feb 1966, M. Silva 572 fr. (MG); Quatipuru, Estrada para Araribe, 10 Jul 1966, M. Silva 613 fr. (MG); E.F.B. Sta. Izabel, 14 Jan 1909, w/o collector MG10162 fr. (MG); E.F.B. Sta. Izabel, May 1909, w/o collector MG10397 fl. (MG, RB).

3. Rourea glabra Humboldt, Bonpland and Kunth, Nov. Gen. et Sp. 7: 41. 1825.

Scandent shrub or woody vine; branchlets terete, glabrous or pubescent, lenticellate. Leaves imparipinnate, 1-3- (rarely 7-) jugate, rarely unifoliolate; petiole 0.5-7 cm long, glabrous or puberulous; rachis 2-15 cm long (rarely obsolete), glabrous to puberulous. Leaflets 2.5-9(-11) cm long, 1-4.5 cm broad, oblong, elliptic, or oblong-elliptic, rigid-chartaceous to subcoriaceous, the upper surface dark, shiny, glabrous, the lower surface pale, opaque, glabrous, the apex acuminate, the base rounded, attenuate or cuneate; petiolule 0.1-0.5 cm long; venation reticulate, prominulous above and below; lateral veins 5-8(-9) pairs, diverging from midrib at angles of  $50^{\circ}$ - $70^{\circ}$ , anastomosing more or less clearly near margin. Inflorescence paniculate, axillary, pseudoterminal or terminal, the rachilla 3-9(-18) cm long, glabrous or puberulous; bracts usually small, 0.1(-0.3) cm long, ovate or triangular. Pedicels articulate, (0.2-)0.25-0.6 cm long above articulation; sepals 0.2-0.3 cm long, 0.1-0.2 cm broad, ovate, glabrous, rarely puberulous without, velutinous within, the margin ciliate, the apex barbate; petals 0.3-0.6 cm long, 0.1-0.3 cm broad, oblong or obovate, glabrous, free; stamens 10, five short c. 0.05-0.25 cm long, five long c. 0.15-0.4 cm long, the tube c. 0.05 cm long; anthers globose or subcordate; ovary villous or pilose, 0.05-0.1 cm long; style 0.05-0.3 cm long, glabrous, or pubescent at base; stigma capitate, two-

lobed. Fruit 1.2-1.6(-2) cm long, 0.5-1 cm wide, glabrous, the immature ones rarely sparsely puberulous; calyx in fruit 0.5 cm long, lobes short (0.05-0.2 cm long), glabrous or minutely and sparsely puberulous. Seed 1-1.5 cm long, 0.5-0.7 cm wide; arilloid c. 0.4 cm long; testa under arilloid smooth, rarely sculptured.

3a. Rourea glabra var glabra

Connarus glaber DC., Prodr. 2: 85. 1825; Mém. Soc. Hist. Nat. Paris 2: 385. 1826.

Robergia glabra (H.B.K.) Spreng., Syst. 4(2): 188. 1827.

Rourea oblongifolia Hook. and Arnott, Bot. Beech. Voy. 283. 1838. Presumed holotype examined (K): Mexico, Guerrero, Acapulco, Beechey s.n. fr. W/o date.

Connarus oblongifolius (Hook. and Arnott) Mart. ex Baker, in Martius, Fl. Brasil. 14(2): 182. 1871, pro parte, nomen nudum in syn.

Santalodes glabrum (H.B.K.) O. Ktze., Rev. Gen. 1: 155. 1891.

Rourea cubensis Urban, Symb. Antill. 5: 356. 1908.

Holotype (GOET): Cuba, W/o locality, C. Wright 2408 (pro parte) fl. fr. 1865. Isotypes examined (G, GH, K, NY, P, S, US, W).

Rourea sympetala Urban, l. c. 357. 1908. Holotype (B?, lost): Cuba, W/o locality, C. Wright 2408 (pro parte) fl. 1865. Isotype examined (US).

Holotype not seen (P). Microfiche of holotype examined (NY): Venezuela, Río Orinoco, Caicara. Humboldt s.n. fl. fr. W/o date.

Scandent shrub or woody vine; branchlets terete, glabrous or pubescent, lenticellate. Leaves imparipinnate, 1-3-jugate; petiole 1.5-5 cm long, glabrous; rachis 1-12 cm long, glabrous.

Leaflets 2.5-9.5 cm long, 1-4.5 cm broad, elliptic or oblong, glabrous above and below, subcoriaceous or rigid-chartaceous, the apex short- to long-acuminate, the base cuneate or attenuate; petiolule 0.2-0.5 cm long; venation reticulate, prominent above and below; lateral veins 5-7 pairs. Inflorescence paniculate, axillary, pseudoterminal or terminal, the rachilla 3-7 cm long, glabrous; bracts 0.1 cm long or less. Pedicels articulate, slender, 0.25-0.6 cm long above articulation, glabrous; sepals 0.2-0.3 cm long, 0.1-0.2 cm broad, ovate, glabrous without, velutinous within, the margin ciliate, the apex barbate; petals 0.3-0.5 cm long, 0.2-0.3 cm broad, obovate, glabrous, free; stamens 10, five short c. 0.2-0.25 cm long, five long c. 0.3-0.4 cm long, the tube 0.03-0.05 cm long; anthers globose, subcordate; ovary villous, c. 0.1 cm long; style pubescent at base, c. 0.05-0.15 cm long; stigma two-lobed. Fruit 1-1.5 cm long, 0.5-0.7 cm wide, oblong, more or less arcuate or straight, glabrous; calyx in fruit c. 0.5 cm long, glabrous. Seed 1-1.2 cm long, 0.6 cm wide; arilloid 0.4 cm long; testa under arilloid smooth.

Distribution: From both coasts of Mexico just below the Tropic of Cancer to southern Mexico and Central America. In the West Indies in Cuba and Trinidad, and in South America from Colombia and Venezuela to southern Brazil in the area of Rio de Janeiro. Some recent collections from the Amazon Basin in the areas of Manaus and the Rio Madeira are provisionally assigned to R. glabra var glabra. This variety

occurs in a wide variety of habitats, including primary and secondary forests, edge of mangrove swamps and river margins, mountain slopes, dry thickets, etc., from sea level to 1480 m altitude.

Local names: "Chilillo" (Yucatán, Campeche, Hidalgo and Jalisco, Mexico); "Bejuco de agua" (Chiapas and Escuintla, Mexico); "Remulatero" (Vera Cruz, Mexico); "Bejuco de Juan Caliente" (Mexico); "Canjura" (El Salvador); "Mata negro" (Oriente, Cuba); "Bejuco prieto" (Pinar del Río, Cuba); "Bejuco baracoa" (Santa Clara, Cuba); "Granada de Monte" (Colombia).

Rourea glabra is the most widespread representative of the genus in the American tropics. This taxon shows great morphological variability as a result of its wide geographical distribution and ecological amplitude. Table 4 shows the characters distinguishing the three varieties accepted in this study.

Rourea glabra var glabra shows a discontinuous pattern of distribution in South America, occurring in Colombia and Venezuela, apparently absent from Amazonia and the Planalto of Brazil, and then reappearing in Rio de Janeiro and surrounding areas. Whether this discontinuity is an actual fact or only the result of incomplete collecting in the area, it is hard say. Some recent collections from the state of Amazonas have been tentatively ascribed to R. glabra var glabra. They lack, however, some definite glabra characters (such as the prominulous venation). Regrettably, these collections are of poor quality. As stated elsewhere, it is usually necessary

TABLE 4  
MORPHOLOGICAL DIFFERENCES BETWEEN THE  
VARIETIES OF ROUREA GLABRA

Character	<u>R. glabra</u> var <u>glabra</u>	<u>R. glabra</u> var <u>floribunda</u>	<u>R. glabra</u> var <u>jamaicensis</u>
Number of jugae	1-3	1-3	4-7
Fruit length	1-1.5 cm	1-1.2 cm	(1.2-)1.5-2 cm
Inflorescence length	3-7 cm	4-9 cm (rarely 18 cm)	(5-)7-15 cm
Petiole	Glabrous	Sparsely puberulous or glabrous	Glabrous
Rachis	Glabrous	Puberulous or glabrescent	Glabrous
Inflorescence	Glabrous	Tomentose or densely puberulous	Glabrous
Sepals	Glabrous	Glabrous or sparsely puberulous	Glabrous

to have either perfect flowers or mature fruits, or both, to identify accurately species of Rourea.

The type specimen of Rourea glabra H.B.K. has not been seen. However, a microfiche has been examined at the Library of the New York Botanical Garden. Equally important in elucidating the actual limits of the taxon has been a topotype collection (Williams 13285) from the type locality at Caicara, Río Orinoco, Venezuela.

MEXICO. Chiapas: Las Garzas, Jan 1939, E. Matuda 2699 fr. (A, F, G, K, NY); Nandolópez, Acapetahua, 23 Jun 1947, E. Matuda 16650 fr. (BR, F). Colima: Manzanillo, 2-18 Mar 1891, E. Palmer 1349 fr. (G, GH, NY, U, US). Guerrero: Vallecitos, Montes de Oca, 9 Feb 1937, G. B. Hinton 11353 fl. (F, K, NY, US); Acapulco and Vicinity, Oct 1894-Mar 1895, E. Palmer 455 fr. (A, GH, US). Hidalgo: Vicinity of Huejutla on Road to San Felipe Orizatlán, 20 May 1947, H. E. Moore, Jr. 2900 fr. (GH). Jalisco: Santa Cruz de Vallarta, 9 Dec 1926, Y. Mexia 1265 fr. (A, F, G, GH, NY, US). Michoacán: Distr. Coalcoman, San Pedro, 6 Apr 1941, G. B. Hinton 15902 fr. (NY, US). Oaxaca: Distr. Choapan, San Juanito, near Village, 1 Apr 1938, Y. Mexia 9248 fl. (F, G, GH, K, NY, S, U, US). Sinaloa: Between Acaponeta and Rosario, 4-6 Jul 1897, J. N. Rose 1572 fr. (US). Tabasco: Mercedes, Balancan, 9-14 May 1939, E. Matuda 3004 fl. (A, F, NY). Tamaulipas: Vicinity of Gómez Farias, 13-21 Apr 1907, E. Palmer 292 fr. (F, GH, NY, US). Veracruz: Vicinity of Pueblo Viejo, 2 km S of Tampico, 23-31 May 1910, E. Palmer 403 fr. (GH, NY, US). Yucatán: Yuxpeña, Campeche, 16 Feb 1932, C. L. Lundell 1342 fr. (F, GH, NY, US). San Agustín, 1841-1843, Liebmann 2799 fl. (C). w/o locality, 1787-1795-1804, Sessé, Mociño, Castillo & Maldonado 1077 fl. (F, frag.). BRITISH HONDURAS. El Cayo District, Kuck run, 11 May 1931, H. H. Bartlett 13126 fr. (F). Belize District, Belize-Sibun road, 1931-1932, P. H. Gentle 33 fr. (F, S). Corozal District, Corozal-Pachacan road, 1933, P. H. Gentle 34 fr. (F). Maskall Pine Ridge, Jan 1934, P. H. Gentle 1099 fr.

(A, F, NY, S). Stann Creek District, Stann Creek-Mullins River Road, 23 Jan 1937, P. H. Gentle 1875 fr. (A, F, K, NY). Toledo District, Río Grande, 11 Sep 1944, P. H. Gentle 4815 fl. (F, S, US). Big Creek, 1 Apr 1929, W. A. Schipp 104 fr. (A, F, G, GH, K, NY, S, US). GUATEMALA. Escuintla: Along or near Río Michatoya, southeast of Escuintla, 12 Mar 1941, P. C. Standley 89044 st. (A, F). Izabal: Vicinity of Puerto Barrios, 2-5 Jun 1922, P. C. Standley 24817 st. (US). Petén: Dos Lagunas, ca. 10 km NWW of village, 19 Dec 1960, E. Contreras 1708 fr. (F, US). Quezaltenango: Río Ocosito, Apr 1892, J. Donnell Smith 1476 fr. (GH, K, M, NY, US). Metalhuleu: Between Nueva Linda and Champerico, 18 Feb 1941, P. C. Standley 87610 st. (F). Santa Rosa: About Guazacapán, 29 Nov-3 Dec 1940, P. C. Standley 78634 fr. (F, G). EL SALVADOR. La Libertad: Near Río Chávez, Huizúcar, 12 Apr 1929, S. Calderón 2526 fr. (F, US). La Unión: Vicinity of La Unión, 13-21 Feb 1922, P. C. Standley 20807 fr. (GH, NY, US). San Vicente: Vicinity of San Vicente, 7-14 Feb 1947, P. C. Standley & E. Padilla V. 3698 fr. (F, GH). HONDURAS. Atlántida: Vicinity of Tela, 14 Dec 1927-15 Mar 1928, P. C. Standley 53023 fr. (A, F, US). Olancho: Vicinity of Juticalpa. Río Juticalpa, 5-16 Mar 1949, P. C. Standley 17629 fr. (F). NICARAGUA. Bluefields: Base Camp 3.6 km SE of Cerro San Isidro. Río Cama, Río Escondido, 2.1 km N of base camp, 25 Mar 1966, G. R. Proctor, G. C. Jones & L. Facey 27238 fl. fr. (NY). Chontales: Vicinity of La Libertad, 29 May-1 Jun 1947, P. C. Standley 9024 st. (F). COSTA RICA. Alajuela: Entre Bebedero y Paso

Hondo, Guanacaste, 19 Jun 1930, A. M. Brenes 12592 fl. (F, NY). Puntarenas: Above Palmar Norte de Osa, 15 Mar 1951, P. H. Allen 6007 fr. (F, GH, US). PANAMA. Canal Zone: Barro Colorado Island, 26 Aug 1929, F. M. Salvoza 841 fr. (A); Quebrada Bonita, 27 Dec 1934, J. A. Steyermark & P. H. Allen 17175 fl. (BR, G, GH, NY, S, U, US). Colón: Between France Field (Canal Zone) and Catival (Prov. Colón), 9 Jan 1924, P. C. Standley 30180 fr. (US). Panama: Near Panama, Sep 1862, S. Hayes 643 fl. fr. (BR, G, M, P, W). San José Island, Pearl Archipiélago, near South Beach, 25 Jul 1945, C. O. Erlanson 525 fr. (GH, US). Penonome and vicinity, 23 Feb-22 Mar 1908, R. S. Williams 149 fr. (NY). Chagres, 26 Jan 1850, A. Fendler 57 fr. (K). "Panamá et Columbia Occidentalis," 831, H. Cuming 1117 fl. (K). CUBA. Pinar del Río: Banks of Las Pozas River, 24 Sep 1952, Bro. A. H. Liogier 2579 fr. (GH, US). Las Villas: Gavilancito, Banao Mts., 1 Aug 1918, Bro. León & Fr. M. Roca 8056 fr. (NY). Santa Clara: Lomas de Banao, Jan 1920, A. Luna 160 fr. (NY). Oriente: Sierra Maestra, inter Río Oro et Río Bayamo, 6 May 1916, E. L. Ekman 7286 fr. (S, US). TRINIDAD. Arima Valley: Santa Isabella trail, near Simla, 10 Mar 1956, A. C. Smith 10104 fr. (A, NY, S, U, US). COLOMBIA. Atlántico: Entre Baranoa y Galapa, 30 Dec 1961, A. Dugand 5955 fl. (COL, US). Bolívar: Vicinity of Cartagena, 1919, Br. Heriberto 125 fl. (US). Cesar: Chiriguana, w/o date, H. Karsten s.n. fr. (W). Magdalena: Santa Marta, Bonda, 8 Oct 1848-1849, H. H. Smith 400 fl. (A, BR, COL, F, G, GH, K, NY, P, S, U, US, W). Meta: Cordillera La Macarena, trocha entre el Río Guejar y el

caño Guapayita, 20-28 Dec 1950, J. M. Idrobo & R. E. Schultes  
750 fr. (COL, US). Isla de San Andrés: Costado Occidental  
 "Alto Los May" (May's Cliff) 17 Oct 1956, A. Fernández-Pérez  
5216 fr. (US). VENEZUELA. Apure: "La Garciera" entre San  
 Fernando y Arichuna, Apr 1969, L. Aristeguieta & H. Zabala  
7051 fr. (NY). Bolívar: Medio Orinoco, Caicara, 12 Jun 1940,  
Ll. Williams 13285 fr. (A, F, G, S, US). Monagas: Vicinity  
 of La Cuchilla, between Guanaguana and Guácharo, 21 Apr 1945,  
J. A. Steyermark 62257 fl. (F, NY). Sucre: Península de Paria,  
 Cerro Espejo, entre Manacal y Pauji, arriba de Mundo Nuevo,  
 arriba de Río Seco de Irapa, 6 Aug 1966, J. A. Steyermark &  
M. Rabe 96036 fr. (F, NY, U, US). Zulia: Camp 2, Perijá Ex-  
 ploration Co., on Río Loro, 14 Dec 1922, H. Pittier 10867 fr.  
 (NY). BRAZIL. Terr. Roraima: Vicinity of Mucajá airstrip,  
 17 Mar 1971, G. T. Prance, W. C. Steward, J. F. Ramos, W. S.  
Pinheiro, O. P. Monteiro & F. P. Harter 11047 fr. (INPA, NY).  
 Amazonas: Municipality of Humaitá, Rio Madeira. Road Humaitá  
 to Lábrea, km 50, 29 Nov 1966, G. T. Prance, B. S. Pena &  
J. F. Ramos 3453 fl. (F, INPA, M, NY, S, U). Guanabara: Rio  
 de Janeiro, Copacabana, Jun 1833, Lund 148 fr. (C); Rio de  
 Janeiro: Serra dos Orgãos, Feb 1824, Luschnath s.n. fr. (BR).  
 Rio de Janeiro, 1844, Widgren s.n. fr. (S).

3b. Rourea glabra var jamaicensis Forero, var. nov.

Holotype (NY): Jamaica, vicinity of Bog Walk. N. L.  
Britton 2623 fr. w/o date. Isotype (F).

A varietate glabra foliolis plus numerosis (4-7-jugatis), fructibus maioribus, inflorescentibus longioribus differt.

Woody vine; branchlets terete, glabrous, conspicuously lenticellate. Leaves imparipinnate (3-)4-7-jugate; petiole 2-7 cm long, glabrous; rachis (3-)4-15 cm long, glabrous. Leaflets 2.5-6.5(-12) cm long, 1.2-2.5(-4) cm broad, elliptic to oblong-elliptic, subcoriaceous or rigid-chartaceous, glabrous above and below, the apex acuminate, the base rounded, the margin entire to slightly revolute; petiolule 0.1-0.3 cm long; venation reticulate, prominulous above and below, anastomosing clearly near margin. Inflorescence paniculate, terminal or axillary, the rachilla (5-)7-15 cm long, glabrous; bracts 0.1-0.2 cm long, triangular. Pedicels articulate, 0.2-0.5 cm long above articulation; sepals 0.3 cm long, 0.2 cm broad, ovate, glabrous, the apex barbate, the margin ciliate; petals 0.5 cm long, 0.2 cm broad, oblong, glabrous, free; stamens 10, five short c. 0.3 cm long, five long c. 0.4 cm long, the tube 0.05 cm long; anthers globose, 0.05 cm in diameter; ovary pilose, 0.05 cm long; style pubescent, 0.1 cm long. Fruit (1.2-)1.5-2 cm long, glabrous; calyx in fruit 0.4-0.5 cm long, the lobes 0.05-0.2 cm long, glabrous. Seed 1-1.5 cm long; arilloid 0.4-0.6 cm long; testa under arilloid smooth.

Distribution: Known thus far only from Jamaica, and there occurring mainly in wooded hillsides, from 300 to 600 m altitude.

Local names: "Black wither" (Jamaica).

This variety can easily be distinguished from var glabra by the large number of leaflets (usually between 9 and 15), by the fruit which may be very large in some specimens, attaining lengths of up to 2 cm, and by the usually longer inflorescence (7-15 cm long).

JAMAICA. St. Ann Parish: Road between Show Meself Corner, Barret Hall, and Jamaica Al., 8 Jul 1966, W. R. Anderson & D. C. Slernberg 3106 fr. (US); Near Schwallenburg, 30 Mar 1908, W. Harris 10336 fr. (F, NY); Soho, 11 May 1915, W. Harris 11981 fl. (NY); Near Lydford Post Office, 20-31 Dec 1953, R. A. Howard & G. R. Proctor 13428 fr. (A); Reynolds Mine area near Lydford Post Office, 21 Sep 1954, R. A. Howard & G. R. Proctor 14021 fr. (A, NY, US); Stirling Castle Forest Reserve, vicinity of Alumina Jamaica Tramline, 15 Jan 1958, R. A. Howard & G. R. Proctor 15052 fr. (A); Reynolds bauxite mine area near Lydford Post Office, 7 Aug 1955, G. R. Proctor 10442 fl. (US). St. Catherine Parish: Mt. Success 4 mi S of Ewarton, 2 Dec 1961, C. D. Adams 8936 fr. (M); Along road between Ewarton and Worthy Park, 1 mi due W of River head, 22 May 1964, G. R. Proctor 24862 fl. (NY, U). Manchester Parish: Vicinity of Marshall's Pen. Est., near Mandeville, trail to New Green, 23 Apr 1961, K. U. Kramer & G. R. Proctor 1687 fr. (U). Trelawny Parish: Barbecue bottom, 4 Mar 1966, R. W. Read s.n. fl. (M). Hanover Parish: Kempshot, 23 Mar 1908, N. L. Britton & A. Hollick 2415 st. (NY).

Cockpit Country; Troy, 13-18 Sep 1906, N. L. Britton 654  
fl. (F, NY). Moneague to Mount Diablo, 5 Apr 1908, N. L.  
Britton 2722 fr. (F, NY). Holly Mount, Mount Diablo, 4 Feb  
1903, W. Harris 8492 fr. (A, NY). Near Troy, Aug 1904, W.  
Harris 8753 fl. (NY). Near Troy, 17 Sep 1906, W. Harris 9423  
fl. fr. (F, NY). Union Hill near Moneague, 13 Jul 1950, R. A.  
Howard 12028 fr. (A, NY). w/o locality, 1857, Marsh 661 fr.  
(K). w/o locality, 1850, R. C. Alexander s.n. fr. (K, NY).

3c. Rourea glabra var floribunda (Planchon) Forero, comb. nov.

Rourea oblongifolia var floribunda Planchon, *Linnaea*

23: 415. 1850. Holotype examined (K): Jamaica, w/o locality, Distan s.n. fl. w/o date.

Rourea paucifoliolata Planchon, *Linnaea* 23: 415. 1850.

Holotype examined (K): Jamaica, w/o locality, McFadyen s.n. fl. w/o date.

Rourea paucifoliata Britton, *N. Am. Fl.* 22: 234. 1908, sphalm.

Rourea paucifolia Schellenberg, *Pflanzenreich Heft* 103: 213. 1938, sphalm.

Rourea granatensis Cuatrecasas, *Fieldiana Bot.* 27(2):

102. 1951. Holotype examined (F): Colombia, Meta, Villavicencio, towards El Parrao, J. Cuatrecasas 4588 fl. 10 Nov 1938. Isotype examined (US). *synon. nov.*

Scandent shrub; branchlets terete, glabrescent, puberulous or tomentose, the lenticels inconspicuous or absent. Leaves imparipinnate, 1-3-jugate, rarely unifoliolate; petiole 0.5-5 cm long, sparsely puberulous or glabrous; rachis 2-7 cm long (rarely obsolete), puberulous or glabrescent. Leaflets 3-11 cm long, 1.5-4.5 cm broad, oblong-elliptic, chartaceous to subcoriaceous, glabrous above and below, the apex acuminate, the base rounded or cuneate; petiolule 0.1-0.5 cm long; venation reticulate, prominulous above and below; lateral veins 5-7 pairs, diverging from midrib at angles of 50°-70°, anastomosing clearly near margin. Inflorescence paniculate, axillary to pseudo-

terminal, 4-9(-18) cm long, tomentose or densely puberulous; bracts 0.1 (rarely 0.3) cm long. Pedicels articulate, 0.2-0.6 cm long, pubescent or glabrescent; sepals 0.25-0.3 cm long, 0.1-0.2 cm broad, ovate, glabrous or puberulous without, pubescent within, the margin ciliate, the apex barbate; petals 0.4-0.5 cm long, 0.1-0.25 cm broad, glabrous, free; stamens 10, five short c. 0.2-0.25 cm long, five long c. 0.3-0.4 cm long; anthers globose; ovary c. 0.1 cm long, pilose; style 0.07-0.3 cm long, pubescent at base or glabrous; stigma two-lobed. Fruit when immature sparsely puberulous, when mature glabrous, 1-1.2 cm long; calyx in fruit 0.5 cm long, sparsely puberulous or glabrous. Seed 0.8 cm long.

Distribution: Mexico and Central America, Jamaica, Cuba, Colombia, Venezuela and Brazil. Occurring in primary forests and along river margins, from sea level to 500 m altitude.

Local names: "Hackam" (British Honduras).

This variety can be distinguished from var glabra and var jamaicensis by the pubescence that is usually present in the axis of the inflorescence as well as on the petiole and rachis of the leaves, and sometimes on the calyx in flowering condition, and by the larger inflorescence.

MEXICO. Oaxaca: Lacoba, Jun 1842, Liebmann 2796 fl. (C, F, GH). Jocolapa, Jun 1842, Liebmann 2800 fl. (C, F). BRITISH HONDURAS. Stann Creek District: Silk Grass Creek Reserve, 25 Aug 1939, P. H. Gentle 2976 fl. (A, K, NY). Toledo District: Between Condemned Branch Pine Ridge and Moffredye Lagoon, 3 Sep 1946, P. H. Gentle 6041 fl. (F, G, NY, S, US); Near Orange Point, 29 Sep 1951, P. H. Gentle 7455

fl. (F, S, US). GUATEMALA. Eastern portion of Vera Paz and Chiquimula, Shore of Lake Izabal, 12 Apr 1885, S. Watson 54 fl. (GH). PANAMA. Chagres, 24 Mar 1850, A. Fendler 127 fl. (GH, K, NY, P, US). CUBA. Santa Clara: Arroyo Navarro, Mina Carlota, SE of Cumanayagua, Sierra de San Juan, Jul 1941, R. A. Howard 5625 fl. (GH, NY, U). Las Villas: Trinidad Mountains, San Blas-Buenos Aires, 9 Mar 1941, A. Gonzales 48 fr. (A, NY); Camino del Nincho, Hanabanilla, Vicinity of Soledad, W/o date, A. Gonzales 69B fl. (A). Oriente: Carojo, SE of Bayamo, 22 Mar 1915, E. L. Ekman 5055 fr. (NY, S). Camaguey: Vicinity of La Gloria, S of Boston, 18 Feb 1909, J. A. Shafer 437 fr. (NY). COLOMBIA. Antioquia: Near Río León, approx. 20 to 30 km up stream and south of the river mouth and approx. 15 km W of Chigorodó (prob. ca. 7°45' N; 76°50' W), 20 Mar 1962, C. Feddema 1980 fr. (COL, NY). VENEZUELA. Zulia: Along Río Lora, near camp 2, of Perijá Exploration Co., 14 Dec 1922, H. Pittier 10967 fr. (G, GH, US). BRAZIL. Terr. Roraima: Between Maitá (3°20' N; 63°24' W) and Paramiteri (3°25' N; 63°3' W), 21 Feb 1971, G. T. Prance, W. C. Steward, J. F. Ramos, W. S. Pinheiro, O. P. Monteiro & F. P. Harter 10650 fr. (INPA, NY).

4. Rourea gardneriana Planchon, Linnaea 23: 417. 1850.

Sweetia gardneri Bentham, J. Linn. Soc. Bot. 8: 263.

1865.

Santalodes gardnerianum (Planchon) O. Kuntze, Rev. Gen.

1: 155. 1891.

Holotype examined (K): Brazil, Pernambuco, G. Gardner 963 (or 962) fl. Jul 1837. Isotypes examined (F, frag., G, GH, NY, P, SP, US, W).

Large shrub; branchlets terete, glabrous. Leaves imparipinnate, 1-2-jugate; petiole 2-7 cm long, glabrous; rachis 0.5-5 cm long, glabrous. Leaflets 3.5-12 cm long, 1.5-7 cm broad, elliptic or broadly elliptic, chartaceous, glabrous above and below, the apex short-acuminate, the base rounded; petiolule 0.2-0.5 cm long; venation reticulate, prominulous above and below; lateral veins 6-7 pairs, anastomosing clearly near margin. Inflorescence paniculate, congested, terminal or pseudoterminal, the rachilla 7-10 cm long, glabrescent; bracts small, 0.1 cm long. Pedicels not clearly articulate, 0.1-0.2 cm long; sepals 0.3 cm long, 0.1 cm broad, glabrous or glabrescent without, densely puberulous within, the apex barbate; petals 0.4 cm long, 0.15 cm broad, glabrous, free; stamens 10, five short c. 0.3 cm long, five long c. 0.5 cm long; anthers globose; ovary pilose, 0.1 cm long; style 0.1-0.15 cm long, pubescent. Fruit unknown.

Distribution: Known from the state of Pernambuco, the

type locality; from a poor collection of Burchell from the state of Goiás and from the state of Bahia (Brazil).

Rourea gardneriana was treated by Schellenberg as a synonym of R. glabra. A detailed study of the type collection and a comparison with a vast amount of material of the latter species has convinced me of the need to accept Planchon's epithet as a valid one. Rourea gardneriana can be distinguished from R. glabra by its shorter pedicels (0.1-0.2 cm vs 0.25-0.5 cm), dense inflorescence, chartaceous leaflets, and by the short-acuminate apex of the leaflets.

Material from the coastal region of the Brazilian state of Bahia (Belém & Pinheiro 2965) approaches R. gardneriana but has a densely puberulous inflorescence, sparsely pubescent calyx, slightly larger flowers, and long-acuminate apex in some leaflets.

BRAZIL. Bahia: Rodovia Ubaitaba-Itacaré, 5 Jan 1967, R. P. Belém & R. S. Pinheiro 2965 fl. (NY, U). Goiás: Rio Manoel Alves, 1828-1830, W. J. Burchell 8206 fr. (GH, P).

5. Rourea surinamensis Miquel, *Linnaea* 26: 221. 1853.

Rourea glabra H.B.K. var coriacea Baker, in Martius,  
Fl. Brasil. 14(2): 182. 1871, pro parte quoad  
exsiccatas Poiteau s.n. (visa); Sagot 1374 (non visa)  
tantum.

Holotype examined (U): Suriname, "ad ripas flumine Mai-  
puribi." A. Kappler 1969 fl. Sep. W/o date. Isotypes examined  
(C, G, P, S).

Small tree or woody vine; branchlets terete, glabrous, lenticellate. Leaves imparipinnate 1(-2)-jugate, rarely unifoliolate; petiole 1-7 cm long, glabrous; rachis 2.5 cm long (rarely obsolete), glabrous. Leaflets 3.5-15 cm long, 2-7 cm broad, elliptic, rigid-coriaceous, shiny and glabrous above and below, the apex acuminate, the base obtuse, the margin revolute; petiolule 0.4-0.6 cm long; venation reticulate, prominulous or plane above, prominulous below; lateral veins 6-9 pairs, diverging from midrib at angles of 50°-70°, anastomosing clearly near margin. Inflorescences paniculate, axillary to pseudoterminal, the rachilla 6-10 cm long, glabrescent; bracts large, 0.2-0.4 cm long, carinate, pilose. Pedicels articulate, 0.2-0.6 cm long above articulation, glabrous; sepals 0.2 cm long, 0.15 cm broad, ovate-lanceolate, glabrous without, tomentose within, the apex barbate, the margin ciliate; petals 0.3-0.5 cm long, 0.15 cm broad, glabrous, free; stamens 10, five short c. 0.15 cm long, five long c. 0.25 cm long, the tube very short;

anthers globose; ovary pilose, 0.05 cm long; style 0.25 cm long, base pilose; stigma two-lobed. Fruit 1-1.2 cm long, glabrous; peduncle 0.2-0.6 cm long; calyx in fruit 0.5 cm long, glabrous, the lobes 0.1-0.2 cm long. Seed 0.8 cm long, 0.5 cm wide; arilloid 0.4 cm long; testa under arilloid smooth.

Distribution: From Haiti through the Lesser Antilles to the Guianas and adjacent Venezuela. Occurring in various habitats, from forest to savanna, and on lateritic and sandy soils, from sea level to approximately 1000 m.

Local names: "Bejuco Lis Gómez," "Luis Gómez" (Dominican Republic); "Bejuco garroti" (Puerto Rico); "Bruinhart tee," "Bruinhart-tétē" (Suriname).

This widely distributed species is remarkably constant in its morphological characters. It can easily be distinguished by its trifoliolate (rarely unifoliolate or 2-jugate) leaves, and by its rigid-coriaceous, glabrous and shiny leaflets with revolute margins. The leaflets are usually much larger than those of many species (5.5-15 cm long, 2.7-7 cm broad, or occasionally larger). Rourea surinamensis is most closely related to R. glabra, from which it differs in the above characters; furthermore, R. surinamensis replaces R. glabra in the Antilles from Haiti to Trinidad.

HAITI. Massif du Nord, Valliere, Hills south of town, 2 May 1928, E. L. Ekman 9940 fl. (S). DOMINICAN REPUBLIC. La Vega: Vicinity of Piedra Blanca, 2 Jan 1948, H. A. Allard 18301 st. (US). Pacificador: Vicinity of San Francisco de Macorís, 5-17 Apr 1922, W. L. Abbott 2107 fl. fr. (GH, NY). El Seibo: Jovero, 20 Feb 1923, W. L. Abbott 2680 fr. (US).

Santo Domingo: Llanura de Santo Domingo, Las Rosas, 2 Apr 1926, E. L. Ekman 5811 fr. (GH, S, US). La Manaclita, about 10 mi S of La Vega, 28 May 1968, Bro. A. H. Liogier 11468 fr. (NY). PUERTO RICO. Fajardo and vicinity, Rfo Arriba, 2-6 Mar 1923, N. L. Britton & J. A. Shafer 1692 fr. (F, NY). Vicinity of Mayaguez, 18-27 Feb 1914, E. G. Britton 1884 fr. (GH, NY). Hillside forest near Pueblo Viejo, 27 Feb 1924, N. L. Britton & E. G. Britton 8072 fr. (NY). Sierra de Luquillo, 11 May 1883, B. Eggers 1246 fl. (K, P, US). Near Rfo Piedras, 30 Mar 1899, A. A. Heller 956 fr. (F, NY). University of Puerto Rico, College of Agriculture, Las Vegas Road, 7 May 1913, W. E. Hess 1252 fl. fr. (NY). Las Mesas, Mayaguez, Jun 1963, Bro. A. H. Liogier 9696 fl. (GH, NY). "Sierra de Luquillo in regione media montis Jimenes in Sylvis" Jun 1885, P. Sintenis 1496 fl. (G, GH, M, NY, W). Las Marías, Tabonuvo, 21 Jan 1887, P. Sintenis 5984 fr. (G, M, S, US). Rfo Piedras, 12 Jun-22 Jul 1901, L. M. Underwood & R. F. Griggs s.n. fr. (NY). SAINT LUCIA. Near mile post 4 on Castries-Dennery Road, 22 Apr-18 May 1950, R. A. Howard 11354 fl. fr. (NY). GRENADA. Near Minorca, 11 Dec 1905, W. E. Broadway 1841 fr. (F). TRINIDAD. Quase River forests, near the reservoir, 24 Jan 1930, W. E. Broadway 7538 fr. (S). ST. THOMAS. W/o locality, W/o date, Riedlé 108 fl. (P). VENEZUELA. Bolívar: Between Camp and Agua Linda, 7 km E of Hato de Nuria, E. of Miamo, Altiplanicie de Nuria, 14 Jan 1961, J. A. Steyermark 88447 fr. (F, NY, U, VEN). GUYANA. Kama Kusa, Upper Mazaruni River, 23-29 Nov 1922, J. S. de la Cruz 2848 fr. (F, GH, NY). Basin of Kuyuwini River (Essequibo tributary) about 150 mi

from mouth, 21-26 Nov 1937, A. C. Smith 2538 fr. (F, G, K, NY, U). SURINAME. Brownsberg, 29 Sep 1924, B. W. 6668 fl. (A, U). Brokopondo: Bank of Suriname River N of Kalstation (afterwards lake), 8 Apr 1964, J. van Donselaar 1143 fl. (U). Saramacca River, 16 Jun 1944, B. Maguire 23832 fr. (F, K, NY, RB, U). FRENCH GUIANA. Corda de la Mana, 1854, Melinón s.n. fl. (P). Maroni, Ibe Portal, 1858-1886, Sagot s.n. fl. (P).

6. Hourea neglecta Schellenberg, Pflanzenreich Heft 103: 289. 1938.

Scandent shrub or woody vine; branchlets terete, glabrous, conspicuously lenticellate. Leaves imparipinnate, (1-)2-3-jugate; petiole 1.5-7 cm long, glabrous; rachis 0.5-1.5 cm long, glabrous. Leaflets 5.5-12 cm long, 2.5-3.5 cm broad, narrow to broadly elliptic, coriaceous, the upper surface dark, shiny, glabrous, the lower surface pale, shiny or opaque, glabrous, the apex acuminate or sharply acuminate, the base rounded or attenuate, the margin revolute; petiolule 0.2-0.5 cm long; venation finely reticulate, diffuse, plane or slightly prominulous above, prominulous below; lateral veins 5-6 pairs diverging from midrib at angles of 50°-60°, not anastomosing near margin. Inflorescence paniculate, pseudoterminal, terminal or axillary, the rachilla 4-7 cm long, glabrous; bracts 0.2 cm long, carinate. Fruit 1.2-1.5 cm long, 0.5 cm wide, glabrous; peduncle obsolete to 0.5 cm long; calyx in fruit 0.4-0.5 cm long, the lobes 0.2-0.3 cm long, glabrous or glabrescent, the apex barbate. Seed 0.8-1.1 cm long, 0.3-0.5 cm wide; arilloid 0.2-0.3 cm long; testa under arilloid sculptured or smooth(?).

6a. Rourea neglecta var neglecta

Rourea glabra H.B.K. var coriacea Baker, in Martius,  
Fl. Brasil. 14(2): 182. 1871, pro parte quoad  
exsiccatum Spruce 2952 tantum.

Rourea coriacea (Baker) Schellenberg, Pflazenreich  
Heft 103: 213. 1938, nom illegit. non R. coriacea  
De Wild.

Holotype examined (K): Brazil, "prope San Carlos, ad  
Rio Negro." R. Spruce 2952 fr. Apr 1853. Isotypes examined  
(BR, G, K, P, W).

Scandent shrub. Leaves 2-3-jugate; petiole 3-7 cm long;  
rachis 0.5-15 cm long. Leaflets 8-12 cm long, 3-3.5 cm broad,  
narrowly to broadly elliptic, the apex sharply acuminate  
(acumen 1-2.5 cm long), the base attenuate or rounded; pe-  
tiolule 0.2-0.5 cm long. Inflorescence paniculate, terminal  
or axillary. Pedicels articulate, 0.3-0.5 cm long above arti-  
culation; sepals 0.25-0.3 cm long, 0.1-0.15 cm broad, ellip-  
tic, puberulous; petals 0.4 cm long, 0.2 cm broad, oblong-  
obovate, glabrous, free; stamens 10, five short c. 0.1 cm long,  
five long c. 0.2 cm long, the tube 0.02 cm long; anthers glo-  
bose, 0.05 cm in diameter; ovary pilose, 0.1 cm long; style  
0.2 cm long, base pubescent; stigma capitate, two-lobed.  
Fruit 1.3-1.5 cm long, glabrous; calyx in fruit 0.4-0.5 cm  
long, the lobes 0.2-0.25 cm long, glabrescent, the apex bar-

bate. Seed 1-1.1 cm long, 0.5 cm wide; arilloid 0.2 cm long; testa under arilloid sculptured.

Distribution: Brazil and Venezuela, in the area of the Rífo Negro, northwestern Amazonia, in forest at approximately 100-150 m altitude.

This taxon closely resembles R. surinamensis, but differs mainly in the more numerous leaflets which are usually smaller, in the sharply acuminate apex of the leaflets, in the glabrous inflorescence, and in the longer calyx lobes in fruiting material.

Rourea neglecta is one of the species confined to northwestern Amazonia, while R. surinamensis does not occur in that region.

VENEZUELA. Terr. Amazonas: Sanariapo, 7 Apr 1942, Ll. Williams 16018 fr. (F, G, US). BRAZIL. Amazonas: km 21 da Rodovia Itacoatiara-Manaus, 12 Nov 1963, B. Oliveira 2984 fl. (UB); Rio Negro, Serra de São Gabriel, 1 May 1947, J. M. Pires 583 fl. (COL, NY).

6b. Rourea neglecta var brevipes Forero, var. nov.

Holotype (GH): Colombia, Vaupés, "Alto Vaupés, alrededores de Miraflores." G. Gutiérrez V. & R. E. Schultes 822 fr. 17 Feb 1944. Isotypes (COL).

A varietate neglecta pedunculo brevissimo, foliis trifoliolatis cum rachibus brevibus, foliolis breviter acuminatis differt.

Liana; branchlets terete, glabrous, conspicuously lenticellate. Leaves imparipinnate, 1-jugate; petiole 1.5 cm long, glabrous; rachis 0.5 cm long, glabrous. Leaflets 5.5-6.5 cm long, 2.5-3.5 cm broad, elliptic, coriaceous, dark, shiny and glabrous above and below, the apex short-acuminate (acumen 0.5-0.7 cm long), the base rounded, the margin revolute; petiolule 0.2-0.3 cm long; venation finely reticulate, diffuse above, prominulous below; lateral veins 5-6 pairs, diverging from midrib at angles of  $50^{\circ}$ - $60^{\circ}$ , not anastomosing clearly near margin. Inflorescence paniculate, pseudoterminal, the rachilla 4-6 cm long, glabrous or glabrescent. Flowers unknown. Fruit 1.2 cm long, 0.5 cm wide, glabrous; peduncle articulate, the fruit sessile or peduncle 0.1 cm long above articulation; calyx in fruit 0.4 cm long, glabrous, the lobes 0.2-0.3 cm long. Seed 0.8 cm long, 0.3 cm wide; arilloid 0.2-0.3 cm long.

Distribution: Known only from the type collection in Amazonian Colombia, comisaría del Vaupés.

This variety is closely related to R. neglecta var neglecta. The best character to differentiate it is the very short peduncle. It can also be separated from var neglecta by its unjugate leaves. Rourea neglecta var brevipes is also related to R. surinamensis, from which it differs in the smaller leaflets which are coriaceous rather than rigid-coriaceous. The petiolule is usually shorter in var brevipes than it is in R. surinamensis. As in var neglecta, it is geographically disjunct from R. surinamensis.

7. Rourea kappleri Lanjouw, Recueil Trav. Bot. Néerl. 37: 291. 1940.

Holotype examined (L): Suriname, W/o locality, Kappler 95 fl. W/o date.

Scandent shrub; branchlets terete, densely puberulous, conspicuously lenticellate. Leaves imparipinnate, 2-jugate; petiole 2-3.5 cm long, glabrous; rachis 2-6 cm long, glabrous. Leaflets 5.5-10 cm long, 2.8-4.5 cm broad, elliptic to ovate-elliptic, subcoriaceous, subconcolorous, glabrous above and below, the apex acuminate, the base cuneate or rounded; petiolule 0.2 cm long; venation reticulate, plane or prominulous above, prominulous below; midrib impressed above, prominulous below; lateral veins 5-7 pairs, diverging from midrib at angles of 50°-80°, anastomosing clearly near margin. Inflorescence paniculate, terminal, the rachilla 3-5(-7) cm long, densely puberulous; bracts 0.1-0.15 cm long, triangular. Pedicels articulate, 0.4-0.5 cm long above articulation, puberulous; sepals 0.3 cm long, 0.15 cm broad, densely puberulous without, puberulous within; petals 0.4-0.5 cm long, 0.15-0.2 cm broad, glabrous, free; stamens 10, five short, c. 0.15 cm long, five long c. 0.3 cm long; anthers globose, 0.05 cm in diameter; ovary pilose c. 0.1 cm long; style pubescent at base, 0.15-0.25 cm long. Fruit unknown.

Distribution: Suriname, the exact type locality unknown, and territory of Amapá, Brazil. Occurring in forest.

Lanjouw places the affinities of R. kappleri with R. amazonica. In my opinion it resembles much more R. neglecta, from which it differs primarily in the densely puberulous pubescence of inflorescence and calyx. It can also be recognized in that the venation is not finely reticulate, by the longer leaf rachis, and by the gradually acuminate apex of the leaflets.

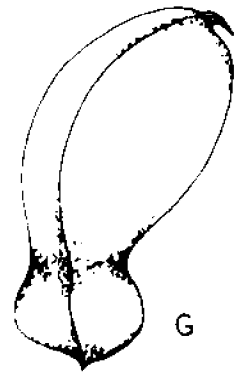
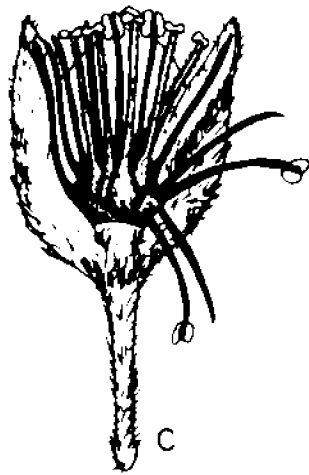
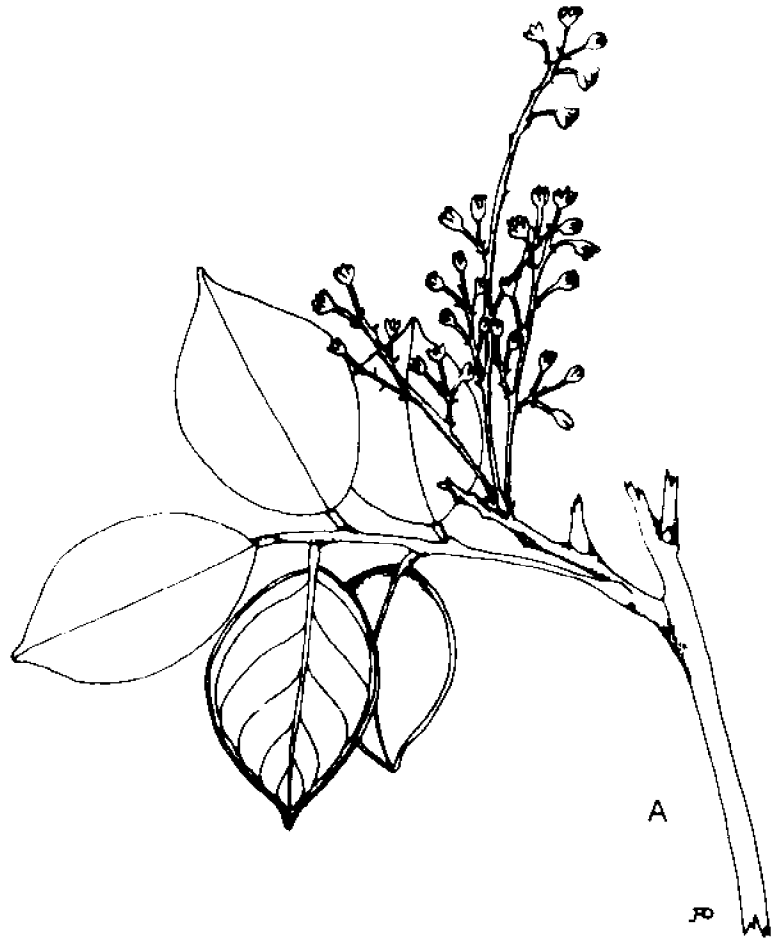
BRAZIL. Terr. Amapá: Rio Oiapoque, 16 Oct 1950, R. L. Fröes 26662 fl. (NY, P, RB, SP, U).

8. Rourea paraensis Forero, sp. nov. Fig. 26.

Holotype (NY): Brazil, Pará, 1 km N of Rio Muirapiranga.  
G. T. France, T. D. Pennington & N. T. Silva 1607 fr. 11 Oct  
 1965. Isotypes examined (F, GH, S, U, W).

Frutex parvus vel frutex scandens, ramulis teretibus, minute et dense puberulis, conspicue lenticellatis. Folia imparipinnata 1-2-(rare 3-) jugata, cum petiolo 1.5-5 cm longo, glabro, rachi 1-5.5 cm longa, glabra. Foliola 4.5-11 cm longa, 2.5-6 cm lata, late elliptica, coriacea, concolore, utrinque glabra, apice acuminata vel plus minusve rotundata, base rotundata, margine versus basim semper revoluta versus apicem saepe revoluta; petiolo 0.2-0.4 cm longo; venis reticulatis; costa supra plana vel leviter impressa subtus prominente; nervis lateralibus 4-5 jugis, difusis, planis cum costa angulo  $60^{\circ}$ - $70^{\circ}$  facienti, versus marginem plus minusve distincte anastomosantibus. Inflorescentiae paniculatae, rachibus 3-9 cm longis crassis puberulis; bractaeae 0.1-0.2 cm longae, triangularis. Pedicelli articulati, supra articulum 0.4-0.5 cm longi, puberuli; sepala 0.35-0.4 cm longa, 0.2 cm lata, ovato oblonga, puberula, versus basim imbricata; petala haud visa; stamina 10, 5 brevibus circa 0.2 cm longis, 5 longioribus circa 0.3 cm longis; tubo 0.02-0.05 cm longo; ovarium pilosum, 0.1 cm longum; stylus pubescens, c. 0.3 cm longus. Folliculus immaturus glabrus, calyce 0.4 cm longo puberulo, lobis 0.2 cm longis versus basim imbricatis.

Fig. 26. Rourea paraensis. A-E, Maguire et al 56032.  
A. Habit (x 0.5). B. Flower (x 6). C. Flower with two  
sepals removed (x 6). D. Sepal (x 8). E. Pistil (x 8).  
F and G, Prance et al. 1607. Fruit (x 3.5).



Small shrub or liana; branchlets terete, minutely and densely puberulous, conspicuously lenticellate. Leaves imparipinnate, 1-2-(rarely 3-) jugate; petiole 1.5-5 cm long, glabrous; rachis 1-5.5 cm long, glabrous. Leaflets 4.5-11 cm long, 2.5-6 cm broad, broadly elliptic, coriaceous, concolorous, glabrous above and below, the apex short-acuminate or nearly rounded, the base rounded, the margin revolute (at least near base); petiole 0.2-0.4 cm long; venation reticulate, the midrib plane or slightly impressed above, prominent below; lateral veins 4-5 pairs, diffuse, plane, diverging from midrib at angles of  $60^{\circ}$ - $70^{\circ}$ , anastomosing more or less clearly near margin. Inflorescence paniculate, the rachilla 3-9 cm long, thick, puberulous; bracts 0.1-0.2 cm long, puberulous, triangular. Pedicels articulate, 0.4-0.5 cm long above articulation, puberulous; sepals 0.35-0.4 cm long, 0.2 cm broad, ovate-oblong, puberulous, imbricate near base; petals not seen; stamens 10, five short c. 0.2 cm long, five long, c. 0.3 cm long, the tube 0.02-0.05 cm long; ovary pilose, 0.1 cm long; style pubescent, c. 0.3 cm long. Immature fruit glabrous; calyx in fruit 0.4 cm long, puberulous, the lobes 0.2 cm long, imbricate near base.

Distribution: Brazil, known only from the state of Pará. Occurring in forest.

This species resembles R. neglecta but differs in the short-acuminate or nearly obtuse leaflets, in the thick inflorescence, and in the puberulous rachilla and calyx. So far this species appears to be restricted to the southeastern flo-

ristic region of Amazonia, and is found very near the boundary between Amazonia and the northernmost limit of the cerrado vegetation.

BRAZIL. Pará: Rio Tocantins, 28 Sep 1948, R. L. Fróes 23552 fr. (GH, NY); Belém-Brasília Highway, km 98, 6 Aug 1963, B. Maguire, J. M. Pires, C. K. Maguire & N. T. Silva 56032 fl. (NY); Road BR 22, Capanema to Maranhão, Vicinity of Cachoeira, km 96, 30 Oct 1965, G. T. Prance & T. D. Pennington 1835 fr. (F, G, GH, NY, S, U).

9. Rourea omissa Forero, sp. nov. Fig. 27.

Holotype (NY): Perú, Loreto, Yarina Cocha. G. Tessmann  
5421 fl. Oct 1925.

Frutex scandens; ramulis teretibus, dense puberulis, inconspicue lenticellatis. Folia 1-juga vel unifoliolata, petiolo 2.5-4.5 cm longo, glabro, rachis (0-)2-4 cm longa, glabra. Foliola 9-15 cm longa, 3.5-5.5 cm lata, elliptica, chartacea, utrinque glabra, apice acuminata, basi cuneata, petiolulo 0.2-0.4 cm longo; venis reticulatis, costa supra plana vel impressa, subtus prominente; nervis lateralibus 6-8 jugis, supra planis, subtus subprominentibus, cum costa angulo 40°-60°facienti. Inflorescentiae laxae pseudoracemosae (ramis plerumque uniflorentibus), pseudoterminales, rachibus 7-11 cm longis, puberulis; bractee 0.1-0.2 cm longae, triangulares, puberulae. Pedicelli articulati, dense puberuli supra articulum 0.2-0.5 cm longi, sepala 0.25-0.3 cm longa, 0.25 cm lata, ovata vel orbiculata, dense puberula; petala 0.5-0.7 cm longa, 0.3 cm lata, elliptica vel ovato-elliptica, glabra, libera, stamina 10, 5 episepala c. 0.2 cm longa, 5 epipetala c. 0.45 cm longa, tubo 0.05 cm longo; ovarium dense pilose c. 0.1 cm longo; stylus c. 0.3 cm longus, versus basim pubescens. Fructus mihi ignotus.

Liana; branchlets terete, densely puberulous, inconspicuously lenticellate. Leaves 1-jugate, or unifoliolate; petiole 2.5-4.5 cm long, glabrous; rachis 2-4 cm long (rarely

Fig. 27. Hourea omisa. A-D, Tessmann 5421. Magnifications approximate. A. Habit (x 0.5). B. Flower (x 10). C. Flower with one sepal and three petals removed (x 10). D. Petal (x 10).



obsolete), glabrous. Leaflets 9-15 cm long, 3.5-5.5 cm broad, elliptic, chartaceous, glabrous above and below, the apex acuminate, the base cuneate; petiolule 0.2-0.4 cm long; venation reticulate, the midrib plane or impressed above, the lateral veins plane; venation prominulous below; lateral veins 6-8 pairs, diverging from midrib at angles of  $40^{\circ}$ - $60^{\circ}$ . Inflorescence lax, racemoid (mostly with one- to three-flowered branches), pseudoterminal, the rachilla 7-11 cm long, puberulous; bracts 0.1-0.2 cm long, triangular, puberulous. Pedicels articulate, densely puberulous, 0.2-0.5 cm long above articulation; sepals 0.25-0.3 cm long, 0.25 cm broad, ovate to orbiculate, densely puberulous; petals 0.5-0.7 cm long, 0.3 cm broad, elliptic or ovate-elliptic, glabrous, free; stamens 10, five short c. 0.2 cm long, five long c. 0.45 cm long, the tube 0.05 cm long; ovary densely pilose, c. 0.1 cm long; style c. 0.3 cm long, the base pubescent. Fruit unknown.

Distribution: Known to date only from the type locality in Perú.

This species is most closely related to R. puberula and was mistaken for that species by Schellenberg. It can be separated from R. puberula by its long, racemoid inflorescence and by the large size of the petals. The leaflets in R. omissa tend to be larger than those of R. puberula.

10. Rourea doniana Baker, in Martius, Fl. Brasil. 14(2): 179.  
1871.

Rourea patentinervis Radlk., in Sitzb. Math.-Phys. Akad.  
Muench 16: 375. 1886. Holotype (B, lost). Photo-  
graph of holotype examined (NY); Brazil, "Brasilia  
australis" Sello 1825 fr. w/o date.. Isotypes examined  
(BR, F, frag., M).

Santalodes donianum (Baker) O. Ktze., Rev. Gen. 1: 155.  
1891.

Holotype examined (BR); Brazil, Maranhão. G. Don 41 fl.  
1858.

Liana; branchlets terete, minutely puberulous or gla-  
brescent, conspicuously lenticellate or lenticels absent.  
Leaves imparipinnate, 1-2-jugate, rarely unifoliolate, petiole  
1.5-3.5 cm long, glabrous; rachis 2.5-3.5 cm long (rarely ob-  
solete), glabrous. Leaflets 2.5-7 cm long, 1.5-3 cm broad,  
ovate-elliptic, chartaceous, glabrous above and below, the  
lower surface darker than the upper surface (in most herba-  
rium specimens), the apex bluntly acute or acuminate, the  
base obtuse, rarely cuneate; petiolule 0.2-0.3 cm long; vena-  
tion reticulate, prominulous above and below; lateral veins  
4-9(-13) pairs, anastomosing clearly near margin. Inflores-  
cence paniculate, terminal or axillary, the rachilla 3-5(-7)  
cm long, puberulous or tomentose; bracts 0.1 cm long. Pedicel

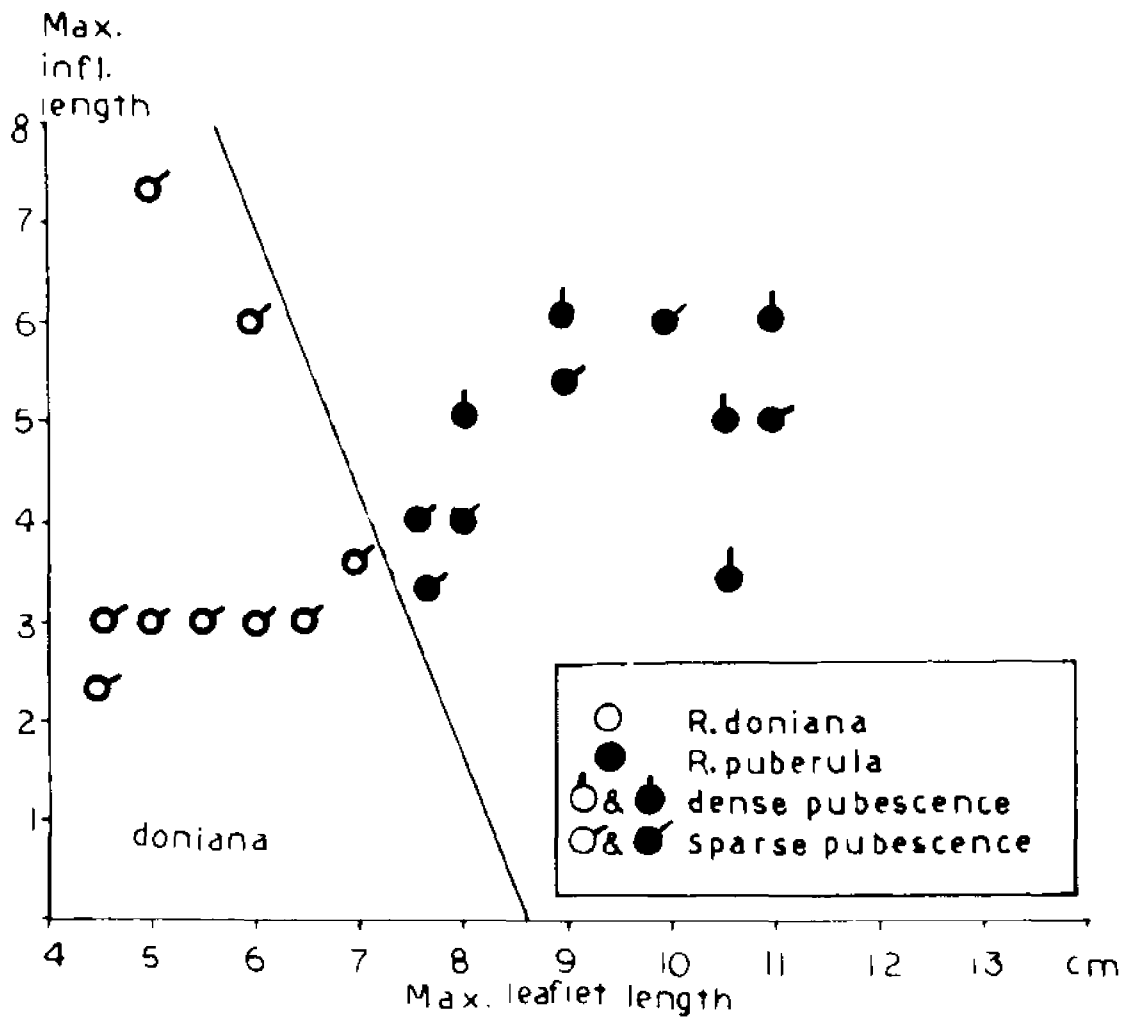
articulate, very short to 0.3 cm long; sepals 0.2 cm long, 0.1 cm broad, oblong to ovate-oblong, puberulous or tomentose without, densely puberulous within; petals 0.4 cm long, 0.15 cm broad, glabrous, free; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long; anthers globose; ovary pilose, c. 0.1 cm long; style pubescent, c. 0.3 cm long. Fruit 1.2 cm long, 0.5 cm wide, glabrous, sessile or peduncle very short; calyx in fruit 0.5 cm long, puberulous, the lobes 0.2 cm long. Seed 0.9 cm long, 0.5 cm wide; arilloid 0.25 cm long; testa under arilloid smooth.

Distribution: Brazil, in the states of Pará, Maranhão, and Espírito Santo(?). Apparently occurring in disturbed habitats.

Rourea doniana is most closely related to R. puberula. Despite the separate distribution patterns of these two species, few taxonomic differences exist between them. There are some differential characters (as opposed to "diagnostic" characters cf., White 1962), which can not be relied upon to distinguish the two taxa; however, when these characters are used in combination, the two species can be readily separated. The pictorialized-scatter diagram in Fig. 28 illustrates the correlation between the following differential characters: maximum leaf length, maximum inflorescence length, and pubescence of the calyx.

BRAZIL. Pará: Castanhal, Colônia 3 de Outubro, 11 Dec 1949, G. A. Black 49-8613 fl. (P); Campina de Arumatena (E. de T. de Alcobaça), 3 Jan 1915, A. Ducke RB19745 fr. (RB);

Fig. 28. Pictorialized scatter-diagram of R. doniana and R. puberula, showing the correlation between maximum leaflet length, maximum inflorescence length and pubescence of calyx.



Município de Castanhal, Colônia 3 de Outubro, 11 Feb 1950,  
T. Guedes 264 fl. (NY, US); W/o locality, W/o date, Schwarz  
s.n. fr. (W). Maranhão: Ilha, 9 Nov 1903, A. Ducke 339 fl.  
(MG, RB). Espírito Santo: Serra de Itabapoana, 5 Sep 1875,  
A. Glaziou 9757 fl. (C, P). W.o locality, W/o date, Newman  
s.n. fl. (P).

11. Rourea puberula Baker, in Martius, Fl. Brasil. 14(2): 178. 1871.

Connarus oblongifolius Martius ex Baker, in Martius, Fl. Brasil. 14(2): 179. 1871, pro parte, nomen nudum in syn.

Connarus gilgianus Pilger, Bot. Jahrb. Syst. 30: 154. 1901. Holotype not seen (B, lost): Brazil, Kulisehu, Pilger 791 Aug 1899.

Holotype examined (M): Brazil, Mato Grosso, Cuiabá.

Patricio da Silva Manso (Martius Herb. Fl. Brasil.) 1267 fl. pro parte, W.o date. Isotypes examined (BR, F, frag., G, K, M, NY, P, W).

Scandent shrub or woody vine; branchlets terete, striate, puberulous. Leaves imparipinnate, 1-5-jugate, rarely unifoliolate; petiole 1.5-4.5 cm long, glabrous; rachis 1-11 cm long, glabrous. Leaflets 3.5-12 cm long, 1.5-6 cm broad, elliptic, orbicular or ovate-oblong, subchartaceous or chartaceous, opaque (rarely shiny), glabrous above and below, the apex acuminate, the base rounded or cuneate; petiolule 0.2-0.4 cm long; venation reticulate, plane or prominulous above and below; lateral veins 5-7 pairs, diverging from midrib at angles of 50°-70°, anastomosing clearly near margin. Inflorescence paniculate, axillary to terminal, the rachilla 2-7 cm long, puberulous or tomentose; bracts 0.1 cm long.

Pedicels articulate, 0.1-0.2 cm long above articulation; sepals 0.3 cm long, 0.15-0.2 cm broad, villous, tomentose or puberulous without, densely tomentose within; petals 0.3 cm long, 0.2 cm broad, glabrous, free; stamens 10, five short c. 0.25 cm long, five long c. 0.35 cm long; ovary pilose. Fruit 1-1.2 cm long, 0.5 cm wide, glabrous or sparsely puberulous; calyx in fruit 0.4-0.5 cm long, puberulous, the sepals ovate, imbricate. Seed 0.8 cm long; arilloid 0.3-0.4 cm long; testa under arilloid sculptured.

Distribution: Found in southern and southwestern Amazonia, in the Brazilian states of Rondônia and Mato Grosso and in Bolivia. Growing in forest, in islands of forest in cerrado and in the margin of forest and campo, at altitudes of 100 to 850 m above sea level. Two collections from the Brazilian state of Minas Gerais and one from the Territory of Rondônia are provisionally assigned to R. puberula.

Rourea puberula is closely related to R. amazonica, R. duckei and R. doniana. These four species form a very compact aggregation, and distinction among them is usually difficult. Rourea puberula differs from R. amazonica in the smaller leaflets and in the usually shorter inflorescences. It differs from R. doniana in the much larger and elliptic leaflets, and in the few lateral veins. Finally it can be distinguished from R. duckei by the imbricate sepals in fruiting condition and by the shorter inflorescences.

The collections Irwin 2736 and Saint-Hilaire C 341, from the Brazilian state of Minas Gerais, and Krukoff 1655, from

the Territory of Rondônia, differ from the rest in the more numerous, ovate-oblong or elliptic and shiny leaflets. Their inclusion in R. puberula is provisional, and will only be verified or corrected when more collections become available.

BRAZIL. Terr. Rondônia: Rio São Miguel, afluyente do Guaporé, 20 Jun 1952, G. A. Black & E. Cordeiro 52-15226 fl. (INPA); Source of the Jatuarana River, Machado River region, Dec 1931, B. A. Krukoff 1655 fr. (G, NY, S, U); Forte Príncipe da Beira, local Baía, 11 Jan 1962, W. Rodrigues & B. Wilson 4285 fr. (INPA). Mato Grosso: 50 km from Cuiabá en route to Rondonópolis, 28 Sep 1963, B. Maguire, J. M. Pires, C. K. Maguire & N. T. Silva 56884 fl. (NY); 50 km from Cuiabá to Rondonópolis, 28 Sep 1963, J. M. Pires 56884 fl. (UB). Minas Gerais: Viçosa, State Agricultural School, 24 Feb 1959, H. S. Irwin 2736 fr. (F, NY, US); Itapuru, 1816-1821, A. de Saint-Hilaire C-341 fr. (P). BOLIVIA. Rio Guaporé, Santo Antonio de Manoelito, 25 Jun 1952, G. A. Black & E. Cordeiro 52-15329 fr. (UB). Santa Cruz: Prov. Sara, Río Surutu, 4 Oct 1917, J. Steinbach 3491 fl. (G, K, NY); Prov. Sara, Buena Vista, 1 Oct 1924, J. Steinbach 6529 fl. fr. (A, F, K); Prov. Sara, Río Palometilla, 13 Dec 1924, J. Steinbach 6735 fl. fr. (A, F, G, S, U); Prov. Sara, Río Palometilla, 12 Jan 1926, J. Steinbach 7608 fr. (F, G, GH, S, U); Prov. Sara, Río Palometilla, 12 Jan 1926, J. Steinbach 7610 fr. (F, G, S).

12. Rourea amazonica (Baker) Radlkofer, Sitzb. Math.-Phys. Akad. Muench 16: 375, 377. 1886.

Rourea glabra var amazonica Baker, in Martius, Fl.

Brasil. 14(2): 182. 1871, pro parte. Lectotype examined (M): Brazil, Rio Negro, "in sylvis Yapurensibus."

Martius s.n. fr. W/o date. (Lectotype selected by Schellenberg, 1938).

Rourea amazonica Huber, Bol. Mus. Goeldi 5: 373. 1909.

Holotype examined (MG). Fragment and photograph of holotype examined (F): Brazil, Amazonas, Rio Negro, Parana do Adauca a W de Faro. A. Ducke 8659 fr. 7 Sep 1907. Isotype examined (HB).

Scandent shrub, shrub or small tree; branchlets terete, glabrous or puberulous. Leaves 1-2-jugate, rarely unifoliolate; petiole 1.5-3.5 cm long, glabrous; rachis 1-10 cm long, glabrous. Leaflets 6-31 cm long, 3-15 cm broad, elliptic or obovate, chartaceous, glabrous above and below, the apex sharply or gradually acuminate, the base attenuate or obtuse; petiolule 0.2-0.5 cm long; venation reticulate, diffuse, plane above, prominulous (midrib prominent) below; lateral veins 6-7 pairs, ascending, anastomosing diffusely near margin. Inflorescence paniculate, pseudoterminal, the rachilla 4-13 cm long, puberulous; bracts 0.1-0.15 cm long, triangular, minutely puberulous. Pedicels articulate, very short or 0.1-0.4 cm long, puberulous; sepals 0.3-0.4 cm long, 0.1-0.2 cm broad, oblong-lanceolate, oblong-elliptic or ovate-oblong, densely to sparsely puberulous

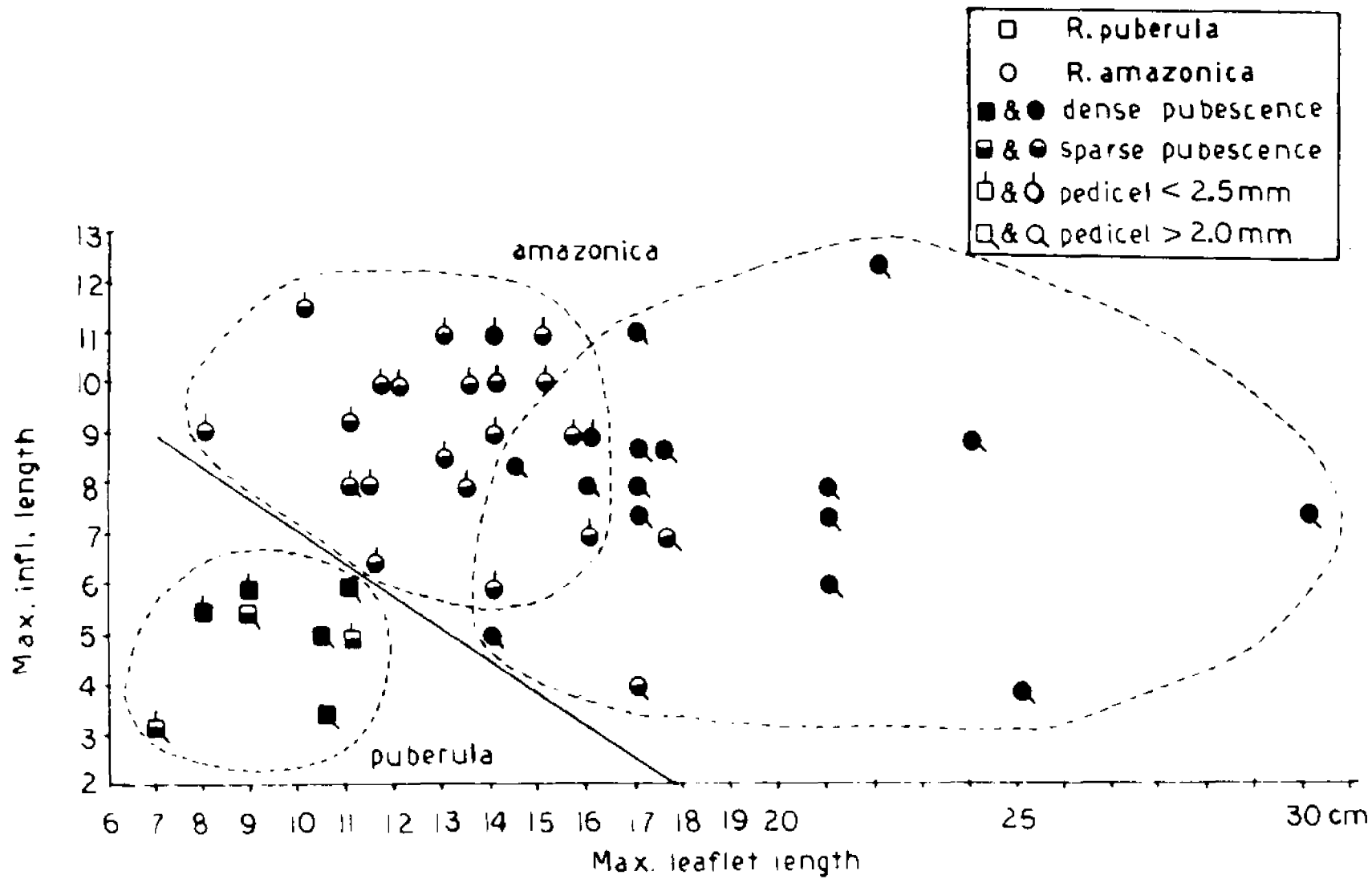
without, puberulous within; petals 0.5 cm long, 0.1-0.2 cm broad, glabrous, free; stamens 10; anthers globose. Fruit 1-1.2 cm long, 0.3-0.5 cm wide, glabrous, recurved, the apex villous; calyx in fruit 0.5-0.6 cm long, lanceolate-elliptic, densely or sparsely puberulous, the margin ciliate. Seed 0.6-1 cm long, 0.3-0.4 cm wide; arilloid 0.2-0.3 cm long; testa under arilloid smooth.

Distribution: In the Brazilian states of Amazonas, Acre and Territory of Rondônia and adjacent Bolivia, in the territory of Amazonas in Venezuela, and in Dept. Loreto in Perú. Occurring in forests, river margins and edge of forest.

The variability found in R. amazonica is not surprising, given its wide area of distribution. Its distinction from the closely related and very similar R. puberula is often difficult. The pictorialized scatter-diagram in Fig. 29 shows the correlation between maximum leaf length, maximum inflorescence length, length of the pedicel and density of indumentum on the calyx in R. puberula and R. amazonica. None of these characters, when taken separately, is absolutely diagnostic; the values for one species overlap with those of the other so that there is no clearcut discontinuity between them. But when these characters (especially leaf length and inflorescence length) are used in combination, as shown in the pictorialized scatter-diagram, the two species can be readily separated.

Rourea amazonica is a species with considerable biological diversity, as can be seen from the scatter-diagram in Fig. 29. The following forms can be distinguished when the

Fig. 29. Pictorialized scatter-diagram of Rourea puberula and R. amazonica, showing correlation between maximum leaflet length, maximum inflorescence length, length of pedicel and peduncle, and pubescence of calyx.



material available is examined closely, and after the different characters are plotted in the scatter-diagram. These forms are best left unnamed until the species becomes better known throughout its range:

a) The populations from western Amazonia (Dept. Loreto, Perú), characterized by the sessile or very short-pedicellate flowers and fruits, the large leaflets of which the terminal one is usually obovate, the sharply and abbreviately acuminate apex of the leaflets, the usually long inflorescence, and the densely puberulous calyx.

b) The populations from south-central Amazonia, characterized by the elliptic, smaller leaflets with gradually and usually long-acuminate apex of the leaflets, the sparsely puberulous calyx, the long inflorescence, and the longer pedicel and peduncle (0.3-0.5 cm long). This variant approaches R. puberula mainly in the size of the leaflets and in the length of pedicels and peduncles.

c) The reason for not recognizing the above forms as formal infra-specific taxa is the large number of intermediate variants found throughout the range of the genus. One of these intermediates is the type of the species (Martius s.n. from the area of the Rio Negro in Brazil), which has long pedicels and a sparsely pubescent calyx. Poeppig 2332, Tessmann 4030 and Williams 4091, from Perú, differ from the form growing in that country only in the smaller size of the leaflets. Tessmann 4053 and Woytkowsky 6278 differ in the longer pedicels. Williams 15293, from Amazonian Venezuela, approaches

the Peruvian populations in the shape of the terminal leaflet and in the sharp and short-acuminate apex of the leaflets, but resembles the other form in the long peduncle and in the sparsely puberulous calyx.

VENEZUELA. Terr. Amazonas: Tamatana, Alto Orinoco, W/o date, Ll. Williams 15293 fr. (F, VEN). BRAZIL. Amazonas: Purús, Bom Lugar, 22 Jul 1903, A. Goeldi 3961 fl. (MG, RB); Municipality Manicore, near Bella Vista, 8-11 Sep 1934, B. A. Krukoff 6001 fl. (BR, F, G, K, NY, S, U); Km 21 da Rodovia Itacoatiara-Manaus, 8 Nov 1963, E. Oliveira 2905 fl. (UB); Rio Juruá, Marary, Sep 1900, E. Ule 5054 fr. (F, G, K, MG). Mato Grosso: Serra do Roncador, 50 km N of Chavantina, Rio Vau, 8 Oct 1964, G. T. Prance & N. T. Silva 59302 fl. fr. (F, GH, NY, S, U). Terr. Rondônia: Porto Velho, Cachoeira Samuel, 18 Aug 1963, B. Maguire, J. M. Pires, C. K. Maguire & N. T. Silva 56721 fr. (NY, UB); Basin of Rio Madeira, Rio Laje on road Guajará-Mirim to Abunã, 3 Aug 1968, G. T. Prance, E. Forero, B. L. Wrigley, J. F. Ramos & L. G. Farias 6743 fr. (INPA, NY). Acre: Municipality of Tarauacá, Rio Murú, 12 km above confluence with Rio Tarauacá, 16 Sep 1968, G. T. Prance, J. F. Ramos & L. G. Farias 7314 fl. (INPA, NY). PERU. Loreto: Masisea, 25 Jul 1929, E. P. Killip & A. C. Smith 26849 fr. (US); Yurimaguas, lower Río Huallaga, 22 Aug-9 Sep 1929, E. P. Killip & A. C. Smith 29037 fr. (F, NY); "Maynas, in sylvis ad Yurimagua," 1830, Poeppig 2152 fr. (F, P, W); Mouth of Río Santiago, 1924, G. Tessmann 4030 fl. (G, NY, S); Along Río Itaya, 13 May 1929, Ll. Williams 221 fr. (F, G); Yurimaguas, lower Río Huallaga, 22 Oct 1929, Ll. Williams 3885 fl. (A,F); Pucallpa, shores of Ucayali River,

3 May 1961, F. Woytkowski 6278 fr. (NY). BOLIVIA. Rurrenabaque,  
22 Nov 1921, M. Cárdenas 1753 fr. (K, NY,US).

13. Rourea duckei Huber, Bol. Mus. Goeldi 5: 373. 1909.

Lectotype examined and selected (RB): Brazil, Pará, Rio Mapuera, affl. Rio Trombetas. A. Ducke 9097 fl. 11 Dec 1907. Paratype examined (RB): Brazil, Pará, Rio Mapuera affl. Rio Trombetas. A. Ducke 8962 fl. 30 Nov 1907.

Liana; branchlets tomentose. Leaves imparipinnate, 3-5-jugate; petiole 4-5 cm long; rachis 10-15 cm long. Leaflets 7-15 cm long, 4-7 cm broad, ovate to elliptic, subcoriaceous, concolorous, glabrous, the apex acuminate, the base rounded; petiolule 0.5 cm long; venation reticulate, prominulous above, prominent below. Inflorescence paniculate, terminal, the rachilla 8 cm long, puberulous; bracts 0.4 cm long; sepals 0.25-0.3 cm long, ovate-oblong, puberulous; petals 0.5 cm long, obovate-lanceolate; stamens 10, five short c. 0.35 cm long, five long c. 0.4 cm long, the tube 0.05 cm long; ovary pilose, c. 0.1 cm long; style pubescent, c. 0.1 cm long. Fruit 1.5 cm long, 0.6 cm wide, glabrous, the peduncle articulate, 0.4-0.5 cm long above articulation; calyx in fruit puberulous, the lobes valvate, 0.3 cm long. Seed 1 cm long, 0.5 cm broad; arilloid 0.4 cm long.

Distribution: Brazil, state of Pará, and territory of Amapá. Growing on river margins and on sandy soils near sea level.

Rourea duckei is closely related to R. amazonica, R. puberula and R. doniana. It can be distinguished from amazonica by the calyx lobes which are shorter and valvate

in fruiting condition. A summary of the differences with R. puberula and R. doniana can be found under those species.

BRAZIL. Amapá: Rio Araguaí, 13 Sep 1961, J. M. Pires, W. Rodrigues & G. C. Irvine 50895 fl. (G, NY). Pará: Alenquer, Colônia Lauro Sodré, km 15, estrada para o Igarapé do Cipoal, 21 Feb 1953, R. L. Frões & G. P. Filho 29380 fr. (SP).

14. Rourea camptoneura Radlkofer, Sitzb. Math.-Phys. Akad. Muench. 16: 375. 1886.

Rourea glabra var amazonica Baker, in Martius, Fl.

Brasil. 14(2): 182. 1871, pro parte quoad exsiccata Spruce 2168 tantum.

Rourea glabra var trifoliolata Britton, Bull. Torrey

Bot. Club 16: 192. 1889. Holotype examined (NY):

Bolivia, Junction of Rivers Beni and Madre de Dios,

H. H. Rusby 1360 fl. fr. Aug 1886. Isotypes examined (GH, K, US).

Rourea rectinervia A. C. Smith, Bull. Torrey Bot.

Club 60: 353. 1933. Holotype examined (NY): Brazil,

Terr. Rondônia, Source of the Jatuarana River, Machado

River region. B. A. Krukoff 1660 fl. fr. Dec. 1931.

Isotypes examined (A, G, K, S, U).

Lectotype examined (M): Brazil, "Prope São Gabriel de Cachoeira, ad Rio Negro." R. Spruce 2168 fr. Jan-Aug 1852.

(Lectotype selected by Schellenberg, 1938). Isotypes examined (G, K, P, W).

Scandent shrub or woody vine; branchlets terete, glabrous, glabrescent or puberulous, inconspicuously lenticellate. Leaves imparipinnate, 1-3-jugate; petiole 3-11 cm long, glabrescent; rachis 1.5-12 cm long, glabrescent. Leaflets 5-16 cm long, 2.7-8 cm broad, elliptic, ovate-elliptic or rarely obovate (terminal leaflets), chartaceous, glabrous above and

below, the midrib sparsely puberulous or glabrous, the apex acuminate, the base obtuse to attenuate; petiolule 0.2-0.5 cm long; midrib impressed above, prominent below; lateral veins 4-7 pairs, ascending, diverging from midrib at angles of 40°-50°, impressed above, prominent below, the veinlets transverse. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 8-14 cm long, puberulous; bracts 0.1-0.2 cm long. Pedicels articulate, 0.1-0.4 cm long; sepals 0.25 cm long, 0.2-0.25 cm broad, orbiculate or suborbiculate, densely puberulous or tomentose, the margin ciliate; petals 0.8-1 cm long, 0.25 cm broad, cochleariform (spoon-shaped), glabrous, free; stamens 10, five short c. 0.15 cm long, five long c. 0.3 cm long, the tube short; anthers 0.05 cm in diameter, globose or subcordate; ovary pilose, c. 0.1 cm long; style 0.02-0.03 cm long; stigma two-lobed. Fruit 1.3-1.5 cm long, 0.7 cm wide, glabrous; calyx in fruit 0.4-0.5 cm long, puberulous, ascending. Seed 1 cm long, 0.4-0.5 cm wide; arilloid 0.3-0.4 cm long; testa under arilloid smooth.

Distribution: Widespread in the Amazonian regions of Brazil, Ecuador, Perú and Bolivia. Occurring in upland forest, várzea forest, river margins and disturbed woodland (capoeira), at altitudes of about 100 m above sea level.

Rourea camptoneura is readily recognized by the ascending lateral veins and the transverse veinlets, as well as by the long, cochleariform petals which are 3-5 times as long as the sepals. Its closest affinities are with the Central American species Rourea schippii, which has oblong-obovate and sometimes emarginate petals, usually twice as long as the sepals.

BRAZIL. Amazonas: Rio Javary, Remate de Males, 11 Jul 1906, A. Ducke 7422 fl. (MG, RB); São Paulo de Olivença, Igarapé Jundiatuba, 7 Jan 1949, R. L. Frões 23844 fl. (SP); Lago de Bedajós, 24 Aug 1950, R. L. Frões 26369 fl. (SP); Basin of Rio Juruá, near mouth of Rio Embira (tributary of Rio Tarauacá), 17 Jun 1933, B. A. Krukoff 4899 fr. (A, G, K, NY, S, U); Basin of Rio Madeira, Municipality of Humaitá, near Três Casas, 14 Sep-11 Oct 1934, B. A. Krukoff 6289 fr. (A, F, G, NY, S, U); Municipality São Paulo de Olivença, near Palmares, 11 Sep-26 Oct 1936, B. A. Krukoff 8380 fr. (A, BR, G, K, P, S, U); Rio Negro, Ilha das Flores, Fóz do Rio Vaupês, 17 Apr 1947, J. M. Pires 381 fr. (COL, NY); Basin of Rio Purús, Municipality of Lábrea, East bank of Rio Purús, 5 km above Lábrea, 31 Oct 1968, G. T. Prance, J. F. Ramos & L. G. Farias 8118 fr. (INPA, NY); Manaus, Cabeceira do Ig. do Buião, 25 Feb 1960, W. Rodrigues & J. Chagas 1495 fl. (MG, INPA); Rio Juruá, Sta. Clara, Oct 1900, E. Ule 5056 fl. (F, G, MG). Mato Grosso: Entre Barão de Melgaço e Pimenta Bueno, Jun 1918, J. G. Kuhlmann 1993 fl. (SP). Terr. Rondônia: Near Tabajaza, upper Machado River region, Nov-Dec 1931, B. A. Krukoff 1351 fr. (A, G, K, NY, S, U). Acre: Municipality of Sena Madureira, km 1-3 road Sena Madureira to Rio Branco, 10 Dec 1968, G. T. Prance, D. F. Coelho, J. F. Ramos & L. G. Farias 7966 fr. (INPA, NY). ECUADOR. Santiago-Zamora: Taisha, 6 Feb 1962, P. C. D. Cazalet & T. D. Pennington 7686 fl. (NY). PERU. Loreto: Vic. of Iquitos, Hacienda Soledad on Río Itaya, 13 Nov 1940, E. Asplund 14486 fl. (US); Mishuyacu, near Iquitos, Oct-Nov 1929, G. Klug 458 fl. (F, NY, US).

BOLIVIA. Junction of Rivers Beni and Madre de Dios, Aug 1886,

H. H. Rusby 1370 fl. fr. (G, GH, NY, P, US).

15. Bourea schippii Standley, Publ. Carnegie Inst. Wash. 461: 58. 1935.

Holotype examined (F): British Honduras, Rio Grande. W. A. Schipp 1168 fl. 28 May 1933. Isotypes examined (A, G, GH, K, NY, P, S).

Scandent shrub; branchlets terete, slightly striate, glabrous. Leaves imparipinnate, 1-2-jugate, rarely unifoliate; petiole (1-)4-6 cm long, glabrous; rachis 6-7.5 cm long, glabrescent. Leaflets 5-14 cm long, 2.5-7 cm broad, elliptic to slightly ovate, chartaceous, glabrous above and below, the apex acuminate, the base obtuse; petiolule 0.2-0.4 cm long, the midrib impressed above, prominent below; lateral veins 3-5 pairs, ascending, diverging from midrib at angles of  $20^{\circ}$ - $40^{\circ}$  ( $-50^{\circ}$ ); veinlets transverse. Inflorescence panicle, axillary, the rachilla 4-18 cm long, puberulous; bracts 0.15 cm long. Pedicels articulate, tomentose, 0.1-0.2 cm long above articulation; sepals 0.2-0.3 cm long, 0.2 cm broad, orbicular, densely tomentose without, tomentose within; petals 0.7 cm long, 0.4 cm broad, oblong-obovate, glabrous, free; stamens 10, five short c. 0.1 cm long, five long c. 0.2 cm long; anthers globose or subcordate, 0.05 cm in diameter; ovary villous, c. 0.07 cm long; style glabrous, c. 0.03 cm long. Fruit 1.5-2 cm long, glabrous, longitudinally striate; calyx in fruit 0.3-0.4 cm long, tomentose. Seed 1 cm long; arilloid 0.5-0.6 cm long; testa under arilloid sculptured or smooth.

Distribution: Central America, in British Honduras, Guatemala and Honduras. Occurring in forest and on river banks from near sea level to 300 m altitude.

The primary characters used to recognize Rourea schippii are the transverse veinlets, the ascending lateral veins, the large petals and the tomentose pubescence of the calyx in flower and fruit. The closest relative of this species is R. camptoneura from the Amazon basin.

BRITISH HONDURAS. Toledo District: Golden Stream River, 16 May 1944, P. H. Gentle 4612 fl. fr (F, US); Río Grande, 3 Aug 1944, P. H. Gentle 4734 fr. (US); Near Moffredye Creek, near San Antonio, 3 Apr 1945, P. H. Gentle 5312 fl. (F); Joe Taylor Creek, 28 Aug 1951, P. H. Gentle 7418 fr. (S, US). GUATEMALA. Peten: Dolores, on Sto. Toribio trail, 7 Jun 1961, E. Contreras 2433 fl. (F). HONDURAS. Comayagua: Río Frío cerca de La Libertad, 19 May 1956, A. Molina R. 7004 fr. (F).

16. Rourea accrescens Forero, sp. nov. Fig. 30.

Holotype (NY): Brazil, Acre, Cruzeiro do Sul, Rio Juruá, km 18 road Cruzeiro do Sul to Japiim. G. T. France, B. S. Pena & J. F. Ramos 2853 fr. Oct 1966. Isotype (INPA).

Frutex scandens, ramulis teretibus puberulis. Folia imparipinnata, rare unifoliolata, cum petiolo 2-8 cm longo, glabro vel minute puberulo, rachis (1-)3-8 cm longa, glabra vel minute puberula, basim versus teretia foliola versus planiore. Foliola 8-18 cm longa, 3-7 cm lata, elliptica vel anguste elliptica, chartacea, supra opaca vel plus minusve nitida, glabra, subtus pallida, opaca vel plus minusve nitida, glabra; apice acuminata, basi cuneata vel rotundata, margine leviter revoluta, petiolulo 0.3-0.6 cm longo, venis impressis vel planis; nervis lateralibus 6-8 jugis ascendentibus, cum costa angulo  $30^{\circ}$ - $50^{\circ}$  facienti, versus marginem anastomosantibus; venulis versus basim foliolorum transversis. Inflorescentiae paniculatae, axillares vel terminales, rachibus 2-9 cm longis, puberulis. Bracteeae 0.1-0.2 cm longae, triangulares vel lineares. Pedicelli articulati, 0.1 cm longi vel flores sessiles; sepala 0.25-0.3 cm longa, 0.1-0.15 cm lata, ovata vel oblongo-ovata, extus dense puberula; petala 0.4-0.5 cm longa, 0.1-0.15 cm lata, oblongo-elliptica, glabra, libera; stamina 10, 5 brevibus c. 0.25 cm longis, 5 longioribus c. 0.3 cm longis; tubo 0.05 cm longo; anthera globosa, 0.05 cm in diametro; ovarium tomentosum, c. 0.1 cm longum; stylus c. 0.1 cm longus. Folliculus 1-1.1 cm longus, 0.5 cm latus,

Fig. 30. Rourea accrescens. A - C. Prance et al 2835.  
A. Habit (x 0.4). B. Fruit and calyx (x 3). C. Seed (x 3).  
D - E. Tessmann 3590. D. Flower with two petals removed  
(x 8). E. Open flower, carpels and stamens; petals and  
three stamens removed.



glabrus, sessilis vel cum pedunculo 0.1 cm longo munitus, calyce (0.5-)0.7-0.9 cm longo toto acrescenti dentibus 0.15-0.2 cm longis, margine ciliato vel glabro apice barbato. Semen 0.8 cm longum; arilloidio 0.4-0.5 cm longo; testa sub arilloidio sculpto.

Woody vine; branchlets terete, puberulous. Leaves imparipinnate 1-2-jugate, rarely unifoliolate; petiole 2-8 cm long, glabrous to minutely puberulous; rachis (1-)3-8 cm long, glabrous to minutely puberulous, terete at the base, flattening out in the areas of insertion of the distal pair of leaflets. Leaflet 8-18 cm long, 3-7 cm broad, elliptic or narrowly-elliptic, chartaceous, the upper surface opaque or somewhat shiny, glabrous, the lower surface pale, opaque or somewhat shiny, glabrous, the apex acuminate, the base cuneate or rounded, the margin slightly revolute; petiolule 0.3-0.6 cm long; venation impressed or plane; lateral veins 6-8 pairs, ascending, diverging from midrib at angles of 30°-50°, anastomosing diffusely near margin; veinlets transverse in lower half of leaflets. Inflorescence paniculate, axillary to terminal, the rachilla 2-9 cm long, puberulous; bracts 0.1-0.2 cm long, triangular or linear, densely puberulous. Pedicel articulate, 0.1 cm long or flowers sessile; sepals 0.25-0.3 cm long, 0.1-0.15 cm broad, ovate to oblong-ovate, densely puberulous without; petals 0.4-0.5 cm long, 0.1-0.15 cm broad, oblong-elliptic, glabrous, free; stamens 10, five short c. 0.2 cm long, five long, c. 0.3 cm long, the tube c. 0.05 cm long; anthers globose, 0.05 cm in diameter; ovary glabrescent, c. 0.1 cm long; style c. 0.1 cm long. Fruit glabrous,

1-1.1 cm long, 0.5 cm wide, sessile or peduncle 0.1 cm long; calyx in fruit completely accrescent, (0.5-)0.7-0.9 cm long, glabrous, the teeth 0.15-0.2 cm long, the margin ciliate or glabrous, the apex barbiculate. Seed 0.9 cm long; arilloid 0.4-0.5 cm long; testa under arilloid sculptured.

Distribution: Known from Amazonian Perú and adjacent Brazil. Occurring in upland forest (terra firme).

This very distinct species from western and southwestern Amazonia can be readily recognized by its usually narrowly elliptic leaflets with impressed venation, but especially by the accrescent calyx in fruiting condition. The arilloid is very well developed, covering a little more than the lower half of the seed, and the testa under the arilloid is characteristically sculptured. Rourea accrescens is related to R. amazonica.

BRAZIL. Amazonas: Manaus, 18 Feb 1910, A. Ducke RB19723 fr. (RB); Basin of Rio Madeira, Municipality of Humaitá, near Livramento, 12 Oct-6 Nov 1934, B. A. Krukoff 6795 fr. (A, BR, F, G, K, NY, S, U); Manaus, Igarapé do Bindá, 12 Dec 1955, F. Mello & L. Cõelho INPA3089 fr. (INPA); Manaus, Campos Sales, km 10 Estrada da Forquilha-Tarumã, 2 Sep 1954, W. Rodrigues INPA22 fl. (INPA); Manaus, Estrada Manaus-Itacoatiara, km 70, 26 Oct 1960, W. Rodrigues & L. Cõelho 1876 fl. (INPA). Acre: Cruzeiro do Sul, Estrada Alemanha, 14 Apr 1971, G. T. France 11886 fr. (INPA, NY). PERU. Loreto: Iquitos, 1924, G. Tessmann 3590 fl. (G, NY, S).

SECTION 2 ADENOPHORAE

17. Bourea adenophora Blake, Bull. Torrey Bot. Club 50 (8): 273. 1923.

Holotype examined (US): Panama, Canal Zone, between Gatún and León Hill, H. Pittier 2566 fl. 26 Jan 1911.

Vine, scandent shrub or small tree; branchlets terete, puberulous to tomentose, conspicuously lenticellate. Leaves imparipinnate, 2-3-jugate; petiole 1-3.5 cm long, puberulous; rachis 2-5 cm long, puberulous to tomentose. Leaflets 2-8.5 cm long, 1-4.5 cm broad, elliptic, rigid-chartaceous, the upper surface dark, glabrous, the lower surface pale, glabrous, the lateral veins puberulous or sparsely tomentose, the midrib puberulous to tomentose above and below, the apex acuminate, the base cuneate; petiolule 0.1-0.2 cm long, tomentose to densely tomentose; venation reticulate prominulous on both surfaces; midrib impressed above; lateral veins 6-7 pairs, diverging from midrib at angles of  $50^{\circ}$ - $80^{\circ}$ , anastomosing clearly near margin. Inflorescence paniculate, slender, axillary to terminal, the rachilla 6-10 cm long, glandulose-puberulous; bracts 0.1 cm long, with glandular hairs. Pedicels articulate, with glandular hairs, 0.2-0.3 cm long; sepals 0.3 cm long, 0.1-0.2 cm broad, sparsely glandulose-puberulous without, puberulous within; petals 0.3-0.4 cm long, 0.15-0.2 cm broad, glabrous, free; stamens 10, five short c. 0.1 cm long, five long c. 0.2

cm long; anthers globose; ovary pilose, c. 0.08-0.1 cm long; style c. 0.12 cm long. Fruit 1-1.5 cm long, 0.6 cm wide, glabrous; calyx in fruit 0.4-0.6 cm long, puberulous, the lobes 0.1-0.2 cm long. Seed 0.8-1 cm long, 0.4 cm wide; arilloid 0.3-0.4 cm long.

Distribution: Central America, in Honduras, and Panama where it is very common. Occurring in forests and on lake shores, from sea level to 600 m.

Rourea adenophora is very closely related to R. pittieri, from which it differs by the shorter inflorescences, rigid-chartaceous and narrowly elliptic leaflets with cuneate base, more dense glandular hairs, puberulous pubescence of the leaf rachis, petiole, and inflorescence, and the presence, on the lower surface, of pubescence on the midrib and lateral veins only.

Rourea adenophora is, morphologically, a very variable species. The descriptions given by Blake and Schellenberg imply that the glandular hairs are present on the calyx only before anthesis; however, some specimens have scattered glandular hairs on the calyx of open flowers, and some even have them on the calyx in fruiting stage. Glandular hairs may be completely absent, or be present only rarely, on the pedicels, the axis, or the branches of the inflorescence.

Rourea adenophora has been repeatedly confused with R. glabra, from which it differs by the glandular hairs as well as by the puberulous pubescence of inflorescence and calyx. Specimens belonging to one of these two species can be distinguished in the herbarium by the presence (R. adenophora) or

absence (R. glabra) of hairs on the midrib above and below.

HONDURAS. Atlántida; Lancetilla Valley, near Tela, 6 Dec 1927-20 Mar 1928, P. C. Standley 52869 st. (A, F, US).  
 PANAMA. Puerto Remedios, Chiriquí, 31 Mar 1911, H. Pittier 3380 fr. (US); Gamboa, 16 Aug 1923, F. L. Stevens 1094 fl. (US). Canal Zone and adjacent Panama, 15 Mar 1935, P. H. Allen 887 fr. (BR, F, G, GH, NY, S, U, US). Canal Zone: Barro Colorado Island, 1931, S. Aviles 51 fl. (F); Barro Colorado Island, Shore line from tip of "Pearson trail." Peninsula south and west to 3rd large cove, 7 May 1968, Th. B. Croat 5396 fr. (NY); Barro Colorado Island, 10 Aug 1961, J. D. Dwyer 1434 fl. (F); Northwestern part of Canal Zone (area west of Limón Bay, Gatún Locks and Gatún Lake) along road southwest of Fort Sherman, 16 Nov 1955, I. M. Johnston 1707 fr. (A); Vicinity of Frijoles, 3 Mar 1923, C. V. Piper 5812 fr. (US); Near Old Fort Lorenzo, Mouth of Río Chagres, 8 Mar 1923, C. V. Piper 5976 fl. (US); Hills west of the Canal, near Gatún, 17 Dec 1923, P. C. Standley 27216 st. (US); Barro Colorado Island, Gatún Lake, 5 Jan 1932, R. H. Wetmore & E. C. Abbe 142 fl. (A, F, GH).

18. Rourea pittieri Blake, Bull. Torrey Bot. Club 50 (8), 274, 1923.

Holotype examined (US): Panama, Southern Darién, Foothills of Garagará, Sambú basin. H. Pittier 5613 fl. fr. Feb 1912. Isotype examined (F).

Vine; branchlets terete, sparsely tomentose. Leaves imparipinnate, 1-3-jugate; petiole 4-6 cm long, tomentose; rachis 5.5-10.5 cm long, tomentose. Leaflets 6-11.5 cm long, 4-7 cm broad, broadly elliptic, ovate or orbiculate, chartaceous (rarely subcoriaceous), the upper surface dark, glabrous, the lower surface pale, tomentose, the midrib densely tomentose above and below, the apex acuminate, the base obtuse; petiolule 0.2-0.4 cm long; venation reticulate, prominulous above and below; lateral veins 5-7 pairs, diverging from midrib at angles of 50°-60°, anastomosing more or less clearly near margin. Inflorescence paniculate, pseudoterminal or axillary, the rachilla 8-16 cm long, densely griseo-tomentose; bracts 0.1-0.2 cm long, linear, tomentose. Pedicels articulate, densely tomentose, 0.4 cm long above articulation; sepals 0.3-0.4 cm long, 0.2 cm broad, griseo-tomentose, obscurely glandulose-pubescent without, tomentose within; petals 0.5 cm long, 0.2 cm broad, glabrous, free; stamens 10, five short c. 0.3 cm long, five long c. 0.4 cm long; anthers globose; ovary villose-lanate, c. 0.1 cm long; style c. 0.8 cm long. Fruit 1.5 cm long, 0.5 cm wide, glabrous, the apex sparsely pilose; calyx in fruit 0.5 cm long, tomentose, the lobes 0.2 cm long. Seed 1 cm long, 0.4 cm

wide; arilloid 0.3 cm long.

Distribution: Known thus far only from Panama, in the provinces of Darién and Colón. Occurring in forest from 10-600 m altitude.

Rourea pittieri is most closely related to R. adenophora, from which it differs by the longer inflorescence, the chartaceous (rarely subcoriaceous) and broadly elliptic leaflets with obtuse base, the obscurely glandulose calyx, the griseo-tomentose pubescence of the leaf, rachis, petiole, inflorescence and, in some cases, sepals, and by the tomentose lower surface of the leaflets.

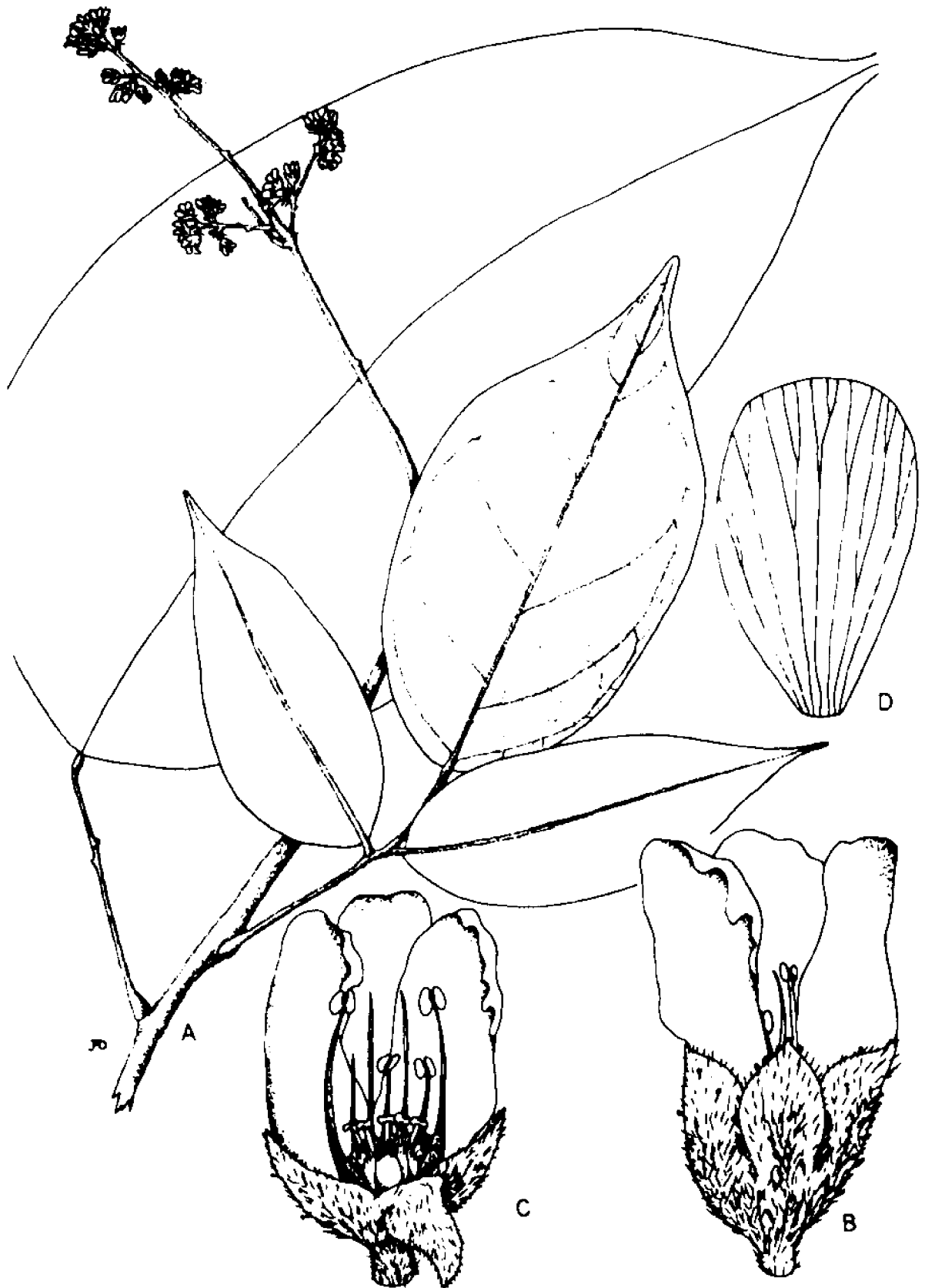
PANAMA. Colón: Loma La Gloria, near Fató (Nombre de Dios), Jul-Aug 1911, H. Pittier 4247 fl. (F, S, US). Darién: Canacuasi trail (camp 2), Chepigana District, 12 Mar 1940, M. E. Terry & R. A. Terry 1536 fr. (A, F).

19. Rourea prancei Forero, sp. nov. Fig. 31.

Holotype (NY): Brazil, Maranhão, Road Carolina to Estreita, 2-15 km from Estreita, G. T. Prance & N. T. Silva 58625 fl. 9 Aug 1964.

Frutex scandens, ramulis teretibus, villosis. Folia imparipinnata, 1-jugata; petiolo 1-6 cm longo, dense tomentoso vel villoso, rachis 0.1-4 cm longa, villosa. Foliola 4.5-23 cm longa, 2-10 cm lata, ovata vel ovato-oblonga, subchartacea, supra opaca, villosa, subtus dense pilosa, costa dense villosa; apice cuspidata, basi rotundata, margine revoluta; petiolulo 0.5 cm longo; venis reticulatis, supra impressis, subtus prominentibus; nervis lateralibus 5-7 jugis; ascendentibus, cum costa angulo  $40^{\circ}$ - $60^{\circ}$  facienti, versus marginem anastomasantibus. Inflorescentiae terminales, paniculatae; rachibus 2.5-6 cm longis, dense villosis cum pilis glanduliferi munitis; bractee 0.1-0.25 cm longae, lineares, dense villosis, cum pili glanduliferi munita. Pedicelli articulati, 0.1 cm longi vel flores sessiles; sepala 0.4 cm longa, 0.3 cm lata, ovata, dense villosa, cum pili glanduliferi munita; petala 0.7 cm longa, 0.5 cm lata, obovata, glabra, libera; stamina 10, 5 brevibus c. 0.2-0.25 cm longis, 5 longioribus c. 0.35 cm longis, tubo 0.03-0.05 cm longo; anthera globosa, 0.05 cm in diametro; carpella 5 libera; ovarium pilosum, 0.1 cm longum; stylus c. 0.1-0.12 cm longus. Fructus ignotus.

Fig. 31. Rourea prancei. A-D, Prance et al 58625. Magnifications approximate. A. Habit (x 0.5). B. Flower (x 6). C. Flower with two petals removed (x 6). D. Petal (x 6).



Liana; branchlets terete, villous. Leaves 1-jugate; petiole 1-6 cm long, densely tomentose or villous; rachis 0.1-4 cm long, villous. Leaflets 4.5-23 cm long, 2-10 cm broad, ovate to ovate-oblong, subchartaceous, the upper surface dark, villous, the lower surface densely pilose, the midrib densely villous above and below, the apex cuspidate, the base rounded, the margin revolute; petiolule 0.5 cm long; venation reticulate, impressed above, prominent below; lateral veins 6-7 pairs, diverging from midrib at angles of  $40^{\circ}$ - $60^{\circ}$ , ascending, anastomosing diffusely near margin. Inflorescence paniculate, terminal, the rachilla 2.5-6 cm long, densely villous, with glandular hairs; bracts 0.1-0.25 cm long, linear, densely villous, with glandular hairs. Flowers sessile or pedicels 0.1 cm long, articulate; sepals 0.4 cm long, 0.3 cm broad, ovate, densely villous, with glandular hairs; petals 0.7 cm long, 0.5 cm broad, obovate, glabrous, free; stamens 10, five short c. 0.2-0.25 cm long, five long c. 0.35 cm long, the tube 0.03-0.05 cm long; anthers globose, 0.05 cm in diameter; ovary pilose, 0.1 cm long; style 0.1-0.12 cm long. Fruit unknown.

Distribution: Known only from the locality of the type in the state of Maranhão, Brazil. Occurring in low forest, in the area of transition between the Amazonian forest and the cerrado vegetation of the Planalto.

The affinities of this very distinct species are uncertain. It can be easily distinguished from any other species by the bullate leaflets, which are large and have revolute margins, and especially by the presence of glandular hairs and by

the densely villous pubescence of inflorescence, calyx, lower surface of the leaflets and bracts.

SECTION 3 ROUREA

20. Rourea frutescens Aublet, Hist. Pl. Guiane 1: 467, fig. 187. 1775.

Robergia frutescens Willd., Sp. Pl. 2: 752. 1797.

Rourea induta var concinna Baker, in Martius, Fl. Brasil. 14(2): 178. 1871. Presumed Isotypes examined (F, G, K): French Guiana. W/o locality. Poiteau s.n. fl. fr. W/o date.

Santalodes frutescens (Aublet) O. Ktze., Rev. Gen. 1: 155. 1891.

Rourea cardonae Lasser and Maguire, Bol. Soc. Venez. Ci. Nat. 15: 104. 1954. Holotype examined (VEN). Fragment of Holotype examined (NY): Venezuela, Guayana, Selvas del Rfo Uenan, afluyente del Tkabarú. F. Cardona 1694 fl. 1 Oct 1946. synon. nov.

Holotype not seen (P); French Guiana, Cayenne, Aublet s.n. fl. fr. W/o date. Isotypes (BM, not seen; W, examined),

Shrub or woody vine; branchlets terete, striate, densely puberulous to densely tomentose, inconspicuously lenticellate. Leaves imparipinnate, (1-)2-4-jugate; petiole 1-7 cm long, tomentose; rachis 2-8 cm long, tomentose. Leaflets 3-12 cm

long, 1.9-7 cm broad, constantly obovate, rarely elliptic or obovate-elliptic, chartaceous to rigid-chartaceous, the upper surface dark, somewhat shiny or opaque, glabrous, the midrib and veins puberulous, the lower surface pale, opaque, tomentose, the hairs appressed, parallel, the apex acuminate, the base rounded or attenuate; petiolule 0.1-0.3 cm long, densely tomentose; venation reticulate, prominulous above and below, the midrib impressed above, prominent below; lateral veins 4-6 pairs, ascending, diverging from midrib at angles of  $40^{\circ}$ - $60^{\circ}$ , anastomosing diffusely near margin. Inflorescence paniculate, axillary, the rachilla 7-10 cm long, tomentose; bracts 0.1-0.2 cm long. Pedicels not or obscurely articulate, 0.3-0.5 cm long; sepals 0.2-0.25 cm long, 0.1-0.15 cm broad, ovate, densely grey-tomentose without, densely tomentose within, acute; petals 0.4 cm long, 0.1 cm broad, glabrous, free; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long; anthers globose; ovary c. 0.1 cm long, pilose; style c. 0.1-0.4 cm long, glabrous. Fruit 1.3 cm long, glabrescent; calyx in fruit 0.3 cm long, puberulous. Seed 1 cm long, 0.6 cm wide; arilloid 0.3 cm long; testa under arilloid smooth.

Distribution: Venezuela, Guyana, French Guiana and Brazil. Interestingly enough no material of this species has been collected in Suriname, where it may be expected. In Brazil it has been found in the territory of Amapá and in the state of Pará, near the Atlantic coast. Occurring in rain forest, gallery forest, Mora forest and mixed forest, from near sea level in most of its range to about 1300 m altitude in Venezuela.

Local names: "Supple Jack," "Shinaballi" (Guyana).  
 "Bejuco negro" (Venezuela).

Rourea frutescens is very similar morphologically to R. pubescens and to R. araguaensis. As pointed out by Schellenberg, it has been repeatedly confused with R. pubescens, R. surinamensis and R. revoluta. The differences with the last two species mentioned are several and can be seen clearly in the key. It differs from R. pubescens var pubescens and var spadicea mainly in the reticulate venation. Furthermore, the lower surface of the leaflets is glaucous in R. pubescens var pubescens, brownish and shiny in R. pubescens var spadicea, and opaque in R. frutescens. Specimens belonging to this species can be easily recognized also by the dense grey tomentum of the calyx.

TRINIDAD. Mount Tocuche, 3-5 Apr 1920, N. L. Britton, T. E. Hazen & W. Mendelson 1245 st. (GH, NY); Aripo Road, end of the forest, 5-mile post, 19 Feb 1927, W. E. Broadway 6564 fr. (F, NY, S). VENEZUELA. Barinas: Municipio Pedraza, Alto de Aguada, 18 Feb 1955, L. Bernardi 1953 fr. (NY). Terr. Delta Amacuro: Este de Río Grande, Este-Noreste de El Palmar, cerca de los límites del Estado Bolívar, Nov 1965, C. Blanco 478 fr. (NY, US); Alto del Río Cuyuni, 10-15 km below Cerro Escalera, 17 Aug 1962, B. Maguire, J. A. Steyermark & C. K. Maguire 46716 fr. (NY, VEN); Alto Río Cuyuni, Río Uiri-Yuk, 25 Aug 1962, B. Maguire, J. A. Steyermark & C. K. Maguire 46963 fl. (NY, VEN). GUYANA. Banks of Pomeroon River, Sep 1904, A. W. Bartlett 8137 fl. (U); Upper Mazaruni River, 22 Sep-6 Oct 1922, J. S. de la Cruz 2278 fl. (F, GH, NY); Malali,

Demerara River, 30 Oct-5 Nov 1922, J. S. de la Cruz 2641 fr. (F, GH, NY); Wanama River, Northwest District, 10-23 May 1923, J. S. de la Cruz 3978 fl. (F, GH, NY, RB); Mazaruni River, Aug 1889, Jenman 5246 fl. (K, U); Kamuni Creek, Groete Creek, Essequibo River, 20 Apr 1944, B. Maguire & D. B. Fanshawe 22910 fr. (F, GH, NY, RB, U, W); Simiri, Jul 1924, A. C. Persaud 69 fr. (F, NY); Essequibo River, Moraballi Creek, near Bartica, 15 Oct 1929, N. Y. Sandwith 457 fr. (K, NY, U). FRENCH GUIANA. Cayenne, 1792, Leblond 243 fr. (P); W/o locality, 1833, Leprieur 330 fl. (G); W/o locality, 1839, Leprieur s.n. fr. (F, G, K); La Compté, Jard. Bot. de Radwel, 1842, Melinón 237 fl. (P); Cayenne, W/o date, Patris s.n. fl. (F); Cayenne, W/o date, Perrottet s.n. fl. (F); Cayenne, 1857, Sagot 1274 fr. (W); Godebert, W/o date, Wachenheim 399 fl. (P). BRAZIL. Terr. Amapá: Rio Oiapoque, between first and second cachoeiras on Rio Iaué, about 2 km E of confluence with Rio Oiapoque, 27 Aug 1960, H. S. Irwin, J. M. Pires & L. Y. Th. Westra 47891 fl. (NY, U, UB); Rio Araguaí, 3 Sep 1961, J. M. Pires, W. Rodrigues & G. C. Irvine 50684 fl. (NY, R). Pará: Mata da Cia. Pirelli, Fazenda Uriboça, Jul 1958, J. M. Pires 6921 fl. (UB); Road BR 22, Capanema to Maranhão, vicinity of Cachoeira, km 96, 27 Oct 1965, G. T. Prance & T. D. Pennington 1688 fl. (F, GH, NY, S, U).

21. Rourea antioquiensis Cuatrecasas, Fieldiana Bot. 27(2): 103. 1951.

Holotype examined (F): Colombia, Antioquia, Banks of the Rfo Cauca at Puerto Valdivia. R. D. Metcalf & J. Cuatrecasas 30045 fl. 17-20 Feb 1942. Isotypes examined (A, G, US).

Tree(?) 20-30 m; branchlets terete, puberulous to tomentose, conspicuously lenticellate. Leaves imparipinnate, 1-2-jugate; petiole 1.5-3 cm long, puberulous to tomentose; rachis 1.5-4 cm long, puberulous to tomentose. Leaflets 3-10 cm long, 1.5-4 cm broad, elliptic to broadly elliptic, chartaceous or rigid-chartaceous, the upper surface dark, shiny, glabrous, the lower surface pale, opaque, puberulous, the hairs appressed, parallel, the midrib sparsely puberulous above, puberulous to tomentose below, the apex cuspidate, the base obtuse; petiolule 0.1-0.3 cm long; venation reticulate, prominent above and below; lateral veins (4-)6-9 pairs, diverging from midrib at angles of 60°-70°, anastomosing clearly near margin. Inflorescence paniculate, congested, axillary to pseudoterminal, the rachilla 8-14 cm long, puberulous to tomentose; bracts small c. 0.1 cm long, ovate or lanceolate. Pedicels obscurely articulate, 0.3-0.5 cm long, slender, puberulous; sepals 0.2 cm long, 0.1-0.15 cm broad, suborbiculate, puberulous; petals 0.3-0.35 cm long, 0.1-0.15 cm broad, obovate-elliptic, glabrous, free; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long, the tube very short, c. 0.01

cm long; ovary pilose, c. 0.1 cm long; style pubescent c. 0.1 cm long; stigma two-lobed. Fruit unknown.

Distribution: Known thus far only from the type locality in the Department of Antioquia, Colombia. Occurring on river banks at altitudes of 240-260 m above sea level.

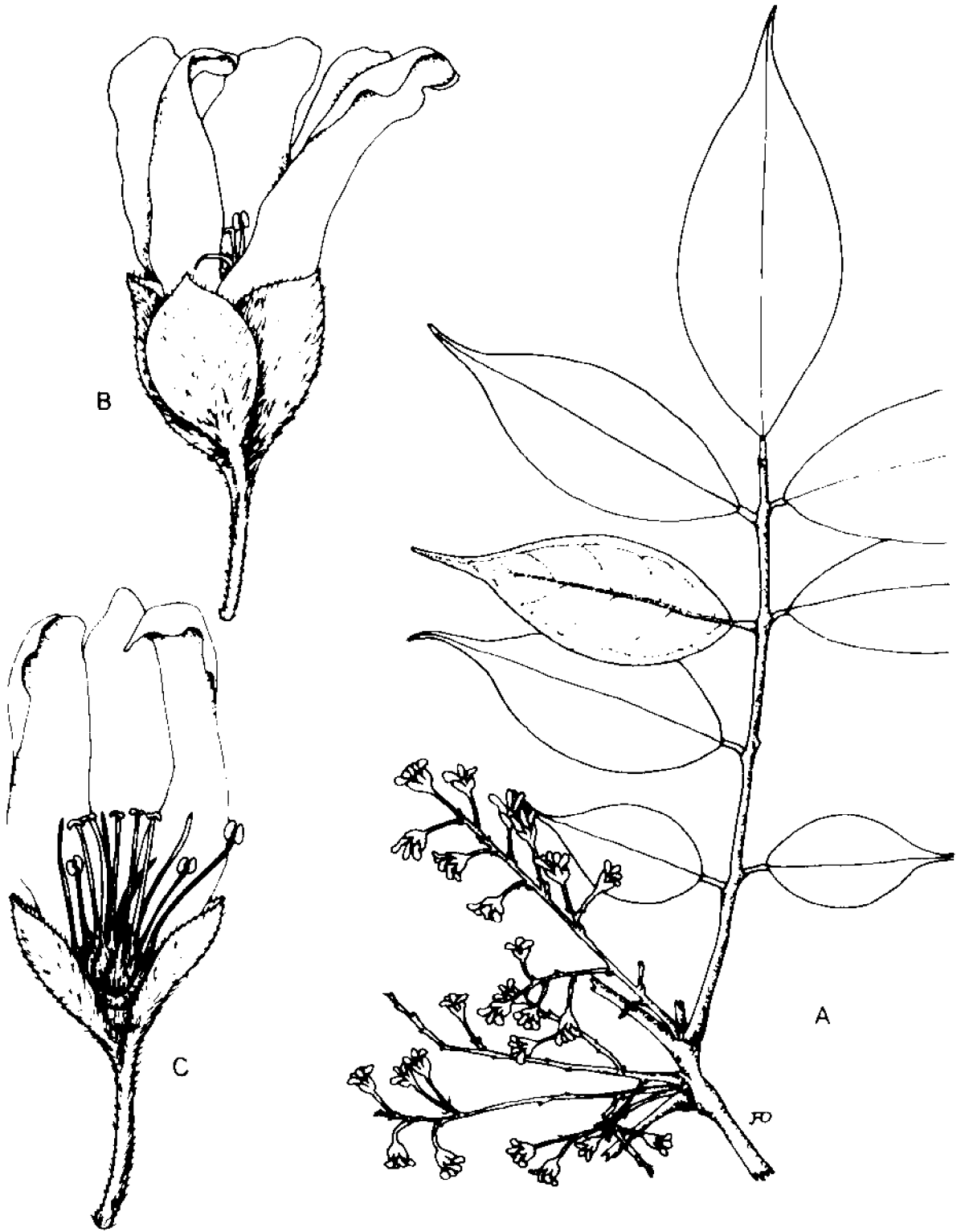
Hourea antioquiensis is most closely related to H. frutescens but can be distinguished, as pointed out by Cuatrecasas, by its elliptic and cuspidate leaflets, which are completely glabrous above, and by the suborbiculate sepals.

22. Rourea araguaensis Forero, sp. nov. Fig. 32.

Holotype (VEN): Venezuela, Aragua, Parque Nacional "H. Pittier," Rancho Grande. G. Agostini & M. Farías 29 fl. Nov 1962. Isotypes (K, US).

Frutex scandens, ramulis teretibus, minute puberulis vel grabrescentibus. Folia imparipinnata, 2-4-jugata; petiolo 1.5-4.5 cm longo, minute puberulo vel glabrescente, rachis 1.5-12 cm longa, minute puberula vel glabra. Foliola (2.5-)4-10 cm longa, (1.5-)2-4 cm lata, elliptica vel late-elliptica, chartacea, supra nitida, opaca, glabra, subtus pallida opaca, brunneola, puberula, pilis adpressis, nervis secundariis parallelis dispositis, costa puberula; apice abrupte cuspidata vel caudata (0.5-)1-2 cm longa, basi attenuata; petiolulo 0.3-0.6 cm longo; nervatura prominula; costa supra impressa, subtus prominentibus; nervis lateralibus 6-9, cum costa angulo 60°-80° facienti, distincte versus marginem anastomosantibus. Inflorescentiae axillares paniculatae, rachibus 3-7 cm longis, dense puberulis, bracteis 0.1-0.2 cm longis, puberulis. Pedicelli articulati, (0.5-)0.6-0.8 cm longi, dense puberuli, sepala 0.4 cm longa, 0.2-0.3 cm lata, late ovata vel suborbiculata, dense puberula; petala 0.6-0.7 cm longa, 0.2 cm lata, oblongo-obovata, glabra, libera; stamina 10, 5 brevibus c. 0.2-0.25 cm longis, 5 longioribus c. 0.4-0.45 cm longis, tubo 0.05-0.1 cm longo; anthera globosa, 0.5-0.7 cm in diametro; carpella 5 libera, ovarium dense lanate pilosum, 0.07-0.1 cm

Fig. 32. Rourea araguaensis. A-C, Agostini et al 29. Magnifications approximate. A. Habit (x 0.5). B. Flower (x 6). C. Flower with one sepal and two petals removed (x 6).



longum; stylis 0.15-0.35 cm longis, pubescentibus. Frutus ignotus.

Woody vine; branchlets terete, minutely puberulous to glabrescent. Leaves imparipinnate, 2-4-jugate; petiole 1.5-4.5 cm long, minutely puberulous or glabrescent; rachis 1.5-12 cm long, minutely puberulous or glabrous. Leaflets (2.5-) 4-10 cm long, (1.5-)2-4 cm broad, elliptic or broadly elliptic, chartaceous, the upper surface dark, opaque, glabrous, the lower surface pale, opaque, brownish, puberulous, the hairs appressed, parallel, the midrib puberulous, the apex sharply cuspidate to caudate, (0.5-)1-2 cm long, the base attenuate; petiolule 0.3-0.6 cm long; venation reticulate, prominulous above and below, the midrib impressed above, prominent below; lateral veins 6-9 pairs, diverging from midrib at angles of  $60^{\circ}$ - $80^{\circ}$ , anastomosing clearly near margin. Inflorescence paniculate, axillary, the rachilla 3-7 cm long, densely puberulous; bracts 0.1-0.2 cm long, puberulous. Pedicels articulate, (0.5-)0.6-0.8 cm long above articulation, densely puberulous; sepals 0.4 cm long, 0.2-0.3 cm broad, broadly ovate or sub-orbiculate, densely puberulous; petals 0.6-0.7 cm long, 0.2 cm broad, oblong-obovate, glabrous, free; stamens 10, five short c. 0.2-0.25 cm long, five long c. 0.4-0.45 cm long, the tube 0.05-0.1 cm long; anthers globose, 0.5-0.7 cm in diameter; ovary densely pilose-lanate, 0.07-0.1 cm long; style 0.15-0.35 cm long, pubescent. Fruit unknown.

Distribution: Known thus far only from the type locality in the state of Aragua, Venezuela. Occurring in cloud forest.

This very distinct species is most closely related to R. frutescens, but differs in the much larger pedicel and petals and in the sharply cuspidate or caudate apex of the leaflets.

23. Hourea sprucei Schellenberg, Pflanzenreich Heft 103: 205. 1938.

Scandent shrub or woody vine; branchlets terete, tomentose, densely tomentose or densely puberulous. Inconspicuously lenticellate. Leaves imparipinnate, 2-3(-5)-jugate; petiole 0.5-0.6 cm long, puberulous to densely puberulous; rachis 1-7 cm long, puberulous to densely puberulous. Leaflets (0.8-)1.5-12 cm long, (0.5-)1-5 cm broad, elliptic or oblong-elliptic, chartaceous to rigid-chartaceous, the upper surface dark, shiny, glabrous, the lower surface pale, opaque, minutely to densely puberulous or glabrescent, the midrib glabrous above, puberulous to densely puberulous below, the apex sharply acuminate, acumen emarginate or entire, the base obtuse or cuneate; petiolule 0.1-0.3 cm long, densely puberulous; venation reticulate, plane to prominulous (rarely impressed) above, prominulous below; midrib impressed above, prominent below; lateral veins 5-7(-10) pairs, diverging from midrib at angles of  $50^{\circ}$ - $80^{\circ}$ , anastomosing clearly near margin. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 1-6 cm long, puberulous or tomentose; bracts 0.1-0.2 cm long, triangular. Fruit 1-1.2 cm long, 0.5 cm wide, sparsely pubescent or glabrous; peduncle articulate 0.1-0.5 cm long above articulation; calyx in fruit 0.4-0.6 cm long, puberulous or densely puberulous, the lobes 0.15-0.3(-0.5) cm long. Seed c. 1 cm long, 0.4 cm wide; arilloid 0.3-0.4 cm long; testa under arilloid smooth.

23a. *Rourea sprucei* var *sprucei*

Holotype (B, lost). Lectotype examined and selected (NY): Brazil, "Prope Panuré ad Rio Uaupés." R. Spruce 2760 fr. Oct 1852-Jan 1853. Isolectotypes examined (BR, C, F, frag., G, GH, K, P, W). Photograph of holotype examined (NY).

Scandent shrub; branchlets tomentose to densely tomentose. Leaves imparipinnate, 2-3-jugate; petiole 1-3 cm long, puberulous; rachis 1-6 cm long, puberulous. Leaflets 1.5-12 cm long, 1-5 cm broad, elliptic, chartaceous, glabrous above, minutely puberulous below, the midrib puberulous; petiolule 0.3 cm long, densely puberulous; venation prominulous above and below, the veinlets subtransverse. Inflorescence paniculate, the rachilla 3-6 cm long. Mature flower unknown. Fruit sparsely pubescent; peduncle 0.3-0.6 cm long; calyx in fruit puberulous, 0.5 cm long, the lobes 0.15 cm long.

Distribution: Known from the states of Amazonas and Mato Grosso in Brazil, and from Venezuela and Colombia. Occurring in forest and forest margins at elevation of 100-240 m.

*Rourea sprucei* is a widely distributed species and is also morphologically variable. *Rourea sprucei* var *sprucei* differs from *R. sprucei* var *rondoniense* in the sparse appressed pubescence of the leaflets, in the prominulous venation of the upper surface, and in the nearly transverse venation of some leaflets. It differs from var *subcoriacea* primarily in

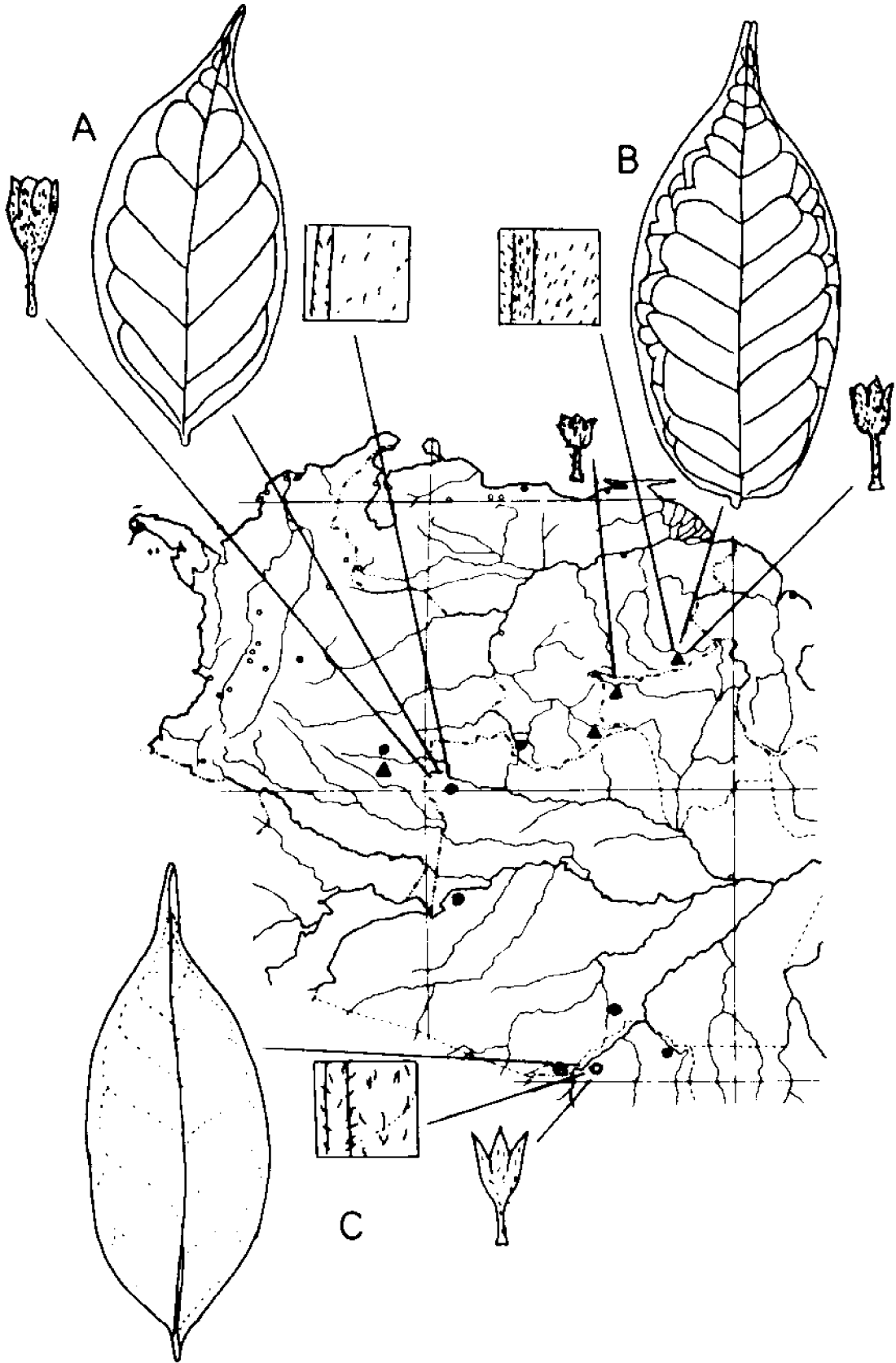
the chartaceous texture of the leaflets but, also, in the sparse pubescence of the lower surface. The pictorialized distribution map in Fig. 33 illustrates some of the characters in these three varieties.

Rourea sprucei var sprucei differs from R. antioquiensis in the nearly transverse venation of the leaflets, in the shorter inflorescences (3-6 cm long in R. sprucei var sprucei; 8-14 cm in R. antioquiensis), and in the glabrous upper surface of the leaflets.

The choice of a lectotype was made necessary by the destruction, during World War II, of the holotype which was deposited in Berlin. The isotype Spruce 2760 deposited at NY, has been chosen as the lectotype.

COLOMBIA. Comisaría del Vaupés; Río Guayabero, 8 Nov 1939, J. Cuatrecasas 7513 fl. (COL, F, US). VENEZUELA. Terr. Amazonas; San Carlos, Río Negro, 4 Mar 1942, Ll. Williams 14627 fr. (A, F, G, NY, RB, US, W). BRAZIL. Amazonas: Municipality of São Paulo de Olivença, basin of creek Belém, 26 Oct-11 Dec 1936, B. A. Krukoff 8719 fr. (A, BR, F, G, NY, S, U); Municipality of Humaitá, Rio Madeira, Road Humaitá to Lábrea, km 80, between Rios Ipixuna and Itaparana, 24 Nov 1966, G. T. Prance, B. S. Pena & J. F. Ramos 3256 fr. (F, INPA, NY, S, U). Mato Grosso: Near Tabajaza, upper Machado River region, Nov-Dec 1931, B. A. Krukoff 1321 fr. (A, G, K, NY, S, U).

Fig. 33. Pictorialized distribution map of Rourea sprucei sensu lato. A. R. sprucei var sprucei. Leaflet (x 1); fruit calyx and peduncle (x 2); pubescence on lower surface of leaflets (x 10). B. R. sprucei var subcoriacea. Leaflet (x 1); fruit calyx and peduncle (x 2); pubescence on lower surface of leaflets (x 10). C. R. sprucei var rondoniense. Leaflet (x 1); fruit calyx and peduncle (x 2); pubescence on lower surface of leaflets (x 10).



23b. Rourea sprucei var subcoriacea Forero, var. nov.

Holotype (NY): Brazil, Territory of Roraima, Serra dos Surucucús, Vicinity of Posto Surucucú Mission G. T. Prance, J. R. Steward, J. F. Ramos & L. G. Farias 10072 fr. 19 Feb 1969. Isotype (INPA).

A varietate sprucei pedicelli brevior, petiolo longiore, foliolis subcoriaceis vel rigida chartaceis subtus sparsissime puberulis vel glabris (costa puberula), acuminis emarginates differt.

Liana or tree (?) 20 m tall; branchlets densely brown-puberulous. Leaves 2-3(-5)-jugate; petiole 1-6 cm long, densely puberulous; rachis 2-7 cm long, densely puberulous. Leaflets (2-)3-8.5 cm long, (1-)1.7-4 cm broad, oblong-elliptic or elliptic, rigid-chartaceous to subcoriaceous, glabrous above, sparsely puberulous or glabrous below, the midrib glabrous above, densely puberulous below, the apex acuminate, the acumen emarginate; petiolule 0.1-0.2 cm long, densely puberulous; venation reticulate, prominulous above and below. Inflorescence paniculate, the rachilla 3-5 cm long. Pedicel articulate, 0.1 cm long above articulation, densely puberulous; sepals 0.2 cm long, 0.15-0.2 cm broad, orbiculate to ovate, densely puberulous; petals 0.4-0.5 cm long, 0.15 cm broad, elliptic, glabrous, free; stamens 10, five short c. 0.1-0.15 cm long, five long c. 0.15-0.2 cm long, the tube c. 0.05 cm long; anthers globose; ovary pilose, c. 0.05 cm long; style

c. 0.15 cm long. Immature fruit glabrous; calyx in fruit 0.4 cm long, densely puberulous, the lobes 0.1-0.15 cm long.

Mature seed unknown.

Distribution: Known from the Brazilian territory of Roraima and adjacent Venezuela in the state of Bolívar. Occurring in forest at altitudes of 450-1340 m above sea level.

The differences between R. sprucei var subcoriacea and the other two varieties of R. sprucei are summarized under the typical variety.

Rourea sprucei var subcoriacea is also related to R. frutescens, from which it differs mainly in the elliptic or broadly elliptic leaflets, the dense puberulous but not grey-puberulous pubescence of the calyx, the subcoriaceous texture of the leaflets, the sparse pubescence of the lower surface, and the completely glabrous upper surface of the leaflets.

VENEZUELA. Terr. Amazonas: Sierra Parima, headwaters of Río Siapa and Río Padauri. Boundary Post No. 4, 8 Apr 1946, F. Cardona 1493 fr. (US, VEN). Bolívar: Región de los Ríos Icabaru, Hacha y Cordillera sin nombre a 280° de las cabeceras del Río Hacha, 8 Jan 1956, L. Bernardi s.n. fl. (NY).  
COLOMBIA. Amazonas-Vaupés: Río Apaporis, entre los Ríos Kanarí y Pacoa, 1-15 Dec 1951, H. García-Barriga 13901 fr. (COL, NY).

23c. Rourea sprucei var rondoniensis Forero, var. nov.

Holotype (NY): Brazil, Territory of Rondônia, basin of Rio Madeira, Vicinity of São Lorenzo Mines, 65°6' W, 9°33'S  
G. T. Prance, W. A. Rodrigues, J. F. Ramos & L. G. Farias  
8951 fr. 28 Nov 1968. Isotype (INPA).

A varietate sprucei folia 4(-5)-jugata, calice lobis longioribus, foliolis subtus cum pilis erectis haud appressis haud parallelis, dense pubescentibus, venis reticulatis, folliculis glabris differt.

Liana; branchlets densely puberulous. Leaves imparipinnate, 4(-5)-jugate; petiole 0.5-2 cm long, puberulous; rachis 3-7 cm long, puberulous. Leaflets (0.8-)4-7.5 cm long, (0.5-) 1.5-2.5 cm broad, elliptic, chartaceous, the upper surface glabrous, the lower surface densely puberulous, the hairs more or less erect; the midrib densely puberulous; petiolule 0.1-0.2 cm long; venation reticulate. Inflorescence paniculate, the rachilla 1-5 cm long, puberulous. Flowers unknown. Fruit glabrous; peduncle articulate, 0.3-0.4 cm long above articulation, densely puberulous; calyx in fruit 0.6 cm long, puberulous, the lobes 0.3-0.5 cm long. Seed 1 cm long, 0.4 cm wide; arilloid 0.4 cm long; testa under arilloid smooth.

Distribution: Brazil, territory of Rondônia; occurring in disturbed vegetation.

Rourea sprucei var rondoniensis is a taxon of doubtful affinities. Its inclusion in R. sprucei is in itself uncertain, and will only be verified or corrected when more collections

become available. Known only from Rondônia Territory, both extant collections are in fruiting stage.

BRAZIL. Terr. Rondônia: Basin of Rio Madeira. Trail from Fortaleza, Rio Abunã, 20 km above mouth to São Sebastião mines, 15 Nov 1968, G. T. France, W. A. Rodrigues, J. F. Ramos & L. G. Farias 8458 fl. (INPA, NY).

24. Rourea pubescens (DC.) Radlkofer, Sitzb. Math.-Phys. Akad. Muench 16: 371, 376. 1886.

Woody vine; branchlets terete, puberulous to tomentose, conspicuously lenticellate. Leaves imparipinnate, 2-3-jugate; petiole 4-8 cm long, puberulous to tomentose; rachis 3-4.5 cm long, puberulous to tomentose. Leaflets chartaceous, (2.5-) 3-9.5 cm long, 1.7-4.5 cm broad, the proximal pair usually ovate, small, the distal pairs ovate, ovate-lanceolate, or elliptic, the terminal leaflet usually obovate, the upper surface dark, opaque, glabrous, the lower surface pale, puberulous, glaucous (whitish) or light brown, the hairs appressed, parallel, brown and shiny or colorless, the midrib and lateral veins puberulous, the apex abruptly or gradually acuminate, the acumen obtuse or acute, the base rounded or attenuate; petiolule 0.1-0.2 cm long, tomentose; midrib impressed above, prominent below; lateral veins 4-8 pairs, diffuse above, prominulous or prominent below; diverging from midrib at angles of  $40^{\circ}$ - $60^{\circ}$ , ascending near margin; veinlets transverse. Inflorescence paniculate, axillary to terminal, the rachilla 6-8 cm long, tomentose to densely tomentose; bracts 0.1-0.3 cm long. Pedicels articulate, 0.1-0.2 cm long above articulation; sepals 0.2-0.3 cm long, 0.1-0.15 cm broad, lanceolate or ovate, densely tomentose without, tomentose or glabrescent within, the apex acute or obtuse, the margin ciliate; petals 0.35-0.6 cm long, 0.1-0.15 cm broad, glabrous, free; stamens 10, five short c. 0.1-0.2 cm long, five long c. 0.2-0.3 cm long, the tube short; anthers globose; ovary pilose, 0.1 cm long; style

pubescent in lower half, 0.2-0.3 cm long; stigma two-lobed. Fruit 1-1.1 cm long, 0.3-0.5 cm wide, glabrous or glabrescent, the apex villous; calyx in fruit 0.4-0.5 cm long, tomentose to densely tomentose. Seed 0.6-1 cm long, 0.3-0.5 cm wide; aril-  
loid 0.25-0.5 cm long; testa under arilloid smooth.

24a. Rourea pubescens var pubescens

Connarus pubescens DC. Mém. Soc. Hist. Nat. Paris 2: 384, fig. 15. 1825. Holotype examined (G): French Guiana, Cayenne. Patris s.n. fl. fr. W/o date. Isotypes examined (F, G, M).

Woody vine or shrub. Leaves 2-3-jugate; rachis 3-4.5 cm long. Leaflets (2.5-)4.5-9 cm long, (1.7-)3-4.5 cm broad, the proximal pair ovate, the distal pairs subovate or elliptic, the terminal leaflet usually obovate, the upper surface glabrous, the lower surface pale, puberulous, glaucous (whitish), the hairs colorless; apex abruptly acuminate, the acumen acute; petiolule 0.1-0.2 cm long, densely tomentose; veinlets transverse. Inflorescence paniculate; bracts up to 0.3 cm long; sepals 0.2 cm long, 0.1-0.15 cm broad, ovate or lanceolate, the apex obtuse; petals 0.35-0.4 cm long, 0.15 cm broad; stamens 10, five short c. 0.1 cm long, five long c. 0.25 cm long. Calyx in fruit densely tomentose. Seed 0.6-0.7 cm long, 0.3-0.4 cm wide; arilloid 0.25-0.3 cm long.

Distribution: Known from French Guiana and Guyana. No material of this variety has been collected in Suriname where it may be expected. Occurring near sea level.

Rourea pubescens var pubescens can be distinguished from R. pubescens var spadicea by the color of the lower surface of the leaflets and by the shape of the leaflets which may be ovate-lanceolate in var spadicea, whereas in var pubescens it is usually ovate or elliptic. Rourea pubescens

var pubescens is also closely related to R. frutescens but differs in the transverse venation and the whitish lower surface of the leaflets.

GUYANA. Bartica-Potaro Road, 12 Nov 1943, D. B. Fanshawe 1452 fl. (NY). FRENCH GUIANA. W/o locality, W/o date, L. C. Richard s.n. fl. fr. (C, P); Roura, 1858, Sagot s.n. fl. (W); Matury, Roura, 1859, Sagot s.n. fl. (P).

24b, Rourea pubescens var spadicea (Radlkofer) Forero, comb.  
nov.

Rourea spadicea Radlkofer, Sitzb. Math.-Phys. Akad.

Muench 16: 372. 1886. Holotype examined (P):

French Guiana, Cayenne. Leblond s.n. fl. 1792.

Isotype examined (M). synonym. nov.

Woody vine; branchlets terete, striate. Leaves 2-3-jugate; petiole 4-7 cm long, puberulous; rachis 2-6 cm long. Leaflets 3-9.5 cm long, 1.8-3.6 cm broad, elliptic or ovate-lanceolate, gradually acuminate, the acumen obtuse, the upper surface glabrous, the lower surface pale, puberulous, light brown, the hairs brownish, shiny; petiolule 0.2 cm long. Inflorescence paniculate; bracts 0.1-0.2 cm long; sepals 0.3 cm long, 0.1 cm broad, lanceolate, the apex acute; petals 0.5-0.6 cm long, 0.1 cm broad; stamens 10, five short c. 0.15-0.2 cm long, five long c. 0.3 cm long. Calyx in fruit tomentose. Seed 0.9-1 cm long; arilloid 0.5 cm long.

Distribution: Known from French Guiana, Suriname, and the region of the Rio Jarí in Amazonian Brazil. Occurring in forest.

The species R. spadicea (sensu Radlkofer) has repeatedly been confused with R. pubescens, even by Schellenberg. These two entities are very similar morphologically. The most significant difference between these two taxa is the appearance (in herbarium specimens) of the lower surface of the leaflets. It is whitish and opaque in pubescens and

brownish and shiny (due to the shiny hairs) in spadicea.

As pointed out under var pubescens, the shape of the leaflets is also useful to distinguish herbarium specimens, and was actually used by Radlkofer as one of the primary characters to distinguish B. spadicea.

SURINAME. Brokopondo; E of village Brokopondo, 26 Jan 1966, J. van Donselaar 3065 st. (U); N of village Brokopondo, 14 Feb 1966, J. van Donselaar 3116 st. (U); W of village Brokopondo, 6 Oct 1966, J. van Donselaar 3753 st. (NY). Joden-savanne-Mapane Kreek area (Suriname River), 2 Oct 1953, J. C. Lindeman 4807 st. (U). FRENCH GUIANA. Cayenne, w/o date, Desfont s.n. fl. (C); w/o locality, 1833, Leprieur 281 fl. (G); Cayenne, 1879, Martin s.n. fl. (F, K, M, P); Cayenne (La Mana), 1859, Sagot 1175 fr. (K, P, U); w/o locality, 1840, H. F. Talbot s.n. fr. (GH). BRAZIL. Amapá; Rio Jarí, Monte Dourado, Planalto, 28 Jan 1968, E. Oliveira 4024 fl. (NY).

25. Rourea pseudospadicea Schellenberg, Pflanzenreich Heft 103: 207. 1938.

Holotype (B. lost): Brazil, São Paulo, Paranapanema. Loefgren 8962. The isotype material of this species has not been found and, to the author's knowledge, no further collection of it has been made.

Shrub; branchlets tomentose, minutely lenticellate. Leaves imparipinnate, 4-5-jugate; rachis 9.5-13.5 cm long, slender, tomentose or glabrescent. Leaflets 4.5-8.5 cm long, 1.8-3.5 cm broad, oblong-elliptic, chartaceous, the upper surface dark, glabrous, the lower surface villous, the apex gradually long acuminate, the base rounded; venation finely reticulate; lateral veins 4-5 pairs. Flowers unknown. Inflorescence axillary, the rachilla up to 7 cm long, slender, glabrous (or glabrescent). Fruit 1.2 cm long, glabrous; calyx in fruit 0.7 cm long; sepals lanceolate-linear, glabrous. Seed 1 cm long.

Distribution: known only from the type locality in the state of São Paulo, Brazil.

According to Schellenberg this species resembles R. spadicea (= R. pubescens var spadicea) at first glance, especially in the shape of the leaflets in exsiccatae, but it differs in the type of pubescence, in the size of the fruiting calyx, and in geographic distribution. Since no material of this taxon was seen during the preparation of the present treatment, its description has been transcribed directly from Schellenberg. It should be kept in mind that discrepancies

have been found time and time again between the material studied by Schellenberg and his descriptions, and between the characters used in the keys and those given in the descriptions.

26. Rourea gracilis Schellenberg, Pflanzenreich Heft 103:  
204. 1938.

Holotype (B, lost). Fragment of holotype examined (F).  
Photograph of holotype examined (NY): Brazil, Santa Catarina,  
Itajahy. E. Ule 495 fr. May 1886.

Liana; branchlets terete, slightly striate, puberulous, lenticellate. Leaves imparipinnate, 2(-3)-jugate; petiole 1-5 cm long, puberulous; rachis 2-4 cm long, puberulous. Leaflets 2-7 cm long, 1-2.5 cm broad, elliptic or narrowly elliptic, chartaceous, the upper surface dark, shiny, glabrous, the lower surface pale, opaque or somewhat shiny, glabrous, the midrib glabrous above, puberulous below, the apex acuminate, the base rounded or attenuate; petiolule 0.2-0.4 cm long, slender; venation reticulate, diffuse, plane or prominulous above, prominulous below; lateral veins 5-8 pairs, diverging from midrib at angles of  $70^{\circ}$ - $90^{\circ}$ , anastomosing clearly near margin. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 4-6 cm long, slender, sparsely puberulous; bracts c. 0.1 cm long, linear. Pedicels articulate, 0.3-0.6 cm long above articulation; sepals 0.3 cm long, 0.2 cm broad, ovate, sparsely puberulous, the margin ciliate; petals 0.5 cm long, 0.2 cm broad, obovate-oblong, glabrous, free; stamens 10, five short c. 0.35 cm long, five long c. 0.45 cm long, the tube 0.08-0.1 cm long; anthers globose; ovary pilose, 0.05 cm long; style pubescent, 0.15 cm long. Fruit 1.3 cm long, 0.6 cm wide, glabrous, the apex villous; calyx in fruit 0.4 cm long,

glabrescent, the margin ciliate, the lobes 0.3 cm long. Seed 1 cm long, 0.6-0.7 cm broad; arilloid 0.3 cm long; testa under arilloid smooth.

Distribution: Brazil, in the states of Paraná and Santa Catarina. Occurring in forest from 10-350 m altitude.

The affinities of this species are not clear. Together with R. induta and R. tenuis, R. gracilis is an intermediate species between the forest species and the species growing in more or less open areas. Hourea gracilis differs from most of the members of Section Hourea in the long staminal tube and in the short, although perfectly paniculate inflorescence; it is, furthermore, widely separated geographically from them.

By its occurrence in the Brazilian states of Paraná, Santa Catarina and São Paulo (fide Schellenberg, Prov. São Paulo, am Rio Branco bei Conceição de Itahaen, Wettstein & Schiffner), R. gracilis marks the southernmost limits of the genus in America.

BRAZIL. Paraná: Mun. Paranagua, Rio Cachoeirinha, 1 km abaixo do Pico Torto, 18 Jan 1969, G. Hatschbach 20820 (J. P. Fontella 395) fl. (NY). Santa Catarina: Morro da Ressacada, Itajaf, 14 Oct 1955, R. Klein 1686 fr. (NY, US); Luis Alves, Itajaf, 10 Jan 1956, Reitz & Klein 2362 fl. (GH, NY, S, US); Pilões, Palhoça, 20 Jan 1956, Reitz & Klein 2541 fl. (US); Pilões, Palhoça, 6 Sep 1956, Reitz & Klein 3621 fr. (NY, US); Porto de Palmital, Garuva, S. Francisco do Sul, 3 Oct 1957, Reitz & Klein 4930 fr. (NY); Mina Velha, Garuva, S. Francisco do Sul, 20 Dec 1957, Reitz & Klein 5781 fl. (NY).

27. Rourea laurifolia Schellenberg, Pflanzenreich Heft 103:  
210. 1938.

Holotype not seen (P). Photograph of holotype examined (NY); Brazil, Mato Grosso, Cáceres. Comissão Rondon (F. C. Hoehne) 605 fl. Isotype examined (R).

Tree(?) branchlets puberulous, lenticellate. Leaves imparipinnate, 2-jugate; rachis 5-7 cm long, puberulous or glabrescent. Leaflets 4.5-11 cm long, 1.5-4 cm broad, elliptic, broader above the middle, rigid coriaceous, the upper surface dark, glabrous, the lower surface pale, subopaque, glabrous, the midrib glabrous above, puberulous below, the apex acute to subacuminate, the base cuneate-attenuate; venation reticulate; veinlets prominulous below; lateral veins 8-10 pairs, prominent below, ascending, anastomosing near margin. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 13-25 cm long, puberulous; bracts at base of rachilla up to 0.6 cm long, villous, the apex circinate, appearing as reduced leaves. Pedicels short; sepals 0.35 cm long, 0.25 cm broad, ovate, acute, densely puberulous; petals 0.6 cm long, 0.25 cm broad, glabrous. Fruit unknown.

Distribution: Known only from the type locality in the state of Mato Grosso, Brazil. No further information is available.

The isotype of R. laurifolia is deposited at R and constitutes, as far as I know, the only extant collection of this species. The holotype, which according to Schellenberg,

is deposited at Paris, could not be located. No new collections of this taxon have come to my attention.

Rourea laurifolia is a distinct species that can be recognized by the long inflorescence, the prominent lateral veins on the lower surface of the leaflets, and the conspicuous reticulation.

28. Rourea krukovi Steyermark, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 142. 1940.

Holotype examined (F): Brazil, Amazonas, Municipality of São Paulo de Olivença, near Palmares. B. A. Krukoff 8556 fr. 11 Sep-26 Oct 1936. Isotypes examined (A, BR, G, K, NY, S, U).

Vine; branchlets terete, puberulous to glabrescent, lenticellate. Leaves imparipinnate 2-4-jugate; petiole 2-6 cm long, minutely puberulous; rachis 3.5-11 cm long, minutely puberulous. Leaflets (2.5-)3-12 cm long, (1.2-)1.5-6 cm broad, elliptic or oblong-elliptic, coriaceous, the upper surface dark, opaque, glabrous, the lower surface pale, opaque, subglaucous, papillate, puberulous, the hairs appressed, parallel, shiny, the apex acuminate, the base rounded, the margin markedly revolute; petiole 0.2-0.5 cm long; venation strongly reticulate, plane or prominulous above, prominent below; lateral veins 5-8 pairs, diverging from midrib at angles of 60°-80°, anastomosing more or less clearly near margin. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 8-14 cm long, densely ferruginous-tomentose; bracts 0.1 cm long. Pedicels articulate, flowers sessile or pedicels 0.1 cm long; sepals 0.25-0.3 cm long, broadly ovate, acute, densely tomentose; petals 0.6 cm long, 0.25-0.3 cm broad, oblong-obovate, glabrous, free; stamens 10, five short c. 0.05 cm long; five long 0.1 cm long, the tube 0.05 cm long; anthers

globose, c. 0.05 cm in diameter; ovary pilose lanate, 0.05 cm long; style 0.1 cm long, glabrous. Fruit 1.2 cm long, 0.6 cm wide, straight, immature puberulous, mature glabrous; fruit sessile or peduncle 0.1 cm long above articulation; calyx in fruit 0.5 cm long, puberulous, the lobes c. 0.1 cm long. Seed 0.8 cm long, 0.3 cm wide; ariloid 0.3 cm long.

Distribution: Brazil, state of Amazonas and territory of Roraima. Occurring on upland forest (terra firme).

This species can be readily distinguished by its revolute leaflets, which are strongly reticulate, subglaucous and papillose on the lower surface, and by the ferruginous pubescence of the inflorescences. Rourea krukovi is probably widespread in the Amazon region. Most of the collections available until recently were from the area of Manaus, but this species has now been collected several times in the Territory of Roraima (Brazil).

BRAZIL. Terr. Roraima: Between Maitá ( $3^{\circ}20'$  N;  $63^{\circ}24'$  W) and Paramiteri ( $3^{\circ}25'$  N;  $63^{\circ}3'$  W), 21 Feb 1971, G. T. Prance, W. C. Steward, J. F. Ramos, W. S. Pinheiro, O. P. Monteiro & F. P. Harter 10658 fr. (INPA, NY); Vicinity of Mucajaí airstrip, 14 Mar 1971, G. T. Prance, W. C. Steward, J. F. Ramos, W. S. Pinheiro & O. P. Monteiro 10987 fr. (INPA, NY). Amazonas: Borba (Rio Madeira), 28 Aug 1942, A. Ducke 2170 fl. (COL, GH, R); km 75-79 da Rodovia Manaus-Itacoatiara, 17 Oct 1963, E. Oliveira 2717 fl. (UB); km 21 Rodovia Itacoatiara-Manaus, 14 Nov 1963, E. Oliveira 3028 fl. (UB); Rio Negro, Tapuruquara, 8 Apr 1947, J. M. Pires 258 fl. (NY).

29. Rourea latifoliolata Standley & L. O. Williams, Ceiba 3: 201. 1953.

Holotype not seen (Herb. Esc. Agr. Panama): Costa Rica, Puntarenas, Cantón de Osa, Vicinity of Palmar Norte, Río Terraba. P. H. Allen & D. Allen 5242 fl. 11 Apr 1949. Isotypes examined (NY, frag., US).

Shrub 2.5 m tall; branchlets terete, striate, velvety brown-pilose. Leaves trifoliolate; petiole 7-16 cm long, sparsely to densely pilose; rachis 3-10 cm long, sparsely to densely pilose. Leaflets 8-20 cm long, 3.5-11.5 cm broad, broadly elliptic, broadly ovate or oblong-ovate, subchartaceous or membranaceous, the upper surface dark, slightly shiny, glabrous, the lower surface pale, opaque, tomentose to pilose, the midrib sparsely puberulous above, densely tomentose below, the apex sharply but shortly acuminate, the base truncate (attenuate in distal leaflets); petiolule 0.5-0.7 cm long, densely pilose; venation plane above, prominent below; lateral veins 4-6 pairs, diverging from midrib at angles of 20°-50°, ascending; veinlets transverse. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 5-10 cm long, densely tomentose; bracts large, up to 0.6 cm long, pilose, triangular-lanceolate. Flowers sessile or pedicels 0.1 cm long above articulation; sepals 0.2-0.4 cm long, ovate or elliptic, the apex acute to rounded, glabrescent without, glabrous within; petals 0.4 cm long, 0.4-0.5 cm broad, broadly obovate-oblong,

glabrous, free; stamens 10, five short c. 0.3 cm long, five long c. 0.4 cm long, free or tube very short; anthers globose; ovary c. 0.1 cm long, pilose; style c. 0.1 cm long, glabrous; stigma two-lobed. Fruit unknown.

Distribution: Known only from the type locality in Costa Rica. Occurring near sea level.

This species can be readily recognized by the dense pubescence of the leaflets which is erect rather than appressed, and by the glabrescent sepals. Its affinities are doubtful, although it resembles R. suerrensis. It can be distinguished from this species by the ovate or elliptic sepals with acute or rounded apex, by the broadly elliptic and shortly acuminate leaflets with truncate base, by the prominent venation of the lower surface of the leaflets, by the velvety brown pilose pubescence of the branchlets, and by the dense pubescence of the inflorescence, petiole, leaf rachis, and lower surface of the leaflets.

30. Rourea suerrensii Donnell Smith, Bot. Gaz. 23: 5. 1897.

Holotype examined (US); Costa Rica, Suerre, Llanuras de Santa Clara. J. Donnell Smith 6466 fl. Feb 1896. Isotypes examined (K, NY, frag., US).

Small tree or woody vine; branchlets terete, sparsely puberulous, lenticellate. Leaves imparipinnate, 1-2-jugate, rarely unifoliolate; petiole 6-9 cm long, sometimes longitudinally striate, sparsely puberulous; rachis 1-9 cm long (rarely obsolete), sparsely puberulous, sometimes longitudinally striate. Leaflets 9.5-20 cm long, 3-9 cm broad, elliptic or obovate-oblong, subchartaceous, the upper surface dark, glabrous, the lower surface pale, glabrous, the venation sparsely puberulous or tomentose, the apex cuspidate, the base attenuate (rarely rounded); petiolule 0.3-0.5 cm long; venation impressed above, prominulous below, lateral veins 5-7 pairs, diverging from midrib at angles of  $30^{\circ}$ - $60^{\circ}$ , ascending; veinlets transverse. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 5-8 cm long, puberulous; bracts 0.15 cm long. Pedicels articulate, 0.1-0.2 cm long above articulation, glabrous; sepals 0.3 cm long, 0.2 cm broad, broadly ovate or suborbicular, acuminate, glabrous or glabrescent, the margin ciliate, the apex barbate; petals 0.5 cm long, 0.2 cm broad, glabrous, free; stamens 10, five short c. 0.3 cm long, five long c. 0.4 cm long, the tube short; anthers globose; ovary lanate, c. 0.1 cm long; style c. 0.2 cm long; stigma

two-lobed. Fruit up to 1.5 cm long, glabrous, curved; calyx in fruit 0.4 cm long, glabrescent. the lobes 0.3 cm long. Seed 1.3 cm long, 0.5 cm wide; arilloid 0.4 cm long; testa under arilloid smooth.

Distribution: Known from Costa Rica and adjacent Nicaragua, from near sea level to 300 m altitude. Occurring in wet forest.

Rourea suerrensis closely resembles R. latifoliolata but differs in the broadly ovate or suborbicular sepals with acuminate apex, in the elliptic leaflets with cuspidate apex and attenuate base, in the prominulous venation of the lower surface of the leaflet, in the sparsely puberulous branchlets, and in the sparse puberulous pubescence of the leaf rachis, petiole, and lower surface of the leaflets. The affinities of this species as well as those of R. latifoliolata are uncertain.

NICARAGUA. Vicinity of El Recreo, on Río Mico, 23 Apr-14 May 1949, P. C. Standley 19620 fr. (F). COSTA RICA. Limón: La Colombiana Farm of the United Fruit Co., 6-7 Mar 1924, P. C. Standley 36753 fl. (US); La Colombiana Farm of the United Fruit Co., 6-7 Mar 1924, P. C. Standley 36761 fl. (F, US); La Colombiana Farm of the United Fruit Co., 6-7 Mar 1924, P. C. Standley 36872 fl. (US); Finca Montecristo, on the Río Reventazón below Cairo, 18-19 Feb 1926, P. C. Standley & J. Valerio 48561 fl. (US).

#### SECTION 4 INDUTAE

31. Rourea induta Planchon, *Linnaea* 23: 417. 1850.

Shrub to 2.5 m high; branchlets terete, striate, brown-pilose or densely brown-villous, lenticels absent. Leaves imparipinnate, (1-)2-3-jugate; petiole 1-3 cm long, densely brown-villous to sparsely tomentose; rachis 2.5-8(-12) cm long, densely brown-villous to sparsely tomentose. Leaflets 2.5-8 cm long, 2-4 cm broad, ovate or elliptic, coriaceous, the upper and the lower surface tomentose or glabrous, the midrib glabrate or villous above and below, the apex acute or acuminate, the base obtuse, truncate, subcordate or cordate; petiolule 0.1 cm long; venation reticulate, prominulous to prominent on both surfaces; lateral veins 4-7 pairs, diverging from midrib at angles of 40°-80°, anastomosing clearly near margin. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 5-10 cm long, densely brown-pilose or villous; bracts 0.1 cm long. Pedicels articulate, from very short to 0.1 cm long; sepals 0.3 cm long, 0.2 cm broad, ovate, villous or pilose without, pubescent within, the margin ciliate, the apex barbate, acute; petals 0.6-0.7 cm long, 0.2-0.25 cm broad, glabrous, free; stamens 10, five short 0.25-0.35 cm long, five long 0.35-0.45 cm long, the tube 0.05-0.1 cm long; anthers globose; ovary pilose, c. 0.2-0.25 cm long; style glabrous, c. 0.12-0.15 cm long; stigma two-lobed. Fruit 1-1.5 cm long,

tomentose-villous; calyx in fruit ascending, 0.7 cm long, villous. Seed 0.9 cm long; arilloid 0.4 cm long; testa under arilloid sculptured.

31a. Rourea induta var induta

Santalodes indutum (Planchon) O. Kuntze, Rev. Gen. 1:  
155. 1891.

Lectotype examined and selected (K): Brazil, W/o locality, Pohl 1974 fl. W/o date. Isotype examined (BR).  
Paratypes examined (K, W): Brazil, W/o locality, Pohl 1921 fl. W/o date.

Shrub; branchlets densely brown villous. Leaves (1-)2-3-jugate; petiole 2-3 cm long, densely brown-villous; rachis 3-8 cm long, densely brown-villous. Leaflets 3.5-8(-12) cm long, 2-4(-6) cm broad, elliptic, coriaceous, the upper surface shiny or opaque, only slightly darker than the lower surface, tomentose, the lower surface opaque, tomentose, the midrib villous above and below, the apex acuminate, the base obtuse to truncate; lateral veins 4-6 pairs, diverging from midrib at angles of 60°-80°. Inflorescence paniculate, the rachilla 8-10 cm long, densely brown-villous. Pedicels articulate, from very short to 0.1 cm long; sepals villous without; petals 0.7 cm long, 0.2-0.25 cm broad, glabrous; stamens 10, five short c. 0.35 cm long, five long c. 0.45 cm long, the tube 0.1 cm long; ovary c. 0.1 cm long; style c. 0.12 cm long.

Distribution: A common component of the cerrado vegetation of Central Brazil, found in the states of Maranhão, Bahia, Goiás, Mato Grosso, Minas Gerais, and São Paulo. Occurring at

elevations of approximately 1000 m.

Local names: "Pau de porco" (Minas Gerais), "Caju brabo do campo"

Rourea induta var induta and R. induta var reticulata are the only widespread representatives of the genus in the Planalto of Central Brazil. Judging by the number of collections available, they are probably very important members of the cerrado vegetation; apparently these two varieties grow better in the open wooded areas called "cerrados," but have also been collected, although rarely, in gallery forests. The presence or absence of dense pubescence is difficult to explain in broad ecological terms because the two varieties have frequently been found sharing similar habitats. A generalization can be made to the effect that var reticulata is found usually towards the edges of the area of distribution, being very common in the state of Mato Grosso near the limits of Amazonia, as well as in the states of Piauí and Ceará in northeastern Brazil; it is rarely found in São Paulo and in Minas Gerais. The largest concentrations of var induta are in southcentral Goiás and in Minas Gerais.

As has been pointed out elsewhere, the relationships of R. induta sensu lato are shared by the species of the Planalto and the forest species. It is most closely related to R. psammophila (see under that species).

Both Planchon (1850) and Schellenberg (1938) cited Pohl 1794 and Pohl 1921 as types for R. induta var induta. Pohl 1794, deposited at Kew, shows better the characteristics of

this taxon and has, therefore, been selected as the lectotype in the present treatment.

BRAZIL. Maranhão: Perto de Carolina, 26 May 1950, J. M. Pires & G. A. Black 2202 fl. (NY). Goiás: Serra Dourada, 18 Dec 1968, G. Barroso, Mitzi, M. José & Ana Lima 770 fl. (NY, UB); Ribeirão de São João to Ribeirão da Vendinha, 1828-1830, W. J. Burchell 7604 fl. (GH, P); Córrego Fundo to Porto Real (Porto Nacional), 1828-1830, W. J. Burchell 8397 fl. (K); Entre Papelinha et Ponte Alta, w/o date, A. Glaziou 20872 fl. (BR, C, G, P, R, S); Serra do Caiapó, ca. 35 km S of Caiapônia on road to Jataí, 19 Oct 1964, H. S. Irwin & T. R. Soderstrom 7051 fr. (F, NY); Serra dos Cristais, 25 km W of Cristalina, 6 Nov 1965, H. S. Irwin, R. Souza & R. Reis dos Santos 9993 fr. (NY, UB); Serra do Rio Preto, 25 km E of Cabeceiras (ca. 4 km E of Goiás-Minas Gerais border), 19 Nov 1965, H. S. Irwin, R. Souza & R. Reis dos Santos 10542 fr. (F, NY, S, U); Serra dos Pirineus, ca. 12 km S of Pirinópolis, 1 Dec 1965, H. S. Irwin, R. Souza & R. Reis dos Santos 10881 fr. (F, K, NY, S, U, UB). Distrito Federal: Gama, 8 Sep 1962, L. Duarte & R. S. Santos 147 fl. (NY). Mato Grosso: 5 mi out of Campo Grande on road to São Paulo, 24 Nov 1959, B. Maguire & C. K. Maguire 44514 fr. (NY, SP); 25 km from Cuiabá to Rondonópolis, 28 Sep 1963, B. Maguire, J. M. Pires, C. K. Maguire & N. T. Silva 56895 fl. (NY); Cuiabá, 16 Dec 1893, G. A. Malme 1230 fr. (GH, S, US). Minas Gerais: Lagôa Santa, Quebra, 2 Oct 1956, J. Becker s.n. fl. (R); Retiro do Tenete to Farinha Podre (Uberava), 10 Sep 1827, W. J. Burchell 5675 fl. (GH, K, P); Horto

de Paraopeba, 28 Sep 1965, A. G. Ferreira & M. Marques 103 fl. (SP); Ituiutaba, 12 Nov 1950, A. Macedo 2575 fl. (S, SP, US); Tabuleiro, Paranan, w/o date, Martius 1768 fl. (M); "Prope Arraial Novo et Morada Nova," 1862, L. Netto 301 fl. (BR, GH); Uberava, 2 Oct 1848, Regnell III-402 fl. (S); w/o locality, 1816-1821, A. de Saint-Hilaire C<sup>1</sup> 581 fl. (P). Sao Paulo: Itirapina, Campo Grande, 21 Jan 1951, G. A. Black 51-11172 fl. (INPA); Araraquara, Usina Tamoio, Fazenda Santa Joana, w/o date, G. M. Felipe 99 fl. (F, S, SP, US); Emas, Pirassununga, 13 Sep 1946, M. Kuhlmann 1454 fl. (SP); Campo Alegre, 25 Sep 1940, J. F. Toledo & A. Gehrt SP43183 fl. (SP). Chapada Alto dos Bois, w/o date, Pohl 3424 fl. (G, W). "Brasilia," w/o date, Riedel s.n. fl. (C, G, GH, K, NY, P, S, US, W).

31b. Rourea induta var reticulata (Planchon) Baker, in Martius, Fl. Brasil. 14(2): 178. 1871.

Rourea reticulata Planchon, Linnaea 23: 416. 1850.

Rourea fraterna Planchon, l.c., 416. 1850.

Santalodes fraternum (Planchon) O. Kuntze, Rev. Gen, 1: 155. 1891.

Rourea induta fma reticulata (Planchon) Schellenberg, Pflanzenreich Heft 103: 201. 1938, synonym. nov.

Holotype examined (K): Brazil, Pernambuco, Serra da Batalha, Rio Preto. G. Gardner s.n. fl. Sep 1829.

Shrub to 2.5 m high; branchlets brown-pilose. Leaves 2-3-jugate; petiole 1-1.5 cm long, brown-villous in young leaves to sparsely tomentose in mature leaves. Leaflets 2.5-4.5 cm long, 2-3 cm broad, ovate or elliptic, the upper surface glabrous, the lower surface glabrous, the midrib glabrescent, the apex acute or acuminate, the base cordate, subcordate or truncate; venation reticulate, prominent above and below; lateral veins 6-7 pairs, diverging from midrib at angles of 40°-60°. Inflorescence paniculate, the rachilla 5 cm long, brown-pilose. Pedicels articulate from very short to 0.1 cm long; petals 0.6 cm long, 0.2 cm broad, glabrous; stamens 10, five short c. 0.25 cm long, five long c. 0.35 cm long, the tube c. 0.05 cm long; ovary c. 0.1 cm long; style 0.15 cm long.

Distribution: Brazil, in the states of Ceará, Piauí, Pernambuco, Goiás, Mato Grosso, Minas Gerais and São Paulo. Occurring in cerrado at approximately 1000 m altitude.

Rourea induta var reticulata differs from var induta mainly by the prominent reticulate venation on both surfaces of the leaflets, and by the leaflets which are glabrous rather than more or less tomentose. The characters delimiting this taxon are few, but rather consistent and show clear differentiation from those attributes of var induta. It has been considered advisable to maintain it as a variety following Baker and not as a form as was considered by Schellenberg. The ecology, affinities and pattern of distribution of var reticulata are discussed in conjunction with those of the typical form; see under R. induta var induta.

BRAZIL. Ceará: Campo Grande, 17 Mar 1910, A. Lofgren 286 fr. (S). Piauí: W/o locality, 1841, G. Gardner 2815 fl. (F, G, P, SP, W). Goiás: Córrego Fundo to Porto Real (Porto Nacional), 1828-1830, W. J. Burchell 8394 fr. (GH, K); Serra dos Cristais, ca. 20 km W of Cristalina, 5 Nov 1965, H. S. Irwin, R. Souza & R. Reis dos Santos 9964 fr. (F, NY, S, U, UB); W/o locality, 1816-1821, A. de Saint-Hilaire C<sup>1</sup> 810 fl. (P). Mato Grosso: Três Jacús, Chapada dos Parecís, Jun 1909, Comissão Rondon 2174 fl. (R); Xavantina to Cachimbo road, 65 km from Cachimbo, 25 May 1966, D. R. Hunt & J. F. Ramos 5561 fl. (NY); ca. 50 km S of Garapū, 29 Sep 1964, H. S. Irwin & T. R. Soderstrom 6422 fl. fr. (F, NY); Serra do Roncador, ca. 86 km N of Xavantina, 3 Jun 1966, H. S. Irwin, J. W. Grear, Jr.,

R. Souza & R. Reis dos Santos 16544 fl. (F, NY, S, U); Rosario, Oct 1914, J. G. Kuhlmann 324 fl. (SP); Santa Anna da Chapada, 18 Jul 1902, G. A. Malme 1970 fl. (S). Minas Gerais: "Flumine São Francisco, prope Salgado et alibi," Aug 1768, Martius s.n. fl. (M). São Paulo: Emas, 17 Sep 1952, O. Handro 308 fl. (SP). Jaragua, W/o date, Pohl 941 fl. (F, W). Arragas, W/o date, Pohl 2411 fl. (BR, F, W).

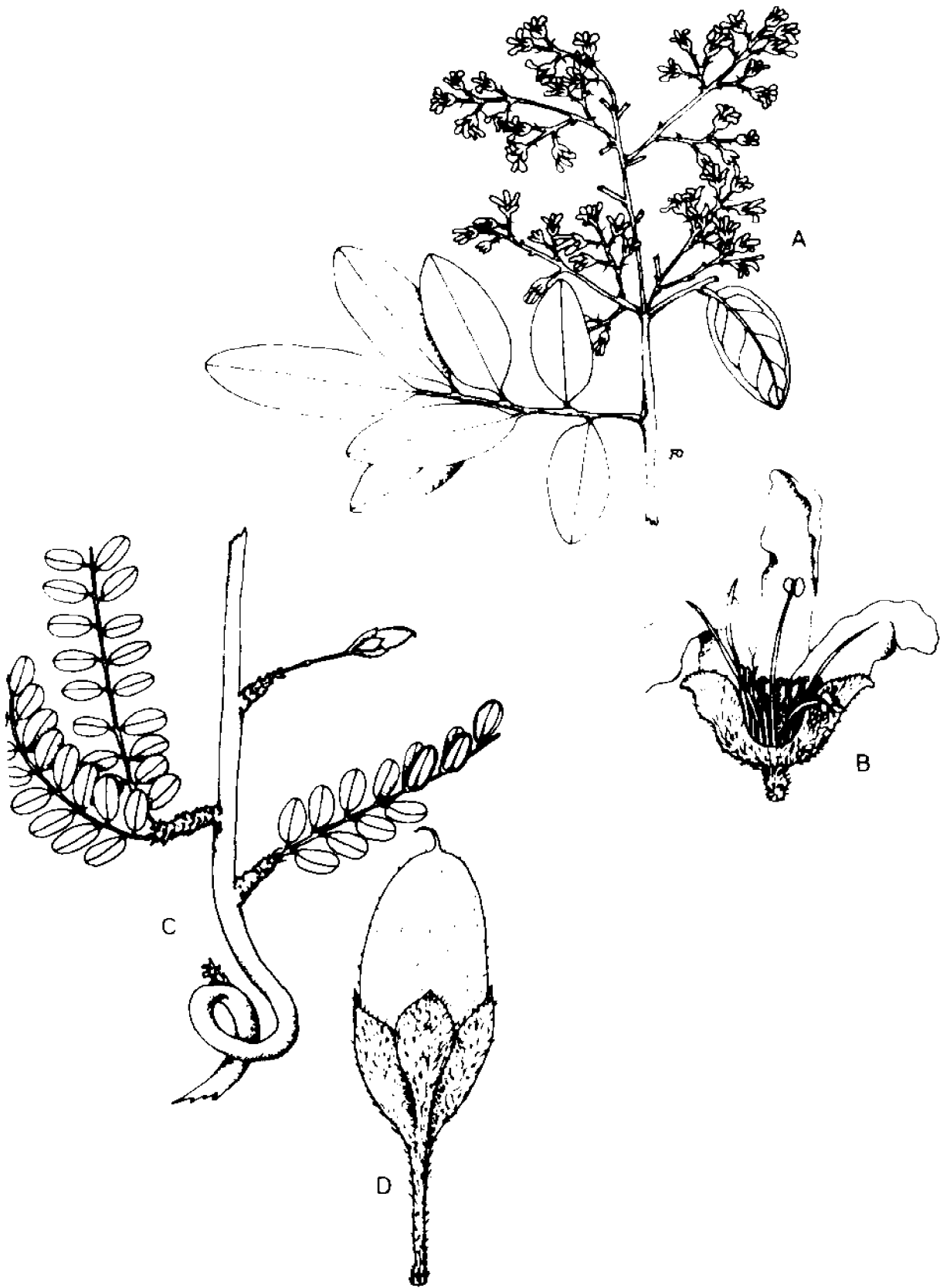
32. Rourea psammophila Forero, sp. nov. Fig. 34 A-B.

Holotype (SP): Brazil, Pará, Conceição do Araguaia.

A. Macedo 4046 fl. 16 Aug 1955. Isotypes (RB, US).

Frutex, ramulis teretibus dense puberulis cum lenticellis inconspicuis. Folia imparipinnata, 2-3-jugata, cum petiolo 1-4 cm longo, puberulo, rachi 1.5-5 cm longa, puberula. Foliola (2-)3-6.5 cm longa, (0.8-)1.5-2 cm lata, anguste elliptica, chartacea vel subcoriacea, concoloria, supra juvenilia sparse pubescens mox glabra, subtus glabra vel sparse pubescens, costa media supra basim versus pubescente subtus puberula, apice acuta, basi cuneata vel rotundata leviter obliqua; margine in foliola juvenilia plus ciliata, petiolulo 0.2-0.3 cm longo, venis reticulatis prominulis, costa media plana, nervis secundariis 6-7 jugis cum costa angulo 50°-70° facienti, versus marginem anastomosantibus. Inflorescentiae paniculatae, terminales vel axillares rare ab foliis redactis subtendentes, rachibus 1.5-7cm longis, dense puberulis vel tomentosus. Bracteeae 0.1 cm longae, triangulares, puberulae. Pedicelli articulati, supra articulum 0.05-0.1 cm longi, puberuli; sepala 0.4 cm longa, 0.2 cm lata, extus sparse puberula vel tomentosa; petala 0.5-0.6 cm longa, 0.15 cm lata, oblonga, glabra; stamina 10, 5 brevibus c. 0.25 cm longis et 5 longis c. 0.35-0.4 cm longis; tubo 0.05 cm longo; anthera globosa; ovarium pilosum, c. 0.08 cm longum; stylus 0.12 cm longus. Fructus immaturus sparse tomentosus; calyce 0.5-0.7 cm longo dense tomentoso, lobis 0.1-0.2 cm longis.

Fig. 34. A-B, Rourea psammophila, Macedo 4046. A. Habit  
(x 0.5). B. Flower with one sepal and two petals removed  
(x 5). C-D, R. bahiensis, Belém et al 3225. C. Habit  
(x 0.5); D. Fruit (x 3.5).



Shrub; branchlets terete, densely puberulous, inconspicuous lenticellate. Leaves imparipinnate, 2-3-jugate; petiole 1-4 cm long, puberulous; rachis 1.5-5 cm long, puberulous. Leaflets (2-)3-6.5 cm long, (0.8-)1.5-2 cm broad, narrowly elliptic, chartaceous to subcoriaceous, concolorous, the upper surface glabrous (young leaflets sparsely pubescent), the lower surface glabrous or sparsely pubescent, the midrib puberulous near base above, puberulous below, the apex acute, the base cuneate or rounded and slightly oblique, the margin ciliate, especially in young leaflets; petiolule 0.2-0.3 cm long; venation reticulate, the lateral veins and veinlets prominulous above and below, the midrib plane above, prominent below; lateral veins 6-7 pairs, diverging from midrib at angles of  $50^{\circ}$ - $70^{\circ}$ , anastomosing clearly near margin. Inflorescence paniculate, terminal to axillary, sometimes subtended by reduced leaves, the rachilla 1.5-7 cm long, densely puberulous or tomentose; bracts 0.1 cm long, triangular, puberulous. Pedicels articulate, 0.05-0.1 cm long above articulation, puberulous; sepals 0.4 cm long, 0.2 cm broad, sparsely puberulous or tomentose without; petals 0.5-0.6 cm long, 0.15 cm broad, oblong, glabrous; stamens 10, five short c. 0.25 cm long, five long c. 0.35-0.4 cm long, the tube 0.05 cm long; anthers globose; ovary pilose, c. 0.08 cm long; style 0.12 cm long. Immature fruit sparsely tomentose; calyx in fruit ascending, 0.5-0.7 cm long, densely tomentose, the lobes 0.1-0.2 cm long.

Distribution: Known from the northern limits of the cerrado vegetation, in the states of Pará and adjacent Goiás.

Occurring in sandy soils.

Rourea psammophila is closely related to R. induta sensu lato, from which it differs in the narrowly elliptic leaflets with acute apex and slightly oblique base, and in the longer petiolule (0.2-0.3 cm in R. psammophila, 0.1 cm in R. induta). The relationship of these two taxa is suggested by the size and general aspect of the flower and by other characters such as pubescence, texture, and aspect of the leaflets. Rourea psammophila obviously does not belong to section Multifoliolatae because of the fewer leaflets, their shape and size, the short staminal tube, and the absence of glandular hairs. It differs from other species of the genus in which the upper surface of the leaflets is more or less pubescent, i.e., those of section Adenophorae, by the absence of glandular hairs, as well as by the shape and texture of the leaflets. In addition, R. psammophila is a plant of the cerrados while the species belonging to section Adenophorae are mainly forest species.

BRAZIL. Goiás: As Araras to Cavalcante, 1828-1830,  
W. J. Burchell 7880 fr. (GH, K).

SECTION 5 CORDATAE

33. Rourea revoluta Planchon, *Linnaea* 23: 415. 1850.

Shrubs or woody vines; branchlets terete, glabrous, glabrescent, puberulous or tomentose, conspicuously lenticellate. Leaves imparipinnate 2-3-jugate; petiole 2-3.5 cm long, glabrous or densely tomentose; rachis 2-4 cm long, glabrous or villous. Leaflets (1-)1.5-10 cm long, (0.5-)1-4.5 cm broad, oblong, elliptic, or oblong-elliptic, chartaceous, the upper surface dark, glabrous, the lower surface pale, opaque, glabrous or velvety villous, papillose, the midrib glabrous above, densely villous or glabrous below, the apex acute or shortly acuminate, the base cordate or subcordate, rarely obtuse or truncate, the margin revolute; petiolule c. 0.1-0.2 cm long; venation reticulate, diffuse or slightly prominulous above, prominulous below; lateral veins 3-6(7) pairs, diverging from midrib at angles of  $40^{\circ}$ - $50^{\circ}$  ( $-70^{\circ}$ ), anastomosing more or less clearly near margin. Inflorescence paniculate, terminal, pseudoterminal or axillary, the rachilla (3-)4-11 cm long, sparsely tomentose or glabrous; bracts 0.2-0.4 cm long, pilose. Pedicels articulate, 0.3-0.7 cm long above articulation; sepals 0.3 cm long, 0.15 cm broad, ovate, glabrous, or glabrescent, the margin ciliate, the apex barbate; petals 0.5-0.7 cm long, 0.15-0.3 cm broad, oblong, glabrous, free; stamens 10, five short c. 0.2-0.35 cm long, five long c.

0.3-0.5 cm long, the tube 0.05-0.06 cm long; anthers globose; ovary pilose, c. 0.1 cm long; style glabrous, c. 0.1 cm long; stigma capitate, two-lobed.

33a. Rourea revoluta var revoluta

Santalodes revolutum (Planchon) O. Kuntze, Rev. Gen.

1: 155. 1891.

Holotype examined (K): Guyana, Along Essequibo River.  
Schomburgk 126 fl. 1836. Isotypes examined: (F, G, P, U, W).

Shrub or woody vine; branchlets puberulous or tomentose. Leaves imparipinnate; petiole 2-3 cm long, densely tomentose; rachis 3-4 cm long, villous. Leaflets (1-)1.5-10 cm long, (0.5-)1-4.5 cm broad, oblong, elliptic or oblong-elliptic, the lower surface velvety villous, the midrib densely villous below, the apex shortly acuminate or acute, the base cordate, subcordate or rarely obtuse; lateral veins 5-6(-7) pairs. Inflorescence axillary to pseudoterminal, the rachilla (3-) 4-11 cm long, sparsely tomentose; petals 0.6-0.7 cm long, 0.3 cm broad, oblong; stamens 10, five short c. 0.3-0.35 cm long, five long c. 0.4-0.5 cm long. Fruit 1.2 cm long, 0.6 cm wide, sparsely villous; calyx in fruit ascending, 0.6 cm long, glabrous, the margin ciliate, the apex barbate. Seed 0.9 cm long; arilloid 0.2 cm long; testa under arilloid smooth.

Distribution: Restricted, as far as known, to Guyana and occurring in savannas and river margins.

Local names: "Supple Jack" (Guyana).

Rourea revoluta sensu lato is most closely related to R. grosourdyana sensu lato. The primary character used to separate them is the revolute margin of the leaflets of R.

revoluta. They also differ in the papillae of the lower surface of the leaflets which are well developed in R. revoluta and poorly developed or absent in grosourdyana.

At the sectional level, this and the other species of section Cordatae are undoubtedly related to section Multifoliolatae; this affinity is shown by the cordate or subcordate base of many leaflets, the pubescence of the leaflets and fruits and, also, by the similar open habitats in which they usually grow. The two sections differ mainly in the length of the staminal tube, number of leaflets, and pubescence of flowers. Species of section Multifoliolatae possess usually more than 11 leaflets, a long staminal tube and usually pubescent flowers. Those of section Cordatae usually have 7 leaflets, a shorter staminal tube, and glabrous or glabrescent sepals. The areas of distribution of the two sections are widely separated by the Amazon basin (One cultivated specimen of R. revoluta var glabra is known from southern Brazil).

Schellenberg (1938) erroneously cited Appun 1835, deposited at Kew, as the type of this variety. However, Planchon (1850) had cited only one specimen, i.e., Schomburgk 126 (also deposited at Kew), accompanying his description of R. revoluta. Schomburgk 126 is indeed R. revoluta var revoluta, and should be kept as the type. There is no apparent reason for Schellenberg's choice, since he listed Schomburgk 126 under the same variety.

GUYANA. W/o locality, 1866. Appun 1835 fl. (K). W/o locality, 2 Jan 1961, V. Graham 458 fl. (K). Rupununi District, 14 Apr 1956, H. S. Irwin 597 fr. (US). W/o locality,

W/o date, G. R. M. Pollard 103 fr. (K). W/o locality, W/o  
date, Schomburgk 125 fl. (W). W/o locality, W/o date, Schom-  
burgk s.n. fl. (U).

33b. Rourea revoluta var glabra Baker, in Martius, Fl. Brasil. 14(2): 180. 1871.

Holotype examined (K): Guyana, W/o locality. Appun 1835a fl. W/o date.

Shrub or woody vine(?); branchlets glabrous or glabrescent. Leaves imparipinnate, 2-3-jugate; petiole 2-3.5 cm long, glabrous; rachis 2-4 cm long, glabrous. Leaflets 2-7 cm long, 1-3 cm broad, elliptic, glabrous above and below, the midrib glabrous, the apex acute, the base subcordate or truncate; petiolule 0.1 cm long; lateral veins 3-5(-6) pairs. Inflorescence paniculate, the rachilla 3-6 cm long, glabrous; petals 0.5 cm long, 0.15 cm broad; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long; ovary c. 0.1 cm long; style c. 0.1 cm long. Fruit unknown.

Distribution: Known from Guyana and the adjacent Brazilian Territory of Roraima, this variety has been grown in cultivation at the Museu Nacional, Rio de Janeiro (Brazil). No information on the natural habitat of this variety is available from collectors' notes, but given its distribution, it probably occurs in savannas or savanna margins, at elevations of 300 m or less.

Rourea revoluta var glabra differs from the typical variety in the glabrous leaflets, rachis, petiole, and inflorescence. Its distribution is probably very similar to that of var revoluta but only three collections are available for study and only two of them are apparently from the natural

habitat in Guyana and northern Brazil.

BRAZIL. Terr. Roraima: Boa Vista, Jun 1913, J. G. Kuhlmann 485 fl. (RB). Guanabara: Rio de Janeiro, Quinta da Boa Vista, São Cristovão (cult.), w/o date, A. Glaziou 13432 fl. (C, P).

34. Rourea grosourdyana Baillon, *Adansonia* 9: 149. 1868-70.

Shrub, scandent shrub or woody vine; branchlets terete, sparsely villous, puberulous or glabrescent, conspicuously lenticellate. Leaves imparipinnate, 2-3(-4)-jugate; petiole 2-4 cm long, villous or glabrous; rachis 2-7(-9) cm long, densely villous or glabrous. Leaflets 1.5-12 cm long, 1-5 cm broad, oblong, elliptic, oblong-elliptic or oblong-obovate, subchartaceous or chartaceous, the upper surface glabrous, the lower surface glabrous or densely villous and velvety, papillae absent or poorly developed, the midrib densely villous or glabrous, the apex rounded, acute or shortly acuminate, the base cordate or subcordate, rarely obtuse, the margin entire or slightly revolute near the base; petiolule 0.01-0.2 cm long; venation reticulate, plane or diffuse above, prominulous below; lateral veins 4-7 pairs, diverging from midrib at angles of 30°-80°, anastomosing more or less clearly near margin. Inflorescence paniculate, pseudoterminal to axillary, the rachilla 5-10 cm long, sparsely tomentose, glabrescent or glabrous; bracts 0.05-0.4 cm long, lanceolate, tomentose. Pedicels articulate, 0.2-0.4 cm long above articulation; sepals 0.3 cm long, 0.25 cm broad, ovate or orbicular, glabrous, the margin ciliate, the apex barbate; petals 0.5-0.6 cm long, 0.15-0.2 cm broad. Fruit 1 cm long, 0.3-0.4 cm wide, glabrous to glabrescent; calyx in fruit 0.4-0.5 cm long, glabrous. Seed 0.6-0.8 cm long, 0.25-0.3 cm wide; arilloid 0.2 cm long; testa under arilloid smooth.

34a. Rourea grosourdyana var grosourdyana

Holotype examined (P): Venezuela, Guyana, Angostura (Ciudad Bolívar). Grosourdy cat. no. 18 fr. 1864. Fragment of holotype examined (F).

Scandent shrub or woody vine; branchlets sparsely villous. Leaves 2-3-jugate; petiole villous; rachis 2-7 cm long, densely villous. Leaflets 1.5-7.5 cm long, 1-3.5 cm broad, the lower surface densely villous, velvety, the midrib densely villous, the apex shortly acuminate or acute, the base subcordate; lateral veins 4-6 pairs, diverging from midrib at angles of 30°-50°. Inflorescence paniculate, the rachilla sparsely tomentose. Pedicels 0.3-0.4 cm long. Fruit 1 cm long, 0.4 cm wide, glabrescent; calyx in fruit 0.5 cm long, coriaceous. Seed 0.6-0.7 cm long, 0.25-0.3 cm wide.

Distribution: Venezuela, Guyana and the adjacent territory of Roraima, Brazil. Occurring in gallery forest, margin of gallery forest and savanna, savanna and primary forest (?), at elevations of 30-400 m.

The character given by Schellenberg to differentiate this taxon from R. revoluta, i.e., leaflets narrower, 3 cm wide, certainly does not hold true. Even the type specimens of these two species have different measurements than those given by him, showing complete overlap. The most important character used here to separate R. grosourdyana from R. revoluta is the entire margin of the leaflets. It also differs

from that taxon in the poorly developed or absent papillae of the lower surface of the leaflet. The similar distribution and habitats of these taxa are indicative of their close affinity.

VENEZUELA. Bolívar: La Paragua, 10 Mar 1940, Ll. Williams 12555 fl. (A, F, US); La Paragua, 22 Mar 1940, Ll. Williams 12680 fl. (F, US); Ciudad Bolívar, 22 Apr 1940, Ll. Williams 12865 fl. (F, S, US); Sabana de El Tigre, cerca del Río Cuchivero, 19 Jun 1940, Ll. Williams 13398 fl. (F, K, S, US).

GUYANA. W/o locality, w/o date, Schomburgk 134 fl. (K).

Western extremity of Kanuku Mountains, in drainage of Takutu River, 4-22 Mar 1938, A. C. Smith 3149 (A, F, G, NY, P, S, U, W).

BRAZIL. Terr. Roraima: Road Boa Vista to Caracarai, 1948, R. L. Frões 22922 fl. (COL); Igarapé Agua Boa, Rio Mucajá, between Pratinha and Rio Apiaú, 24 Jan 1967, G. T. Prance, E. Forero, B. S. Pena & J. F. Ramos 4063 fl. (INPA, NY); Foothills of Serra da Lua, Dormida, 12 Jan 1969, G. T. Prance, J. R. Steward, J. F. Ramos & L. G. Farias 9231 fl. (INPA, NY); 85 km N of Boa Vista, Fazenda União, 1 Feb 1969, G. T. Prance, J. R. Steward, J. F. Ramos, L. G. Farias & O. P. Monteiro 9563 fl. (INPA, NY).

34b. Rourea grosourdyana Baillon var glaberrima Forero, var.  
nov.

Holotype (K): Brazil, Rio Branco (Roraima), San Marcos.  
E. Ule 7898 fl. Jan 1909. Isotypes (G, MG).

A varietate grosourdyana petiolo rachique foliolisque  
subtus rachilibus glabris, calice fructi brevior differt.

Small shrub or woody vine; branchlets terete, minutely  
puberulous to glabrescent, conspicuously lenticellate. Leaves  
imparipinnate, 2-3(-4)-jugate; petiole 2-4 cm long, glabrous;  
rachis 3-7(-9) cm long, glabrous. Leaflets (2-)5-12 cm long,  
(1-)2.5-5 cm broad, oblong-obovate or oblong-elliptic, char-  
taceous, the upper surface dark, shiny, glabrous, the lower  
surface pale, opaque, glabrous, papillae absent, the apex  
rounded or acute, the base cordate or subcordate, the margin  
entire; petiolule 0.1(-0.2) cm long; venation reticulate, dif-  
fuse above, prominulous below; lateral veins 4-7 pairs, diverg-  
ing from midrib at angles of 50°-80°. Inflorescence pani-  
culate, the rachilla 5-10 cm long, glabrous to glabrescent;  
bracts 0.2-0.4 cm long, laceolate, sparsely to densely tomen-  
tose. Pedicels articulate, 0.2-0.4 cm long above articulation;  
sepals 0.3 cm long, 0.25 cm broad, ovate to orbicular, gla-  
brous; petals 0.6 cm long, 0.2 cm broad, oblong, glabrous,  
free; stamens 10, five short c. 0.14 cm long, five long c. 0.3  
cm long, the tube 0.05 cm long; anthers globose, 0.05-0.07 cm  
in diameter; ovary pilose, 0.08 cm long; style 0.12 cm long.

Fruit 1 cm long, 0.3 cm wide, glabrous to glabrate, villous near apex, the peduncle 0.4-0.6 cm long; calyx in fruit 0.4 cm long, glabrous. Seed 0.8 cm long; arilloid 0.3 cm long; testa under arilloid smooth.

Distribution: Known thus far only from the Brazilian territory of Roraima. Occurring in savanna, dry forest in savanna, and in river margins.

This variety can be distinguished from var grosourdyana by the glabrous petiole, rachis, rachilla and lower surface of leaflets. It differs from R. revoluta primarily in the entire margin of the leaflets, and in the absence of papillae on the lower surface. The distribution of R. grosourdyana var glaberrima coincides with that of the other members of section Cordatae.

BRAZIL. Terr. Roraima: Caminho de Samauma a campo de aviação de Mucajaf, kms 14-15 da estrada Boa Vista-Caracaraf, 25 Aug 1951, G. A. Black & D. Magalhães 51-12969 fl. (U); Serra Grande, 30 Jun 1937, A. Ducke RB37635 fl. (RB); São Salvador, 40 km NW of Boa Vista, Island of forest in savanna, 1 Mar 1967, G. T. Prance, E. Forero, B. S. Pena & J. F. Ramos 4621 fr. (INPA, NY); Rio Murupu, 28 km NW of Boa Vista, Road to Taiano, 8 Jan 1969, G. T. Prance, J. R. Steward, J. F. Ramos & L. G. Farias 9104 fl. (INPA, NY); Ilha São Salvador, near Lake Maiú, 40 km NW of Boa Vista, 8 Jan 1969, G. T. Prance, J. R. Steward, J. F. Ramos & L. G. Farias 9152 fl. (INPA, NY); Rio Surumú, prox. a vila, 27 Feb 1964, M. Silva 38 fr. (MG).

SECTION 6 MULTIFOLIOLATAE

35. Rourea discolor Baker, in Martius, Fl. Brasil. 14(2): 180.  
1871.

Eichleria lucida Progel, in Martius, Fl. Brasil. 12(2):  
518, tab. 116, fig. 2. 1877. Types examined (G, P):  
Brazil. Bahia, "partie méridionale." Blanchet 3145A  
fl. 1840.

Santalodes discolor (Baker) O. Ktze., Rev. Gen. 1: 155.  
1891.

Rourea progeliana Kuhlmann, Arq. Inst. Biol. Veg. 1: 40.  
1934.

Holotype examined (BR): Brazil, Bahia, Ilheos. Luschnath  
s.n. fl. 4 Sep 1839.

Treelet(?); branchlets terete, glabrous, conspicuously  
lenticellate. Leaves imparipinnate, (5-)6-12-jugate; petiole  
1-3 cm long, glabrous; rachis 5-12 cm long, glabrous. Leaf-  
lets (1.5-)3-3.5(-5.5) cm long, (0.7-)1.5-2 cm broad, oblong-  
rectangular, chartaceous to subcoriaceous, the upper surface  
glabrous, the lower surface glaucous, papillose, tomentose,  
the midrib glabrescent or glabrous, the apex rounded or obtuse,  
the base obtuse or subcordate, the margin revolute; petiolule  
0.03-0.1 cm long; venation reticulate, diffuse; lateral veins

4-6 pairs diverging from midrib at angles of 50°-70°, joining clearly near margin. Inflorescence paniculate, axillary to pseudoterminal, the rachilla 7-11 cm long, glabrous or glabrescent, glandular hairs absent; bracts 0.1 cm long, more or less linear; bracteoles small, linear. Pedicels articulate, erect, slender, glabrous, 0.8-1(-1.5) cm long above articulation; sepals 0.5-0.7 cm long, 0.2-0.25 cm broad, ligulate-lanceolate, glabrous or glabrescent without, glabrescent within, glandular hairs absent, the margin ciliate; petals 0.8 cm long, 0.2 cm wide, connate above the base, glabrous; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long, the tube 0.08-0.1 cm long; anthers globose; ovary pilose, c. 0.1 cm long; style pubescent, c. 0.5 cm long; stigma subpeltate, two-lobed. Fruit unknown.

Distribution: Known only from the Brazilian state of Bahia.

Rourea discolor and R. blanchetiana superficially resemble the Oxalidaceae in many features, and Progel and Moricand, in fact, mistook them for members of that family. Kuhlmann (1934) corrected this mistake showing that these species have a pair of basal erect ovules and not numerous ovules with axile placentation.

BRAZIL. Bahia: "partie méridionale," 1840, Blanchet 3145 fl. (G); Porto Seguro, 2 Sep 1961, A. P. Duarte 6118 fl. (RB); Ilheos, Sep 1821, L. Riedel s.n. fl. (NY).

36. Rourea bahiensis Forero, sp. nov. Fig. 34.C-D.

Holotype (NY): Brazil, Bahia, Belmonte, "mata costeira"  
R. P. Belém & R. S. Pinheiro 3225 fr. 31 Jan 1967. Isotypes  
 (NY, UB).

Arbor parva(?) 3 m alta, ramulis teretibus, sparse  
 puberulis, inconspicue lenticellatis. Folia imparipinnata,  
 5-11-juga, petiolo 0.5-1 cm longo, puberulo, rachi 2-9 cm longa,  
 puberula. Foliola chartacea, 0.5-2 cm longa, 0.4-0.8 cm lata,  
 rectangular, foliolo terminali obovato, supra glabra nitida  
 nigrescens, subtus glabra opaca pallida haud papillosa, apice  
 obtusa vel rotundata, basi cordata vel obtusa, margine revo-  
 luta, sessile vel brevissima petiolulata, petiolulo 0.1 cm  
 longo, venis reticulatis, utrinque diffusis. Inflorescentiae  
 in paniculis (?) redactis. Flores ignoti. Bracteolae li-  
 neares, 0.1 cm longae. Folliculus solitarius, 1 cm longus,  
 0.3-0.4 cm latus, minute puberulus; calyce 0.7 cm longo imbric-  
 ato, minute puberulo, eglanduloso. Semen 0.8 cm longum; aril-  
 loidio 0.2 cm longo; testa sub arilloidio laeve.

Treelet(?) 3 m tall; branchlets terete, sparsely puberu-  
 lous, inconspicuously lenticellate. Leaves imparipinnate, 5-  
 11-jugate; petiole 0.5-1 cm long, puberulous; rachis 2-9 cm  
 long, puberulous. Leaflets chartaceous, 0.5-2 cm long, 0.4-  
 0.8 cm broad, rectangular, the terminal leaflet obovate, the  
 upper surface glabrous, dark, shiny, the lower surface opaque,  
 pale, glabrous, papillae absent, the apex obtuse or rounded,

the base obtuse or cordate, the margin revolute; petiolule 0.01 cm long; venation reticulate, diffuse above and below. Inflorescence a reduced panicle(?). Flowers unknown. Bracteoles linear, 0.1 cm long. Fruit one per inflorescence, 1 cm long, 0.3-0.4 cm wide, minutely puberulous; calyx in fruit 0.7 cm long, imbricate, minutely puberulous, glandular hairs absent. Seed 0.8 cm long; arilloid 0.2 cm long; testa under arilloid smooth.

Distribution: Known only from the type locality in the Brazilian state of Bahia. Occurring in Coastal forest near sea level.

The most important character to differentiate this species is the very reduced infrutescence. The fruiting material available shows only one fruit produced very near the apex of the branchlet. No flowering material of this species has come to my attention, but the ascending, imbricate fruiting calyx and the fruit itself leave little doubt as to the position of this species in the genus Hourea. It is closely related to R. discolor, from which it differs in the very reduced inflorescence and in the absence of papillae on the lower surface of the leaflet. It can be distinguished from R. blanchetiana by the fewer leaflets and the absence of glandular hairs as well as by the reduced inflorescence.

37. Rourea blanchetiana (Progel) Kuhlmann, Arq. Inst. Biol. Veg. 1: 40. Fig. 1. 1934.

Eichleria blanchetiana Progel, in Martius, Fl. Brasil. 12(2): 518, tab. 116, Fig. 1. 1877.

Oxalis blanchetiana Moricand, nomen nudum in Sched. ex Progel, l.c.

Holotype (P): Brazil, Bahia, W/o locality. Blanchet 1050 fl. 1836. Isotype examined (P). Presumed isotype examined (RB23705).

Treelet(?) or scandent shrub, 1-2 m tall; branchlets terete, faintly striate, conspicuously lenticellate. Leaves imparipinnate, 14-16-jugate; petiole 1.5-2 cm long, densely tomentose; rachis up to 9-11 cm long, densely tomentose and with sparse glandular hairs. Leaflets 1.3-2.5 cm long, 0.6-0.7 (-1) cm broad, oblong, terminal oblong-elliptic, membranaceous to subchartaceous, the upper surface dark, glabrous, the lower surface pale, glaucous, opaque, glabrous, the midrib sparsely tomentose, the apex obtuse or rounded to rarely emarginate, the base obtuse, the terminal leaflet cuneate; petiolule 0.05-0.1 cm long; venation reticulate, diffuse above and below; lateral veins 5-6 pairs, diverging from midrib at angles of 50°-70°. Inflorescence a reduced panicle, or pseudo-umbellate, axillary to pseudoterminal, the rachilla 5-9 cm long, velutinous, glandular hairs present; bracts small, (less than 0.1

cm long), caducous. Pedicels articulate, velutinous, 0.4-0.6 cm long above articulation; sepals 0.5 cm long, 0.15 cm broad, linear-lanceolate, densely tomentose and glandulose without, sparsely tomentose or glabrescent within; petals 1.2 cm long, 0.1-0.2 cm broad, oblong-lanceolate, shortly connate above base, glabrous; stamens 10, five short c. 0.1 cm long, five long, c. 0.2 cm long, the tube c. 0.1 cm long; anthers subcordate; ovary pilose, c. 0.1 cm long; style pubescent for more than half its length, c. 0.35 cm long; stigma capitate. Fruit 1.2 cm long, densely minute puberulous; calyx in fruit shortly imbricate; sepals 0.5-0.6 cm long, 0.2 cm broad, lanceolate, minutely puberulous, the lobes 0.4-0.5 cm long. Seed 1 cm long; arilloid 0.2-0.3 cm long.

Distribution: Known only from the state of Bahia, Brazil, although no precise locality is given in any of the specimens studied.

Rourea blanchetiana is most closely related to R. bahiensis. It is also close to R. discolor. The most important differences are listed under R. bahiensis. Rourea blanchetiana is furthermore the only species with pseudoumbellate inflorescences.

BRAZIL. Bahia: W/o locality, W/o date, Blanchet 297 fl. fr. (P); W/o locality, 1835, Blanchet s.n. fl. fr. (NY); W/o locality, 1830, P. Salzmänn s.n. fl. (G); W/o locality, 1831, P. Salzmänn s.n. fl. (G); W/o locality, W/o date, P. Salzmänn s.n. fl. (P).

38. Rourea tenuis Schellenberg, Pflanzenreich Heft 103: 199.  
1938.

Holotype (B, lost). Photograph of holotype examined  
(NY); Brazil, Bahia, Vittoria. Sellow s.n. fr. W/o date.

Neotype selected (BR); Brazil, Bahia(?). Fohl s.n. fl.  
W/o date.

Shrub; branchlets terete, villous. Leaves imparipinnate,  
1-3-jugate, villous; rachis 5.5-6.5 cm long, villous. Leaf-  
lets 3-8 cm long, 1.7-3 cm broad, elliptic, membranaceous or  
subchartaceous, the upper surface dark, sparsely pilose, the  
lower surface pale, opaque, villous on midrib and lateral  
veins, the apex acute, the base attenuate, cuneate or obtuse,  
the lateral leaflets oblique; petiolule 0.1-0.2 cm long; ve-  
nation reticulate, impressed or diffuse above, prominent below;  
lateral veins 5-6 pairs, suberect, anastomosing clearly near  
margin. Inflorescence a reduced panicle, terminal, the ra-  
chilla in flowering stage 2.5-3 cm long, in fruiting state 7-  
12 cm long, villous; bracts 0.1-0.4 cm long, triangular. Pe-  
dicels articulate, 0.5-0.7 cm long above articulation, slender,  
glandulose-villous; sepals 0.5 cm long, 0.3 cm broad, elliptic,  
puberulous, with sparse glandular hairs; petals 0.6-0.7 cm  
long, 0.2 cm broad, oblong, glabrous, connate above base,  
stamens 10, five short c. 0.3-0.35 cm long, five long c. 0.45  
cm long, the tube 0.08 cm long; anthers globose, 0.05 cm in  
diameter; ovary pilose, 0.1 cm long; style 0.2 cm long. Fruit

(ex descr.) 1.3 cm long, 0.7 cm wide; calyx in fruit 0.5 cm long, puberulous; sepals oblong-lanceolate. Seed 1.2 cm long, 0.6 cm wide; arilloid 0.2 cm long.

Distribution: Known only from the state of Bahia, Brazil. Apparently occurring in the cerrado.

Rourea tenuis is a borderline species between the species of south, central and eastern Brazil and those of the Amazon, northern South America and Central America. It belongs to section Multifoliolatae mainly because it has connate petals, a long staminal tube, a reduced inflorescence, and leaflets with acute or rounded apex and with sparse pilose pubescence on the upper surface. Rourea tenuis resembles some of the other species of the genus in the presence of only 1-3-jugate leaves, and in the comparatively large leaflets.

The holotype of R. tenuis was destroyed in Berlin during World War II. For this reason and because there are no duplicates of the type (as far as I know), the choice of a neotype is necessary. The specimen Pohl s.n., deposited at Brussels (BR), and labeled R. martiana Baker, agrees well with the description of R. tenuis given by Schellenberg (1938), and with the photograph of the holotype available at New York. Pohl s.n. (BR) is therefore selected here as the neotype.

39. Rourea chrysomalla Glaziou ex Schellenberg, Pflanzenreich Heft 103: 196. 1938.

Rourea chrysomala Glaziou, Bull. Soc. Bot. France 56, Mém. 3(b): 126. 1906. nomen nudum.

Holotype examined (P): Brazil, Goiás, "chemin do Rio Parananá á Chico Lobo, dans les campos." A. Glaziou 20871 fr. 8 Nov 1894. Isotypes (C, F, frag., G, K, K, KB, S).

Suffrutex; branchlets terete, densely villous, lenticels absent. Leaves imparipinnate, 5-8-jugate; petiole 0.5-2 cm long, densely villous; rachis 7-9.5 cm long, densely villous. Leaflets 0.6-3.2 cm long, 0.5-1.6 cm broad, oblong-ovate, proximal pair rarely suborbiculate, chartaceous, the upper surface dark and somewhat shiny in mature leaflets, densely villous, the lower surface pale, opaque, densely villous, the apex acute to subobtuse, the base cordate, the margin entire or more or less revolute; leaflets sessile or petiolule 0.1 cm long; venation reticulate, diffuse above, prominent below; lateral veins 5-6 pairs, diverging from midrib at angles of  $60^{\circ}$  (near base) to  $90^{\circ}$  (near apex), clearly anastomosing near margin. Inflorescence racemose, axillary, the subtending leaves towards tip of branchlets sometimes reduced to bract-like structures, glandulose-villous, the rachilla very short, glandulose-villous; bracts 0.1-0.5 cm long. Flowers unknown. Fruit pedicel articulate, 0.1 cm long, or fruit sessile. Fruit c. 1.4 cm long, densely villous, with

glandular hairs; calyx in fruit up to 0.9 cm long, densely villous, and with glandular hairs. Seed c. 1 cm long; arilloid c. 0.4 cm long; testa under arilloid sculptured.

Distribution: Known only from the state of Goiás. Occurring in the "campos cerrados."

Rourea chrysomalla forms with R. martiana, R. glazioui and R. cnestidifolia a group of very closely related species. Rourea chrysomalla can be readily distinguished by its sessile fruit, very reduced inflorescence, small leaflets which are twice as long as wide and sometimes suborbicular, by the very densely villous pubescence of the fruit and fruiting calyx, and the dense pubescence of both surfaces of the leaflet.

40. Rourea glazioui Schellenberg, Pflanzenreich Heft 103,  
289. 1938.

Rourea polyphylla Schellenberg, Pflanzenreich Heft 103,  
197. 1938. nom. illegit., non R. polyphylla Blume.

Holotype (B, lost). Photograph of holotype examined (NY). Lectotype examined and selected (P); Brazil, Rio de Janeiro, Recende (fide Schellenberg). A. Glaziou 8625 fr. Aug 1877. Isotypes examined (C, F, frag., K).

Shrub(?); branchlets terete, pilose, young ones tomentose, inconspicuously lenticellate or lenticels absent. Leaves imparipinnate (5-)7-13-jugate; petiole 0.05-1 cm long, tomentose; rachis 6-10 cm long, pilose. Leaflets 0.8-3.7 cm long, 0.6-1 cm broad, oblong or oblong-lanceolate, chartaceous, the upper surface dark, shiny, sparsely pubescent, the lower surface pale, opaque, dense brown, tomentose, the midrib densely pilose, the apex rounded, the base cordate, the terminal leaflets cuneate, the margin revolute; leaflets sessile or petiole up to 0.1 cm long; venation diffuse above and below; lateral veins 5-6 pairs, diverging from midrib at angles of 60°-90°. Inflorescence a reduced panicle, axillary to pseudoterminal, the rachilla 2-3 cm long, tomentose; bracts 0.3-0.5 cm long. Flowers unknown. Fruit pedicels articulate, 0.5 cm long above articulation. Fruit 1.3-1.5 cm long, glabrescent, densely villous near apex; style persistent, conspicuous; calyx

tomentose. Seed 1 cm long; arilloid 0.4 cm long; testa under arilloid smooth.

Distribution: Known only from the type locality in the state of Rio de Janeiro, Brazil.

Hourea glazioui is most closely related to R. martiana, from which it differs primarily in the more numerous leaflets, but also in the shiny and sparsely pubescent upper surface of the leaflets, and in the slightly revolute margins. The holotype of R. glazioui, deposited at Berlin, was destroyed during World War II. The isotype of Glaziou 8625, deposited at Paris is, therefore, selected here as the lectotype for this species.

BRAZIL. Rio de Janeiro: Hôrto Florestal de Rezende, 10 Nov 1931, Aristóteles e Silva RB33943 fr. (RB).

41. Rourea cnestidifolia Schellenberg, Pflanzenreich Heft 103: 198. 1938.

Holotype (B, lost). Photograph of holotype examined (NY); Brazil, W/o locality. Sellow s.n. fl. W/o date.

Lectotype examined and selected (K); Brazil, Minas Gerais, Lagôa Santa. E. Warming 1849 fl. fr. 18 Nov 1864. Isotypes (C, GH).

Frutex(?); branchlets terete, slightly striate near apex, puberulous to tomentose and with glandular hairs, conspicuously lenticellate. Leaves imparipinnate 5-6-jugate; petiole 2-3.5 cm long, glandulose-tomentose; rachis 8 cm long, glandulose-tomentose. Leaflets (1-)2.2 - 4.3 cm long, (0.7-) 1.2-1.4 cm broad, oblong or oblong-elliptic, the young leaflets membranaceous, the mature leaflets chartaceous, the upper surface dark, shiny, glabrescent, the lower surface pale, tomentose, the apex acute, apiculate or mucronate, the base cordate, sometimes slightly unequal, the terminal leaflet attenuate, the margin revolute; petiolule 0.1 cm long; venation reticulate, more or less diffuse above and below; lateral veins 7-9 pairs, diverging from midrib at angles of 60°-70° (near base) to 85° (near apex). Inflorescence paniculate, axillary to pseudoterminal, the rachilla (3-)5-7 cm long, glandulose-tomentose; bracts c. 0.2 cm long, linear, with glandular hairs. Pedicels conspicuously or inconspicuously articulate, 0.5 cm long above articulation; sepals 0.5 cm long, 0.3 cm broad, ovate or oblong-ovate, densely tomentose and with glandular hairs without,

tomentose within; petals 0.8 cm long, 0.25 cm broad, connate above base, glabrous; stamens 10, five short c. 0.15 cm long, five long c. 0.25 cm long, the tube c. 0.15 cm long; anthers globose; ovary pilose, c. 0.15 cm long; style tomentose, with sparse glandular hairs, c. 0.55 cm long; stigma capitate, two-lobed. Fruit 1.3 cm long, 0.5 cm wide, glabrescent, villous near apex; style persistent conspicuous; calyx in fruit ascending, 0.7 cm long, glandulose-tomentose. Seed 0.8-1 cm long, c. 0.4 cm wide; arilloid 0.2 cm long; testa under arilloid smooth.

Distribution: Known from the area of eastern-central Brazil, in the localities of Lagôa Santa and Serra do Cipó. Occurring in cerrado vegetation(?).

This distinct species can be distinguished from its closest relatives, i.e., R. martiana, R. chrysomalla and R. glazioui, by the very long staminal tube (0.15 cm), the comparatively long inflorescence, the oblong or oblong-elliptic leaflets, which are about four times as long as wide, the revolute margin, acute apex and longer petiolule.

The holotype of R. cnestidifolia was destroyed in Berlin during World War II. The specimen Warming 1849, deposited at Kew, is selected here as the lectotype for this species.

BRAZIL. Minas Gerais: Serra do Cipó, Aug 1895, Sena s.n. (Herb. Schwacke 11767) fl. (NY, photo, P, RB); Lagôa Santa, Capella nova, 4 Dec 1863 (fr.), 2 Oct 1864 (fl.), E. Warming 1853 fl. fr. (C, K); Lagôa Santa, 26 Dec 1863, E. Warming 2468 fr. (C).

42. Rourea martiana Baker, in Martius, Fl. Brasil. 14(2):  
178. 1871.

Santalodes martianum (Baker) O. Kuntze, Rev. Gen. 1:  
155. 1891.

Cnestis americana Martius ex Schellenberg, Pflanzenreich  
Heft 103, 196. 1938, nomen nudum in syn.

Holotype examined (M): Brazil, Minas Gerais, "tabuleiro  
ad fl. S. Francisco, prope Salgado." Martius 1675 fl. Aug  
W/o date.

Treelet(?); branchlets terete, tomentose or sparsely  
pilose, lenticels more or less conspicuous. Leaves impari-  
pinnate, 5-jugate; petiole 2 cm long, tomentose to velutin-  
ous; rachis 9-11 cm long, tomentose to velutinous. Leaflets  
0.8-2.7(-3.2) cm long, 0.6-1(-2.2) cm broad, oblong or ovate-  
oblong, proximal ones sometimes suborbiculate, chartaceous,  
the upper surface dark, sparsely or densely brown-tomentose,  
the lower surface pale or dark, opaque, densely tomentose,  
the apex obtuse, the base cordate, the margin entire; leaf-  
lets sessile or petiolule very short; venation diffuse above,  
prominulous below; lateral veins 5-6 pairs, diverging from  
the midrib at angles of 60°-70° (near base) to 90° (near  
apex), anastomosing clearly near margin. Inflorescence a  
reduced panicle, terminal or axillary, the rachilla 2 cm  
long, densely villous and with glandular hairs; bracts up  
to 0.3 cm long, linear, villous. Pedicels articulate 0.5 cm

long above articulation; sepals 0.3-0.4 cm long, 0.2 cm broad, ovate, sparsely villous and with glandular hairs without, sparsely tomentose within, the apex acute; petals 0.6-0.8 cm long, 0.18-0.2 cm broad, connate above base, glabrous; stamens 10, five short c. 0.2 cm long, five long c. 0.3 cm long, the tube 0.1 cm long; anthers globose; ovary pilose, c. 0.1 cm long; style tomentose, with sparse glandular hairs, 0.35 cm long; stigma capitate, two-lobed. Fruit immature, 0.8 cm long, sparsely tomentose; calyx in fruit ascending, c. 0.5 cm long, tomentose.

Distribution: Brazil, in the states of Bahia and Minas Gerais.

Rourea martiana is most closely related to R. glazioui. The most important differences between these two species are listed under R. glazioui.

BRAZIL. Bahia: Vicinity of Machado Portello, 19-23 Jun 1915, J. M. Rose & P. G. Russell 19932 fr. (NY); "in sylvis catingas," W/o date, Martius s.n. fr. (M). Minas Gerais: Figueira, Rio Doce, 11 Sep 1930, J. G. Kuhlmann 348 fl. (RB).

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NEW TAXA AND NEW COMBINATIONS

Rourea subgenus Rourea section Cordatae Forero, sect. nov.

Rourea subgenus Rourea section Multifoliolatae Forero, sect.  
nov.

Rourea accrescens Forero, sp. nov.

Rourea araguaensis Forero, sp. nov.

Rourea bahiensis Forero, sp. nov.

Rourea cuspidata vardensiflora (Steyermark) Forero, comb. nov.

Rourea cuspidata var multiuga Forero, var. nov.

Rourea glabra var floribunda (Planchon) Forero, comb. nov.

Rourea glabra var jamaicensis Forero, var. nov.

Rourea grosourdyana var glaberrima Forero, var. nov.

Rourea neglecta var brevipes Forero, var. nov.

Rourea omissa Forero, sp. nov.

Rourea paraensis Forero, sp. nov.

Rourea prancei Forero, sp. nov.

Rourea psammophila Forero, sp. nov.

Rourea pubescens var spadicea (Radlkofer) Forero, comb. nov.

Rourea sprucei var rondoniense Forero, var. nov.

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- Proctor, G. R. 8643 (3b);  
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- Proctor, G. R., Jones, G. C.  
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- Pulle, A. 339 (5).
- Purpus, C. A. 8799 (3a); 8817  
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- Read, R. W. s.n. (3b).
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- Reitz & Klein 2362 (26); 2541  
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- Reks, B. P. 3400 (3a).
- Renton s.n. (3a).
- Richard, L. C. s.n. (24a);  
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- Riche, M. s.n. (5).

- Richs s.n. (20).
- Ridley s.n. (5).
- Riedlé 108 (5).
- Riedel, L. 2859 (31a); s.n. (3a); s.n. (31a); s.n. (35).
- Robert, A. 426b (31b).
- Rodrigues, W. INPA22 (16); 343 (1a); 1569 (1a); 8784 (14); 8831 (1a).
- Rodrigues, W. & Chagas, J. 1495 (14).
- Rodrigues, W. & Coêlho, L. 1876 (16); 2555 (1a).
- Rodrigues, W. & Wilson, B. 4285 (11).
- Roig, J. T. 3196 (3a).
- Rose, J. N. 1572 (3a).
- Rose, J. N. & Russell, P. G. 19932 (42).
- Rovirosa, J. N. 303 (3a); 466 (3a).
- Rusby, H. H. 1336 (12); 1360 (14); 1370 (14).
- Rusby, H. H. & Squires, R. W. 443 (3a).
- Sagot, P. A. 1175 (24b); 1274 (20); s.n. (24a); s.n. (5); s.n. (20).
- St. Hilaire, A de, C-341 (11); c<sup>1</sup>-581 (31a); c<sup>1</sup>-601 (31a); c<sup>1</sup>-810 (31b); s.n. (31a).
- Salvoza, F. M. 841 (3a); 921 (17).
- Salzmann, P. s.n. (37).
- Sandwith, N. Y. 183 (5); 457 (20).
- Sargent, F. H. 229 (5).
- Schipp, W. A. 104 (3a); 1168 (15).
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- Schomburgk, Rich. 835 (20).
- Schomburgk, Robt. 125 (33a); 126 (33a); 134 (34a); s.n. (33a).
- Schott s.n. (3c).
- Schultes, R. S. 6684 (1c).
- Schultes, R. S. & Black, G. A. 8305 (1c).
- Schulz, J. P. 8637 (5).
- Schwarz s.n. (3a); s.n. (10).
- Sello 1825 (10); s.n. (3a);

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