MONOGRAPH OF RUPRECHTIA (POLYGONACEAE)

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ABSTRACT. *Ruprechtia* is a genus of 37 species of dioecious trees, shrubs, and lianas in the tribe Triplarideae of the Polygonaceae. Its range extends from Uruguay and northern Argentina to northern Mexico. The greatest diversity is found in Brazil, which has 17 species. Most species are found in lowland and montane, seasonally dry tropical forests and have narrow distributions; a few species grow in lowland riverine forests and have wider distributions. Species are defined primarily on characters in the female flowers and the fruits, which are distinctive and have three wings formed by elongated sepals. The fruits are similar to those of *Triplaris*, the sister genus, and the relationship between the two genera is discussed. Earlier infrageneric classifications are rejected. A molecular phylogeny of *Ruprechtia* using the nuclear ribosomal ITS region was generated from samples of 19 species. The ancestral area of *Ruprechtia* was in South America, and the genus may not have reached Central America until after the closure of the Isthmus of Panama. South American riverine forest species are shown to be among the most recently evolved in the genus. Two new species, *Ruprechtia laevigata* and *R. latifunda,* are described.

INTRODUCTION

Ruprechtia is a genus of 37 species of trees, shrubs, and lianas in the tribe Triplarideae of the Polygonaceae. It bears a distinctive three-winged fruit; the wings are formed by the elongated sepals, which are united at the base to form a perianth tube. Within the Triplarideae *Ruprechtia* shares this putative synapomorphy with *Triplaris* Loefl. ex L., which is therefore considered to be its sister genus. The two genera have always been considered to be closely related. The first three species of *Ruprechtia* described were originally assigned to *Triplaris*, *Ruprechtia* has twice been included within *Triplaris* (Endlicher 1847; Kuntze 1898), and in all classifications of the Polygonaceae the two genera have been placed beside each other (Meisner 1856; Bentham 1880; Dammer 1892; Roberty & Vautier 1964).

Ruprechtia is found in all the countries of Latin America with the exception of Chile. It has a primarily tropical distribution, though in Mexico it is found to 26°N and reaches as far as 33°S in Argentina and Uruguay (Fig. 1). Brazil has the greatest diversity with 17 species; Venezuela has eight species and Mexico six. A previously unrecognized center of diversity is located in Ecuador and northwestern Peru, where five species are found, four of which were described during this study. Although *Ruprechtia* is primarily a genus of seasonally dry tropical forests, almost a third of the species grow in moist conditions in riverine rain forests, and gallery forests in savannas and dry forest areas. In general the most widely distributed species are those of moist forests, whereas the species found in dry forests often confined to single, disjunct dry forest regions.

The impetus for this monograph came from a study of the historical biogeography of the seasonally dry tropical forests of Latin America. The aim of the dry forest study was to apply vicariance biogeography methods to investigate whether cycles of expansion and fragmentation of the ranges of dry forest species in response to the climatic oscillations of

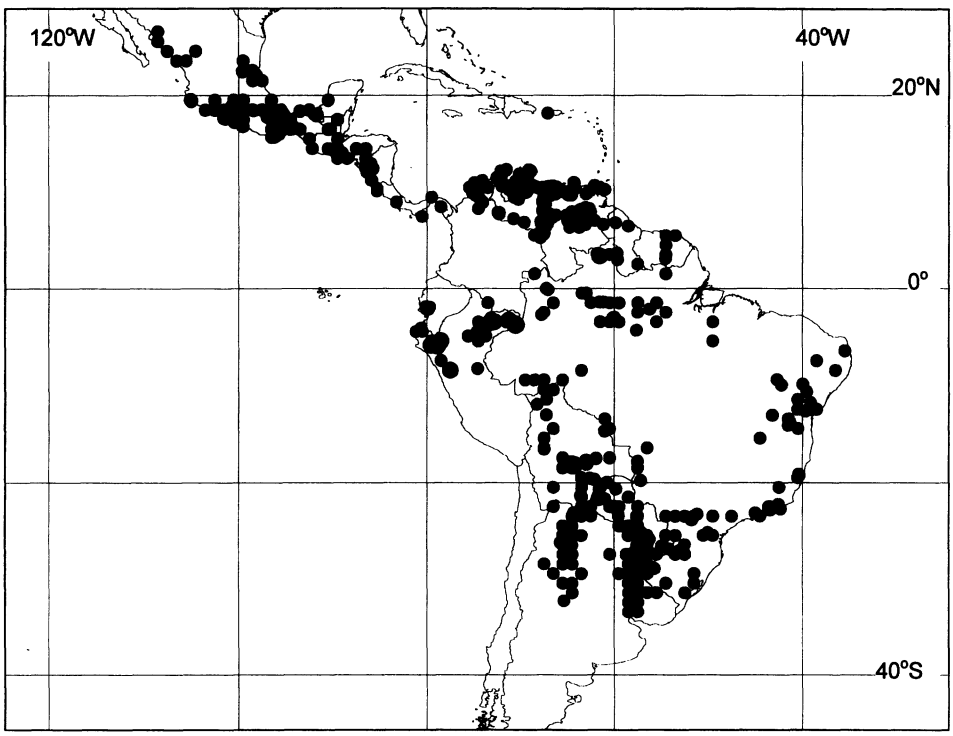

FIG. 1. Distribution of *Ruprechtia*.

the Pleistocene might have driven speciation (Pennington et al. 2000). In this approach the phylogenies of unrelated genera are compared to see if common patterns are found, as such patterns imply that speciation has been driven by similar causes in the different genera. *Ruprechtia* was considered to be an ideal genus for this work, because it is primarily found in dry forests and has many taxa that are endemic to restricted areas of dry forests. Since the publication of the Cocucci's account of *Ruprechtia* in 1961 numerous new collections have become available and several new species have been discovered, and therefore a complete revision is desirable.

The aim of this monograph is to delimit the species of *Ruprechtia*, to clarify nomenclatural problems, to discuss the infrageneric classification, to present a molecular phylogeny of the genus, and to use that phylogeny to comment on the evolution and historical biogeography of the genus. The species are presented according to the phylogeny, with the placement of unsampled species inferred from their morphology.

TAXONOMIC HISTORY

Ruprechtia was created by Meyer (1840) in honor of the Austro-Bohemian botanist F. J. Ruprecht, who worked in St. Petersburg (Stafleu & Cowan 1983). Meyer transferred *Triplaris ramiflora* Jacq., *T. laurifolia* Cham. & Schltdl., and *T. salicifolia* Cham. & Schltdl. to his new genus and noted that these species shared three-lobed, semitrilocular fruits with a furrowed, lobed seed, in contrast to the other species of *Triplaris*, which have three-angled fruits with simple seeds.

Bentham (1845) described two new species in *Ruprechtia*, as did Weddell (1849). Meisner's (1855) account of the Polygonaceae in Martius's *Flora brasiliensis* included 13 species of *Ruprechtia*, eight of which were new to science. His treatment of the genus in Candolle's *Prodromus* (1856) contained 18 species, including three further new species from outside the area covered by the *Flora brasiliensis*. His *R. cumingii* of Panama and Colombia was the first species to be described that occurs outside South America.

Grisebach (1874, 1879) published five species from Argentina, based on collections by Lorentz and Hieronymus. Earlier, he had listed *R. cruegeri* from Trinidad in his *Flora of the British West Indies* (1864), but as a nomen nudum that was validated by Lindau (1897).

Increased interest in New World floristics, particularly during the first part of the 20th century, resulted in the discovery of many additional taxa. Five species from Mexico and Central America were published by Fernald (1897), Greenman (1898), and Donnell Smith (1909), and three Amazonian species by Huber (1909). Blake (1918, 1919) recognized three species from Curaçao, Venezuela, and Colombia, and transferred *Triplaris coriacea* Karst., also from Venezuela, to *Ruprechtia*. Standley (1920, 1922, 1940) published four species from Mexico and Peru. Seven species were described from Bolivia (Herzog 1922, Rusby 1927), Venezuela (Pittier 1927), Suriname (Eyma 1935), and Mexico (Steyermark & Standley 1946).

Cocucci (1957b) produced a floristic account of *Ruprechtia* in Argentina, Paraguay, and Uruguay, and later (Cocucci 1961) a monograph of the entire genus in which he recognized 17 species, including one novelty. Brandbyge (1986) monographed *Triplaris* and also worked on *Ruprechtia*; he published papers on inflorescence structure and generic delimitation (Brandbyge & Øllgaard 1984), generic synonymy (Brandbyge 1989), and two new species of *Ruprechtia* (Brandbyge 1990). Aymard and Berry (1999) recognized a new species of *Ruprechtia* during their work on Polygonaceae for the *Flora of the Venezuelan Guayana*. During this study, nine new species of *Ruprechtia* from Central and South America were described (Pendry 2003) and two additional novelties, from Mexico and Brazil, are proposed here.

MORPHOLOGY

Habit. All species of *Ruprechtia* are woody and grow as trees, shrubs, or lianas. They are usually small trees or shrubs (to 10 m), but trees taller than 10 m have been recorded for *R. brachysepala*, *R. carina*, *R. chiapensis*, *R. coriacea*, *R. costaricensis*, *R. costata*, *R. cruegeri*, *R. exploraticis*, *R. laxiflora*, *R. lundii*, *R. maracensis*, *R. paranensis*, and *R. tenuiflora*. The tallest recorded tree is a 35 m individual of *R. maracensis*. *Ruprechtia laurifolia* and *R. obidensis* grow exclusively as lianas, and *R. brachysepala* has been recorded as both a tree and a liana.

Bark. Bark is usually smooth and grey when young, becoming fissured with age. The rhytidome is shed in some species (e.g., *R. aperta*, some populations of *R. ramiflora*, *R. triflora*), giving the bark a flaky appearance reminiscent of members of Myrtaceae, such as *Psidium* (guayaba in Spanish); some of the vernacular names for these species refer to this resemblance. Reddish inner bark has been recorded for *R. aperta*, *R. apetala*, *R. cruegeri*, *R. fusca*, *R. ramiflora*, and *R. tenuiflora*. Red exudate in the inner bark has been recorded in *R. aperta*.

Twigs. The twigs are terete, often prominently lenticellate, and usually solid. Hollow twigs have been observed in *R. cruegeri*, *R. laurifolia*, *R. lundii*, *R. maracensis*, *R. obidensis,* and *R. tangarana*, and seem to be inhabited by ants. It is not known whether these ants offer the trees any protection from herbivory. Young twigs are usually at least somewhat hairy, but they are soon glabrescent. Brachyblasts, side shoots with congested internodes, are present in *R. triflora*, and give a distinctive "tufted" appearance, which can be a useful field character for spotting the trees from a distance.

Indumentum. Hairs are usually simple, and may be either straight or more or less wavy, appressed or erect. In *R. triflora* stellate hairs with arms of irregular length may be seen on the upper surface of the leaves.

Stipules. The conical, intrapetiolar stipules are analogous to those found in the Moraceae and are termed "ochreas." They are generally to about 2 mm long, and after the leaf has emerged, remain encircling the twig as a ring of tissue that is eventually shed, leaving a circular scar around the twig at the base of the petiole. These stipule scars are characteristic of the family. The largest ochreas that I have seen are in *R. jamesonii*, where they can be to 20 mm long but are not persistent.

Leaves. Leaves in all species are simple, alternate, and pinnate-veined. They are elliptic or oblong to ovate or obovate, though in *R. triflora* they can be almost orbicular. The apex ranges from obtuse to long-acuminate, and the base from cuneate to rounded or rarely cordate. The margins are usually more or less undulate. Maximum lengths of mature leaves range from about 5 cm in *R. triflora* to 23 cm in *R. tangarana*. Two types of secondary venation are present; venation that is rather indistinct and almost as prominent above as below, and venation that is prominent below and much less visible above. In the latter case, the secondary and even tertiary venation may be slightly sunken above with the lamina bullate between the veins. Young leaves, petioles, and venation are often slightly red-tinged. Young leaves are usually hairy, and mature leaves vary from completely glabrous to densely, evenly hairy on the lower surface, and sparsely hairy on the upper surface. Glands are present as minute brown dots (visible at 10× magnification) found on the lower surfaces of the laminas of *R. curranii* and sometimes *R. coriacea, R. ramiflora,* and *R. laevigata.* They are found on the upper surface of the lamina in *R. aperta* and sometimes *R. jamesonii.* The leaves of dry forest species appear to be deciduous; species growing in areas with less pronounced seasons may be evergreen, but there are no reports of leaf phenology to confirm or deny this.

Inflorescences. *Ruprechtia* is strictly dioecious. In both male and female plants, the inflorescence is axillary or terminal, and simple or branched at the base. Inflorescence length ranges from the condensed inflorescences of *R. triflora* with peduncles as short as 0.2 cm to the male inflorescences of *R. obidensis* with peduncles 20 cm long. In both sexes, the inflorescence is a pleiothyrse, with the partial inflorescences consisting of monochasia (scorpioid cymes) that are 2–4-flowered in male inflorescences and 2–3-flowered in female inflorescences (Brandbyge & Øllgaard 1984). In *R. triflora* the partial inflorescences are single-flowered. The partial inflorescences are irregularly distributed along the peduncle, with the longest internode found between the lowest two. The length of the next longest internode is given in each description to indicate the degree of separation of the partial inflorescences and thus the density of the mature inflorescence. Inflo-

rescences vary from very dense, catkin-like structures in which the main axis is concealed by the bracts and partial inflorescences (e.g., *R. coriacea*, *R. costata*) to much more open structures in which the main axis is clearly visible. Each partial inflorescence is subtended by a bract, and the individual flowers are subtended by two bracteoles that are fused into a single tubular organ. The flowers are pedicellate, but the base of the perianth tube is extended into a narrow, pedicel-like structure, which is delimited from the true pedicel by an abscission zone (Brandbyge & Øllgaard 1984). In the descriptions the measurement for the "pedicel" includes both the pedicel and the elongated base of the perianth tube, and the measurement for the stalk remaining after the flowers or fruits have been shed indicates the length of the pedicel proper.

Male flowers. The male flowers have three free sepals and three free petals, which are oblong, ovate, or obovate. The petals and sepals are often almost identical, though generally the indumentum is denser on the sepals. Aestivation is valvate. The disk is simple and within the corolla. The stamens are in two whorls; the outer whorl consists of six stamens inserted on the disk alternate with the sepals and petals, and the inner whorl consists of three stamens opposite the petals. The filaments are slender and filiform, and the anthers are bisporangiate, dorsifixed, and introrse, with longitudinal slits. The outer whorl dehisces before the inner (Cocucci 1961). The disk is pubescent and is thought to produce nectar (Cocucci 1961). The gynoecium is rudimentary and consists of a vermiform structure in the center of the disk.

Female flowers and fruit. Many more taxonomic characters are found in the female flowers than in the male ones. The sepals are either free or partially united in a perianth tube, which encloses the ovary. The indumentum is generally dense on all abaxial surfaces of the calyx. Aestivation is valvate. The petals are much smaller than the sepals or occasionally absent, and are either free or more or less adnate to the inside of the perianth tube. Where a perianth tube is present, the tips of the petals usually project slightly beyond it. The staminodes vary greatly in size, and may be absent or present as bristles or tooth-like projections from the disk that are to 2 mm long. I do not agree with Cocucci's (1961) interpretation of the disk. He distinguished a range of disk sizes and shapes more or less adnate to the calyx with the petals and staminodes inserted at the margin of the disk. The illustrations imply that it is the disk that is adnate to the calyx rather than the petals, but I have always observed that the disk is small with the staminodes originating from beneath the ovary, whether or not the petals are adnate to the calyx. The ovary is tricarpellate, unilocular, with a solitary basal ovule and three short styles, each of which bears an unlobed stigma.

The fruits are more or less winged; the sepals enlarge greatly after fertilization and form the wings. Two sepal types are present: coriaceous sepals in which the secondary and especially tertiary venation is obscure, and chartaceous (thinner) sepals in which both the secondary and tertiary venation are evident. Because the free parts of the sepals enlarge so much more than the perianth tube during maturation of the fruits, the indumentum is very much sparser on the wings. The petals persist in the fruit, and may be slightly enlarged. The achenes are three-lobed, or occasionally three-angled, usually with a smooth surface and are glabrous to densely hairy. The fruits of 35 species are illustrated in Fig. 2.

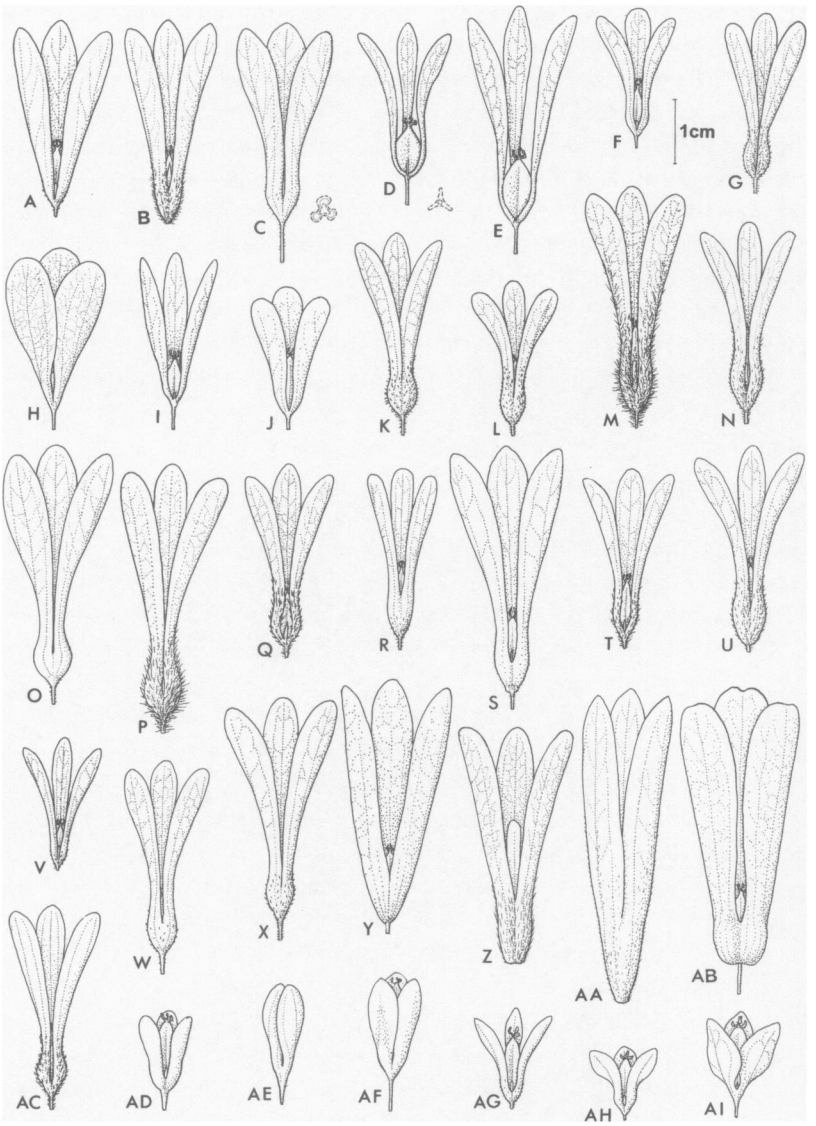

FIG. 2. Fruits of 35 species of *Ruprechtia*. All fruits are drawn at the same scale. Note that the short stalk at the base of the fruit is an extension of the calyx and not the pedicel. A, *R. peruviana* (*Haught 131*); B, *R. triflora* (*Nee 35654*); C, *R. apetala*, including cross section of achene (*Kurtz 8599*); D, *R. laxiflora*, including cross section of achene (*Kiesling 8161*); E, *R. paranensis* (*Smith & Klein 14909*); F, *R. exploraticis* (*Bernardi 20463*); G, *R. fagifolia* (*Thomas et al. 9638*); H, *R. obovata* (*Sagástegui & Leiva 15360*); I, *R. aperta* (*Díaz 2190*); J, *R. albida* (*Alayo 88*); K, *R. jamesonii* (*Asplund 16658*); L, *R. laevigata* (*Cedillo Trigos 571*); M, *R. standleyana* (*Reznicek & Gregory 354*); N, *R. costata* (*Nelson & Romero 4354*); O, *R. carina* (*Broadway 3*); P, *R. coriacea* (*Steyermark 106879*); Q, *R. nicaraguensis* (*Williams & Molina 10946*); R, *R. costaricensis* (*Araquistan 3827*); S, *R. chiapensis* (*Vázquez et al. V-2414*); T, *R. pallida* (*Bullock 1510*); U, *R. fusca* (*Koch & Fryxell 77460*); V, *R. cruegeri* (*Broadway 2416*); W, *R. curranii* (*Liesner & González 6032*); X, *R. ramiflora* (*Dugand 5970*); Y, *R. lundii* (*Lund s.n.*); Z, *R. laurifolia* (*Sucre 3512*); AA, *R. obidensis* (*Pittier 13302*); AB, *R. latifunda* (*Kallunki et al. 700*); AC, *R. maracensis* (*Vázquez & Jaramillo 9130*); AD, *R. apurensis* (*Aristeguieta 7067*); AE, *R. brachystachya* (*Stannard & Arrais 762*); AF, *R. salicifolia* (*Herter 83167*); AG, *R. tenuiflora* (*Stergios 10049*); AH, *R. tangarana* (*Mori et al. 9045*); AI, *R. brachysepala* (*Silva et al. 1977*).

PLACEMENT OF RUPRECHTIA WITHIN POLYGONACEAE

When Meyer (1840) established his new genus, he placed it in the tribe Triplarideae beside *Triplaris* and *Podopterus* Bonpl. In this arrangement he was followed by Meisner (1856), though Meisner reduced the Triplarideae to a subtribe within his tribe Apterocarpeae. Bentham (1880) once again raised the Triplarideae to tribal level and included *Leptogonum* Benth. and *Symmeria* Benth. Dammer's (1892) circumscription of Triplarideae excluded *Podopterus*. Roberty and Vautier (1964) maintained the Triplarideae with *Triplaris*, *Ruprechtia*, *Symmeria,* and *Leptogonum*.

Coccoloba P. Browne is the largest genus of trees in the Polygonaceae. In flower it can appear superficially similar to *Ruprechtia*; however, the flowers of *Coccoloba* are hermaphrodite with a perianth of five tepals, and the genus is placed in a separate tribe, the Coccolobeae (Roberty & Vautier 1964).

GENERIC DELIMITATION

Ruprechtia and *Triplaris* are closely related, linked by their distinctive three-winged fruits. Most authors have kept together the species of *Ruprechtia*, as set out in this monograph, as a distinct group, albeit of varying rank, without interchange of species with *Triplaris* sensu Brandbyge (1986). For example, whilst Endlicher (1837) included *Ruprechtia* within *Triplaris*, he maintained the five species previously recognized as *Ruprechtia* as a section. Meisner (1856) maintained *Ruprechtia* as a separate genus, as did Bentham (1880) and Dammer (1892).

Exceptions to this pattern of maintaining a distinction between the species of *Triplaris* (sensu Brandbyge) and *Ruprechtia* (this monograph) are found in the work of Kuntze, Herzog, Cocucci, and Roberty and Vautier. Kuntze (1891) assigned all 25 names that had then been published in *Ruprechtia* to *Magonia* Vell., recognized in 1825 to include only *M. scandens* [=*R. laurifolia*], but he did not mention *Triplaris* in this work. On realizing that *Magonia* Vell. is a later homonym of *Magonia* A. St.-Hil. (Sapindaceae), Kuntze (1898) moved all the names he had recognized in *Magonia* Vell. to *Triplaris*, but without any discussion of infrageneric classification.

Herzog (1922) created *Enneatypus* to contain a single species, *E. nordenskjoeldii* [=*R. laxiflora*], at the same time that he published *Ruprechtia bolivensis* [=*R. apetala*]. Herzog discussed the relationship of *Enneatypus* with *Coccoloba*, but did not note any link between his new genus and *Ruprechtia*.

Cocucci (1957a) did not accept Meyer's inclusion of *Triplaris laurifolia* in the initial circumscription of *Ruprechtia* and proposed the new combination *Triplaris scandens* based on *Magonia scandens* Vell. (The name *Triplaris scandens* Schott, which appears in Meisner's account for *Flora brasiliensis*, was listed only in synonymy.) Within his *T. scandens* Cocucci included *Triplaris laurifolia* Cham. & Schltdl., *T. macrocalyx* Casar., *R. lundii* Meisn., *R. obidensis* Huber, *R. macrocalyx* Huber, and *R. scandens* Rusby. The heterogeneous nature of *T. scandens* (Vell.) Cocucci was discussed by Howard (1985), who considered that it was actually composed of three species that should remain in *Ruprechtia*, *R. laurifolia* (Cham. & Schltdl.) C. A. Mey., *R. lundii* Meisn., and *R. obidensis* Huber. Brandbyge (1986, 1989) also disputed Cocucci's creation of *Triplaris scandens*, and agreed that the species thus combined by Cocucci are better placed in *Ruprechtia*. Yet, it should be noted that the fruits of *R. obidensis* and

TABLE 1. Characters separating *Ruprechtia* and *Triplaris* (Coccuci 1961).

Character	*Ruprechtia*	*Triplaris*
Twigs	solid	hollow
Perianth tube	up to half as long as achene	more than half as long as achene
Achenes	trilobed in cross section	three-angled in cross section
Ochreas	caducous	persistent
Chromosome number	x = 14	x = 11

R. laurifolia are atypical of the genus, since their bases are not extended into a stalk that meets the pedicel (see Table 2). It is unfortunate that it was not possible to extract and sequence DNA from herbarium specimens of either species and thus attempt to clarify their placement.

Roberty and Vautier (1964) divided the species of *Ruprechtia* between *Enneatypus* and *Ruprechtia*. They defined *Enneatypus* as having sepals that are free and not auriculate at the base, and *Ruprechtia* as having the sepals fused and basally auriculate. Roberty and Vautier had an extremely broad species concept; although they recognized only two species in *Enneatypus*, *E. ramiflorus* and *E. tenuiflorus*, and a single species in *Ruprechtia*, *R. salicifolia*, they added confusion to the situation. Their definition of *Enneatypus* in the family key (free sepals) contradicts their definition of *E. ramiflorus* in their discussion (fused sepals). The ITS analysis (see below) gives no support for their arrangement, since *E. ramiflorus* is paraphyletic and *E. tenuiflorus* is polyphyletic. Furthermore, they transferred *E. ramiflorus* from *Ruprechtia*, apparently unaware that Cocucci (1961) had lectotypified the genus with that species, and they did not discuss the placement of five of the 17 species recognized by Cocucci (1961).

In his monograph of the genus, Cocucci (1961) discussed the relationship between *Ruprechtia* and *Triplaris*, and indicated that the two genera could be separated as shown in Table 1. Brandbyge and Øllgaard (1984) noted the several problems with the use of these characters to delimit the genera. Hollow twigs are found in *R. tangarana*, *R. lundii*, *R. obidensis*, *R. laurifolia* (and I have since found them in *R. cruegeri* and *R. maracensis*). The perianth tube of the fruits of *Ruprechtia* can reach to 3/4 of the height of the achene. Achenes that are 3-angled in cross section are found in *R. laxiflora* and *R. paranensis*; also, one variety of *T. americana* has achenes that are trilobed in cross section. All species of *Triplaris* were found to have deciduous ochreas; ochreas are retained only on the youngest shoots. Brandbyge and Øllgaard also commented on confusion over the chromosome number of *Ruprechtia*; they noted that some reports suggest a base chromosome number of x=7 and concluded that chromosome data are too scanty to be used for generic delimitation. They listed an alternative suite of characters to delimit the genera, which I accept and reproduce here with slight modifications in Table 2. Brandbyge and Øllgaard (1984) also examined the pollen of six species of *Ruprechtia* and nine species of *Triplaris*, and found that the pollen fell into two distinct groups; however, more work is necessary to test whether these differences extend throughout the genera.

TABLE 2. Characters separating *Ruprechtia* and *Triplaris* (Brandbyge & Øllgaard 1984).

Character	*Ruprechtia*	*Triplaris*
Female partial inflorescences	2–3-flowered (1-flowered in *R. triflora*)	1-flowered
Perianth tube	¾ as long as achene	longer than achene
	base extending into a stalk, with an abscission layer visible part way along the pedicel; fruits with a short stalk at the base (narrow constriction in *R. triflora* and fruits with a scar at the base in *R. obidensis* and *R. laurifolia*)	terminating abruptly at the base of the fruit and not extending into a stalk; fruits with a scar at the base
Bracteoles	tubular	fissured abaxially
Male flowers	pedicellate	sessile
Male perianth segments	free	connate for more than half of their length
Pollen	perforate-rugulose	microreticulate or punctate-microreticulate

INFRAGENERIC CLASSIFICATION

Meisner (1855) divided *Ruprechtia* into sect. *Euruprechtia*, consisting of eight species with petals present in the female flowers, and sect. *Apetalae*, containing two species lacking petals. Three species could not be placed in these sections because female material had not been not seen. In his account of the Polygonaceae in Candolle's *Prodromus*, Meisner (1856) maintained his sections, but renamed them *Hexasepalae* and *Trisepalae* ["*Trisepasae*"], containing twelve and three species, respectively. This division of the genus is unwieldy, because two of the species of the *Trisepalae* are conspecific (*R. apetala* and *R. mollis*) and the third is *Triplaris americana*.

Bentham (1880) completely revised the infrageneric classification, based on the morphology of the calyx in fruit. His sect. *Pseudotriplaris* consists of the species with membranous, wing-like sepals, which are hairy at the base and conspicuously veined. His sect. *Euruprechtia*, which was defined differently from Meisner's sect. *Euruprechtia*, contains the species with smaller, glabrous, subcoriaceous sepals that lack conspicuous venation. This classification was maintained in Dammer's account of the Polygonaceae in *Die Natürlichen Pflanzenfamilien* (1892).

Cocucci (1957b, 1961) considered the nature of the calyx indumentum to be insufficiently stable to be used as the basis for defining sections and maintained that *Ruprechtia* is a natural group that cannot be subdivided. The ITS phylogeny presented below confirms Cocucci's view. Although at first sight Bentham's infrageneric classification seems to be a practical way to divide the genus, neither of his sections proved monophyletic. Section *Euruprechtia* is polyphyletic, its species having three separate origins, and sect. *Pseudotriplaris* is paraphyletic.

SPECIES CONCEPT

A morphological species concept has been used in the delimitation of species; species are recognized as distinct if they possess a unique suite of characters that distinguishes them from other species. Because of the paucity of characters in the male flowers, species have been delimited primarily on female flower and fruit characters, and secondarily on the characters of the leaves. Female specimens are therefore the most easily identified, and male and sterile specimens are best determined by matching them with female specimens from the same locality.

HABITATS AND DISTRIBUTION

Most species of *Ruprechtia* grow in seasonally dry tropical forests and woodlands (sensu Pennington et al. 2000), and a small group of species occurs in riverine and gallery forests. The dry forests in which *Ruprechtia* can be found range from low, open, arid woodlands to low, closed canopy forests to tall, semideciduous forests. These forests occur in regions with a pronounced dry season, where the rainfall is less than 1600 mm per year (Gentry 1995; Graham & Dilcher 1995) and the soils are fertile (Sarmiento 1992). The forests are mostly deciduous during the dry season; deciduousness increases along a gradient as rainfall declines (Mooney et al. 1995). In general, the dry forest species of *Ruprechtia* have chartaceous, often hairy sepals, and the species of gallery and riverine forests have coriaceous, glabrous sepals. These species groups correspond to Bentham's (1880) sectional delimitation. *Ruprechtia cruegeri* is anomalous, because its chartaceous sepals place it with the dry forest species, but it is found in damp hollows and along watercourses, in habitats typical of the species with coriaceous sepals.

Ruprechtia can be found in all areas of Latin America with seasonally dry tropical forest, as defined by Pennington et al. (2000), and in the physiognomically similar, but ecologically distinct, Chaco forests of Argentina, Bolivia, and Paraguay. Pennington's et al. (2000) definition of seasonally dry tropical forest covers the caatingas of northeastern Brazil; the semideciduous forests of the Paranense province (sensu Cabrera & Willink 1980); the forests of Misiones province and surrounding areas in Paraguay and Brazil (defined as the "Misiones Nucleus" by Prado and Gibbs; 1993); the Chiquitano semideciduous forests of eastern Bolivia; the forests on the eastern slopes of the Andes in Argentina, and Bolivia (defined as the "Piedmont Nucleus" by Prado and Gibbs; 1993); the forests of dry interandean valleys in Bolivia, Peru, Ecuador, and Colombia; the coastal forest of Ecuador and northern Peru; the forests of the Caribbean coasts of Colombia and Venezuela; dry forests along the Pacific coast of Central America and Mexico; and the dry forests of central Mexican valleys and the Gulf of Mexico. Within all of these areas, seasonally dry tropical forests occur in a complex of vegetation types depending on local climatic, edaphic, and topographic conditions. Outside these dry forest regions, by contrast, *Ruprechtia* is found in the gallery forests of the Río Uruguay and its tributaries and the riverine forests of the Amazon and Orinoco basins, including the gallery forests of the Venezuelan Llanos. The dry forest species have rather narrow distributions and are found in single areas of dry forest, as defined by Pennington et al. (2000), with the exception of *R. laxiflora*, which occurs from the caatingas through the Misiones Nucleus and into the

Piedmont Nucleus. By contrast, several of the moist forest species have quite wide distributions, in particular *R. brachysepala*, which is found in riverine and seasonally flooded forests from Guyana to northern Argentina. In general, species of *Ruprechtia* appear to occur as scattered individuals, but many species are showy in fruit and then may be a conspicuous feature of the vegetation.

POLLINATION AND DISPERSAL

The flowers of *Ruprechtia* are fragrant and conspicuous, but there are no reports of pollinators. In Venezuela I observed visits to *R. ramiflora* by a wide range of flies and bees. It therefore seems reasonable to assume that insect pollination is likely. Brandbyge (1986) suggested that wind pollination is likely to occur to some extent in *Triplaris*, because it has many flowers in each male inflorescence and individuals grow at short distances apart in open habitats. These factors also apply to some extent in *Ruprechtia*, and it is possible that wind pollination also occurs in some species.

The winged fruits of *Ruprechtia* are clearly adapted to wind-dispersal, and ripe fruits glide for a few meters in moderate winds (pers. obs.). The wings may also assist in dispersal by water or animals. Ripe fruits with dry wings float (pers. obs.), and this may be an important dispersal method for species of riverine forests. *Ruprechtia* fruits are probably too heavy for routine long-distance wind dispersal, which may account for the narrower distributions of most of the dry forest species compared with those of moist forests.

CHROMOSOME NUMBERS

Few counts of chromosome numbers are known in *Ruprechtia*. Cocucci (1957b) reported counts of 2n=28 for *R. corylifolia* [=*R. apetala*], 2n=28 for *R. laxiflora*, 2n=30 for *R. salicifolia*, and 2n=112 for *R. triflora*. He concluded that n=14 is the base chromosome number for *Ruprechtia*; Darlington and Wylie (1955) give n=7. Counts from two species suggest that *Triplaris* has a base chromosome number of x=11 (Brandbyge 1984). Cocucci's (1957b) suggestion that the chromosome number could be used to separate the two genera requires further examination.

FOSSIL RECORD

One fruit of *Ruprechtia* has been recorded from the Cuenca Basin of southern Ecuador (Burnham & Graham 1999). The fruit is in a good state of preservation and clearly belongs to *Ruprechtia* rather than *Triplaris*, because it shows the two features that distinguish the fruits of the two genera: the perianth tube is less than 3/4 of the length of the achene and is not constricted about the apex of the achene, and the base of the perianth tube is elongated into a short stalk. The venation is clearly visible and typical of the species with chartaceous sepals. The fossil specimen does not correspond exactly to the fruits of any existing species, but appears to be most similar to those of *R. aperta* and has been dated at 8–12 million years ago (mya), in the Miocene epoch (Burnham, pers. comm.).

PHYLOGENETIC ANALYSIS OF RUPRECHTIA

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METHODS

Taxon sampling. It seems reasonable to hypothesize that *Ruprechtia* is a monophyletic group based upon the putative synapomorphies of a perianth tube that is shorter than the achene, tubular bracteoles, pedicellate male flowers, and male perianth segments only connate for one-third of their length. This assumption is not based upon an explicit phylogenetic analysis, and therefore if *Ruprechtia* is to be used as an ingroup for cladistic analysis, ideally this hypothesis of monophyly should be tested using multiple outgroups (Nixon & Carpenter 1993). For this reason, we used accessions of three species of *Triplaris* as outgroups. *Triplaris* is a reasonable source for outgroup species, because all previous taxonomic schemes imply that it is the most closely related genus to *Ruprechtia*. The cladistic analysis was carried out on 38 accessions representing 19 species of *Ruprechtia*. The 19 species sampled constitute only half of *Ruprechtia*, but they represent most of the variation found in the genus and cover its full geographic range. Multiple accessions of individual species were included when fieldwork had permitted their collection. Difficulties in extracting DNA from herbarium specimens (see below) prevented wider sampling both within and among species.

Phylogenetic characters. Morphological characters were not considered as a source of phylogenetic information, partly because most tend to vary continuously across *Ruprechtia*, a situation common in many woody, neotropical genera (Pennington 1996). Attribute values for individual species for these characters overlap, and although such characters may be useful for species delimitation, in the context of cladistic analysis character state delimitation within them is arbitrary (Stevens 1991; Gift & Stevens 1997). Such characters are therefore widely considered to be unsuitable for phylogenetic analysis (Pimentel & Riggins 1987). It has been argued that using such characters can result in increased phylogenetic resolution (e.g., Archie 1985; Chappill 1989; Thiele 1993; Wiens 2001), but methods proposed for character state coding are not straightforward. We considered it simpler to collect DNA sequence data for which character state definition is unambiguous.

Whenever possible, total genomic DNA was extracted from leaves dried in the field using silica gel (Chase & Hills 1991). For many species of *Ruprechtia* silica-dried material was not available and extractions were made from herbarium material. The success rate of these extractions was only about 20%. The specimens used in the analysis are listed in Appendix 1. We investigated three chloroplast regions (*trnL* intron-spacer, *rps*16 intron, and *atpB-rbcL* spacer), and one nuclear region (nuclear-ribosomal internal transcribed spacer [ITS]) as sources of phylogenetic characters. Three of these regions have been shown to provide phylogenetically informative characters at the species-level (e.g., Richardson et al. 2000, *trnL*; Savolainen et al. 1994, *rbcL-atpB*; Beyra-M. & Lavin 1999, ITS), and the *rps*16 intron has been used to elucidate the relationships of closely related genera (Clarkson et al. 1999).

DNA extraction followed a modification of the CTAB method of Doyle and Doyle (1987). PCR amplifications were carried out using Bioline Taq and reagents (Bioline, London NW2, UK). Templates were purified using the QIAquick PCR Purification Kit

(Qiagen Ltd., Dorking, Surrey, UK), and dye-terminator cycle sequencing used Thermosequenase II (Amersham Pharmacia, Buckinghamshire, UK). Samples were analyzed on an ABI model 377 Prism Automatic DNA sequencer.

Sequences of all three chloroplast regions were gathered for small numbers of species representing the geographical and morphological diversity of *Ruprechtia*. It rapidly became apparent that sequence divergence of these chloroplast regions among *Ruprechtia* species was too low to resolve clearly species relationships, and therefore it was decided not to sequence these regions for all available accessions.

PCR amplification of the entire region comprising ITS1, 5.8S, and ITS2 generally used primers 5p (White et al. 1990) and ITS4 (White et al. 1990) that are located in the 18S and 26S subunits of the ribosomal repeats. In other cases when this was unsuccessful, primers ITS1 (White et al. 1990) and 8p (Möller & Cronk 1997) were used, which are situated downstream of 5p and ITS4, respectively. For some degraded DNAs extracted from herbarium specimens, it was not possible to amplify the entire ITS1-5.8S-ITS2 region, and internal primers 2g (Möller & Cronk 1997) and 2p (White et al. 1990), which are situated in the 5.8S region, were used. PCR reactions began with a 94°C denaturation step (3 min) followed by 35 cycles of: (1) 1 min 94°C denaturation; (2) 1 min 50°C annealing; (3) 2 min 72°C extension, with a final 10 min at 72°C. In most cases, sequences were generated using primers 5p and ITS4, but the internal primers 2g and 2p were also used. ITS DNA sequences were aligned manually, which was straightforward, and alignment was unambiguous for the entire length. The data matrix is available on the Treebase website [http://www.treebase.org; TreeBase study accession number S298]. Genbank accessions are listed in Appendix 1.

Maximum parsimony analyses were carried out using PAUP*4.0b2 (Swofford 1999). Heuristic search options included 1000 random addition replicates, tree-bisection-reconnection branch swapping, retaining one tree per replicate. This random addition strategy ensured adequate exploration of tree space and avoids searching for shortest trees in only a few local optima. The trees retained from this search were used as the basis for a further heuristic search in which steepest descent and Multrees (saving multiple trees) were implemented, and which saved a maximum of 10,000 minimal length trees, which is sufficient to capture all topological variation (cf. Sanderson & Doyle 1993). As an approximate guide to the support offered to various monophyletic groups by the data, bootstrap values were calculated. Each of 10,000 bootstrap replicates used one random addition sequence replicate, saving one minimal length tree.

RESULTS

Parsimony analysis of 99 informative sites produced trees with minimal length 179 steps (of which 10,000 were saved), with a consistency index (CI; excluding autapomorphies) of 0.75 and a retention index (RI) of 0.91. A strict consensus tree is presented in Fig. 3, and a single most-parsimonious tree showing branch lengths in Fig. 4. These figures highlight the geographic areas in which the species of *Ruprechtia* occur. *Ruprechtia* was resolved as monophyletic with 100% bootstrap support, corroborating the hypothesis that it is a monophyletic group.

DISCUSSION

Species delimitation. Enneatypus ramiflorus and *E. tenuiflorus* are shown to be polyphyletic assemblages, and the very broad species concept employed by Roberty and

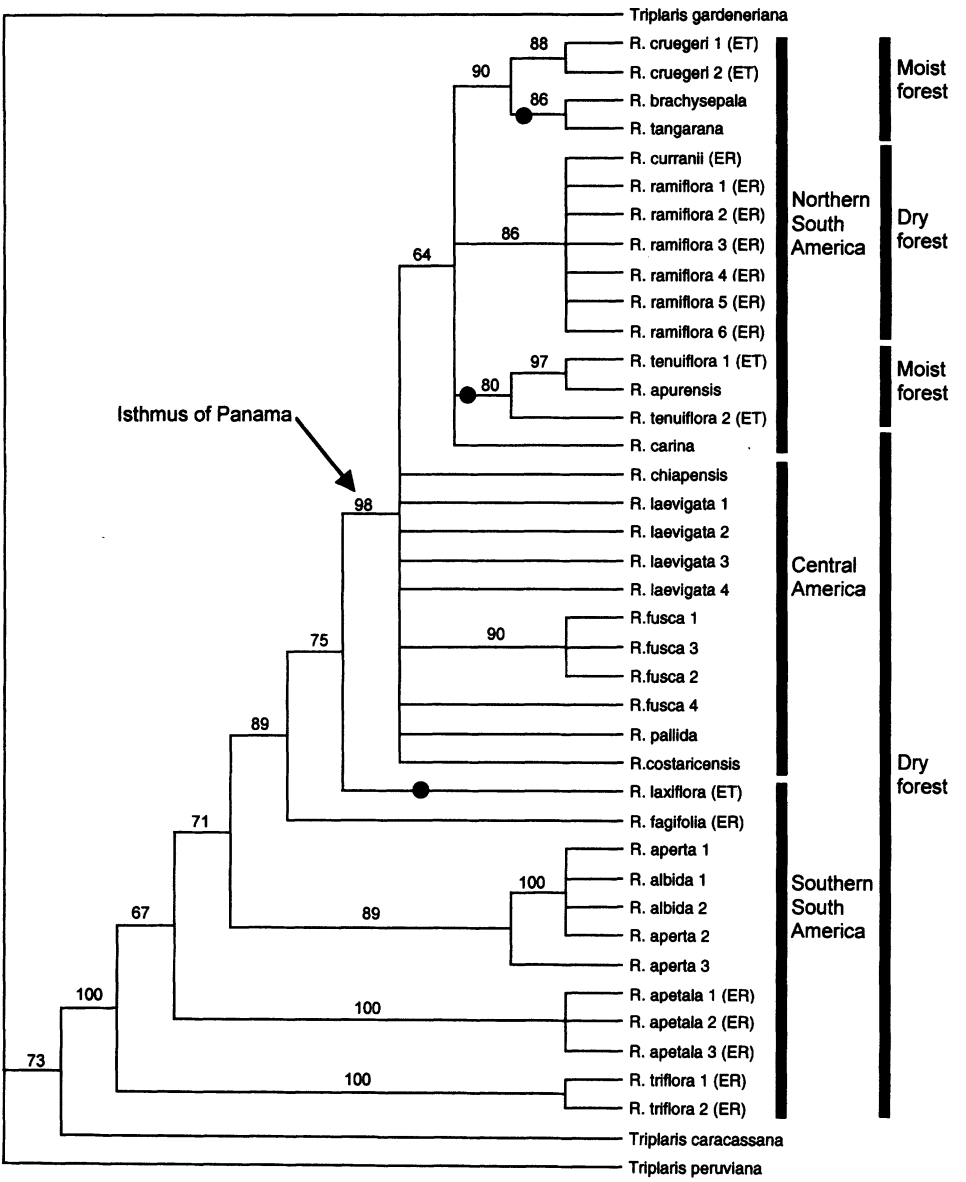

FIG. 3. Strict consensus cladogram of ca. 10,000 equally most parsimonious cladograms derived from cladistic analysis of ITS DNA sequences from *Ruprechtia*. Bootstrap values >50% are indicated above the branches. The black circles indicate the clades containing the species assigned by Bentham (1880) to sect. *Euruprechtia*, defined by glabrous, coriaceous sepals. ET/ER indicates whether the species so marked was referred to *Enneatypus tenuiflorus* or *E. ramiflorus* by Roberty and Vautier (1964). The first set of black lines to the right of the cladogram indicates the geographical distribution of the taxa, and the second set of lines indicates their habitat. "Isthmus of Panama" indicates the point at which *Ruprechtia* is inferred to have crossed the Isthmus of Panama from South America into Central America. The numbers following the names refer to multiple accessions of the same taxon. For full details of all accessions see Appendix 1.

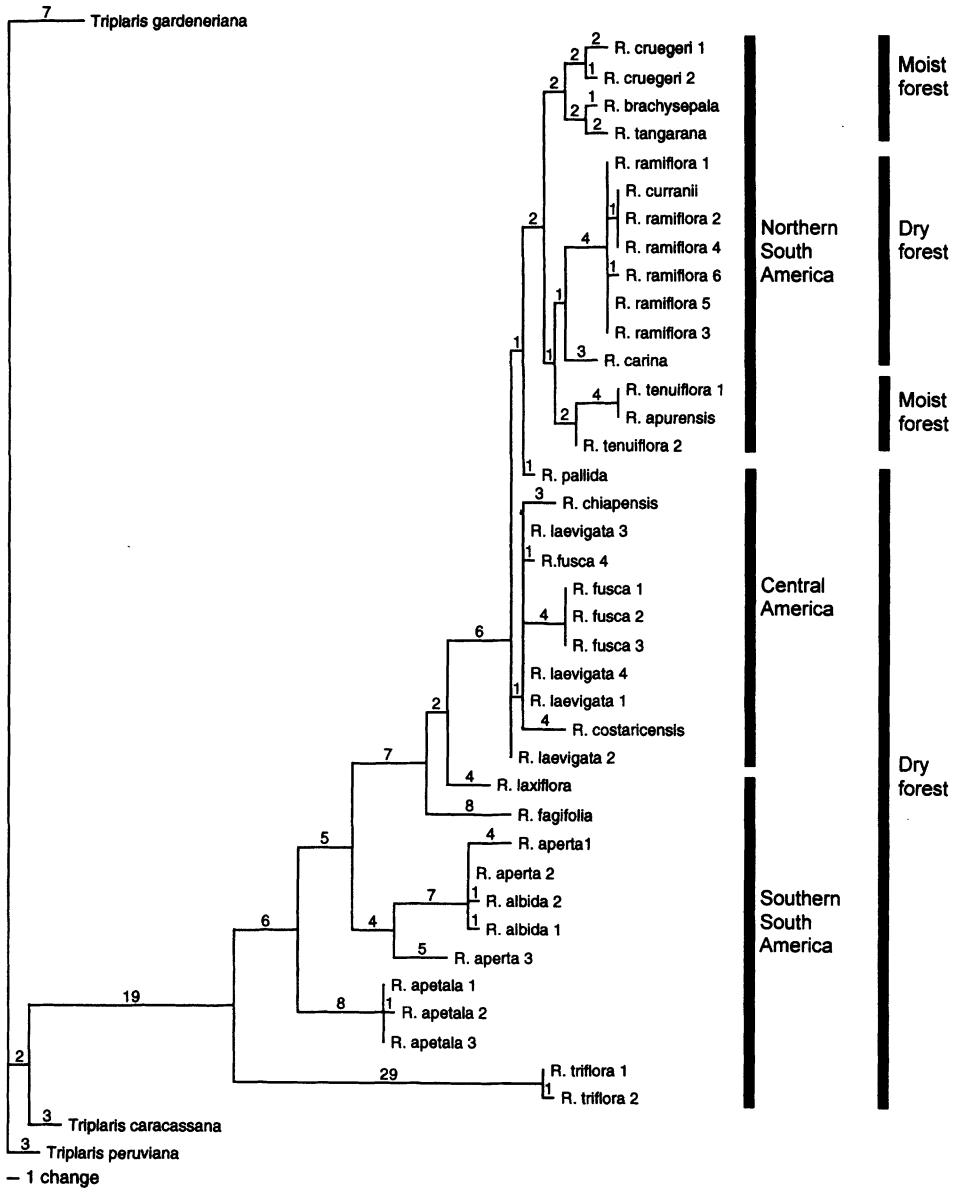

FIG. 4. One most-parsimonious trees derived from cladistic analysis of ITS DNA sequences from *Ruprechtia*. The numbers above the branches correspond to the number of substitutions. The first set of black lines to the right of the phylogram indicates the geographical distribution of the taxa, and the second set of lines indicates their habitat. The numbers following the names refer to multiple accessions of the same taxon. For full details of all accessions see Appendix 1.

Vautier (1964) is therefore rejected. In contrast, in the few cases where multiple individuals of the same species were sampled, the accessions are generally not widely scattered across the tree and have similar ITS sequences, giving more confidence in the species delimitations presented in this monograph.

In some cases, however, individual accessions of the same species are resolved as paraphyletic (e.g., *R. tenuiflora* with respect to *R. apurensis*), which may be consistent with the relatively recent derivation of one species from populations of the paraphyletic species. *Ruprechtia aperta* is the only case where different accessions of the same species are separated by a significant number of ITS substitutions (14–18). These accessions, though collected from localities only ca. 100 km apart in northern Peru, are separated by the Andean mountain chain. The accession *Bridgewater 2815*, which represents the only record of this species from the western (Pacific) side of the mountains, is distinct from two accessions from the eastern (Amazonian) side. This hints that the populations west and east of the Andes may be genetically distinct but morphologically cryptic. In the absence of wider intraspecific sampling and clear morphological differences it would, however, be inappropriate to describe a new species based on the accession from the Pacific side of the mountains.

Character evolution, infrageneric classification. Calyx morphology can be treated as a binary character: sepals membranous, hairy at the base and with conspicuous venation mm vs. sepals subcoriaceous, glabrous and lacking conspicuous venation. This represents Bentham's (1880) concept of this variation, which he used to define the sections *Pseudotriplaris* and *Euruprechtia*. If this character is mapped most-parsimoniously on to the strict consensus topology (Fig. 3), it is clear that it provides no basis to define monophyletic sections. For this reason, Bentham's sections are abandoned, and we concur with Cocucci's view that infrageneric groups would not be useful in *Ruprechtia*.

Ancestral area and timing of diversification. An ancestral area of South America, with a later arrival in Central America, predicts a cladogram topology with South American lineages basally divergent and paraphyletic (Lavin & Luckow 1993). The topology in Fig. 3 shows exactly this pattern: the southern South American lineages are basally paraphyletic, and all the Central American species are placed within a more apical monophyletic group. South America as an ancestral area for *Ruprechtia* is also supported by the discovery of a 10–12 million year old fossil fruit in Miocene sediments from Ecuador. South America was isolated from the split of Gondwanaland (ca. 100 mya; Burnham & Graham, 1999) until the closure of the Isthmus of Panama 3.5 mya (Coates & Obando 1996). It seems reasonable to assume that species of *Ruprechtia* do not disperse well over water, because they are not widespread in the Caribbean islands and have not reached the Galapagos islands. It might therefore be speculated that the species of *Ruprechtia* in Central America may have arrived there overland only after the Isthmus of Panama closed, or at least when the over-water gap was narrow.

Using the *Ruprechtia* fossil to calibrate a molecular clock and to provide absolute dates for lineages of *Ruprechtia*, such as that postulated to correspond with the closure of the Isthmus of Panama, will be the subject of a subsequent paper; however, some preliminary observations are pertinent. First, the long branch lengths separating the southern South American lineages at the base of the tree are consistent with these being more ancient. Second, if *Ruprechtia* did not reach Central America until the Panama isthmus closed, then all the Central American and northern South American species must have

originated relatively recently (in the past 3.5 million years). This recent origin is corroborated by the short branch lengths separating these species, and by *R. tenuiflora*, where individual accessions are resolved as paraphyletic with respect to *R. apurensis*, which is consistent with the recent origin of *R. apurensis* from populations of *R. tenuiflora*. Similar low sequence divergence for ITS between species was used by Richardson et al. (2001) to infer recent origin for species of the neotropical woody legume *Inga*. It may also be noteworthy that these Central American and northern South American species are less distinctive morphologically and present more problems of delimitation than the southern South American species. This may reflect the relative ages of lineages, with the more recently derived species having had less time to accumulate marked morphological differences.

The riverine and rain forest species sampled (*R. tenuiflora*, *R. apurensis*, *R. tangarana*, *R. brachysepala*, and *R. cruegeri*) may be inferred to belong to some of the most recent *Ruprechtia* lineages given their placement in apical monophyletic groups. Unless moist forest species have gone extinct in other lineages, this implies that *Ruprechtia* is a geologically recent addition to the flora of South American moist forests.

TAXONOMY

NOTES. Measurements were made on herbarium specimens with the reproductive parts rehydrated in boiling water prior to dissection. The leaf measurements refer to mature, fertile specimens; leaves from suckering shoots from the base of a tree or from the sprouting stump of a cut tree are generally markedly larger. The measurement for inflorescence internode length gives an indication of the density of the inflorescence. The partial inflorescences are irregularly spaced along the rachis, with the basal internode by far the longest; the measurement in the description is for the longest internode above the basal one.

Ruprechtia C. A. Meyer, Mém. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 6: 148. 1840. *Triplaris* [unranked] *Ruprechtia* (C. A. Meyer) Endlicher, Gen. pl. suppl. 4(2): 55. 1847. *Ruprechtia* sect. *Pseudotriplaris* Bentham in Bentham & Hooker, Gen. pl. 3: 105. 1880.—LECTOTYPE, designated by Cocucci, 1961: *Ruprechtia ramiflora* (Chamisso & Schlechtendal) C. A. Meyer.

Magonia Vellozo, Fl. flumin. 165. 1825, non *Magonia* A. St.-Hilaire, 1824 (Sapindaceae).—TYPE: *Magonia scandens* Vellozo [=*Ruprechtia laurifolia* (Chamisso & Schlechtendal) C. A. Meyer].

Ruprechtia sect. *Apetalae* Meisner in Martius, Fl. bras. 5(1): 57. 1855. *Ruprechtia* sect. *Trisepalae* ["*Trisepasae*"] Meisner in DC., Prodr. 14: 182. 1856, nom. superfl.—LECTOTYPE, here designated: *Ruprechtia apetala* Weddell.

Enneatypus Herzog, Meded. Rijks-Herb. 46: 4. 1922.—TYPE: *Enneatypus nordenskjoeldii* Herzog [=*Ruprechtia laxiflora* Meisner].

Unarmed, dioecious, small to large trees, shrubs, and lianas. Twigs terete, occasionally hollow, sometimes hairy when young, glabrescent with age; brachyblasts sometimes present. Stipules intrapetiolar, sheath-like and enclosing the emerging leaf, appressed-hairy outside, glabrous within, deciduous and either shed completely or leaving a more or

less persistent ring of tissue; stipule scar encircling the twig. Leaves simple, alternate, petiolate, pinnate-veined; lamina elliptic or oblong to ovate or obovate, apex acute to acuminate or rarely obtuse, base cuneate to rounded or occasionally cordate; when young generally sparsely hairy, the hairs simple (except in *R. triflora*, which may have stellate hairs), at maturity glabrous to rather densely hairy, particularly abaxially; midrib prominent abaxially, flat or prominent adaxially; venation usually more prominent abaxially than adaxially, and then sometimes with the lamina bullate between the veins, venation sometimes almost equally prominent on both faces; glands sometimes visible as minute dark spots abaxially, very rarely present adaxially. Male inflorescence axillary or terminal, solitary or clustered, unbranched or branched at the base, glabrous to hairy; a thyrse, with cymose partial inflorescences of 2–4-pedicellate flowers (flowers solitary in *R. triflora*). Partial inflorescences irregularly spaced along the rachis, subtended by an acute bract, bracteoles fused into a tubular structure; bracts and bracteoles glabrous within, usually hairy on the outside. Sepals 3, petals 3, sometimes indistinguishable, ovate, oblong, or obovate, glabrous or hairy abaxially, glabrous adaxially. Stamens 9, in an outer whorl of 6 and an inner whorl of 3, stamens of the outer whorl alternate with the sepals and petals, stamens of the inner whorl opposite the petals. Anthers introrse, dorsifixed, bilocular with longitudinal slits; pollen tricolpate, perforate-rugulose, occurring in monads. Disk hairy, gynoecium vermiform, rudimentary. Female inflorescences like the male inflorescences but partial inflorescences of 2–3-pedicellate flowers (flowers solitary in *R. triflora*). Sepals 3, free or united in a tube, the free parts ovate, oblong, or obovate, and enlarging greatly in fruit, glabrous to densely hairy abaxially. Petals absent or 3, alternate with the sepals, bristle-like, linear, elliptic, or obovate, free or adnate to the calyx, persistent and enlarging slightly in fruit, glabrous to hairy. Staminodes absent or present, tooth-like. Disk glabrous or hairy. Ovary ovoid, glabrous to hairy; styles 3, stigmas linear to ellipsoid or ovoid; ovule solitary, basal. Calyx enlarging and enclosing the achene in fruit, the free parts usually developing into prominent wings, chartaceous with evident venation or coriaceous with the secondary and tertiary venation obscure. Achene ovoid, three-lobed, or three-angled, glabrous to hairy.

Key to the Species of Ruprechtia
[for specimens with female flowers and/or fruits]

Regional keys for both fertile and sterile specimens are presented in Appendix 2. Because most species of *Ruprechtia* have rather narrow distributions and are found in only one of the regions in which the genus grows, identifications are simplified using the regional keys. Two Brazilian species, *R. crenata* (no. 36; Rio de Janeiro) and *R. glauca* (no. 37; Bahia) are known only from male material and thus are included only in the keys provided in Appendix 2.

1. Fruiting sepals coriaceous, their secondary and tertiary venation rather obscure.
    2. Sepals of fruits 18–30 mm long. 30. *R. maracensis*.
    2. Sepals of fruits to 15 mm long.
        3. Sepals of fruits to 2 mm wide. 24. *R. tenuiflora*.
        3. Sepals of fruits more than 3 mm wide.
            4. Achene tightly enclosed and concealed within the cucullate sepals.
                5. Leaves very narrowly ovate, length:width ratio more than 3.5. 26. *R. salicifolia*.
                5. Leaves elliptic, ovate, or oblong, length:width ratio less than 3.0. 27. *R. brachystachya*.
            4. Achene visible within the sepals.
                6. Sepals of fruits obovate, apex reflexed, margin revolute. 28. *R. tangarana*.
                6. Sepals of fruits oblong to ovate or deltate, apex not reflexed, margin flat.
                    7. Sepals of fruits oblong, apex obtuse. 25. *R. apurensis*.
                    7. Sepals of fruits ovate or deltate, apex acute. 29. *R. brachysepala*.

1. Fruiting sepals chartaceous, their secondary and tertiary venation clearly visible.
   8. Lianas.
      9. Sepals of fruits to 33–40 mm long; bracts 2–2.5 mm long; staminodes 1.5 mm long. 35. *R. laurifolia.*
      9. Sepals of fruits to 40–55 mm long; bracts 1.5 mm long; staminodes less than 1 mm long. 34. *R. obidensis.*
   8. Trees or shrubs.
      10. Sepals of fruits spathulate; achene three-angled.
         11. Sepals of fruits 30–36 mm long. 11. *R. paranensis.*
         11. Sepals of fruits 14–24 mm long. 10. *R. laxiflora.*
      10. Sepals of fruits obovate or oblong; achene three-lobed.
         12. Leaves with tertiary venation prominent below, densely reticulate.
            13. Petals 4–5 mm long in female flowers, 8–12 mm long in fruit; sepals 30–38 mm long in fruit. 13. *R. standleyana.*
            13. Petals ca. 2 mm long in female flowers, 2.5–7 mm long in fruit; sepals to 30 mm long in fruit.
               14. Sepals of fruits 13–18 mm long, petals 2.5–3 mm long. 8. *R. exploraticis.*
               14. Sepals of fruits 23–30 mm long, petals 5–7 mm long. 12. *R. fusca.*
         12. Leaves with tertiary venation flat or scarcely prominent below, not densely reticulate.
            15. Calyx not enclosing achene, sepals united to 2 mm.
               16. Leaves glabrous and glaucous below. 4. *R. albida.*
               16. Leaves glabrous or hairy, not glaucous below.
                  17. Ochrea greater than 5 mm long, caducous; twigs often hollow. 31. *R. cruegeri.*
                  17. Ochrea less than 3 mm long, more or less persistent; twigs solid.
                     18. Secondary venation almost equally prominent on both surfaces of the leaf, upper and lower leaf surfaces appearing rather similar. 19. *R. pallida.*
                     18. Secondary venation more prominent on the underside of the leaf, upper and lower leaf surfaces appearing very different.
                        19. Petals to 1 mm long in fruits. 3. *R. aperta.*
                        19. Petals more than 2 mm long in fruits.
                           20. Petiole 1–2 mm long; lamina almost completely glabrous below. 16. *R. nicaraguensis.*
                           20. Petiole more than 2 mm long; lamina evenly erect-hairy below.
                              21. Sepals of fruits broadly obovate, 20–24 mm long, 7–9 mm wide. 5. *R. obovata.*
                              21. Sepals of fruits narrowly obovate, 28–31 mm long, 6–7 mm wide. 6. *R. peruviana.*
            15. Calyx enclosing achene, sepals united for 2 mm or more.
               22. Female partial inflorescences subtended by bracts 2.5 mm long; inflorescence dense, the main axis often scarcely visible amongst the bracts and partial inflorescences, giving a catkin-like appearance.
                  23. Sepals of fruits 34–43 mm long, petals ca. 7 mm long. 22. *R. coriacea.*
                  23. Sepals of fruits ca. 30 mm long, petals ca. 3 mm long. 17. *R. costata.*
               22. Female partial inflorescences subtended by bracts to 2 mm long; inflorescence open, the main axis clearly visible amongst the bracts and partial inflorescences.
                  24. Petals vestigial, to 0.5 mm in female flower. 2. *R. apetala.*
                  24. Petals at least 1.5 mm long in female flower.
                     25. Female inflorescences less than 1 cm long, partial inflorescence 1-flowered; leaves often clustered on brachyblasts (short side shoots with condensed internodes). 1. *R. triflora.*
                     25. Female inflorescences at least 1 cm long, partial inflorescence 2-or 3-flowered; leaves rather evenly spaced along twig, rarely clustered on brachyblasts.
                        26. Petals of female flowers completely glabrous.
                           27. Sepals of fruits 30–45 mm long, 5–10 mm wide.
                              28. Infructescences with pedicels ca. 5 mm long. 18. *R. chiapensis.*
                              28. Infructescences with pedicels 8–11 mm long.

29. Base of perianth tube pointed, tapering to pedicel. 32. *R. lundii.*
29. Base of perianth tube obtuse, rounded, not tapering to pedicel. 33. *R. latifunda.*
27. Sepals of fruits 20–28 mm long, 3–6 mm wide.
30. Perianth tube of fruit 4–6 mm long; ochrea to 20 mm long, very early caducous. 7. *R. jamesonii.*
30. Perianth tube of fruit ca. 2 mm long; ochrea to 0.5–1 mm long, persistent. 9. *R. fagifolia.*
26. Petals of female flowers at least ciliate, sometimes densely hairy.
31. Perianth tube of female flowers 3 mm long; petals adnate to calyx for 1–2.5 mm, forming 3 prominent keel-like structures. 20. *R. carina.*
31. Perianth tube of female flowers to 2 mm long; petals free or scarcely adnate to calyx, not forming keel-like structures.
32. Female inflorescences with pedicels to 2 mm long; perianth tube in fruit 5–6 mm long. 21. *R. ramiflora.*
32. Female inflorescences with pedicels longer than 3 mm; perianth tube in fruit 3–5 mm long.
33. Leaves with minute dark brown glands below, visible at 10× magnification. 23. *R. curranii.*
33. Leaves without glands.
34. Secondary veins 6–10, often only slightly prominent below; sepals of fruits 20–25 mm, united for 4–5 mm, diverging about the apex of the achene; Costa Rica and Nicaragua. 15. *R. costaricensis.*
34. Secondary veins 10–15, usually very prominent below; sepals of fruits 20–30 mm, united for 3–4 mm, constricted about the apex of the achene; Mexico. 14. *R. laevigata.*

1. Ruprechtia triflora Grisebach, Abh. Königl. Ges. Wiss. Göttingen 24: 89. 1879. *Magonia triflora* (Grisebach) Kuntze, Revis. gen. pl. 2: 553. 1891. *Triplaris triflora* (Grisebach) Kuntze, Revis. gen. pl. 3(2): 271. 1898.—TYPE: ARGENTINA. Salta: Gran Chaco, Dragones, Aug 1873, *Lorentz & Hieronymus 599* (holotype: GOET!).

Ruprechtia triflora var. *guaranitica* Chodat & Hassler, Bull. Herb. Boissier, sér. 2, 3: 393. 1903.—TYPE: PARAGUAY. Concepción: prope Concepción, 1901–1902, *Hassler 7336* (holotype: G, photo, Field Museum negative no. 27778: F! MO!; isotypes: BM! C! F! GH! K! MO! NY! P!).

Shrubs or trees to 10 m tall. Bark papery or flaky. Twigs solid, glabrous, appressed-hairy when young; brachyblasts present. Laminas 2–5 cm long, 1.7–3.4 cm wide (length:width ratio 1.4–1.7), broadly elliptic to obovate or orbicular, apex obtuse to slightly acute, base cuneate, margin slightly undulate, sometimes inrolled; midrib prominent adaxially; secondary veins 6–8, prominent abaxially and markedly more prominent than the dense, faint scalariform-reticulate tertiary venation; indumentum of simple hairs on lamina and veins adaxially and abaxially, irregular stellate hairs sometimes present adaxially; glands absent; petioles 2–5 mm long, hairy; ochreas 0.5–4 mm long, hairy, caducous. Male inflorescences to 0.2 cm long, dense, internodes ca. 0.5 mm long, with a dense indumentum of whitish hairs; bracts 1.5–2 mm long, densely hairy; bracteoles 2.5 mm long, glabrous to sparsely hairy; pedicels 1–2 mm long, leaving 1–2 mm long stalks after the flowers have fallen, hairy; perianth greenish white, pink, or yellow; sepals 2–2.5 mm long, obovate, densely hairy; petals 2–2.5 mm long, elliptic, densely hairy; filaments

to 1.5 mm long, anthers 1–1.2 mm long. Female inflorescences ca. 0.1 cm long, dense, internodes ca. 0.5 mm long, with a dense indumentum of whitish hairs; bracts 1.5–2 mm long, densely appressed-hairy; bracteoles 2–3 mm long, glabrous to sparsely hairy; pedicels ca. 2 mm long, leaving ca. 2 mm long stalks after the flowers have fallen, densely hairy; perianth white, pink, or yellow-green, densely erect-hairy abaxially; sepals 6 mm long, perianth tube 1 mm long, free parts of the sepals linear; petals 2.5 mm long, adnate to the perianth tube for 1 mm, the free part elliptic, hairy; staminodes to ca. 0.2 mm long; disk hairy; ovary 2 mm long, hairy in the distal half, stigmas 1.5–2.5 mm long, linear, occasionally hairy. Fruits pale red to pale brown; pedicels to 3–4 mm long, leaving 2–3 mm long stalks after the fruits have fallen; sepals of mature fruits 30–33 mm long and 7–8 mm wide, perianth tube 4–5 mm long, sepals chartaceous with evident venation, obovate, not keeled, with a dense indumentum of erect hairs at the base, sparsely hairy on the wings; petals 6–8 mm long, adnate to the perianth tube for 2–3 mm, the free part ovate or elliptic; achene 7–9 mm long, three-lobed, smooth, hairy in the distal half. Fig. 2B.

Phenology. Flowering and fruiting mainly from August to December, occasional records from the first half of the year.

Distribution (Fig. 5). Argentina (Formosa, Jujuy, Salta, Santiago del Estero, Tucumán), Bolivia (Chuquisaca, Santa Cruz, Tarija), Brazil (Mato Grosso do Sul), Paraguay (Alto Paraguay, Boquerón, Chaco, Concepción, Nueva Asunción, Presidente Hayes); in dry thorny Chaco forests and thickets (chaco, bosque achaparrado espinoso, bosque arbustivo con cactus columnares, bosque chaqueño), also recorded from seasonally inundated forests; 200–1500 m.

Vernacular names. Duraznillo colorado, shoishe (Argentina); choraque, choroquete, coroguete, guayabochi (Bolivia); guaingui pire, inuk (Paraguay).

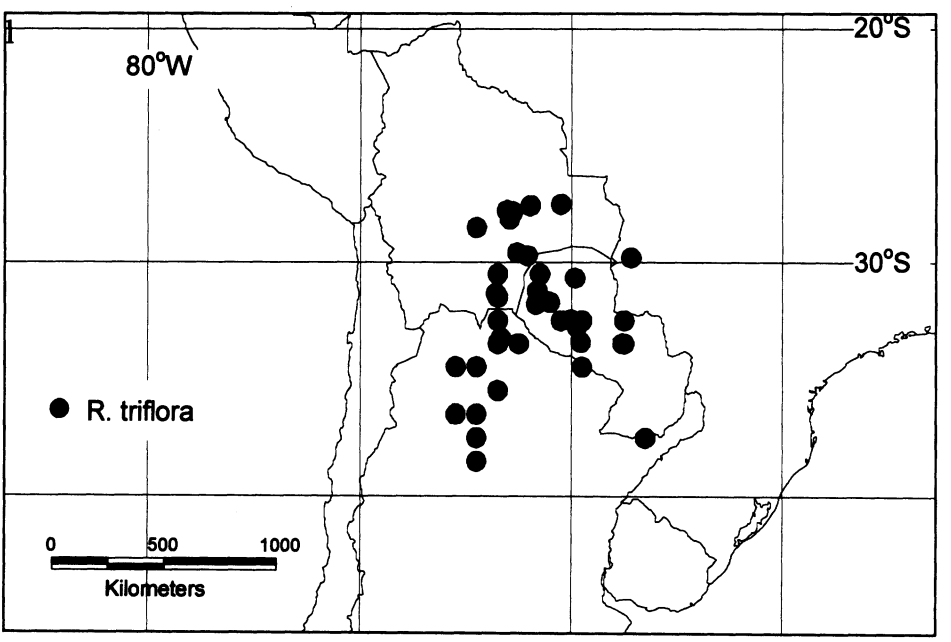

FIG. 5. Distribution of *Ruprechtia triflora*.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** MATO GROSSO DO SUL: Fazenda Acurizal at Estação de Carandazal, 19°48′S, 57°11′W, *Ratter et al. R5954* (E, K, NY). **Bolivia.** CHUQUISACA: Luis Calvo, El Salvador, zona central, *Pensiero & Marino 4316* (MO).—SANTA CRUZ: Cordillera, Boyuibe, 55 km hacia la frontera Paraguaya via F. Villazón, *Beck & Liberman 9416* (AAU); "Señor Pinto's ranch," Santiago & Robore District, *Bourke-Borrowes 52* (K); near San José of Chiquitos, *Cardenas 3016* (F); Yanaigua, 30 km W of Paraguay border, 19°42′S, 62°06′W, *Gentry 75372* (MO); Valle Grande, de Valle Grande camino a Río Grande, *Kiesling & Metzing 8487* (AAU); Jardín Botánico de Santa Cruz, 17°46′S, 63°04′W, *Nee 35627* (K, NY, U), *35654* (AAU, K, NY, U); Prov. Cordillera, 5 km N of YPFB Gas Plant, N the Río Grande, 1 km S of road "Brecha 5-1/2," 18°08′S, 62°56′W, *Nee 37921*, *37928* (NY); Prov. Ibañez, 9 km ESE of Comunidad Don Lorenzo, near Quebrada Caracore on road to Estancia Caracore, 17°50′S, 62°47′W, *Nee & Coimbra 39961* (NY); Ibañez, Jardín Botánico de Santa Cruz, ca. 12 km E de Santa Cruz, *Pendry 650* (E, LPB); Chiquitos; Pozo del Tigre, 135 km al E de ciudad de Santa Cruz, propiedad de la empresa ABAFA, alrededores del campamento principal, 17°34′S, 61°57′W, *Vargas & Ortiz 3213* (NY); Cordillera, Ibasiriri (Bañados del Izozog), 19°35′S, 62°35′W, *Vargas & Tapia 1028* (MO, NY).—TARIJA: Gran Chaco, Palos Blancos, 3 km hacia Puerto Margarita via Río Pilcomayo, *Beck & Liberman 9724* (AAU); Gran Chaco, Palos Blancos, 3 km hacia Puerto Margarita via Río Pilcomayo, *Beck & Liberman 9725* (AAU, MO); W de Villa Montes, Río Isiri, 21°20′S, 63°35′W, *Billiet 6044* (MO); Villa Montes, Chaco, *Cardenas 2553* (F); Gran Chaco; Puerto Margarita, *Coro 1335* (GH), *Coro-Rojas 1482* (GH). **Paraguay.** ALTO PARAGUAY: Chaco 21°S, *Fiebrig 1309*, *1309a* (K); Estancia "La Americana" 280 km NE de Filadelfia, *Molas & Vera 1055* (MO); Isla Alta, *Schmeda 1510* (GH).—BOQUERÓN: Mcal. Estigarribia, *Arenas 1258* (MO); Trayecto Colonia Neuland-Filadelfia, 20 km antes de Filadelfia, *Degen 2785* (MO); N de Filadelfia, *Fernández Casas & Molero 4269* (MO, NY); 14 km S of Filadelfia, 22°28′S, 60°02′W, *Gentry et al. 52017* (AAU, NY); Puerto Casado and vicinity; Estancia Guajho, *Pedersen 4073* (NY); Col. Meno, Loma Plata, *Vanni et al. 1934* (F, MO).—CHACO: Misión Santa Rosa, Manxuf Ethnobotanical Study, 21°48′S, 61°41′W, *Gragson 170*, *299* (MO); PN Defensores del Chaco Madrejón, 20°40′S, 59°50′W, *Hahn 1621* (MO); Gran Chaco, *Pride s.n.* (BM, K).—CONCEPCIÓN: prope Concepción, *Hassler 7415* (BM, GH, K, MO, NY, P), *7415a* (BM, GH, K, MO, NY, P), *7415b* (NY).—NUEVA ASUNCIÓN: Ruta Trans Chaco entre Marisc. Estigarriba y Tte. Ochoa, a 9 km S de Tte. Ochoa, *Basualdo & Zardini 1271* (MO); Marisc. Estigarriba hacia Gral. E.A. Garay, *Beck & Liberman 9451* (AAU), *9452* (AAU, MO); Parque Nacional Tte. Agripino Enciso Km 656, Ruta Trans-Chaco 600 km NO Asunción, *Little 40057* (K, MO, NY); PN Tte. Enciso, *Vavrek 381* (MO); Ruta Transchaco entre Mariscal Estigarriba y Tte. E. Ochoa, 9 km de Tte. Ochoa, *Zardini & Basualdo 3537*, *3541* (MO).—PRESIDENTE HAYES: Km 134 de Ruta Militar entre Pozo Colorado y Concepción, 23°29′S, 57°36′W, *Brunner 1393* (MO); Estancia Yoldman, *Degen & Mereles 3002* (NY); Río Verde, cerca de Pozo Colorado, *Fernández Casas & Molero 4488* (NY); 8 km before 25 Leguas, Trans Chaco Highway SE of Filadelfia, 22°45′S, 59°45′W, *Gentry et al. 52002* (MO, NY); Estancia "La Perla," 23°26′S, 59°34′W, *Pedersen 14635* (AAU). **Argentina.** FORMOSA: Depto. Matacos, 2–3 km SE Igr. Guillermo N. Juárez, *Charpin & Eskuche 20359* (AAU), *Jorgensen 3336* (MO); Depto. Matacos, Igr. Juárez, *Pedersen 12922* (AAU); Depto. Patiño, Pozo del Tigre, Casa de los Gómez, 22 Dec 1999, *Prado s.n.* (E).—JUJUY: Depto. El Carmen, Panipa Blanca, *Cabrera & Fabris 20963* (K); Depto. Santa Bárbara, *Cabrera & Kiesling 20272* (K); 10 km SE of San Pedro, *Eyerdam & Beetle 22328* (K); Río Lavagin, 15 km SE of San Pedro, *Eyerdam & Beetle 22540* (K, MO); Depto. San Pedro, El Quemado, a 8 km W de la Ruta 34, *Marmel et al. 8894* (GH); San Pedro, Santa Clara, *Venturi 5178* (GH).—SALTA: Ruta 34, km al N del Río Juramento, *Burkart et al. 30439* (F); en los alrededores de la ciudad de Orán, *Hieronymus & Lorentz 386* (K); Orán, por la ruta a Orán, desvío a Embarcación, *Legname & Cuezzo 5852* (GH); Antilles, *Lillo 8579* (GH, U); Orán, *Lorentz s.n.* (K); pasaje del Río Juramento, *Lorentz & Hieronymus 304* (F, GH, NY, P); Orán, Dragones, *Lorentz & Hieronymus 609* (NY); Depto. Capital, Ruta 34, 3 km al sur del cruca Ruta 51, *Novara 3821* (MO); Orán, El Tabacal, *Rodríguez 1093* (NY), *1094* (GH, K).—SANTIAGO DEL ESTERO: Depto. Chola, La Punta to Chola, *Bartlett 20449* (GH); Depto. Guasayán, Sierra de Guasayan, Ruta 64 Km 73, *Krapovickas & Cristóbal 46224* (K); Depto. Choya, Villa lo Punto, *Moldouado Buzzone 1537* (F, GH).—TUCUMÁN: Raco, *Meyer 3336* (GH, U), *3337*, *3339* (GH); Trancas, Vipos, *Schreiter 1816* (F), *1817* (MO), *1819* (F, U), *8789* (GH, U), *Venturi 2177* (GH).

Ruprechtia triflora is a very distinctive species, with the most pronounced development of brachyblasts (short, leafy side branches) in the genus. It also shows a greater tendency to flowering and fruiting whilst leafless than other members of the genus, and has very short inflorescences with single-flowered partial inflorescences. Chodat and Hassler recognized *R. triflora* var. *guaranitica* on the basis of short, clustered twigs, but having seen the range of morphological variation within the species, I do not think it is possible

to distinguish varieties. There is a deletion of about 30 base pairs in ITS sequences from *R. triflora,* which is unique to the species.

Ruprechtia triflora is found throughout the Chaco, and in places is one of the most abundant species there (R. Spichiger, pers. comm.). The leaves and a decoction of the bark are used against diarrhea in Bolivia and Paraguay.

2. Ruprechtia apetala Weddell, Ann. Sci. Nat. Bot., sér. 3, 13: 268. 1849. *Magonia apetala* (Weddell) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BOLIVIA. Chuquisaca: Tomina, bords du Río Pilcomayo, Jan 1846, *Weddell 3873* (lectotype, here designated: P!; isolectotype: P!).

Ruprechtia mollis Weddell, Ann. Sci. Nat. Bot., sér. 3, 13: 268. 1849. *Magonia mollis* (Weddell) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BOLIVIA. La Paz: Inquisivi, 1800 m, Dec 1846, *Weddell 4197* (lectotype, here designated: P!; isolectotype: P!).

Ruprechtia corylifolia Grisebach, Abh. Königl. Ges. Wiss. Göttingen 19: 65. 1874. *Magonia corylifolia* (Grisebach) Kuntze, Revis. gen. pl. 2: 553. 1891. *Triplaris corylifolia* (Grisebach) Kuntze, Revis. gen. pl. 4(2): 270. 1898.—TYPE: ARGENTINA. Córdoba: in der Vorbergen der Sierra bei Ascochinga, Apr 1871, *Lorentz 372* (holotype: GOET!).

Ruprechtia excelsa Grisebach, Abh. Königl. Ges. Wiss. Göttingen 19: 65. 1874. *Magonia excelsa* (Grisebach) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: ARGENTINA. Tucumán: La Cruz, Apr 1872, *Lorentz 324* (holotype: GOET!; isolectotype: C! F!).

Ruprechtia boliviensis Herzog, Meded. Rijks-Herb. 46: 5. 1922.—TYPE: BOLIVIA. Santa Cruz: am Absteig von Samaipata ins Mairantal, ca. 1700 m, Mar 1911, *Herzog 1781* (lectotype, here designated: JE!; photo of destroyed W isotype, Field Museum negative no. 31195: F! MO!).

Trees or shrubs to 10 m tall. Bark smooth, grey, becoming fissured with age. Twigs solid, glabrous, appressed-hairy when young; brachyblasts sometimes present. Laminas 2.5–8 cm long, 1.2–4 cm wide (length:width ratio 1.5–2.2), broadly elliptic to ovate, apex acute to acuminate, base cuneate to rounded, margin undulate to crenate; midrib prominent adaxially, secondary veins 8–14, prominent abaxially, often slightly impressed adaxially and giving the leaf a bullate appearance, markedly more prominent than the faint, dense, scalariform tertiary venation; glabrous to evenly erect-hairy adaxially and abaxially, occasionally slightly glaucous abaxially; glands absent; petioles 4–8 mm long, glabrous to pubescent; ochreas 1–3 mm long, glabrous to slightly appressed-hairy, rather persistent. Male inflorescences to 5 cm long, rather lax, internodes to 3 mm long, with a dense indumentum of erect, short, curled hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1.5–2 mm long, glabrous to sparsely hairy; pedicels to 1.5–3 mm long, leaving 1–2.5 mm long stalks after the flowers have fallen, sparsely hairy; perianth green to violet; sepals 1.5–2 mm long, ovate, glabrous or sparsely hairy; petals 1.5–2 mm long, obovate, glabrous or sparsely hairy; filaments to 2 mm long; anthers 0.6–0.8 mm long. Female inflorescences to 7 cm long, lax and the internodes to 10 mm long, or shorter and dense and the internodes to ca. 0.5 mm long, with a dense indumentum erect, short, curled hairs; bracts 1–2 mm long, densely appressed-hairy; bracteoles 1–2 mm long, appressed-hairy; pedicels 4–7 mm long, leaving 3–6 mm long stalks after the flowers have fallen, sparsely to densely hairy; perianth red, glabrous to appressed-hairy abaxially, sepals to 6

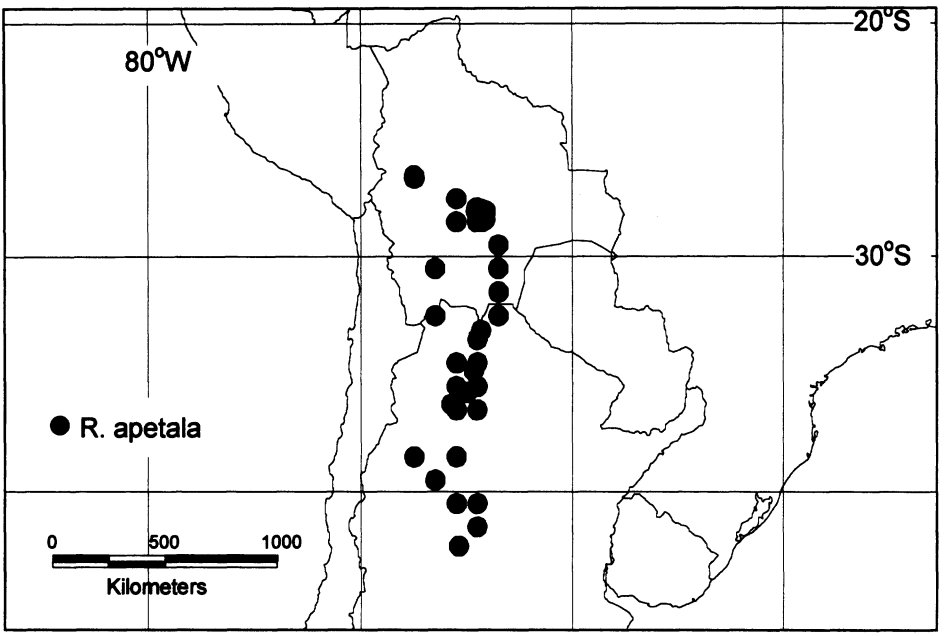

FIG. 6. Distribution of *Ruprechtia apetala*.

mm long, acuminate, spreading and not forming a tube; petals absent or to 0.5 mm long, free from the calyx and tooth-like, glabrous; staminodes to 0.1 mm long or absent; disk glabrous or hairy; ovary 2.0–2.5 mm long, glabrous; stigmas 0.5–0.7 mm long, linear. Fruits white, pale green, pale pink, or orange-brown; pedicels to 10 mm long, leaving 4–5 mm long stalks after the fruits have fallen; sepals of mature fruits 25–33 mm long and 4–8 mm wide, perianth tube 3–4 mm long, sepals chartaceous with evident venation, almost oblong, slightly constricted above achene, not keeled, glabrous or with an indumentum of semi-erect hairs at the base, sparsely hairy on the wings; petals absent; achene 8–10 mm long, three-lobed, smooth, glabrous. Fig. 2C.

Phenology. Male flowers: May, December–February; female flowers: November–February; fruits: August, October–June.

Distribution (Fig. 6). Argentina (Catamarca, Córdoba, Salta, Tucumán), Bolivia (Chuquisaca, La Paz, Santa Cruz); in seasonally dry tropical forests (bosque seco caducifolio), on hillsides and beside rivers, swamps, in clay soils; 100–2300 m.

Vernacular names. Duraznillo, duraznillo blanco, higuerilla macho, higuerilla hembra, higuerón, manzano del campo, manzanilla, sacha manzano, virarú, virarú colorado (Argentina).

ADDITIONAL SPECIMENS EXAMINED. **Bolivia.** CHUQUISACA: Tomina, Monteagudo 64 km hacia Sucre, *Beck 6369* (GH); Oropeza, La Palma 18°00′S, 65°15′W, *Pinto 5* (AAU).—COCHABAMBA: Mizque, salida del pueblo, *Antezana 492* (MO); Campero, bajada de Buena Vista, cercano al Río Grande, *Antezana 613* (MO); Aiquile, *Badcock 634* (K); Prov. Aiquile, 27 km hacia Epizana, *Beck 8923* (AAU, K); Tako, farm near Miske, 18°00′S, 065°15′W, *Brooke 5922* (BM, F, NY, U); above Pojo-Cochabamba, *Cardenas 5750* (K); Prov. Mizque, Quioma silver mines, *Eyerdam 25335* (F, K); Campero, between Aiquile and Peña Colorada, ca. 40 km from Aiquile, 18°11′S, 64°56′W, *Pendry 718* (E, LPB); Campero, 23 km from Pasorapa on the road to Quinori, *Pendry 727* (E, LPB); Campero, valley of Río Mizque, below Quinori, *Pendry 735* (E, LPB); Prov. Campero, Mizque, *Steinbach 750* (F, GH, MO, NY).—LA PAZ: Sud Yungas, por debajo de Villa Barrientos, valle del Río

Tamanpaya arriba de Totorapampa, *Beck 17353* (AAU); Inquisivi, entre Plazuela y Miguillas, 16 km de distancia, *Beck 21112* (AAU); Sud Yungas, "Ridge of Pasto Grande," ridge between Río La Paz and the Río Jucumarini 10–12 km upstream from La Plazuela bridge, 16°37′S, 67°29′W, *Lewis 37177* (MO); Sud Yungas, "Pasto Grande," slope of Cerro Jucumarini above Pasto Grande, 15 km up Río La Paz from La Plazuela bridge, 16°37′S, 67°30′W, *Lewis 37227* (MO); Sud Yungas, valley of Río Boopi, ca. 5 km W of village below Las Mercedes on road to Villa Barientos, 16°17′S, 67°23′W, *Pendry 571* (E, LPB); Sud Yungas, above the bridge over the Río La Paz, on the road to Miguillas, 16°32′S, 67°24′W, *Pendry 609* (E, LPB); Sud Yungas, valley of Río La Paz, 2 km E of Miguillas on road to La Plazuela, *Pendry 624* (E, LPB).—SANTA CRUZ: Caballero, Saipina, a 3 km al E de Los Chacras, 18°03′S, 64°34′W, *Balcazar 300* (MO); Cordillera, Alto Parapeti, *de Michel 4* (GH, MO); Cordillera, Alto Parapeti, *de Michel 5* (GH); Cordillera, Alto Parapeti, *de Michel 105* (GH); May 1892, *Kuntze s.n.* (NY); Caballero, W side of Río Comarapa, 0.5 km W of center of Comarapa, 17°54′S, 64°32′W, *Nee 43091, 43092* (NY); Prov. Vallegrande, 1 km S on Mataral to Trigal road, 10 km S of Mataral and 10 km NNW of El Trigal, 18°13′S, 64°12′W, *Nee & Vargas 38321* (NY); Florida, 7 km N of Pampa Grande, just E of Las Juntas on hwy from Samaipata to Comarapa, 18°02′S, 64°06′W, *Nee & Vargas 44703* (MO, NY); Valle Grande, on road from Valle Grande to Mataral, 34 km N of Valle Grande, 18°12′S, 64°12′W, *Pendry 687* (E, LPB); Valle Grande, on road from Pucará to bridge over Río Grande, ca. 14 km S of Pucará, 18°41′S, 64°15′W, *Pendry 695* (E, LPB); Valle Grande, on road from Samaipata to Comarapa, 3 km W of Samaipata, 18°10′S, 64°53′W, *Pendry 710* (E, LPB); Caballero, San Juan del Portero, Río Palmar, 17°58′S, 64°17′W, *Saldias & Rios 4423* (NY); Valle Grande, Quina-Quina, 8 km al N de Valle Grande, 18°25′S, 64°07′W, *Vargas 10* (MO); Valle Grande, Quina-Quina, 8 km al N de Vallegrande, 18°25′S, 64°07′W, *Vargas 102* (NY); Valle Grande, Río Mizque, salida deresera de Gallineros, 18°30′S, 64°16′W, *Vargas 424* (MO, NY).—TARIJA: Gran Chaco, bei Villamontes, *Gerold & Beck 306* (AAU); Ruta Tarija–Villa Montes, El Angusto, 11 km E de Villa Montes, *Krapovickas et al. 19319* (F). **Argentina.** CATAMARCA: Desmonte, *Bartlett 19625* (GH, US); Río Huacra, Jan 1947, *O'Donell s.n.* (GH, K, US); Miraflores, *Risso 1020* (NY); Depto. Capital; Chacarita de los Padres, *Varela 132* (GH, NY); Valle Viejo, La Courera, *Varela 166* (BM, GH, US).—CORDOBA: Depto. Punilla, near La Reducción towards El Pan de Azucar, *D'Arcy & Hunziker 13953* (AAU); Depto. Colón, Cerro Azul, *Dawson 17* (F, NY), *1106* (F, GH, NY), Oct 1906, *Gandoger s.n.* (MO, K); Colachanga, Sierra Chica de Córdoba, Apr 1877, *Hieronymus s.n* (GH); in der Nähe Caleras in der Sierra de Córdoba, Apr 1877, *Hieronymus s.n.* (BM, F, K, NY, US); Depto. Talumba, falda del Cerro Colorado, *Hunziker 7779* (NY); Depto. Colón, Sierra Chica (Falda E), quebrada del Río Primero, en la falda de sierra cercana a El Diquecito, *Hunziker 10946* (MO); Depto. Colón, Sierra Chica (Falda E), quebrada del Río Primero en las immediaciónes de El Diquecito, *Hunziker & Cocucci 10503* (F, MO); Depto. Colón, Sierra Chica (Falda E), quebrada del Río Primero entre La Calera y El Diquecito, *Hunziker & Cocucci 10504* (MO); Depto. Colón, Quebrada del Río Primero, en las inmediaciónes de El Diquecito, *Hunziker & Cocucci 10523* (F); Casabamba, *Krapovickas 1909, 1910* (F, GH),1873, *Lorentz & Hieronymus s.n.* (NY); Sierra Chica, *Lossen 152* (F, GH, MO) *452* (F, GH, K, MO), *Pedersen 152* (MO, P); Depto. Cruz del Eje, Cruz del Eje–La Toma, *Sota 4322* (NY); Punilla, Bialet Masse, *de la Sota 4443* (MO).—JUJUY: near El Potrerillo, San Antonio, near Jujuy, *Balls 5924* (E, F, K); Calilegua, *Bartlett 20395* (GH, NY); Depto. El Carmen, abra de Santa Laura, *Cabrera 22082* (F); abra de Sta. Laura, *Ellenberg 400* (GH); Depto. San Pedro, San Juan de Dios, *Fabris Crisci 7002* (K); Depto. Ledesma, camino a PN Calilegua, *Kiesling 7124* (NY); Depto. El Carmen, Dique La Cienaga, *Krapovickas & Cristóbal 17539* (MO, P); Perico, *Lillo 9844* (GH, U), *9854* (F, GH, U); Depto. Ledesma, Sausal, *Lillo 10806* (GH, U); Laguna de la Brea, *Meyer 4954* (NY).—LA RIOJA: Capital, Los Duraznillos, al Km 23, *Hanig 83* (GH, MO); Famatina, Juanchin, *Venturi 9844* (BM, GH, K, MO, NY).—SALTA: Depto. Orán, Tranquitas, *Abbiatti & Claps 174* (F, K); Joaquin N. González, *Aguilar 203* (BM), *316* (GH, NY); Capital, Cerro San Bernardo, *Correa 35, 36* (NY); Orán; Manuela Pedraza, on Standard Oil Co. grounds, *Eyerdam & Beetle 22871* (GH, K, MO); road from Hwy 34-55 to PN El Rey, 6 km N of hwy, 24°50′S, 64°40′W, *Gentry et al. 51810* (NY); Orán, camino de Santa Rosa a Pichanal, *Legname & Cuezzo 8079, 9021* (GH); Depto. San Martín, Gral. Balliván, próximo el Saladillo, *Medina & Cuezzo 10138* (NY); en las cercanas de Salta, *Lorentz & Hieronymus 1078* (K, US); Depto. La Vina, Coronel Moldes, *Meyer 3585* (GH, NY); Depto. Orán, Campamento Y.P.F., Río Pescado, *Meyer 4785* (F); Orán, El Tabacal, *Meyer 4954* (F); Depto. Orán, Urundel a Río San Francisco, *Meyer 8419* (GH, NY); desv. a Urundel, *Meyer & Vaca 23550* (NY); Capital, cerro al sur del San Bernardo y El Portezuelo, *Novaro 3077* (MO); Depto. Capital, La Pena, 3 km E de Ruta 51, Km 1570, rumbo a Cabeza de Buey, *Novaro & Bruno 8793* (AAU); Depto. Capital, Cerro de 20 de Febrero, 100 m alrededor de la cima, *Novaro & Bruno 8857* (AAU); Depto. Rosario de la Frontera, Almirante Brown, *O'Donell 5391* (NY); Feb 1864, *Pearce s.n.* (BM, K); Depto. Orán, Tranquita, *Pierotti 7301* (MO); Urundel, *Rodríguez 1133* (GH); La Caldera, *Rosa 272* (GH); El Morenillo, *Schreiter 8782* (GH); Orán, Tartagal a Zanja Honda, *Schreiter 11139* (GH); Orán, *Steinbach 1747* (F, U); Rosario de la Frontera, El Naranjo, *Venturi 3895* (US); Orán, Río Blanco, *Venturi 5549* (BM, F, GH, K, MO, US); Orán, Obra Grande, *Venturi 7643* (GH); Orán, *Venturi 8643* (US); Depto. Outillas,

Cerro Negro, *Venturi 10340* (BM, GH, MO, NY); Cerro San Bernardo, *West 6141* (MO).—SAN LUIS: Sierra de San Luis, Bajo de Velis, Las Corrales, *Kurtz 8599* (NY); Depto. Junín, Merlo a Piedra Blanca, *Meyer 13801* (NY).—TUCUMÁN: Oct 1906, *Gandoger s.n.* (MO); Dique Tacanas, *Hjerting et al. 8* (MO); Capital, *Lillo 7329* (GH, U); Nov 1877, *Lorentz s.n.* (K, F); *Meyer 3105* (GH); Trancas, Ruta 38 entre Desv. Cadillal y Tapia, Mar 1971, *Meyer s.n.* (NY); Depto. Famailla, Cumbre El Nogalito, *Olea 142* (BM, NY); Depto. Trancas, Zarate, *Schreiter 1089* (MO); Depto. Cruz, farranca Finca Guillermina, *Schreiter 4571* (F, GH), *Venturi 308* (F, K); Depto. Trancas, Tapia, *Venturi 1192* (F); Tafi, cumbre de Siambón, *Venturi 2879* (GH, NY, US); Depto. Trancas, Vipos, *Venturi 3355* (US).—WITHOUT LOCALITY: Apr 1877, *Hieronymus s.n.* (F, F); *Lorentz 324* (F); *Lorentz 329* (GH).

Ruprechtia apetala is found in the same region as *R. triflora* and *R. laxiflora*. It is readily distinguished from *R. triflora*, which has conspicuous brachyblasts, short male and female inflorescences (less than 1 cm vs. to 7 cm) with single-flowered partial inflorescences (2–3-flowered in *R. apetala*) and more orbicular leaves, which sometimes have irregularly armed stellate hairs on the upper surface. *Ruprechtia triflora* has often been collected leafless in flower and fruit, whereas *R. apetala* appears to bear flowers and fruits only whilst in leaf. *Ruprechtia laxiflora* differs in its three-angled rather than three-lobed achene, spathulate sepals, which are united only at the base (vs. oblong and with a 3–4 mm perianth tube), and narrowly elliptic or ovate laminas with faint secondary and tertiary venation (vs. broadly elliptic or ovate with prominent venation). The fruits of *R. apetala* have a perianth tube 3–4 mm long and thus can easily be distinguished from those of the Peruvian species *R. aperta*, *R. albida,* and *R. obovata,* which lack a perianth tube. The fruits of *R. peruviana* have a perianth tube 2 mm long with divergent sepals, which do not enclose the achene.

In its leaves and fruits, *R. apetala* bears a strong resemblance to the Brazilian species *R. fagifolia*. *Ruprechtia apetala* can be distinguished by its longer petioles (4–8 mm vs. 2–5 mm), ochreas (1–3 mm vs. 0.5–1 mm), and perianth tube in fruit (3–4 mm vs. 2 mm), as well as by its open, apetalous female flowers, which contrast with the perianth tube (1 mm long) and bristle-like petals of the flowers of *R. fagifolia*.

3. Ruprechtia aperta Pendry, Edinburgh J. Bot. 60: 40. 2003.—TYPE: PERU. Cajamarca: carretera entre Huamachuco y Tayabamba, Tramo entre Chagual y Aricapampa, 2000–3000 m, 24 Oct 1986, *Díaz 2190* (holotype: NY!).

Trees to 7 m tall. Bark light grey, lenticellate, flaking; inner bark cream, slash salmon red. Twigs solid, glabrous to appressed-hairy; brachyblasts absent. Laminas 3.5–7 cm long, 1.5–3.5 cm wide (length:width ratio 2.0–2.8), ovate to elliptic or oblong, apex acuminate or acute, base rounded to cuneate, margin smooth to undulate; midrib more or less prominent adaxially, secondary veins 8–13, more prominent abaxially than adaxially, markedly more prominent than the lax, faint, reticulate tertiary venation; glabrous to densely, evenly, erect-hairy abaxially, glabrous to sparsely hairy adaxially; occasionally with minute dark glands adaxially; petioles 2–4 mm long, hairy; ochreas 1–2 mm long, appressed-hairy, more or less persistent. Male inflorescences to 5 cm long, rather lax, internodes to 2–3 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 1–1.5 mm long, densely appressed- to erect-hairy; bracteoles 0.5–1 mm long, glabrous to hairy; pedicels 1.5–2.5 mm long, leaving 1–1.5 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth color unknown; sepals 1 mm long, ovate to oblong, cucullate, glabrous or sparsely hairy, ciliate; petals 1 mm long, obovate to oblong, ciliate; filaments to 1.1 mm long; anthers 0.3–0.4 mm long. Female inflorescences to 9 cm

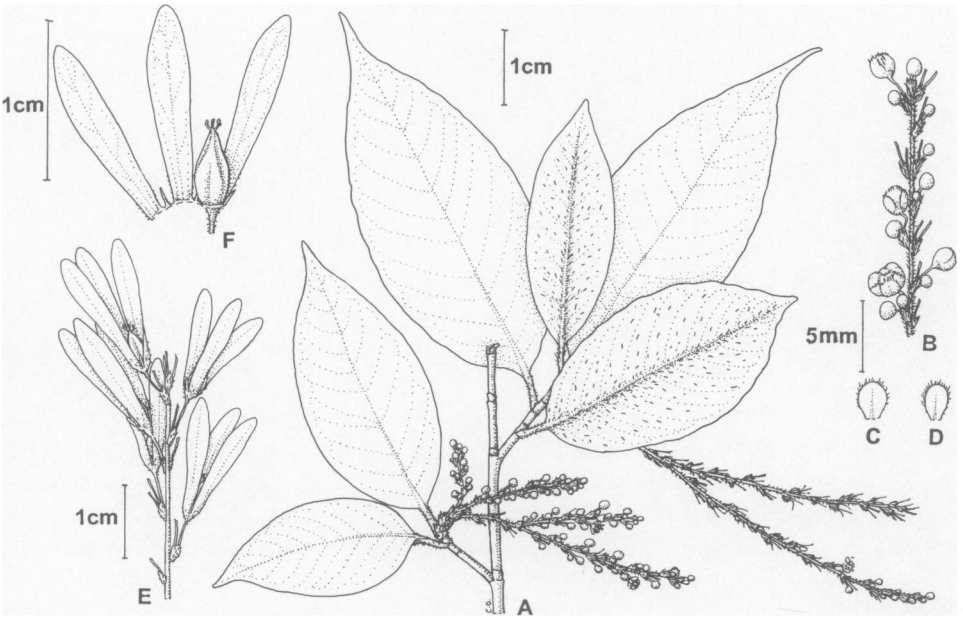

FIG. 7. *Ruprechtia aperta.* A. Flowering branch of male plant. B. Male inflorescence. C. Sepal of male flower. D. Petal of male flower. E. Infructescence. F. Fruit with the sepals opened. (Based on *Díaz 2190.*)

long, lax, internodes to 3–5 mm long, with a sparse to dense indumentum of short, erect, wavy hairs; bracts 1–2 mm long, sparsely to densely appressed-hairy; bracteoles 1.5–2 mm long, densely appressed-hairy; female flowers not seen. Fruits orange-brown; pedicels 4–5 mm long, leaving 2–3 mm long stalks after the fruits have fallen, glabrous to sparsely hairy; sepals of mature fruits 16–24 mm long and 3–5 mm wide, not forming a perianth tube, sepals chartaceous with evident venation, obovate, not keeled, sparsely hairy; petals ca. 1 mm long, free from the calyx, bristle-like, glabrous to sparsely hairy at the base, sparsely hairy on the wings; staminodes inconspicuous or to 0.5 mm long and tooth-like; disk hairy; achenes 6–8 mm long, three-lobed, smooth, very sparsely hairy on the angles in the distal half; stigmas ca. 0.7 mm long, linear or ovoid. Figs. 2I, 7.

Phenology. Male flowers: March–April; fruits: October–November.

Distribution (Fig. 8). Peru (Amazonas, Cajamarca, Piura); dry forests; 360–2000 (–3000) m.

Vernacular name. Guayabilla (Peru).

ADDITIONAL SPECIMENS EXAMINED. **Peru.** AMAZONAS: ca. 20 km from Bagua Grande on road to Chachapoyas, 05°51′67″S, 78°13′56″W, *Bridgewater S2725* (E); Bagua, towards Nazareth, *Ellenberg 3558* (MO); Marañóntal, *Ellenberg 3585* (MO).—CAJAMARCA: road Bagua Grande to Olmos, before Pucará, NE facing slope above Río Huancabamba, 06°02′08″S, 78°52′97″W, *Pennington 812* (E); Prov. Jaén, between Jaén and Bellavista, *Weberbauer 6206* (F, GH, US).—PIURA: Km 23 on road from Olmos to Limón, 05°55′S, 79°33′W, *Bridgewater S2815* (E).

Ruprechtia aperta is named for its open sepals, which are united only at their base, revealing the bristle-like petals and achene within. It differs from the other South American species with free sepals as follows: *R. laxiflora* and *R. paranensis* have spathulate

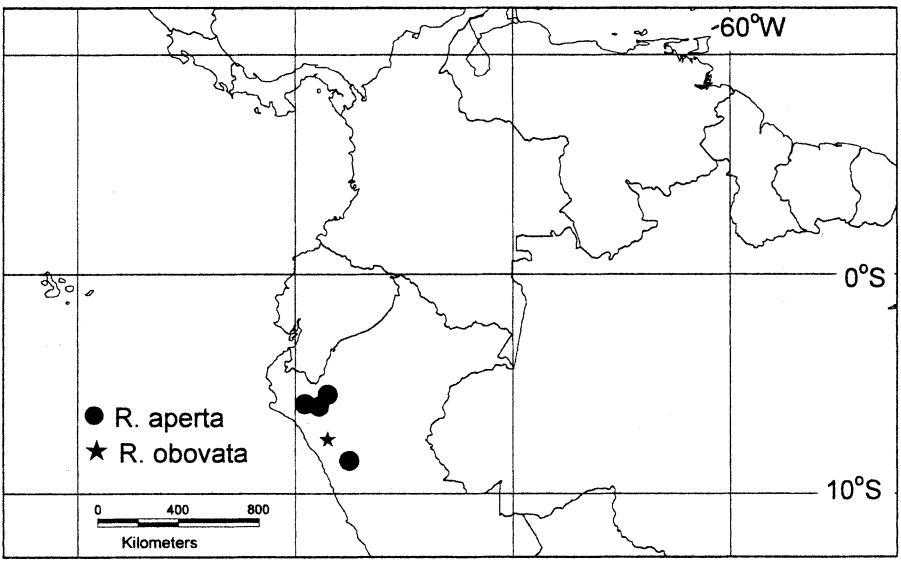

FIG. 8. Distribution of *Ruprechtia aperta* and *R. obovata*.

sepals and a three-angled achene; *R. albida* has shorter sepals in fruit (11–17 mm vs. 16–24 mm) and glabrous leaves with glaucous undersides; *R. obovata* has more markedly obovate and much broader sepals (7–9 mm vs. 3–5 mm).

Although densely hairy leaves are a feature of this species, the type specimen has completely glabrous leaves. Despite being atypical, *Díaz 2190* was selected because it has large numbers of well-preserved, mature fruits, whilst the other fruiting specimen, *Bridgewater 2815*, has old, rather poorly preserved fruits. The resemblance of the bark to that of *Psidium* ("guayaba") gives *R. aperta* its common name.

4. Ruprechtia albida Pendry, Edinburgh J. Bot. 60: 35. 2003.—TYPE: PERU. La Libertad: Pataz, along road W of Chagual, along Marañón River, 1300 m, ca. 07°S, 77°W, Jul 1985, *Young 1202* (holotype: F!; isotype: A!).

Shrubs to 3 m tall. Bark not seen. Twigs solid, glabrous, sometimes lenticellate; brachyblasts absent. Laminas 3–5.5 cm long, 1.3–2.8 cm wide (length:width ratio 1.4–2.8), elliptic to ovate or oblong, apex acute to acuminate, base cuneate to rounded or occasionally cordate, margin undulate to crenate; midrib prominent adaxially, secondary veins 9–11, more prominent abaxially than adaxially, markedly more prominent than the faint, lax, reticulate tertiary venation; completely glabrous, or with a few scattered hairs on the midrib and veins abaxially, glaucous abaxially; glands absent; petioles 5–15 mm long, glabrous; ochreas 1–2.5 mm long, glabrous, usually persistent. Male inflorescences to 3 cm long, dense, internodes to 1 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 1–1.5 mm long, sparsely appressed-hairy; bracteoles 1 mm long, sparsely hairy; pedicels 1.5–2 mm long, leaving 1–1.5 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth red; sepals 1.5 mm long, broadly ovate, glabrous to sparsely hairy, ciliate; petals 1.5 mm long, elliptic, glabrous, ciliate; filaments to 2 mm long; anthers 0.5 mm long. Female inflorescences to 5–9 cm long, lax, internodes to 3–8 mm long, with a sparse indu-

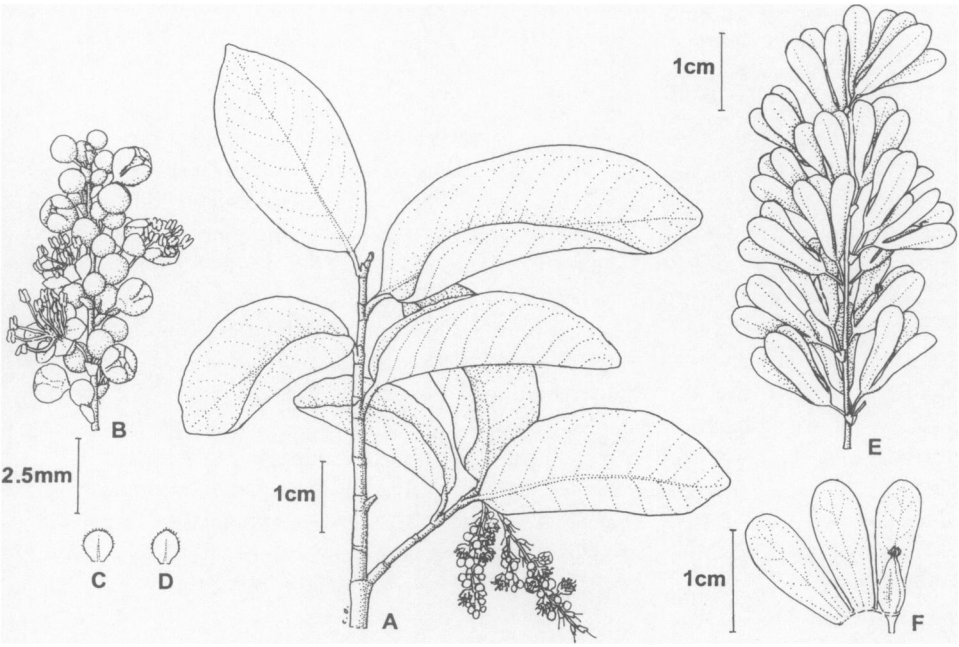

FIG. 9. *Ruprechtia albida*. A. Flowering branch of male plant. B. Male inflorescence. C. Sepal of male flower. D. Petal of male flower. E. Infructescence. F. Fruit with the sepals opened. (Based on *Young 1202*.)

mentum of short, erect, wavy hairs; bracts 1.5 mm long, glabrous to sparsely appressed-hairy; bracteoles 0.5–1 mm long, glabrous to sparsely hairy; female flowers not seen. Fruits orange-brown; pedicels 3–5 mm long, leaving 1.5–3 mm long stalks after the fruits have fallen, sparsely hairy; sepals of mature fruits 11–17 mm long and 3–5 mm wide, not forming a perianth tube, chartaceous with evident venation, obovate, not keeled, almost glabrous to sparsely erect-hairy at the base, almost glabrous on the wings; petals absent or to 2 mm long, free from the calyx, elliptic, sparsely hairy; staminodes inconspicuous, or tooth-like and to 0.4 mm long; disk glabrous to hairy; achene 6 mm long, three-lobed, smooth, very sparsely hairy; stigmas 0.5–0.8 mm long, linear. Figs. 2J, 9.

Phenology. Male flowers: July; fruits: May, July.

Distribution (Fig. 12). Peru (La Libertad); seasonally dry tropical forests, on steep slopes; 1300–1900 m.

ADDITIONAL SPECIMENS EXAMINED. **Peru.** LA LIBERTAD: Pataz, Antapita–Piás, *Alayo 88* (AAU, F, MO).

Ruprechtia albida is named for the pale, glaucous undersides of its leaves, a character unique in the Peruvian species of *Ruprechtia*. *Ruprechtia glauca* is the only other species with glaucous leaves, but it has obovate laminas with an inrolled margin. There are two other Peruvian species that have fruits with short sepals that are scarcely united at the base, *R. aperta* and *R. obovata*. The former has longer, scarcely obovate and almost elliptic sepals (16–24 mm vs. 11–17 mm), and the latter has longer, more obovate sepals (20–24 × 7–9 mm vs. 11–17 × 3–5 mm). *Ruprechtia peruviana* and *R. jamesonii,* which also grow in this area, have larger sepals (in excess of 23 mm long vs. to 17 mm) and more pronounced perianth tubes (at least 2 mm long vs. united only at the base).

5. Ruprechtia obovata Pendry, Edinburgh J. Bot. 60: 38. 2003.—TYPE: PERU. Cajamarca: Contumazá, Nanshá (Contezumá–Chilete), 2000 m, 17 Jun 1994, *Sagástegui, Leiva & Lezama 15360* (holotype: E!).

Trees, height unknown. Bark not seen. Twigs solid, striate, glabrous; brachyblasts absent. Laminas 4–8 cm long, 2.5–4 cm wide (length:width ratio 1.5–2.0), ovate, apex acute to shortly acuminate, base rounded to cuneate, margin slightly undulate, slightly inrolled; midrib prominent adaxially, secondary veins 9–13, slightly impressed adaxially and prominent abaxially, markedly more prominent than the faint densely reticulate tertiary venation; densely, evenly, erect-hairy abaxially, almost glabrous adaxially apart from the midrib; glands absent; petioles 2–3 mm long, hairy; ochreas 1.5 mm long, hairy, persistent. Male inflorescences not seen. Female inflorescences to 11 cm long, lax, internodes to 12 mm long, with a dense indumentum of erect wavy hairs; bracts 1.5–2 mm long, densely appressed-hairy; bracteoles 1–1.5 mm long, densely appressed-hairy; female flowers not seen. Fruits whitish; pedicels 3–5 mm long, leaving 1–3 mm long stalks after the fruits have fallen, glabrescent; sepals of mature fruits 20–24 mm long and 7–9 mm wide, perianth tube ca. 1 mm long; sepals chartaceous with evident venation, broadly obovate, not keeled, sparsely hairy at the base, almost glabrous on the wings; petals 4 mm long, free from the calyx, sometimes vestigial or occasionally becoming sepal-like and then to 15 mm long, linear, slightly hairy; staminodes inconspicuous; disk glabrous; achenes 8–10 mm long, three-lobed, smooth, glabrous; stigmas 0.9 mm long, narrowly ovoid. Figs. 2H, 10.

Ruprechtia obovata is known only from the type, collected in Cajamarca (Fig. 8), and is named for its distinctive, broadly obovate sepals. There is no information on the size of *R. obovata*, but it is unlikely to reach more than a few meters in height. It resembles *R. jamesonii* and *R. peruviana* in its hairy, elliptic leaves, but its sepals are shorter (20–24 mm vs. 23–31 mm long), more obovate (7–9 mm vs. 4–7 mm wide), and are scarcely united at the base (perianth tube at least 2 mm long in *R. jamesonii* and *R. peruviana*). *Ruprechtia albida* has slightly smaller and narrower sepals (11–17 mm long × 3–5 mm wide vs. 20–24 mm long × 7–9 mm wide), and glabrous leaves with glaucous undersides (the leaves of *R. obovata* are not glaucous and are densely hairy below). *Ruprechtia aperta* has narrower sepals (16–24 mm long × 3–5 mm wide), which are almost elliptic (broadly obovate in *R. obovata*).

6. Ruprechtia peruviana Pendry, Edinburgh J. Bot. 60: 34. 2003.—TYPE: PERU. Tumbes: Contralmirante Villar Province Casitas, Parque Nacional "Cerros de Amatape," Quebrada del Plátano, 4 May 1990, *Díaz & Peña 4064* (holotype: AAU!; isotype: MO!).

Shrubs or trees to 6 m tall. Bark not seen. Twigs solid, glabrous, appressed-hairy when young; brachyblasts sometimes present. Laminas 3.5–8 cm long, 2–4 cm wide (length:width ratio 1.5–2.4), oblong, elliptic to ovate or obovate, apex obtuse and sometimes abruptly acuminate, base rounded to slightly cordate or rarely cuneate, margin undulate to crenate, sometimes slightly inrolled; midrib flat or slightly prominent adaxially, secondary veins 9–15, prominent abaxially and sometimes slightly sunken adaxially, markedly more prominent than the faint, lax, scalariform tertiary venation; densely, evenly, erect-hairy abaxially on lamina and veins, sparsely hairy adaxially; glands absent; petioles 3–7 mm long, densely hairy; ochreas 0.8–1 mm long, hairy, glabrescent, caducous

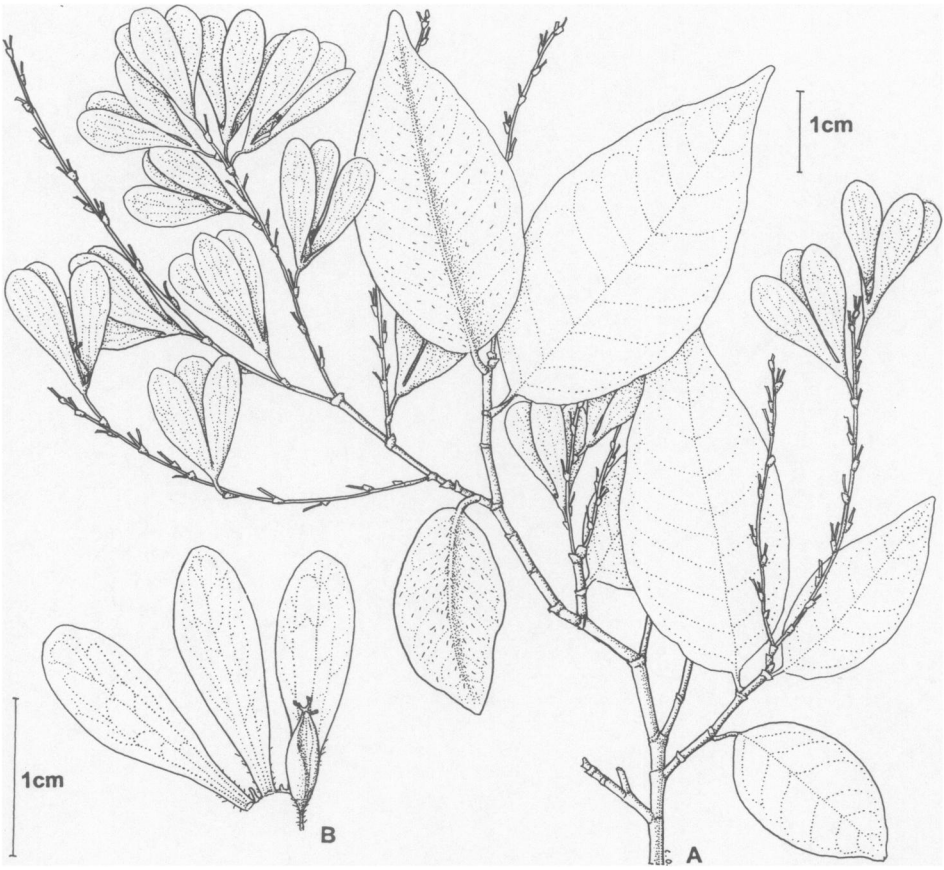

FIG. 10. *Ruprechtia obovata.* A. Fruiting branch. B. Fruit with the sepals opened. (Based on *Sagástegui, Leiva & Lezama 15360.*)

or persistent. Male inflorescences to 5–7 cm long, lax, internodes to 4 mm long, with a dense indumentum of long, erect, wavy hairs; bracts 1.5–2 mm long, densely long appressed-hairy; bracteoles 0.5–1 mm long, densely hairy; pedicels 2–3 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, hairy; flowers wine-red; sepals 2 mm long, elliptic, or obovate and cucullate, hairy; petals 2 mm long, elliptic, hairy; filaments to 2–2.5 mm long; anthers 0.7–0.8 mm long. Female inflorescences to 7–8 cm long, lax, internodes to 5–10 mm long, with a dense indumentum of long, erect, wavy hairs; bracts 1.5–2.5 mm long, densely long appressed-hairy; bracteoles 0.5–1 mm long, densely hairy; pedicels 3–5 mm long, leaving 2 mm long stalks after the flowers have fallen, hairy; perianth purple-red, with a dense indumentum of appressed, silvery hairs abaxially; sepals 8–10 mm long, perianth tube 1–1.5 mm long, free parts of sepals linear to acuminate; petals 2–3.5 mm long, linear, free or scarcely adnate to the calyx, hairy; staminodes 0.5–1 mm long, slender; disk glabrous; ovary 2 mm long, densely hairy at apex; stigmas 0.9–1 mm long, linear. Fruits purple-red; pedicels 3–5 mm long, leaving 2–4 mm long stalks after the fruits have fallen; sepals of mature fruits 28–31 mm long and 6–7 mm wide, perianth tube ca. 2 mm long, sepals chartaceous with evident venation, oblong to obovate,

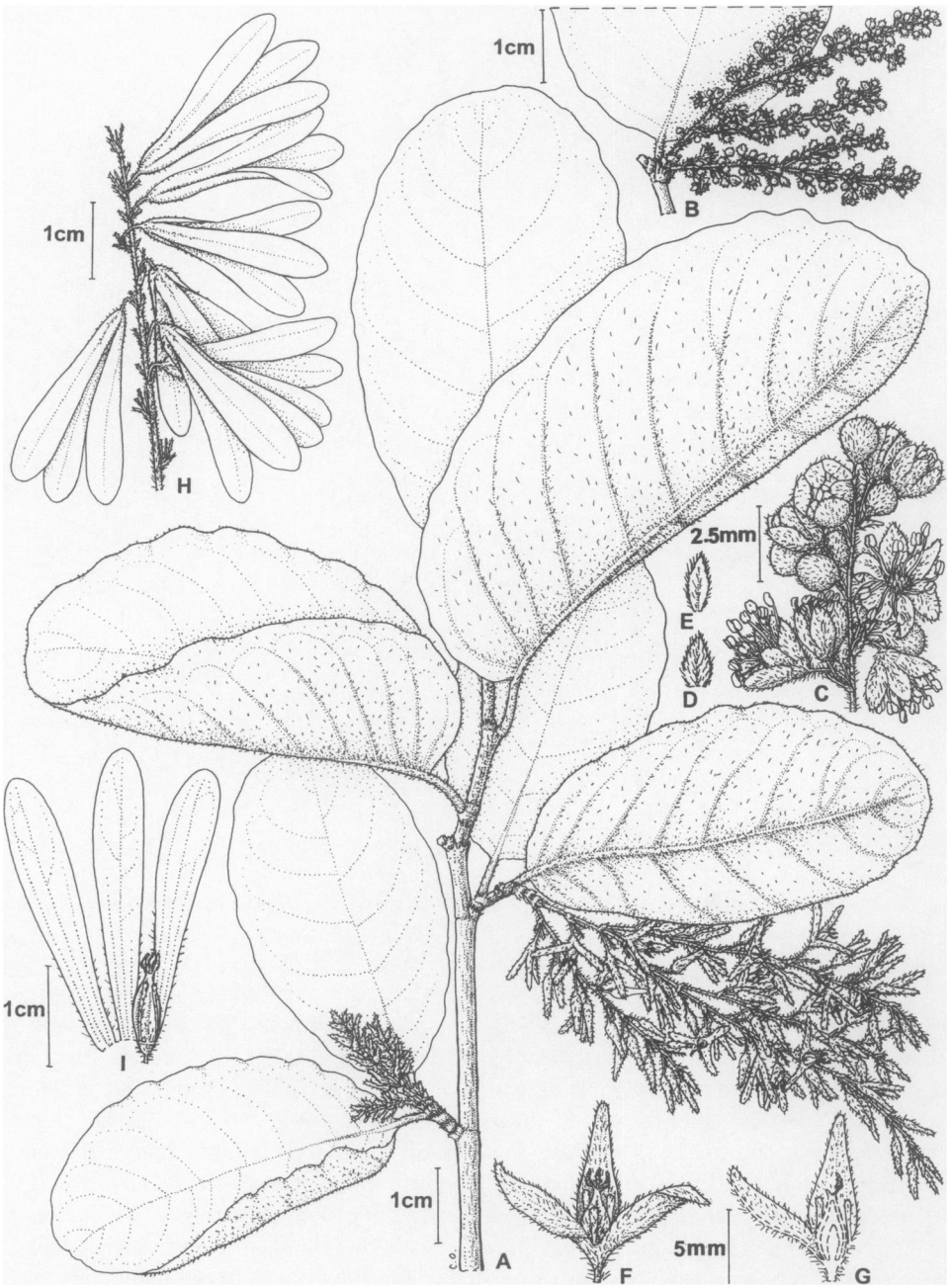

FIG. 11. *Ruprechtia peruviana*. A. Flowering branch of female plant. B. Male inflorescence. C. Male inflorescence (detail). D. Sepal of male flower. E. Petal of male flower. F. Female flower. G. Vertical section of female flower. H. Infructescence. I. Fruit with the sepals opened. (Based on: A, F, G, *Díaz & Peña 4040*; B–E, *Díaz & Peña 4041*; H, I, *Díaz & Peña 4064*.)

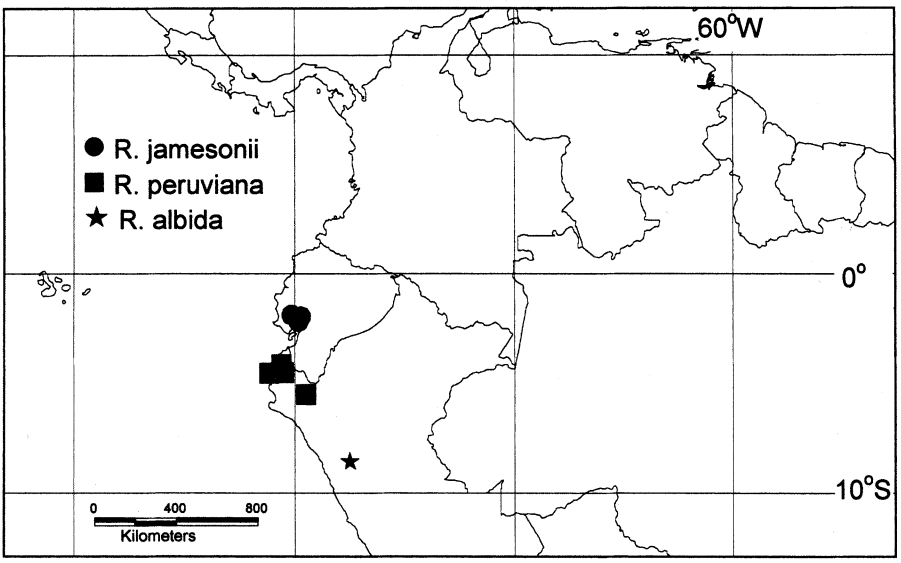

FIG. 12. Distribution of *Ruprechtia albida*, *R. peruviana,* and *R. jamesonii*.

not keeled, hairy at the base, sparsely hairy on the wings; petals 3–4 mm long, free from the calyx, linear or occasionally sepaloid and to 8 mm long; achene 9 mm long, three-lobed, smooth, sparsely hairy. Figs. 2A, 11.

Phenology. Male flowers: May, July; female flowers: May; fruits: April–May, July.

Distribution (Fig. 12). Peru (Piura, Tumbes); coastal dry thickets to premontane moist forest; 0–800 m.

ADDITIONAL SPECIMENS EXAMINED. **Peru.** PIURA: Cerro Vicento, *Haught 131* (BM, GH, NY, US), *131a* (F), *F-29* (F); 24 km E of Olmos, *Hudson 1200* (F); near Ecuador border north of Tumbes, 1926, *Oleson s.n.* (F).—TUMBES: Contralmirante Villar Province Casitas, PN Cerros de Amotape, *Díaz & Peña 4040* (AAU), *Díaz & Peña 4041* (AAU, MO); Cerros de Amotape, Quebrada los Conejos, ca. 25 km SE of Cherralique, 04°09′S, 80°37′W, *Gentry & Díaz 58276* (MO).

Ruprechtia peruviana is most similar to *R. jamesonii*, but differs from it in the sepals of its mature fruits, which are slightly longer (28–31 mm vs. 23–28 mm) with a shorter perianth tube (2 mm vs. 4–5 mm), and which are not constricted about the achene, so that it is clearly visible within the sepals. *Ruprechtia albida*, *R. aperta,* and *R. obovata* all grow in the same region, but are readily distinguished by their shorter sepals (they are to 24 mm long vs. 28 mm or longer), which do not form a perianth tube.

7. Ruprechtia jamesonii Meisner in DC., Prodr. 14: 179. 1856. *Magonia jamesonii* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: ECUADOR. Guayas: banks of the Guaquil [Guayaquil], 1822, *Jameson s.n.* (holotype: E!, fragment of holotype: NY!; isotypes: K! NY!).

Shrubs or trees to 8 m tall. Bark not seen. Twigs solid, appressed-hairy, glabrescent; brachyblasts absent. Laminas 2.5–6 cm long, 1.3–2.5 cm wide (length:width ratio

1.9–2.3), oblong, elliptic or slightly obovate often slightly unequal, apex acute or rarely obtuse, base rounded to cuneate; margin smooth to undulate, midrib slightly raised adaxially, secondary veins 8–11, more prominent abaxially than adaxially, markedly more prominent than the densely reticulate tertiary venation; evenly densely erect-hairy abaxially on lamina and veins, slightly longer and semi-erect on the midrib, evenly appressed-hairy adaxially, slightly denser on midrib and veins; minutely gland-spotted adaxially; petioles 3–5 mm long, densely hairy; ochreas to 2 cm long, hairy, very early caducous and shed completely. Male inflorescences to 2 cm long, dense, internodes to 2 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 1.5 mm long, appressed-hairy; bracteoles 1.5–2 mm long, glabrous to sparsely hairy; pedicels 2.5–3.5 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, hairy; sepals 2 mm long, oblong or obovate, ciliate; petals 2 mm long, oblong or obovate, ciliate; filaments to 3 mm long; anthers 0.5 mm long. Female inflorescences to 1–2 cm long, rather lax and internodes to 2–3 mm long, or inflorescences condensed, with a dense indumentum of short, erect, wavy hairs; bracts 1–2 mm long, sparsely to densely appressed-hairy; bracteoles 2–2.5 mm long, sparsely hairy; pedicels 3–5 mm long, leaving 2–4 mm long stalks after the flowers have fallen, hairy; perianth color unknown, with a dense indumentum of silvery, appressed hairs abaxially; sepals 6 mm long, perianth tube 2 mm long, free parts of sepals linear; petals 1.5 mm long, linear, free or scarcely adnate to the calyx, glabrous; staminodes inconspicuous; disk glabrous; ovary 2 mm long, hairy along the edges; stigmas ovoid, 0.8–1.1 mm long. Fruits pale brown; pedicels 4–7 mm long, leaving 2–4 mm long stalks after the fruits have fallen; sepals of mature fruits 23–28 mm long and 4–6 mm wide, perianth tube 4–5 mm long, sepals chartaceous with evident venation, obovate, not keeled, with erect hairs at the base, sparsely on the wings; petals 4 mm long, free from the calyx, linear or often not developing in fruit; achene 8 mm long, three-lobed, smooth, hairy along the edges in the distal half. Fig. 2K.

Phenology. Fruits: March, July.

Distribution (Fig. 12). Ecuador (Guayas); dry forests and savannas; 0–500 m.

Vernacular name. Náncus (Ecuador).

ADDITIONAL SPECIMENS EXAMINED. **Ecuador.** GUAYAS: near Isidro Ayora, *Asplund 16658* (NY, P); surroundings of Samborondón, 01°57′S, 79°43′W, *Matthewson 129b* (AAU); Guayaquil, in savannis ad fl. Daule, *Spruce 6339* (BM, E, F, K, NY). COUNTRY UNKNOWN: *Ruiz & Pavón 33/98* (F).

Ruprechtia jamesonii is most similar to *R. peruviana*, but differs from it in the shape of its sepals, which are slightly shorter (23–28 mm vs. 28–31 mm) with a longer perianth tube (4–5 mm vs. 2 mm), and which are constricted about the apex of the achene so that it is enclosed by the sepals. *Ruprechtia albida*, *R. aperta,* and *R. obovata* all grow in the same region, but are readily distinguished by their lack of a perianth tube.

The material of *R. jamesonii* includes two sheets of *Glaziou 14218a* at P that are labeled "Nova Friburgo, Brazil." These sheets can be explained as either a remarkable disjunction between Brazil and Ecuador, or as a mistake in the labels. Whilst there are good examples of very large disjuncts for some Neotropical dry forest taxa (Prado & Gibbs 1993; Pennington et al. 2000), no other examples of a SE Brazil-Ecuador pattern have been found. I concur with Brandbyge (1989) that confusion in the labels is the most likely explanation, and that these sheets are in fact duplicates of *Spruce 6339*. Wurdack (1970) noted such erroneous labeling of Glaziou collections in Melastomataceae.

8. Ruprechtia exploraticis Sandwith, Kew Bull. 1928: 143. 1928.—TYPE: BRAZIL. Mato Grosso: Corumbá, 150 m, *Dorrien Smith 45* (lectotype, here designated: K!, photo, Kew negative 4788: K!; isotype: K!, photo, Kew negative 4789: K!).

Trees to 25 m tall. Twigs solid, glabrous, lenticellate, minutely hairy when very young; brachyblasts absent. Laminas 4–11 cm long, 1.5–3.5 cm wide (length:width ratio 2.2–3.9), narrowly oblong or ovate, apex acute, base cuneate to rounded or attenuate, margin undulate sometimes inrolled; midrib flat or prominent adaxially, secondary veins 13–20, prominent abaxially and impressed adaxially, tertiary venation densely reticulate-scalariform, very prominent abaxially; glabrous or with a dense indumentum of minute, erect hairs on lamina and veins abaxially, midrib densely hairy along the sides abaxially, glabrous adaxially; glands absent; petioles 2–6 mm long, glabrous to minutely hairy; ochreas to 0.5 mm long, very early caducous, rarely persistent, glabrous. Male inflorescences to 6 cm long, lax, internodes to 4 mm long, with a dense indumentum of short, wavy hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1 mm long, hairy; pedicels 2–3 mm long, leaving 1.5–3 mm long stalks after the flowers have fallen, hairy; perianth greenish white; sepals 2 mm long, elliptic, cucullate, densely hairy; petals 2 mm long, obovate, slightly cucullate, with a line of grey hairs along the midvein; filaments to 3 mm long; anthers 0.5 mm long. Female inflorescences to 2–5 cm long, lax, internodes to 4–5 mm long, with a short, dense indumentum of erect, wavy hairs; bracts 1 mm long, with short, appressed hairs; bracteoles 1 mm long, hairy; pedicels 1–3 mm long, leaving 1–2.5 mm long stalks after the flowers have fallen, shortly hairy; perianth greenish, with a dense indumentum of silvery appressed hairs abaxially; sepals 5.5–7.5 mm, perianth tube 0.5–1 mm long, free parts of sepals linear to acuminate; petals 2 mm long, adnate to the calyx at their base, elliptic or bristle-like, glabrous or hairy; staminodes inconspicuous; disk sparsely hairy; ovary 2–3 mm long, densely hairy in the distal half; stigmas 0.7–1.0 mm long, narrowly ovoid or linear. Fruits pale brown; pedicels 4–5 mm long, leaving 2–3 mm long stalks after the fruits have fallen; sepals of mature fruits 13–18 mm long and 4–6 mm wide, perianth tube 4–5 mm long, sepals chartaceous with evident venation, obovate, not keeled, with an indumentum of minute erect hairs, especially at the base, wings sparsely hairy; petals 2.5–3 mm long, free from the calyx, elliptic or linear; achene 6–7 mm long, three-lobed, smooth, hairy in the distal half. Fig. 2F.

Phenology. Male flowers: March; female flowers: April; fruits: March, April.

Distribution (Fig. 13). Brazil (Mato Grosso), Paraguay (Alto Paraguay, Concepción); seasonally dry tropical forests and gallery forests; 100–200 m.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** MATO GROSSO: without locality, *Pires & Furtado s.n.* (US); Pantanal, Rio Paragui; Fazenda Acurizal; Plot B, tree 101, 17°52′S, 57°32′W, Jun 1979, *Prance & Schaller s.n.* (NY). **Paraguay.** ALTO PARAGUAY: ad pedem collinarum Tres Mariás, Fuerte Olimpo, *Bernardi 20337* (NY, US), *Bernardi 20337b* (MO, NY).—CHACO: Mayor Pedro Lagrenza, PN Defensores del Chaco, Río Timane, 20°S, 60°45′W, *Schinini & Bordes 15145* (MO).—CONCEPCIÓN: Valle Mi, ad flumen Paraguay, *Bernardi 20463* (MO, NY).

Ruprechtia exploraticis is the only South American species with densely reticulate tertiary venation that is prominent on the abaxial leaf surface, a character also seen in the Mexican species *R. fusca* and *R. standleyana*. It differs from these species in the shorter sepals of its fruit (13–18 mm vs. 23–38 mm long) and the larger number of secondary veins (13–20 vs. 8–15).

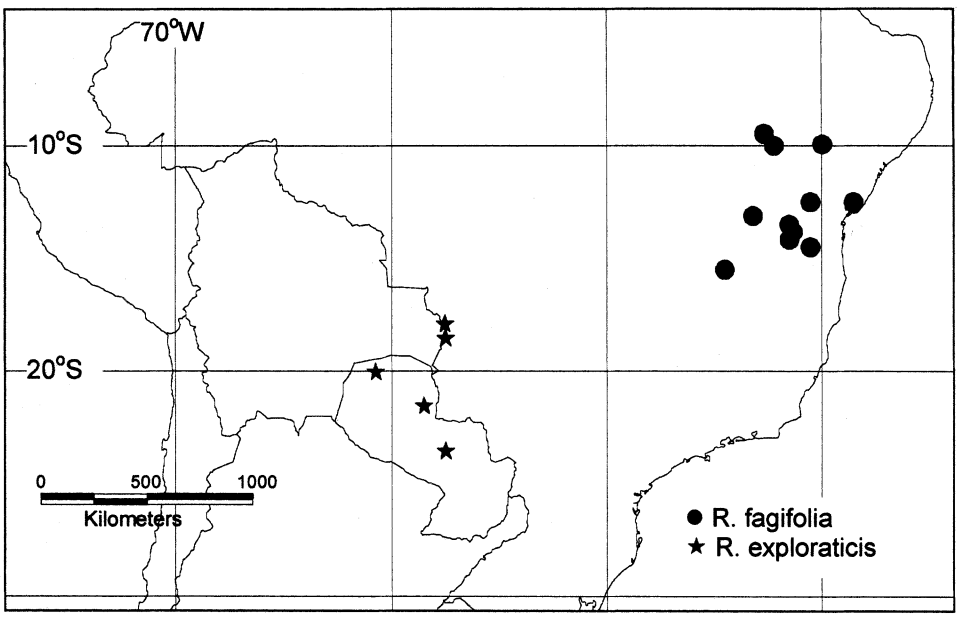

FIG. 13. Distribution of *Ruprechtia fagifolia* and *R. exploraticis.*

9. Ruprechtia fagifolia Meisner in Martius, Fl. bras. 5(1): 58. 1855. *Magonia fagifolia* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Bahia: Igreja Velha, 1841, *Blanchet 3277* (lectotype, here designated: G-DC, photo, Field Museum negative no. 7412: F! GH! NY!; isolectotypes: C! NY! P!, photo of P isotype: AAU!).

Trees to 10 m tall. Bark not seen. Twigs solid, glabrous, sometimes lenticellate; brachyblasts absent. Laminas 3.5–13 cm long, 2.5–7.5 cm wide (length:width ratio 1.4–1.8, rarely to 2.7), broadly oblong, elliptic or obovate or rarely narrowly obovate, apex acute or obtuse, slightly acuminate, base rounded to cuneate or attenuate, margin undulate, sometimes inrolled; midrib flat or rarely slightly prominent adaxially, secondary veins 7–11, more prominent abaxially than adaxially, markedly more prominent than the lax, reticulate tertiary venation; sparsely hairy abaxially on lamina, denser on midrib and veins, glabrous or sparsely hairy adaxially, denser on midrib and veins; glands absent; petioles 2–5 mm long, glabrous to hairy; ochreas 0.5–1 mm long, glabrous or appressed-hairy, persistent. Male inflorescences to 6–9 cm long, lax, internodes to 4–6 mm long, with a short indumentum of erect, wavy hairs; bracts 1–1.5 mm long, with a short indumentum of appressed, wavy hairs; bracteoles 0.5–1 mm long, sparsely hairy; pedicels 2 mm long, leaving 1–1.5 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth cream or pale green; sepals 1.5–2 mm long, broadly elliptic or ovate, sparsely hairy, ciliate; petals 1.5–2 mm long, elliptic, slightly cucullate, sparsely hairy, ciliate; filaments to 2–2.5 mm long; anthers 0.5–0.8 mm long. Female inflorescences to 10–12 cm long, lax, internodes to 8–10 mm long, with a sparse to dense indumentum of erect, wavy hairs; bracts 1–1.5 mm long, with appressed straight or wavy hairs; bracteoles 1 mm long, appressed-hairy; pedicels 2.5–4 mm long, leaving 2 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth green with a dense indumentum

of appressed yellowish hairs abaxially; sepals 6 mm long, perianth tube 1 mm long, free parts of sepals linear; petals 1.5 mm long, adnate to the calyx at the base, bristle-like, glabrous; staminodes inconspicuous, disk sparsely hairy; ovary 2 mm long, hairy along its edges; stigmas 0.6–0.8 mm long, ovoid or linear. Fruits green or pale brown; pedicels 4–7 mm long, leaving 3–5 mm long stalks after the fruits have fallen; sepals of mature fruits 20–23 mm long and 3–5 mm wide, perianth tube 2 mm long, sepals chartaceous with evident venation, obovate, not keeled, with appressed or semi-erect hairs at the base, sparsely hairy on the wings; petals 2–3 mm long, free from the calyx or adnate to 1 mm, bristle-like; achene 6–7 mm long, three-lobed, smooth, hairy along its edges in the distal half. Fig. 2G.

Phenology. Male flowers: January, February; female flowers: January; fruits: January, April, June–August.

Distribution (Fig. 13). Brazil (Bahia, Minas Gerais); seasonally dry tropical forests (caatinga), sandstone areas, on clay and sandy soils; 400–600 m.

Vernacular names. Pau jaú, taipoca (Brazil).

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** BAHIA: Mpio. Bom Jesus da Lapa, 8 km da estrada Lapa–Ibotirama, *Carvalho et al. 1816* (K); Mpio. Brumado, estrada Brumado–Sussuarana Km 20, 14°10′S, 41°29′W, *Coradin et al. 6371* (AAU, K); basin of upper São Francisco River, 32 km from Bom Jesus da Lapa, NE beyond Calderão, 13°07′S, 43°11′W, *Harley et al. 21460* (AAU, K, NY); 10 km S of Livramento do Brumado on road to Brumado, *Lewis & Andrade 1895* (K); Região Cacueira, Mpio. Manoel Vitorino, *Mattos et al. 282* (GH, K, NY); 17 km de Tambari rumo João Amaro-Catinga, *Pereira 9735* (M, NY); Curaca, Fazenda Terra Nova, 09°56′S, 39°57′W, *Pinto & Silva 201/38* (K, NY); Mpio. Ituaca, arredores do Morro de Mangabeira, 13°50′S, 41°19′W, *Queiroz 1619* (NY); Barrinha, *Rose & Russell 19798* (NY); Mpio. Juazeiro, N end of Serra da Jacobina at Flamenga, 11 km S of Barrinha (ca. 52 km N of Senhor do Bonfim) at Fazenda Pasto Bom, 10°00′S, 42°12′W, *Thomas et al. 9637* (AAU, NY); Mpio. Juazeiro, N end of Serra da Jacobina at Flamenga, 11 km S of Barrinha (ca. 52 km N of Senhor do Bonfim) at Fazenda Pasto Bom, 10°00′S, 42°12′W, *Thomas et al. 9638* (AAU, NY).—MINAS GERAIS: 10 km W of Januaria, 15°30′S, 44°30′W, *Ratter 3238* (E).

The range of *Ruprechtia fagifolia* overlaps with that of *R. laxiflora*, which has open, spathulate sepals and a three-angled achene, in contrast to the united, obovate sepals and three-lobed achene of *R. fagifolia*. In its leaves and fruits *R. fagifolia* bears a strong initial resemblance to the Bolivian species *R. apetala*. The ITS study shows that *R. apetala* and *R. fagifolia* are not closely related, and *R. fagifolia* can be distinguished by its shorter petioles (2–5 mm vs. 4–8 mm), ochreas (0.5–1 mm vs. 1–3 mm), and perianth tube of the fruit (2 mm vs. 3–4 mm); also, petals are absent or vestigial in *R. apetala*.

10. Ruprechtia laxiflora Meisner in Martius, Fl. bras. 5(1): 56. 1855. *Magonia laxiflora* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Bahia: Jacobina, 1841, *Blanchet 3304* (lectotype, here designated: G-DC, photo, Field Museum negative no. 7415: F! GH! MO! NY!; isolectotypes: G! P! U!).

Ruprechtia polystachya Grisebach, Abh. Königl. Ges. Wiss. Göttingen 24: 89. 1879. *Magonia polystachya* (Grisebach) Kuntze, Revis. gen. pl. 2: 553. 1891. *Triplaris polystachya* (Grisebach) Kuntze, Revis. gen. pl. 3(2): 271. 1898.—TYPE: ARGENTINA. Salta: Wälder um Orán und San Lorenzo, Oct 1873, *Lorentz & Hieronymus 363* (holotype: GOET!).

Ruprechtia viraru Grisebach, Abh. Königl. Ges. Wiss. Göttingen 24: 90. 1879. *Magonia viraru* (Grisebach) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: URUGUAY. Entre Ríos: Concepción del Uruguay, 8 Nov 1875, *Lorentz 224* (holotype: GOET!).

Enneatypus nordenskjoeldii Herzog, Meded. Rijks-Herb. 46: 4. 1922.—TYPE: BOLIVIA. Tarija: Trockenwald zwischen Embarcación u. Miraflores (Río Bermejo), Oct 1910, *Herzog 1019* (holotype: L!).

Shrub or small tree, occasionally reaching 30 m tall. Bark smooth or flaking. Twigs solid, glabrous, lenticellate, occasionally shortly hairy when young; brachyblasts absent. Laminas 2.5–7.5 cm long, 1–3 cm wide (length:width ratio 2.5–4.0), narrowly elliptic or ovate, apex acute to acuminate, base cuneate to rounded, margin smooth to slightly undulate, sometimes slightly inrolled; midrib prominent adaxially, secondary veins 8–14, almost equally prominent adaxially and abaxially and scarcely more prominent than the dense, faint, reticulate tertiary venation, glabrous, glands absent; petioles 2–4 mm long, glabrous or minutely hairy; ochreas ca. 0.5 mm long, persistent, glabrous. Male inflorescences to 7 cm long, lax, internodes to 5 mm long, glabrous or with a short, dense indumentum of erect, wavy hairs; bracts 0.5–1.5 mm long, glabrous or very sparsely hairy; bracteoles ca. 1 mm long, glabrous to sparsely hairy; pedicels to 2.5 mm long, leaving stalks to 2.0 mm long after the flowers have fallen, glabrous; perianth white; sepals 1.5–2.0 mm long, obovate, glabrous or with a ciliate margin, petals 1.5–2 mm long, obovate, glabrous or with a ciliate margin; filaments to 2.5 mm long; anthers 1.0 mm long. Female inflorescences to 5 cm long, lax, internodes to 6 mm long, glabrous or with a short, dense indumentum of erect, wavy hairs; bracts 1–2 mm long, glabrous or very sparsely hairy; bracteoles 0.5–1.5 mm long, glabrous to sparsely hairy; pedicels to 3 mm long leaving stalks to 1.5 mm long after the flowers have fallen, glabrous; perianth white, glabrous or very sparsely minutely hairy; sepals to 5 mm long, linear, spreading and not forming a tube; petals vestigial, to 0.5 mm long, free from the calyx, glabrous; staminodes absent; disk glabrous to sparsely hairy; ovary 1.0–1.5 mm long, glabrous; stigmas 0.5–0.7 mm long, linear. Fruits yellow-orange, pale brown, or reddish, pedicels to 7 mm long leaving stalks to 3 mm long after the fruits have fallen; sepals of mature fruits 14–24 mm long and 2.5–5 mm wide, diverging from the base so that the petal and achene are clearly visible within, sepals chartaceous with evident venation, spathulate, not keeled, glabrous; petals absent, or to 2 mm long, linear, or very rarely appearing sepaloid and to 7 mm long, free from the calyx; achene 7–8 mm long, three-angled, smooth, glabrous. Fig. 2D.

Phenology. Male flowers: September–November; female flowers: September–November; fruits: January, October, November.

Distribution (Fig. 14). Argentina (Chaco, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta, Tucumán), Bolivia (Chuquisaca), Brazil (Bahia, Minas Gerais, Paraiba, Paraná, Pernambuco, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, São Paulo), Paraguay (Alto Paraná, Caazapá, Central, Concepción, Cordillera, Guaira, Itapuá, Misiones, Neembucú, Paraguarí, Presidente Hayes, San Pedro), Uruguay (Paysandú, Rivera); dry forests, woodlands, or thickets and dry thorny forest (chaco), occasionally in moist forest, on hilltops, slopes, on river banks, and in seasonally inundated forests, in forest interiors, at their margins, and on alluvial, sand or clay soils, and soils over limestone; 50–1300 m.

Vernacular names. Ibirápyta-I, ivirá piutá, marmalero, viraró (Argentina); canchim (Brazil); urupai-pita, yvirá piu guazú (Paraguay); virarú (Uruguay).

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** BAHIA: 5 km al S de Ichu, camino a Tanquinho, 11°48′S, 39°09′W, *Arbo et al. 7259* (NY); entre Paulo Afonso e Jermoabo, *Bautista 450* (K); without locality, *Blanchet 3272* (K, MO, NY); 20 km E of Cameleão on the Itiuba–Cancanção road, 10°40′S, 39°33′W, *Harley et al. 16469*

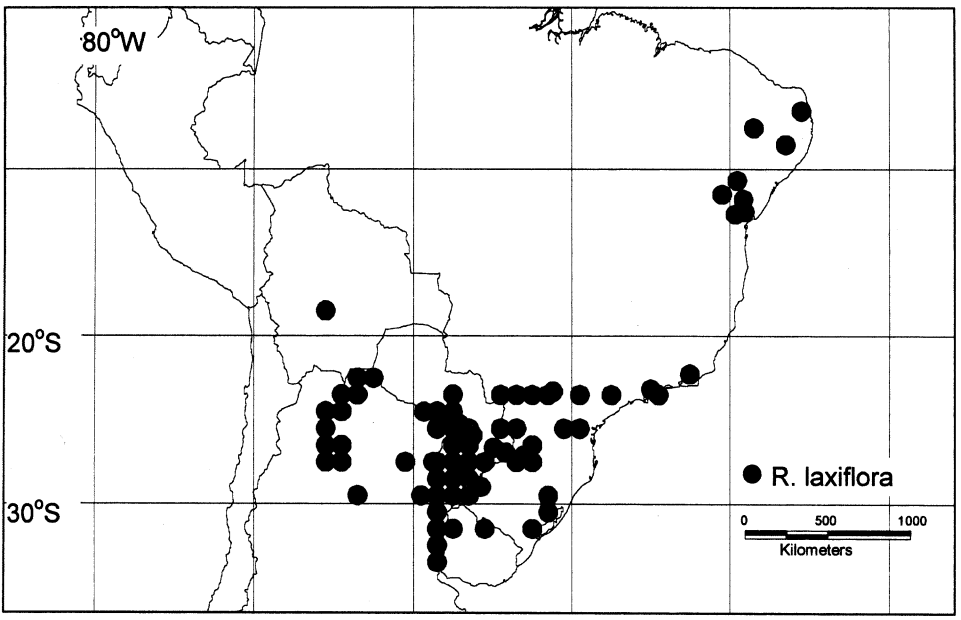

FIG. 14. Distribution of *Ruprechtia laxiflora*.

(K, M, MO, NY, P); 20 km E of Cameleão on the Itiuba–Cancanção road, 10°40′S, 039°33′W, *Harley et al. 16472* (GH, K, NY, P); Mpio. Feira de Santana, Serra do São José, Fazenda Boa Vista, 12°42′S, 39°40′W, *Queiroz et al. 3068* (NY); Pôrto Castro Alves, Cachoeira/Bahia–Vale dos Riós, Paraguacu/Jacuipe, 12°32′S, 39°05′W, *do Cavalo 1012* (NY); trecho superior do Río de Jacuipe, Cachoeira/Bahia–Vale dos Riós, Paraguacu/Jacuipe, 12°32′S, 39°05′W, *do Cavalo 1087* (NY).—MINAS GERAIS: without locality, *Glaziou 19759* (K); Caldas, *Regnell III 1029* (F, GH, K, M, P, U).—PARAIBA: margem de rio, região de Agreste, Remegio, *Coelho de Moraes 2022* (NY, P), *2033* (GH, K).—PARANÁ: Londrina, *Chagas & Silva 1389* (F); Ribeirão Grande (Campina Grande Sul), *Hatschbach 17883* (NY); Mpio. Icaraima, Rio Paraná, Barra do Rio Ivai, *Hatschbach & Haas 15803* (AAU, F, NY); mouth of Rio Ivai, *Hatschbach et al. 4329* (K, NY, U); Mpio. Maringa, Orto Florestal, *Hatschbach et al. 12948* (F, NY, P); FR S of Rio Ivai, 30 km E of Cianorte, *Lindeman & de Haas 752* (U); Fazenda Lagoa, S of Rio Ivai, 15 km E of São Tome, *Lindeman & de Haas 951* (U); N of Brandalize, sawmill near Rio Chopim, 20 km N of Clevelandia, *Lindeman & de Haas 1270* (U); vicinity of Pôrto Byington, *Lindeman & de Haas 1716* (U); 8 km N of Tomazina, Ribeirão Barra-mansa, *Lindeman & de Haas 3146* (F, GH, K, NY, U); Foz do Iguaçú, *Lindeman & de Haas 3301* (U); PN do Iguaçú, 2 km W of road to Capanema, S of Jardinopolis, *Lindeman & de Haas 3387* (U); PN do Iguaçú, Rio Floriano, *Lindeman & de Haas 3554* (U); Mpio. Quedas do Iguaçú, Barra do Rio Perdido, Fazenda ADM, *Silva Soares Maschio 2078* (NY); Mpio. Londrina, Parque Estadual Mata dos Godoy, 23°18′S, 51°11′W, *Silveira 372* (NY).—PERNAMBUCO: Garanhuns, *Andrade Lima 67-5093* (F); Triunfo, *Andrade Lima 70–5793* (F).—RIO GRANDE DO SUL: Mpio. São Jeronimo, Polo Carboquimico, *Abruzzi 719* (F); Pôrto Alegre, Balneario Ipanema, *Emrich 1158* (MO); entrada de Uruguaiana Quarai Mirim, *Girardi & Irgang 22097* (F); São Jeronimo, *Hagelund 13689*, *13732* (F); S. Leopoldo, *Henz 35531* (MO, NY); São Leopoldo, *Leite 2352* (GH), *2353* (GH, NY); Pelotas, *Malme 476* (GH); Itapuá, Viamao, *Sobral 3140* (F); polo petroquimico, Montenegro, *Ungaretti 778* (F); condo do Pôrto Alegre, São Borja, 28°59′S, 55°44′W, *Zachia 107* (MO).—RIO DE JANEIRO: environs de Rio Janeiro, *Glaziou 14218* (F, K, MO); Rio, *Glaziou 19760* (K); Rio de Janeiro, Mpio. Nova Friburgo, Reserva Ecologica Municipal de Macae de Cima, Sitio Sophronites, *de Lima 3804* (K).—SANTA CATARINA: Rio Uruguay, Jun 1911, *Dusén s.n.* (NY); Mpio. São Carlos, Agua da Prata, W of São Carlos, 27°06′S, 53°02′W, *Smith & Klein 13111* (F); Mpio. Itapiranga, Rio Uruguai, W of ferry landing, *Smith & Klein 13133* (K, NY, P).—SÃO PAULO: Cunha, Reserva Florestal, 23°10′S, 45°00′W, *Custodio 544* (MO); Campo Largo, *Hoehne & Gehrt 36776* (GH); Reserva Florestal, Estadual de Cunha, *Kubitzki 81–4* (NY).—STATE UNKNOWN: 1936, *Anon s.n.* (F); *Riedel s.n.* (NY). **Bolivia.** CHUQUISACA: Oropeza, Hda. Charobamba, *Murguia & Múñoz 181* (AAU). **Paraguay.** ALTO PARANÁ: in

regione fluminis, *Fiebrig 5397* (BM, E, GH, K).—CAAZAPA: Dist. Yuty, 15 km S de Capatindy, *Arbo et al. 2827* (F, GH, K).—CENTRAL: Jardín Botánico y Zoológico, Trinidad, Asunción, Reserva Natural, 25°20′S, 57°28′W, *Pérez 296* (MO), *943* (AAU), *1231* (AAU), *1391* (AAU); Jardín Botaníco, Asunción, *Teague 150* (BM); Tavarory, 2.5 km from administration on direction to Arroyo Abai, 25°30′S, 57°30′W, *Zardini & Tilleria 29439* (AAU).—CONCEPCIÓN: prope Concepción, *Hassler 7467* (BM, GH, K, NY, P), *7467a* (GH, K, MO, NY).—CORDILLERA: Cordillera de Altos, *Fiebrig 211* (K), *Fiebrig 211a* (BM, E, F, GH), *Fiebrig 211b* (E, GH, K, M, MO, P), *Fiebrig 360* (E, F, GH), *Fiebrig 361* (BM, E, K, M), *Hassler 773* (K, NY, P), *Hassler 774* (K, NY, P); Valenzuela, arroyo Ihaca guazu, *Schwarz 11273* (NY); Meseta Ybytu Silla, Serranía de Tobati, 25°12′S, 57°07′W, *Zardini 8270* (MO); Cerro Tobati, *Zardini & Degen 3494*, *3648* (MO); 1 km E of Nueva Colombia on road to Atyara, 25°10′S, 57°13′W, *Zardini & Velázquez 20863* (MO).—GUAIRA: Villarrica, *Balansa 2053* (BM, K, P), *2053a* (K), *2058* (K, P, US), *Jorgensen 3731* (F, MO, NY), *3732* (F, K, MO, NY, US), *9731* (F), *Soejarto & Bordas 5669* (F, K); Tororo, Cerro Acati, 25°55′S, 56°15′W, *Soria 2626* (MO).—ITAPUA: inter Itapuapoty et Catupyry, *Bernardi 18584* (AAU, BM, F, MO, U); Reserva Salto Tambey, 26°38′S, 54°57′W, *Brunner 1304* (MO).—MISIONES: Santiago, Estancia "La Soledad," *Pedersen 4350* (GH, MO, NY, P).—NEEMBUCÚ: ad septentrionem Salto del Guaira, Cordillera Mbaracayu, *Bernardi 18270* (AAU, BM, F, K, MO, U); in nemore ripario Río Paraguay, Curupayty, Humaita, *Bernardi 18478* (AAU, BM, U).—PARAGUARÍ: per viam de Ybicui ad La Colmena, *Bernardi 18106* (AAU, BM, F, K, MO, NY, U); Cerro San José, haud procul a civitate Ybicui, *Bernardi 18145* (AAU, BM, F, K, MO, NY, U); Cerro Acahay, 25°54′S, 57°09′W, *Brunner 1267* (MO); La Rosada, near entrance to Ybycui NP, 26°S, 56°50′W, *Gentry et al. 51914* (MO, NY); Cordillera de Altos between Paraguarí and Escobar–Cerro Sto. Tomás, *Soejarto & Bordas 5689* (F, K); Quiindy, *Sosa 93* (MO); Cerro Hu, *Sparre & Vervoorst 541* (MO); Cerro Mbatovi, 25°25′S, 57°07′W, *Zardini 5474* (MO).—PRESIDENTE HAYES: cuenca de Río Pilcomayo, Fortín Gral. Delgado, 24°31′S, 59°19′W, *Brunner 1370* (MO); Chacoi, 25°12′S, 57°38′W, *Schinini 26777* (MO), *26778* (F, MO).—SAN PEDRO: Primavera, Alto Paraguay, *Woolston 1127* (K, NY, U); Depto. San Pedro, Primavera, *Woolston 1143* (K, NY, U, US).—DEPARTMENT UNKNOWN: Oct 1987, *Andeor s.n.* (NY); Guarapi, *Balansa 3276* (BM, K, P), *Balansa 4600* (P), *Hassler 1114* (BM, K, NY, P); in regione lacus Ypacaray, *Hassler 12289* (BM, E, F, GH, K, MO, NY, US), *12289a* (BM, E, F, K, MO, NY); *Hassler s.n.* (NY); a Paraná Rva., Tatii Yupi, *Itaipu Binacional 873* (MO); San Bernardino, *Teague 198*, *199* (BM). **Argentina.** CHACO, *Jorgensen 1999* (GH, MO); 5 km W of Puerto Antequera, Río Paraná, *Kramer et al. 10761* (U); Bermejo, Isla del Cerrito, *Krapovickas et al. 20050* (F, P); Fontana (Ensenada), *Meyer 2814* (GH); Enrique Urien, *Schulz 790* (F, K, NY); Colonia Benítez, *Schulz 10210* (F).—CORRIENTES: Depto. Capital, Molina Punta, barrancas del Río Paraná, *Anzotegui & Schinini 300* (AAU); Depto. Ituzaingo, esteros del Iberá, Laguna Isipo, 27°52′S, 56°49′W, *Arbo 1446* (F); Depto. San Luis del Palmar, Ea. Garabató, 18 km SE de S.L. d. P. y 3 km S de ruta 5, *Cristóbal 1401* (AAU); Depto. San Luis del Palmar, Ea. Garabató, 18 km SE de S.L. d.P. y 3 km S de ruta 5, *Cristóbal 1402* (AAU); vicinity of Goya, *Curran 306* (BM, F, GH, NY); 27°30′00″S, 058°45′W, *Gentry et al. 59478* (MO); Depto. Capital, ripera del Paraná, *Hunziker 5858* (NY); Depto. San Luis del Palmar, Estación Herlitzka, *Ibarrola 3328* (BM, F, K); Depto. San Luis del Palmar, Cerrudo Cue, *Ibarrola 3426* (F, K); Depto. General Paz, Lomas Vallejos, *Ibarrola 3486* (BM, K, NY); Depto. General Paz, Lomas Vallejos–Rincón de Vences, *Ibarrola 3571* (F, K); Depto. Capital, Vivac prefectura, *Krapovickas & Cristóbal 12651* (K); Depto. San Cosme, Paso de la Patria, *Krapovickas & Cristóbal 15598* (MO); Depto. San Martín, Tres Cerros, Cerro Capara, *Krapovickas & Cristóbal 29059* (MO); Depto Santo Tomé, Establecimiento Las Marías, R.N 14, 7 km S de Gdor. Virasoro, *Krapovickas et al. 16804* (MO, P); San Cosme, Ensenada Grande, Ruta 12, *Krapovickas et al. 19991* (F); San Cosme, Ensenada Grande, Ruta 12, *Krapovickas et al. 20007* (NY, P); Depto. San Cosme, 6.5 km E de Paso de la Patria, orillas del Río Paraná, *Krapovickas & Schinini 41914* (GH, K); Depto. Capital, Riachule, *Maidana 117* (AAU); Depto. Capital, Riachule, *Maidana 118* (AAU); La Cruz, *Parodi 12511* (GH); Estancia "Santa Teresa," *Pedersen 169* (K, NY, P, U); Depto. Mburucuya, Estancia "Santa María," *Pedersen 1214* (GH, K, MO, P, U); Depto. Concepción, Carambola, *Pedersen 9846* (GH, K, MO, NY, P); Depto. Empedrado, Estancia "La Yela," *Pedersen 13413* (GH, NY); Depto. Ituzaingo, Isla Apipe, Pto. Vizcaino, *Schinini 13757* (F); Paso Mula, 18 km N de Sauce, Ayo. Barrancas y ruta 23, *Schinini et al. 21670* (F); Depto. San Luis del Palmar, entre el Pontón y San Cayetano, *Schinini & Cristóbal 13715* (F); Depto. Ituzaingo, Isla Apipe Chico, *Schinini & Vanni 15467* (MO); Depto. Mburucuya, Estancia "Sta. Ana," *Schwarz 96* (GH, NY); Depto. Mburucuya, Establecimiento "La Yerba," *Schwarz 176* (NY); Depto. General Paz, Arroyo Santa Isabela, *Schwarz 8265* (NY); Depto. Mercedes, Reserva Natural Prov. Ibera, Paso Picada, costa W de la Laguna Ibera, *Tressens et al. 4344* (NY); Depto. Saladas, Ruta 17 y margen derecha del Río Santa Lucia, *Tressens et al. 2171* (K).—ENTRE RÍOS: Gualeguaychú, *Burkart 4259* (NY); Federación, Salto Grande, *Burkart & Gamerro 21707* (NY); costa del Río Uruguay en Nueva Escocia, *Cordini 40* (F); Concepción, *Lorentz 635* (F, GH, M, MO, NY), *Lorentz s.n.* (GH, K, K); Depto. Gualeguaychú, Gualeguaychú, *Meyer 10278* (AAU).—FORMOSA: Depto. Pilcomayo, Ruta 11 al km 101, *Morel 4281* (NY); Depto. Pilcomayo, SW a 12 km de Filipina (Est. Salaberry),

Morel 8929 (NY); Pilaga, *Pierotti 4168* (AAU).—JUJUY: Capital, entre Las Lajitas y Caraunco, *Cabrera et al. 31032* (F); San Lorenzo, *Hieronymus & Lorentz 374* (F, MO); Depto. Ledesma, camino de Fraile Pintado a El Aibal, *Kiesling et al. 8161* (NY); S of San Pedro, *Renvoice 3528* (K, P, U); San Pedro, El Tucmado, *Venturi 5084* (GH); Depto. Ledesma, Sierra de Calilegua, *Venturi 5373* (F, GH, MO); Depto. Ledesma, Sierra de Calilegua, *Venturi 9680* (BM, F, GH, K, MO, NY).—MISIONES: Picazu-rembiu, *Anon. 8532* (GH); Depto. L.N. Alem, Ruta 14, entre C. Azul and S. José, *Marunak 202* (F, GH); Sta. Ana, *Rodríguez 4* (K); Salto Iguazú, *Rodríguez 435* (GH, U); Depto. San Ignacio, Santo Pipo, *Schwarz 5104* (NY); Depto. Guaraní, Predio Guaraní, 26°55′S, 54°12′W, *Tressens et al. 4600* (MO).—SALTA: Orán; 10 km SE of San Pedrico, *Eyerdam & Beetle 22694* (GH, K, MO); Orán, 10 km S of Volcán, Río Tarija, Bolivia-Argentine border, *Eyerdam & Beetle 22818* (GH, K); Orán, en los alrededores de la ciudad de Orán, *Hieronymus & Lorentz 33* (F, GH, K, NY); Orán, Nov 1877, *Lorentz s.n.* (K); camino a P. Verde,. PN El Rey, *Malmierca 1689* (NY); Santa Victoria, Lipoo, proximo al río, *Marmel et al. 8687* (GH); Orán, Montealto, *Rodrigues 1124* (NY); Orán, El Cedral, *Rodríguez 1019* (F); Depto. Candelaria, Sierra de la Candelaria, *Venturi 9584* (BM, GH, K, MO, NY); Guachipas, *Venturi 10023* (BM, GH, MO, NY).—SANTA FE: Reconquista, FCSF, *Burkart 5775* (F); Reconquista, *Parodi 11163* (F); Depto. Gral. Obligado, 17 Oct 1999, *Prado s.n.* (E).—TUCUMÁN: Quinta, Miguel Lillo, *Castillón 2170* (GH); Depto. Trancas, Cerritos de Tapia pasando Cadillal, *Legname 4177* (GH, K); Villa Nougues, *Lillo 2218* (F); Capital, *Lillo 2324* (GH); Capital, Calle las Piechas, *Lillo 8543* (GH); Capital, *Lillo 2324* (GH), *10463* (MO), *10644* (U), *10645* (F, U), Nov 1910, *Lillo s.n.* (U); Capital, Jardín del Instituto Lillo, *Lourteig 35381* (GH); Capital, Instituto Lillo, *Meyer 12824* (NY); Burruyacu, El Sauce, *Peirano 35382* (GH, MO, NY); Cerro de San Javier, *Schreiter 1054* (GH, U); Barranca de la Toria, *Schreiter 1820* (U); Río Salé, *Schreiter 2205* (F, U); Burruyacu, Río de la Calera, *Schreiter 5946* (MO); Chicligasta, El Porterillo, *Schreiter 35380* (GH, M, NY, U); Leales, *Venturi 599* (GH, NY); Depto. Burruyacu, Río Calera, *Venturi 1393* (GH, US); Depto. Capital, Río Salé, *Venturi 2111* (F, K, MO); Depto. Capital, *Villa Carengo 3645* (K); 21 km N of Tucumán, *de Haas 939* (U); 21 km N of Tucumán, *de Haas 943* (U).—PROVINCE UNKNOWN: *Jorgensen 418* (GH, MO, P). **Uruguay.** PAYSANDU: *Osten 19911* (US).—RIVERA: Cunapiru, 1928, *Wright s.n.* (BM).

Ruprechtia laxiflora is a widespread, common species with a distinctive fruit morphology similar to that of *R. paranensis*, which is the only other species of *Ruprechtia* with a three-angled rather than three-lobed achene and divergent, free sepals that do not enclose the achene. *Ruprechtia paranensis* has larger fruits (sepals 30–36 mm vs. 14–24 mm long), and its leaves have secondary venation that is more prominent on the abaxial surface than the tertiary venation, unlike in *R. laxiflora* in which the secondary and tertiary venation are almost equally prominent on both surfaces. Furthermore, the leaves of *R. paranensis* are sometimes hairy on the abaxial surface, whilst in *R. laxiflora* they are always glabrous. The other South American species with chartaceous sepals that do not form a perianth tube enclosing the achene are *R. albida*, *R. aperta,* and *R. obovata* from Peru. They have three-lobed achenes, and in addition can be distinguished as follows: the leaves of *R. albida* have glaucous undersides; the sepals of *R. aperta* are not spathulate, as in *R. laxiflora*, but obovate and almost elliptic; and *R. obovata* has broadly obovate sepals, which are hairy abaxially.

11. Ruprechtia paranensis Pendry, Edinburgh J. Bot. 60: 26. 2003.—TYPE: BRAZIL. Paraná: Patrimonio, 900 m, 13 Mar 1915, *Dusén 16810* (holotype: MO!; isotype: GH!).

Shrub or tree to 27 m tall. Bark not seen. Twigs solid, with an indumentum of erect, wavy hairs and appressed straight hairs; brachyblasts absent. Laminas 4–9 cm long, 1.7–3.6 cm wide (length:width ratio 1.8–2.9), elliptic or ovate, apex acuminate, base rounded to cuneate or attenuate, margin slightly undulate, sometimes inrolled; midrib prominent adaxially; secondary veins 11–14, almost flat adaxially, prominent abaxially and only slightly more prominent than the dense, reticulate tertiary venation; glabrous or hairy abaxially, particularly along the sides of the midrib at the base, hairy only at the base

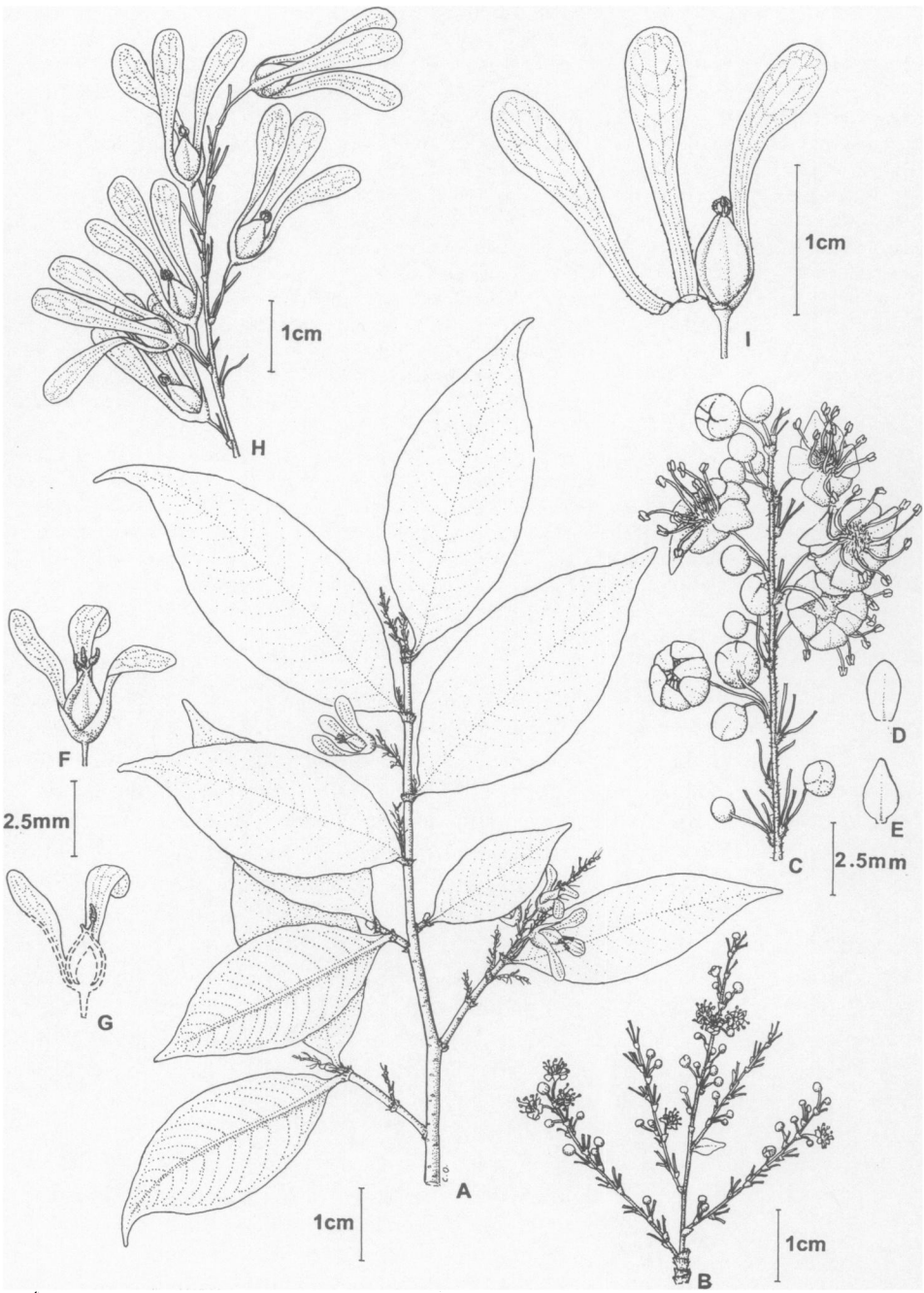

FIG. 15. *Ruprechtia paranensis*. A. Flowering branch with female inflorescences. B. Male inflorescence. C. Male inflorescence (detail). D. Sepal of male flower. E. Petal of male flower. F. Female flower. G. Vertical section of female flower. H. Infructescence. I. Fruit with the sepals opened. (Based on: A, *Hatschbach 28606*; B–E, *Hatschbach 13161*; F, G, *Hatschbach 13164*; H, I, *Dusén 16810*.)

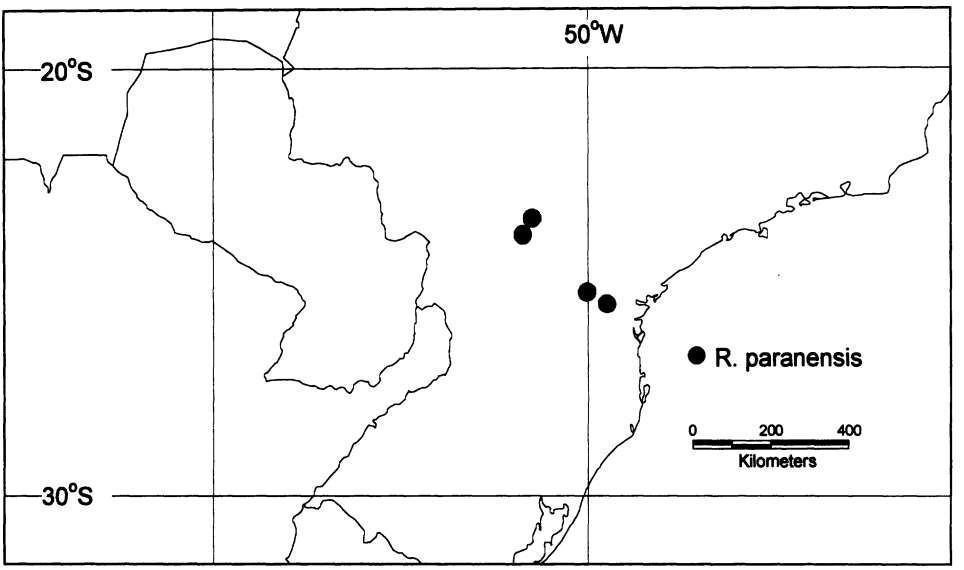

FIG. 16. Distribution of *Ruprechtia paranensis*.

of the midrib adaxially; glands absent; petioles 2–4 mm long, hairy; ochreas 0.5–2 mm long, glabrous or hairy, persistent or caducous. Male inflorescences to 7 cm long, rather lax, internodes to 5 mm long, with a spreading yellowish indumentum; bracts to 1.5 mm long, hairy; bracteoles to 1 mm long, sparsely hairy; pedicels 3–4 mm long leaving 2–3 mm long stalks after the flowers have fallen, glabrous; perianth whitish; sepals ca. 2 mm long, broadly ovate, glabrous with a ciliate margin; petals ca. 2 mm long, obovate, glabrous with a ciliate margin; filaments to 2.5 mm long, anthers 0.7 mm long. Female inflorescences to 5 cm long, lax, internodes to 7 mm long, glabrous or with a spreading yellowish indumentum; bracts 1.0–1.5 mm long, sparsely hairy; bracteoles ca. 1 mm long, glabrous to sparsely hairy; pedicels to 4 mm long, leaving remains 1–2 mm long after the flowers have fallen, glabrous; perianth color unknown, glabrous; sepals 6 mm long, perianth tube 1 mm long, free parts of sepals oblong to slightly obovate; petals absent; staminodes absent; disk glabrous; ovary 3 mm long, glabrous; stigmas 0.5–0.7 mm long, oblong to triangular. Fruits pale brown, pedicels to 9 mm long, leaving 2–5 mm long stalks after the fruits have fallen; sepals of mature fruits 30–36 mm long and 7–8 mm wide, diverging from the base so that the achene is clearly visible within, sepals chartaceous with evident venation, spathulate, not keeled, glabrous or very sparsely hairy; petals absent; achene ca. 10 mm long, three-angled, smooth, glabrous. Figs. 2E, 15.

Phenology. Male flowers: November; female flowers: November–December; fruits: January, March.

Distribution (Fig. 16). Brazil (Paraná, Santa Catarina); moist forest, collected at least once from forest on sandstone; 500–900 m.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** PARANÁ: Londrina, *Chagas & Silva 1455* (F); 1914–16 *Dusén s.n.* (MO); Rio Pardinho, Campina Gde. do Sul, *Hatschbach 13161* (F, GH, MO); Rio Pardinho, Campina Gde. do Sul, *Hatschbach 13164* (AAU, F, MO, NY); Mpio. Cuaratuba, Col. Limeira, *Hatschbach 28606* (C, NY, US); Mpio. Ponta Grossa, Vila Velha, 25°13′S, 50°02′W, *Smith & Klein 14909* (GH, MO, NY, P).—SANTA CATARINA: Morro do Baú, Ilhota, *Reitz & Klein 17013* (US).

Ruprechtia paranensis is similar to *R. laxiflora* with its three-angled achene and spathulate sepals, which do not enclose the achene, but it is easily distinguished by its larger fruits (sepals 30–36 mm vs. 14–24 mm long). Sterile and male specimens may be difficult to identify, but the secondary venation is more prominent on the lower surfaces of the leaves in *R. paranensis*, whilst it is almost equally prominent on both surfaces in *R. laxiflora*. *Ruprechtia laxiflora* always has glabrous leaves, but *R. paranensis* sometimes has leaves with hairy lower surfaces. *Ruprechtia albida*, *R. aperta,* and *R. obovata* from Peru are the other South American species in which the calyx does not enclose the achene, but they all have very much shorter sepals (up to 24 mm long).

12. Ruprechtia fusca Fernald, Proc. Amer. Acad. Arts. 33: 86. 1897.—TYPE: MEXICO. Guerrero: Acapulco, Feb 1895, *Palmer 511* (holotype: GH!; isotypes: A! BM! F! MO! NY! US!).

Ruprechtia pringlei Greenman, Proc. Amer. Acad. Arts. 33: 476. 1898.—TYPE: MEXICO. Oaxaca: Cañón Tomellín, 3000 ft, 7 Dec 1895, *Pringle 7008* (holotype: GH!; isotype: US!).

Ruprechtia occidentalis Standley, Proc. Biol. Soc. Wash. 33: 66. 1920.—TYPE: MEXICO. Sinaloa: San Blas, 29 Mar 1910, *Rose, Standley & Russell 13630* (holotype: US!; isotypes: F! GH! P!).

Ruprechtia macrosepala Standley, Contr. U.S. Natl. Herb. 23: 249. 1922.—TYPE: MEXICO. Sinaloa: Mpio. Mazatlán, Varal, Oct 1919, *Dehesa 1598* (holotype: US!; isotype: K!).

Tree to 10 m tall. Bark grey, flaking. Twigs solid, glabrous; brachyblasts absent. Laminas 3–15 cm long, 1–9 cm wide, rarely 20 cm long and 12 cm wide (length:width ratio 1.7–3), ovate, elliptic, or oblong to obovate, occasionally asymmetric, apex acute to acuminate, base cuneate to rounded, margin entire, crenate or undulate, often inrolled; midrib prominent adaxially, secondary veins 8–12, more prominent abaxially than adaxially, and sometimes sunken adaxially, tertiary venation densely reticulate to scalariform, very prominent abaxially, and sometimes sunken adaxially; almost glabrous adaxially, sparsely to densely pubescent abaxially, especially on midrib and veins; glands absent; petioles 2–6 mm long, glabrous to minutely hairy; ochreas 1–2 mm long, glabrous to appressed-hairy, generally caducous, but sometimes persistent. Male inflorescences to 7 cm long, rather lax, internodes to 4 mm long, with an indumentum of short, erect hairs; bracts 1–1.5 mm long, hairy; bracteoles 1–1.5 mm long, hairy; pedicels 1.5–2.5 mm long, leaving 1–2.5 mm long stalks after the flowers have fallen, hairy; perianth white, yellow, or green; sepals 1.5 mm long, obovate, glabrous or sparsely hairy; petals 1.5 mm long, obovate, glabrous; filaments to 3 mm long; anthers 1 mm long. Female inflorescences to 7 cm long, lax, internodes to 5 mm long, with an indumentum of very short, erect hairs; bracts 0.5–1.0 mm long, hairy; bracteoles 1 mm long, sparsely hairy; pedicels 2.5 mm long, leaving 1.5 mm long stalks after the flowers have fallen, hairy; perianth yellow-green, with a dense indumentum of appressed silvery hairs abaxially; sepals 5–6 mm, perianth tube 1 mm long, free parts of sepals linear; petals ca. 2 mm long, scarcely adnate to the calyx, elliptic, hairy; staminodes inconspicuous; disk glabrous or sparsely hairy; ovary 3–4 mm long, densely hairy; stigmas to 1.2 mm long, linear. Fruits greenish to pinkish red; pedicels 4–5 mm long, leaving 2–4 mm long stalks after the fruits have fallen; sepals of mature fruits 23–30 mm long and 4 (rarely 6) mm wide, perianth tube 2–4 mm long, sepals chartaceous with evident venation, obovate, not keeled, with a sparse indumentum of appressed to semi-erect hairs at base,

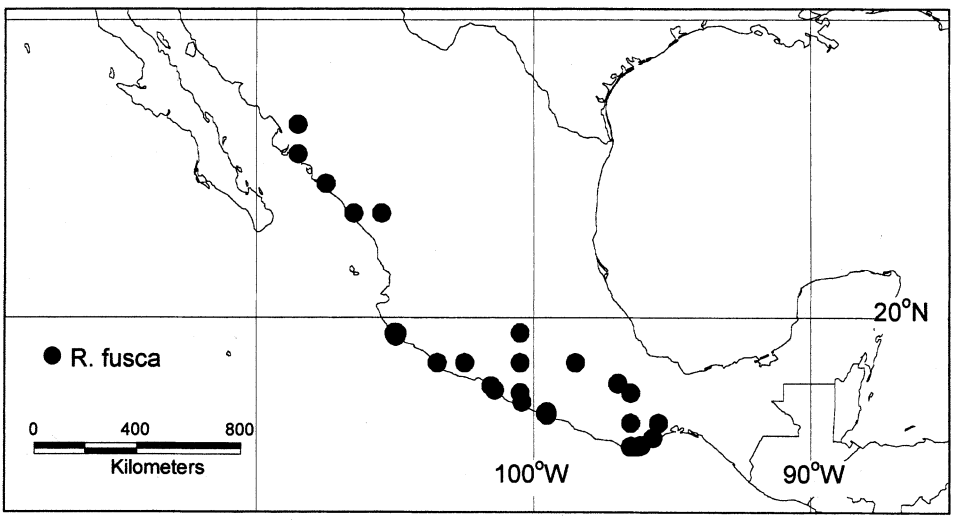

FIG. 17. Distribution of *Ruprechtia fusca*.

sparsely hairy on the wings; petals 5–7 mm long, free from the calyx, elliptic; achene 9–12 mm long, three-lobed, smooth, glabrous or hairy at the apex. Fig. 2U.

Phenology. Male flowers: August–January; female flowers: January, September–November; fruits: May–June, October–February.

Distribution (Fig. 17). Mexico (Colima, Guerrero, Jalisco, México, Michoacán, Oaxaca, Sinaloa); seasonally dry tropical forests and thickets (selva baja caducifolia, selva mediana subcaducifolia, selva mediana subperennifolia), gallery forests; 0–1500 m.

Vernacular names. Caña asada, chachalaco, guayabillo, palo colorado, palo prieto mulato, sangre de toro (Mexico).

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** COLIMA: Oeste Río Tuxpán, cerca Sabana Crescentia, *Miranda 9085* (MEXU).—GUERRERO: Mpio. Petatlán, microondas, orilla de la laguna San Valentín, *Diego 5546* (MEXU); Mpio. José Azueta, sobre el camino a Cd. Altamirano, desviación a la Vainilla, 17°43′40″N, 101°33′15″W, *Gual 513* (MEXU); Dist. Mina, Placares, *Hinton 9126* (K, NY); Dist. Mina, Anonas, *Hinton 10053* (K); Dist. Galeana, Atoyac, *Hinton 10988* (BM, K, NY); Mpio. Atoyac de Alvarez, El Camalote (E de la curvinada), Laguna de Mitla, *Lozada 772* (MEXU); along bank of Papagayo River, Km 421 on hwy, near El Treinta, *Lundell & Lundell 12594* (MEXU, MO, NY, US); Huamuxtitlán, en el camino Tlapa–Tecomatlán, *Martínez 2890* (K).—JALISCO: Chamela, Estación de Biología, *Bullock 1260* (GH, MEXU); Chamela, Sendero El Tejón, 19°30′N, 105°03′W, *Gentry 74412* (MO); La Huerta, Estación de Biología Chamela, *Guadalupe Ayala 997* (K); Mpio. La Huerta, 4 km SE de la entrada a Chamela Estación, carr. Puerto Vallarta–B. de Navidad, *Lott 630* (AAU, MEXU, MO); La Huerta, Estación de Biología Chamela, *Lott 747* (AAU, GH); Chamela, Vereda Chachalaca, 19°30′N, 105°03′W, *Lott 1587* (GH, MEXU); Rancho Cuixmala, Las Caballerizas, SW facing hills at foot of Cerro La Alborada, 19°23′N, 104°59′W, *Lott 3937* (F, K, MO); Estación de Biología Chamela, La Huerta, camino antiguo cerca a la Vereda Chachalaca, *Lott & Butterwick 1504* (GH, MEXU); La Huerta, Chamela, *Magallanes 3139* (GH, MEXU); Chamela, *Magallanes 921* (AAU); Mpio. La Huerta, Arroyo Chamela, *Pendry 868* (E, MEXU); Mpio. La Huerta, Estación Biol. Chamela, *Pérez 805* (F, NY); Chamela, *Pérez 1673* (AAU).—MÉXICO: Balderrama, Dist. Temascaltepec, *Hinton 7110* (BM, F, K, MEXU, NY, U, US).—MICHOACÁN: Mpio. Arteaga, 82 km S de Nueva Italia sobre la carretera a Playa Azul, *Koch & Fryxell 77460* (F, NY).—OAXACA: Mpio. Huatulco, zona urbana de desarrollo turístico de Huatulco, 15°45′30″N, 096°06′30″W, *Castillo 9169* (MEXU); Mpio. Huatulco, camino de terracería a barra de boca vieja, bajos de Coyula, 15°04′00″N, 096°18′20″W, *Castillo 9215* (MEXU); Mpio. Huatulco, al N de Santa Cruz, 15°44′40″N, 096°08′10″W, *Castillo 9241* (MEXU); Mpio. Huatulco, al NE de playa de Cacaluta, 15°45′N, 096°10′W,

Castillo 9355 (MEXU); Cuicatlán, de Cuyamecalio a Santa Ana, *Conzatti 2320* (MEXU); 71.4 mi NW of Salina Cruz on Hwy 200, *Fryxell & Lott 3400* (MEXU, NY); Mpio. Cuicatlán, 9 km al NE de Cuicatlán rumbo a Concepción Papalo, *González et al. 1613* (MO); Mpio. Huatulco, Barra de Copalita, Bahía de Huatulco, *Illescas 29* (MEXU); Dist. Tehuantepec, Ejido Aguascalientes, entrado por Rincón Bamba, al W de Salina Cruz, Mpio. Salina Cruz, *Martínez 357* (MEXU, NY); Mpio. Santiago Astata, Dist. Tehuantepec, Santa María Huamelula, Km 80 de la carretera costera, 16°00′N, 95°42′W, *Martínez 1231* (NY); Dist. Santa María Huatulco, Piedra de Moros, 15°48′N, 096°15′W, *Pendry 814* (E, MEXU); Dist. Tehuantepec, Mpio. Santiago Astata, E of Santa María Huamelula, 16°00′N, 095°42′W, *Pendry 823* (E, MEXU); Mpio. San Pedro Huamelula, W side of valley of Río Ayutla, 5 km N of Hwy 200, *Pendry 835* (E, MEXU); Cuicatlán, brecha a Concepción Papalo, Dist. Cuicatlán, *Salinas 7074* (K); 2 km S de entrada a Bahía de Sta. Cruz, la desviación esta 14.4 SE de el Arenal, *Torres et al. 2277* (F).—SINALOA: Mpio. Sinaloa de Leyva, cañada de enfrente de mina las rastras al NE del Limón, *Bojorquez 405* (MEXU); Culiacán and vicinity, Cerro Prieta, *Gentry 7106* (F, GH, NY, US); Mpio. Rosario, Cacalotán, El Habal, *González 923* (MEXU); Mpio. Concordia, paraje El Rincón, 4 km al NE de la población El Huajote, *Guizar 2700, 2733* MEXU); Mpio. El Rosario, 3 km al N de la población El Rosario, margen izquierda del Río Baluarte, camino a Cacalotán, 23°00′N, 105°00′W, *Guizar 3294* (MEXU); Mpio. Concordia, communidad de Malpica, Loma del Toro, *Guizar 3349* (MEXU); San Blas, *Jones 22977* (F, GH, NY); Sur Culiacán, *Miranda 8964, 8973* (MEXU); Matzatlán, *Ortega 6487* (GH, US); Mpio. Culiacán, Baila, Estación Abuya, *Ortega 6565* (GH, US); Ymala, *Palmer 1710* (F, GH, P, U, US); Culiacán, *Palmer 1780* (GH, US), *1782* (GH, MO, P, U, US).—STATE UNKNOWN: 1841–43, *Liebmann s.n.* (F).

Ruprechtia fusca is characterized by its reticulate tertiary venation, which is prominent on the lower surface of the leaves. In this character it could be confused with *R. standleyana*, but in *R. standleyana* the achene is rugose and densely hairy, with sepals to 38 mm long (vs. 23–30 mm long) with a denser indumentum of semi-erect hairs at the base. The female flowers of *R. fusca* are rather sparsely hairy, and the hairs less erect than in *R. standleyana,* and the perianth tube is shorter (1 mm vs. 3–5 mm). Likewise, the male flowers and inflorescences have a sparser indumentum of shorter and more appressed hairs than in *R. standleyana*.

The collections from Sinaloa had been segregated as *R. occidentalis* on the basis of their narrower leaves (length:width ratio to 3.5) and the shorter calyx of the fruits, but I have not maintained the distinction. Similarly, collections from northern Oaxaca and southern Puebla have been separated as *R. pringlei* on the basis of their pubescent lower leaf surfaces and less distinct, more scalariform tertiary venation, but again I do not feel that these differences merit recognition of a distinct species.

ITS sequences were obtained from four collections of *R. fusca* (Figs. 3, 4), three from Oaxaca and one from Jalisco. The sequences from the Oaxacan specimens were found to be identical to each other, and differing from the Jaliscan sequence by 5 base pairs, indicating some geographical isolation between these populations. It would be interesting to examine the range of genetic diversity in *R. fusca,* since all of the individuals sampled represent "typical" *R. fusca* and not the variants segregated as *R. occidentalis* or *R. pringlei*.

13. Ruprechtia standleyana Cocucci, Kurtziana 1: 249. 1961.—TYPE: MEXICO. Guerrero: Temixco, Feb 1927, *Reko 5091* (holotype: US!).

Tree to 10 m tall. Bark grey, flaking in irregular plates. Twigs solid, with a dense indumentum of appressed or erect hairs when young; brachyblasts absent. Laminas 5–16 cm long, 2.2–8.5 cm wide (length:width ratio 1.9–2.5), elliptic or oblong to obovate, sometimes asymmetric, apex acute to acuminate or obtuse, base cuneate to rounded, margin entire to crenate, often inrolled; midrib prominent adaxially; secondary veins 8–15, more prominent abaxially than adaxially, and sometimes impressed adaxially; tertiary venation dense, very prominent abaxially and sometimes impressed adaxially, scalariform to

reticulate; glabrous adaxially, almost glabrous to pubescent abaxially, especially on midrib and veins; glands absent; petioles 2–4 mm long, appressed to erect-hairy; ochreas 1–3 mm long, appressed-hairy, generally caducous, but sometimes persistent. Male inflorescences to 4 cm long, dense, with internodes to 4 mm long and a dense indumentum of long, erect, reddish, yellow or silvery hairs; bracts 1.5 mm long, densely hairy; bracteoles 1.5 mm long, densely hairy: pedicels to 4 mm long, leaving 2–3 mm stalks long after the flowers have fallen, hairy; perianth white or greenish red, sepals 2 mm long, obovate, hairy outside at least at base; petals 2 mm long, obovate, glabrous to densely hairy; filaments to 3 mm long, anthers 0.9–1.2 mm long. Female inflorescences to 5 cm long, dense, internodes to 2–3 mm long, with a dense indumentum of long, erect hairs; bracts 1–2 mm long, densely hairy; bracteoles 1–1.5 mm long, hairy; pedicels 3–5 mm long, leaving 2–3 mm long stalks after the flowers have fallen, hairy; perianth red with a dense indumentum of erect reddish or silvery hairs abaxially; sepals 6–9 mm long, perianth tube 3–5 mm long, free parts of sepals linear; petals 4–5 mm long, free from the calyx, linear, hairy; staminodes inconspicuous; disk densely hairy; ovary 3–6 mm long, densely hairy; stigmas to 1.2 mm long, linear to triangular. Fruits red or brown, pedicels 3–5 mm long, leaving 3–4 mm long stalks after the fruits have fallen; sepals of mature fruits 30–38 mm long, 5–10 mm wide, perianth tube 5–8 mm long, sepals chartaceous with evident venation, obovate, not keeled, dense indumentum of erect hairs at base, more sparsely hairy on the wings; petals 8–12 mm long, free from the calyx, linear; achene ca. 13 mm long, three-lobed, rugose, usually densely hairy. Fig. 2M.

Phenology. Male flowers: November–January, March–April; female flowers: December–February; fruits: December–March, August.

Distribution (Fig. 18). Mexico (Guerrero, México, Michoacán, Morelos, Oaxaca); seasonally dry tropical forests (selva baja caducifolia), river banks; 500–1300 m.

Vernacular names. Guayabillo, sangre de toro (Mexico).

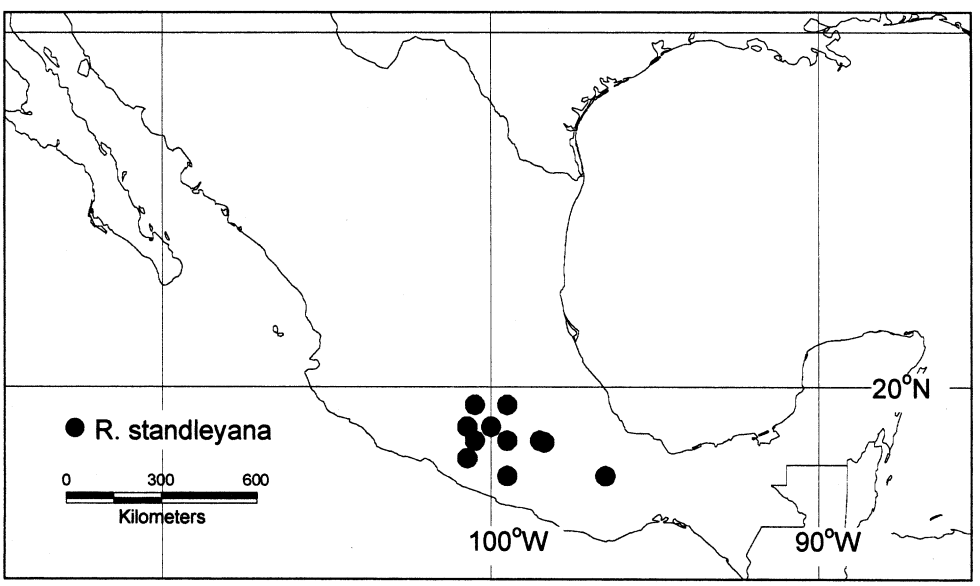

FIG. 18. Distribution of *Ruprechtia standleyana*.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** GUERRERO: Temixco, *Reko 5043* (GH, K); Achotla, *Reko 5054* (GH, NY, US), *5114* (GH, K, US).—MÉXICO: Platanal, Temascaltepec, *Hinton 3346* (BM, K, NY); Bejucos, Temascaltepec, *Hinton 3386* (GH, K); Pungarancho, Dist. Temascaltepec, *Hinton 3746* (K); Limones, Dist. Temascaltepec, *Hinton 5376* (BM, K); Bejucos, Temascaltepec, *Hinton 5382* (GH, K); Claera, Dist. Temascaltepec, *Hinton 5386* (BM, GH, K, MO, NY); Pungarancho, Dist. Temascaltepec, *Hinton 7403* (K, NY, P); al N de Bejucos, sobre la Ladera, S de Nanchitla, *Zepeda 457* (MEXU); Rivera del Dio el Salto, S de Nanchitla, *Zepeda 477* (MEXU).—MICHOACÁN: 7 km N de Tiquicheo, *Chiang & González Medrano 497* (MEXU), *512* (F); 8 km al N de Tiquecheo, rumbo a Tuzantla, *Chiang & González Medrano 513* (MEXU); 6 km al SE de Tuzantla, *Medrano 4128* (MEXU); 3 1/2 km al NW de La Meza, Tuzantla, *Medrano 5119* (MEXU); Mpio. Coyuca de Catalán, loc. 4 km al S de la desviación a Placeres del Oro, carr. Altamirano-Zihuantenejo, *Soto Núñez 11421* (MEXU).—MORELOS: area recreativa del Parque Nacional "El Tepozteco," *Estrada 1541* (MEXU); Mpio. Tlaquiltenango 10 mi SE of Jojutla, camino Valle de Vázquez–Quilamula, 0.5–1 mi NE of Valle de Vázquez, *Liston 618-1* (MO, NY); Fraccionamiento Pedregal de las Fuentes, *Miranda 9331* (MEXU); Mpio. Jojutla de Juárez, Cerro del Higuerón, *Rivera 95* (MEXU); Yautepec, orilla del río, *Vázquez 2138* (MEXU).—OAXACA: Oaxaca–Puebla road, *Smith & Mora 3217* (F, GH).—PUEBLA: along Hwy 190 between Oaxaca and Izúcar de Matamoros, NW of Tehuitzingo, 11 mi NW of Río Atoyac, 10.8 mi SE of turnoff for Hwy 140 to Cuautla and Cuernavaca, *Croat & Hannon 65729* (MEXU); Torres de Microondas (2 km arriba), 12 km al NO de Acatlán, *Medina 658* (MEXU); W side of Mex Hwy 190, 15 mi NW of Acatlán, *Reznicek & Gregory 354* (NY); 20 km al NW de Acatlán, sobre la carretera a Izúcar de Matamoros, *Rzedowski 34517* (MEXU); carretera Huajapan de Léon–Izucar de Matamoros, cerca de El Pitayo, *Zarate 484* (MEXU).

Ruprechtia standleyana is unlikely to be confused with any species apart from *R. fusca*. Both species have prominent reticulate tertiary venation on the underside of the leaves, a character also found in *R. exploraticis* from Brazil and Paraguay. *Ruprechtia standleyana* is characterized by large, rugose, hairy achenes with red sepals to 38 mm in fruit, and the dense indumentum of semi-erect hairs at the base of the sepals. The female flowers are more densely hairy, and with hairs that are more erect than those of *R. fusca*, and the perianth tube is longer (3–5 mm vs. 1 mm). Likewise, male flowers and inflorescences have a denser indumentum of longer and more erect hairs than in *R. fusca*.

14. Ruprechtia laevigata Pendry, sp. nov.—TYPE: MEXICO. Oaxaca: Dist. Juchitán, desviación a Cazadero camino a San Dionicio del Mar, 25 Nov 1981, *Cedillo 571* (holotype: MEXU!; isotype: NY!).

Ruprechtia fructibus R. fuscae Fernald affinis sed foliis glabris sine venatione tertiaria propria ab ea recedens.

Shrub or tree to 8 m tall. Twigs solid, glabrous, slightly lenticellate; brachyblasts rarely present. Laminas 5–13 cm long, 2.2–4 cm wide (length:width ratio 2.3–4.0), elliptic or oblong to obovate, apex acute to acuminate, base cuneate to attenuate, margin smooth or undulate, occasionally inrolled; midrib prominent adaxially, secondary veins 10–15, more prominent abaxially than adaxially, and markedly more prominent than the faint or prominent, lax, reticulate-scalariform tertiary venation; glabrous adaxially, generally glabrous abaxially, but sometimes densely set with short hairs along the sides of the midrib, and occasionally with hairs on the lamina; glands present or absent; petioles 2–3 mm long, glabrous; ochreas 1–2 mm long, caducous, glabrous. Male inflorescences to 4 cm long, rather lax, internodes to 3 mm long, with a short sparse to dense indumentum of silvery, curved hairs; bracts 0.5–1.5 mm long, appressed-hairy; bracteoles 1.0–1.5 mm long, sparsely hairy, ciliate; pedicels 2.0–2.5 mm long, leaving 1.5–2.0 mm long stalks after the flowers have fallen, sparsely hairy; perianth pale green or yellow-green; sepals 1.5–2.0 mm long, obovate, glabrous and ciliate; petals 1.5–2.0 mm long, obovate, glabrous, ciliate; filaments 2.0–2.5 mm long; anthers 0.7 mm long. Female inflorescences

to 6 cm, rather lax, internodes to 3 mm long or dense and with internodes to 1.5 mm, with a short indumentum of erect silvery hairs; bracts 1.0–1.5 mm long, with a short, sparse to dense indumentum; bracteoles 1–1.5 mm long, sparsely hairy; pedicels 3–4 mm long, leaving 1.5–2.5 mm long stalks after the flowers have fallen, hairy; perianth color unknown, with a dense indumentum of silvery hairs abaxially; sepals 5–8 mm, perianth tube 1.5–2 mm long, free parts of sepals linear; petals 2 mm long, free from the calyx, linear, glabrous or slightly ciliate; staminodes inconspicuous; disk glabrous or sparsely hairy; ovary ca. 3–4 mm long, hairy in the distal half; stigmas 0.6–0.8 mm long, ovoid or linear. Fruits pale brown, yellow, or green; pedicels 4–6 mm long, leaving 2–3 mm long stalks after the fruits have fallen; sepals of mature fruits 20–30 mm long and 2–6 mm wide, perianth tube 3–4 mm long, sepals chartaceous with evident venation, obovate or oblong, not keeled, almost glabrous to densely appressed-hairy at the base, sparsely hairy on the wings; petals 4 mm long, free from the calyx, linear; achene 8–10 mm long, three-lobed, smooth, glabrous or very sparsely hairy in the distal half. Figs. 2L, 19.

Phenology. Male flowers: September–November; female flowers: September–November; fruits: November–February.

Distribution (Fig. 20). Mexico (Oaxaca, Veracruz); seasonally dry tropical forests (selva baja caducifolia, selva baja espinosa caducifolia), recorded from deciduous forest on limestone; 0–700 m.

Vernacular name. Juan de lado (Mexico).

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** OAXACA: hills E of Tehuantepec, *Alexander 115* (GH, NY, US); E de Salina Cruz, *Blanco 10* (MEXU); Mpio. Huatulco, 5 km al NW de la Bahía de Santa Cruz, 15°44′40″N, 096°08′10″W, *Castillo 9266* (MEXU); Mpio. Huatulco, 3 km al NW de Santa Cruz, 15°44′40″N, 096°08′30″W, *Castillo 9419* (MEXU); Mpio. Huatulco, Playa de San Agustín, 15°41′50″N, 96°13′50″W, *Castillo 9626* (MEXU); 10 km carretera La Ventosa a Acayucan, *Chavelas ES-4809* (MEXU); San José del Chilar, 4 km de la desviación a Tomellín, Cañón de Tomellín, *Delgado et al. 562* (F, NY); Cerro Guiengola, NW of Tehuantepec on trail to ruins, 19°23′N, 105°00′W, *Fryxell & Lott 3381* (NY); Mpio. Santa María Huatulco, Barra de Copalita, Bahía de Huatulco, *Illescas 56* (MEXU); Dist. Tehuantepec, Santa Cruz Hidalgo, Mpio. Salina Cruz, *Martínez 223* (F, MO), *228* (F); valley of Cuicatlán, *Nelson 1699* (F, US); Mpio. Santa María Huatulco, Bahía de Huatulco, Playa de Cacaluta, 15°43′N, 96°09′W, *Pendry 843* (E, MEXU); Mpio. Santa María Huatulco, Bahía de Huatulco, Playa de Cacaluta, 15°43′N, 96°09′W, *Pendry 848* (E, MEXU); Dist. Juchitán, Mpio. Asunción, bosque ripario hacia el "Agua Tibia," a 500 m en linea recta al N de Nizanda, 16°40′02″N, 95°00′35″W, *Peréz-Garcia 1357* (MEXU); Dist. Teotitlán, 3 km al ENE de Teotitlán del Camino, carretera a Huautla, *Sousa et al. 8068* (MO); Dist. Tehuantepec, laderas W del Cerro Guiengola, 16°21′N 95°19′W, *Torres 480* (E, MEXU); Dist. Tehuantepec, ruinas de Cerro Guiengola, 16°21′N 95°19′W, *Torres 527* (E, MEXU); Dist. Tehuantepec, 1 km al N de Laollaga carretera a Guevea de Humboldt; Mpio. Ixtepec, *Torres 9084* (F, MO); 10.8 km al NE de la Venta, carretera Tapachula–Tehuantepec, Distr. Juchitán, *Torres & Cedillo 1516* (F); Dist. Tehuantepec, Rincón Bamba, 14 km W de Salina Cruz, *Torres et al. 4338* (F, MEXU, NY); Mpio. San Mateo del Mar, Huazantlán, Cerro de Huilotopec, *Zizumbo & Colunga 404*, *487*, *523* (MEXU).—VERACRUZ: Mpio. Actopan, *Dorantes 1412* (F).

Ruprechtia laevigata is most similar to *R. fusca* but lacks the densely prominent venation on the underside of its leaf, which is characteristic of *R. fusca*. It is therefore named "laevigata" for the comparatively smooth appearance of its leaves. It differs from the other Mexican and Central American species of *Ruprechtia* as follows. *Ruprechtia standleyana* has densely prominent tertiary venation similar to that of *R. fusca*. The secondary veins of *R. pallida* are almost equally prominent adaxially and abaxially, so that the upper and lower leaf surfaces appear rather similar; the sepals are scarcely united in the fruit, and the achene is clearly visible within (vs. perianth tube 3–4 mm and the sepals completely enclosing the achene). Similarly, *R. nicaraguensis* has fruits with sepals that are scarcely united and the

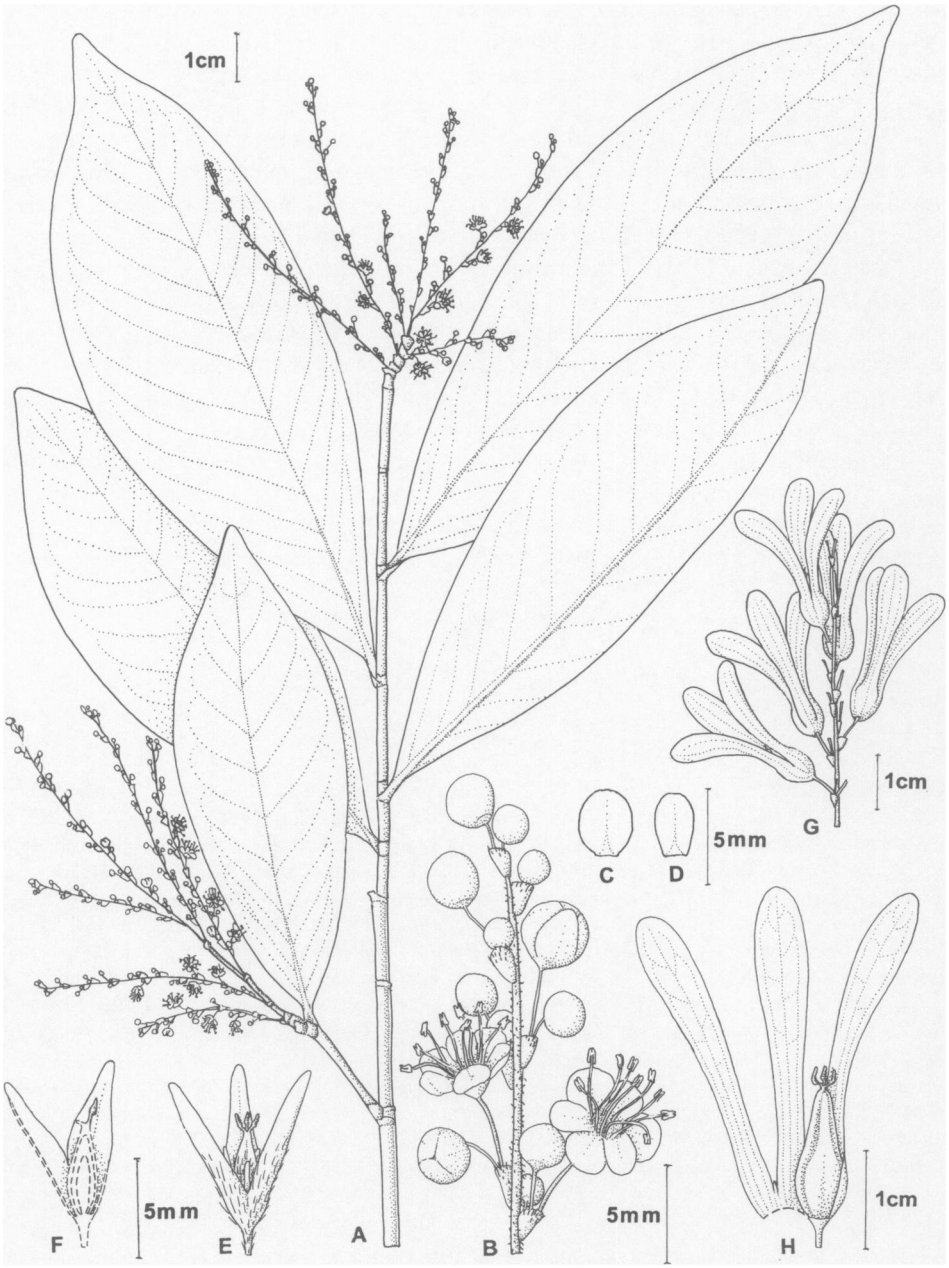

FIG. 19. *Ruprechtia laevigata*. A. Flowering branch. B. Male inflorescence. C. Sepal of male flower. D. Petal of male flower. E. Female flower. F. Vertical section of female flower. G. Infructescence. H. Fruit with the sepals opened. (Based on: A–D, *Torres 480*; E, F, *Torres 1516*; G, H, *Cedillo 571*.)

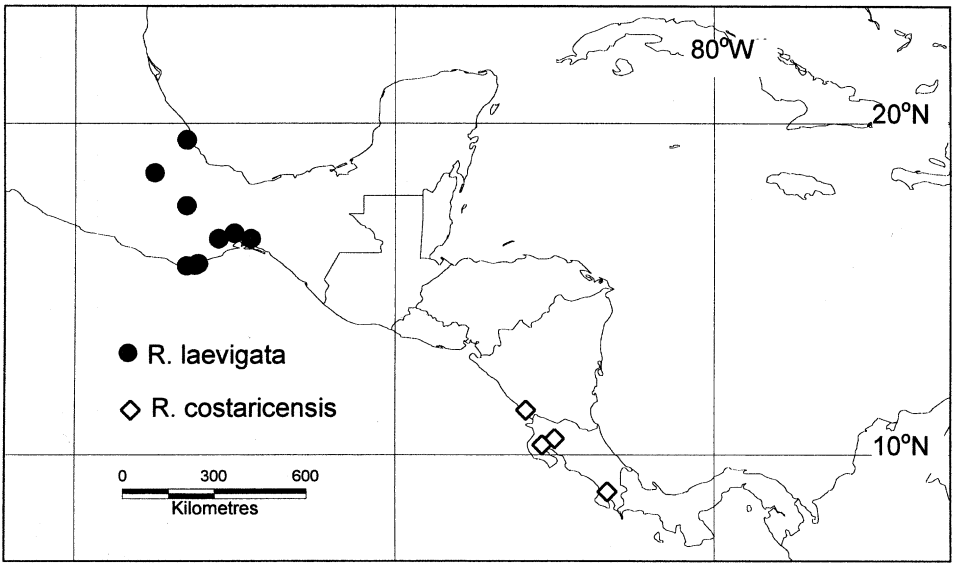

FIG. 20. Distribution of *Ruprechtia costaricensis* and *R. laevigata*.

achene clearly visible within. *Ruprechtia chiapensis* has fruits with larger sepals (30–38 mm vs. 20–30 mm), and its leaves have secondary and tertiary venation, which is almost equally prominent on the upper and lower surfaces (vs. venation much more prominent on the lower surface). *Ruprechtia costata* is distinguished by its inflorescences, which are much denser and have longer bracts (2.5 mm vs. to 1.5 mm long) and thus appear catkin-like (vs. perianth tube 3–4 mm and the sepals completely enclosing the achene). A suite of characters distinguish *R. laevigata* from *R. costaricensis,* which has leaves with fewer secondary veins (6–10 mm vs. 10–15) that are less prominent on the underside, and fruits with shorter sepals (20–25 mm vs. 20–30 mm) and longer perianth tubes (4–5 mm vs. 3–4 mm).

15. Ruprechtia costaricensis Pendry, Edinburgh J. Bot. 60: 23. 2003.—TYPE: COSTA RICA. Bord des chemins a Nicoya, Mar 1900, *Tonduz 13872* (holotype: K!; isotype: BM! P! US!).

Tree to 20 m tall. Twigs solid, glabrous, slightly lenticellate, appressed-hairy when very young; brachyblasts absent. Laminas 3–9 cm long, 1–4 cm wide (length:width ratio 1.8–2.7), elliptic or oblong to obovate, apex acute to acuminate, base cuneate to attenuate, margin smooth or undulate, occasionally inrolled; midrib prominent adaxially, secondary veins 6–10, only slightly more prominent abaxially than adaxially, usually only slightly more prominent than the faint, lax, reticulate-scalariform tertiary venation; glabrous adaxially, generally glabrous abaxially, but sometimes densely set with short hairs along the sides of the midrib; glands absent; petioles 2–3 mm long, glabrous; ochreas 1–2 mm long, caducous, glabrous to sparsely hairy. Male inflorescences to 2 cm long; dense with internodes to 2 mm long, with a short indumentum of silvery, curved hairs; bracts 0.5–1.0 mm long, appressed-hairy; bracteoles 1.0 mm long, sparsely hairy, ciliate; pedicels ca. 2 mm long, leaving ca. 2 mm long stalks after the flowers have fallen, hairy; perianth pale green or yellow-green; sepals 1.5 mm long, obovate, glabrous and ciliate; petals 1.5 mm

long, obovate, glabrous, ciliate; filaments to 2.0 mm long; anthers 0.7 mm long. Female inflorescences to 2 cm, rather lax, internodes to 2–3 mm long, with a short indumentum of erect silvery hairs or a sparse indumentum of longer, appressed hairs; bracts ca. 1.0 mm long, with a short, sparse to dense indumentum; bracteoles 1–1.5 mm long, sparsely hairy; pedicels 3–5 mm long, leaving ca. 2 mm long stalks after the flowers have fallen, hairy; perianth yellow with a dense indumentum of silvery hairs abaxially; sepals ca. 5 mm, perianth tube 2 mm long, free parts of sepals linear; petals 2 mm long, free or adnate to the calyx for to 1 mm, linear, glabrous or slightly ciliate; staminodes inconspicuous; disk glabrous or sparsely hairy; ovary ca. 3 mm long, very sparsely hairy at the apex; stigmas 0.5 mm long, ovoid. Fruits pale brown or white; pedicels 4–7 mm long, leaving 2–4 mm long stalks after the fruits have fallen; sepals of mature fruits 20–25 mm long and 3–5 mm wide, perianth tube 4–5 mm long, sepals chartaceous with evident venation, obovate to oblong, not keeled, appressed-hairy at the base, sparsely hairy on the wings; petals 3–4 mm long, free from the calyx or adnate for 2 mm, linear; achene 9–10 mm long, three-lobed, smooth, glabrous or sparsely hairy towards apex. Figs. 2R, 21.

Phenology. Male flowers: January; female flowers: January, February; fruits: January–March.

Distribution (Fig. 20). Costa Rica (Guanacaste), Nicaragua (Rivas); seasonally dry tropical forests, gallery forests, savannas; 0–200 m.

Vernacular name. Escobillo (Costa Rica).

ADDITIONAL SPECIMENS EXAMINED. **Costa Rica.** GUANACASTE: Comelco, *Bawa 134* (MO); Cantón de Bagaces, PN Palo Verde, Valle de Tempisque, Camino a Hoto Viejo, Lomas del Patio y El Colmenar, 10°21′45″N, 85°18′50″W, *Chavarría 739* (F); vicinity of Cañas, *Daubenmire 632* (F); Palo Verde, *Frankie 420a* (MO); along slough prior to Chamorro dock, Palo Verde, Comelco Ranch, Bagaces, 10°25N, 85°20′W, *Hartshorn 2243* (F); gas station, Limonal de Abangares, Interamerican Highway, 10°25N, 85°20′W, *Hartshorn 2244* (F, MO); Comelco property near Bagaces, *Opler 566* (F); Comelco, 5 km NW of Bagaces, *Opler 1679* (AAU, F, MO); vicinity of Cañas, *Poveda 921* (F).—PUNTARENAS: Cantón de Buenos Aires Rey Curre, márgenes de Río Grande de Terraba, 08°59′N, 83°16′W, *Rojas & Zuniga 148* (MO). **Nicaragua.** RIVAS: Marsella, 11°16′N, 85°52′W, *Araquistain 3827* (NY); San Juan del Sur, camino entre Las Playas de Marsella y Rivas, 11°17′N, 85°54′W, *Rueda et al. 1433* (MO).

Ruprechtia costaricensis is found in the same region as *R. costata*, *R. nicaraguensis,* and *R. ramiflora*. It differs from *R. nicaraguensis* in its fruits, which have a longer perianth tube (4–5 mm vs. 1–2 mm) that conceals the achene and petals. *Ruprechtia costata* has much longer bracts (2–2.5 mm vs. 1.0 mm), and its dense inflorescences appear catkin-like in contrast to the more open inflorescence of *R. costaricensis*. *Ruprechtia ramiflora* has larger leaves (4–13 cm vs. 3–9 cm long) with more numerous secondary veins (8–14 cm vs. 6–10 cm), which are prominent abaxially and often impressed adaxially, whilst those of *R. costaricensis* are only slightly less prominent adaxially than abaxially.

16. Ruprechtia nicaraguensis Pendry, Edinburgh J. Bot. 60: 20. 2003.—TYPE: NICARAGUA. Estelí: mountains N of Estelí, 15 Nov 1946, *Williams & Molina 10946* (holotype: GH!; isotypes: F! MEXU! MO!).

Shrub or tree to 10 m tall. Twigs solid, glabrous, lenticellate; brachyblasts absent. Laminas 4–12 cm long, 1.8–5.6 cm wide (length:width ratio 1.8–2.6), ovate to elliptic or slightly obovate, apex acute to acuminate, base cuneate to rounded, margin undulate, occasionally inrolled; midrib prominent adaxially, secondary veins 8–15, sometimes slightly

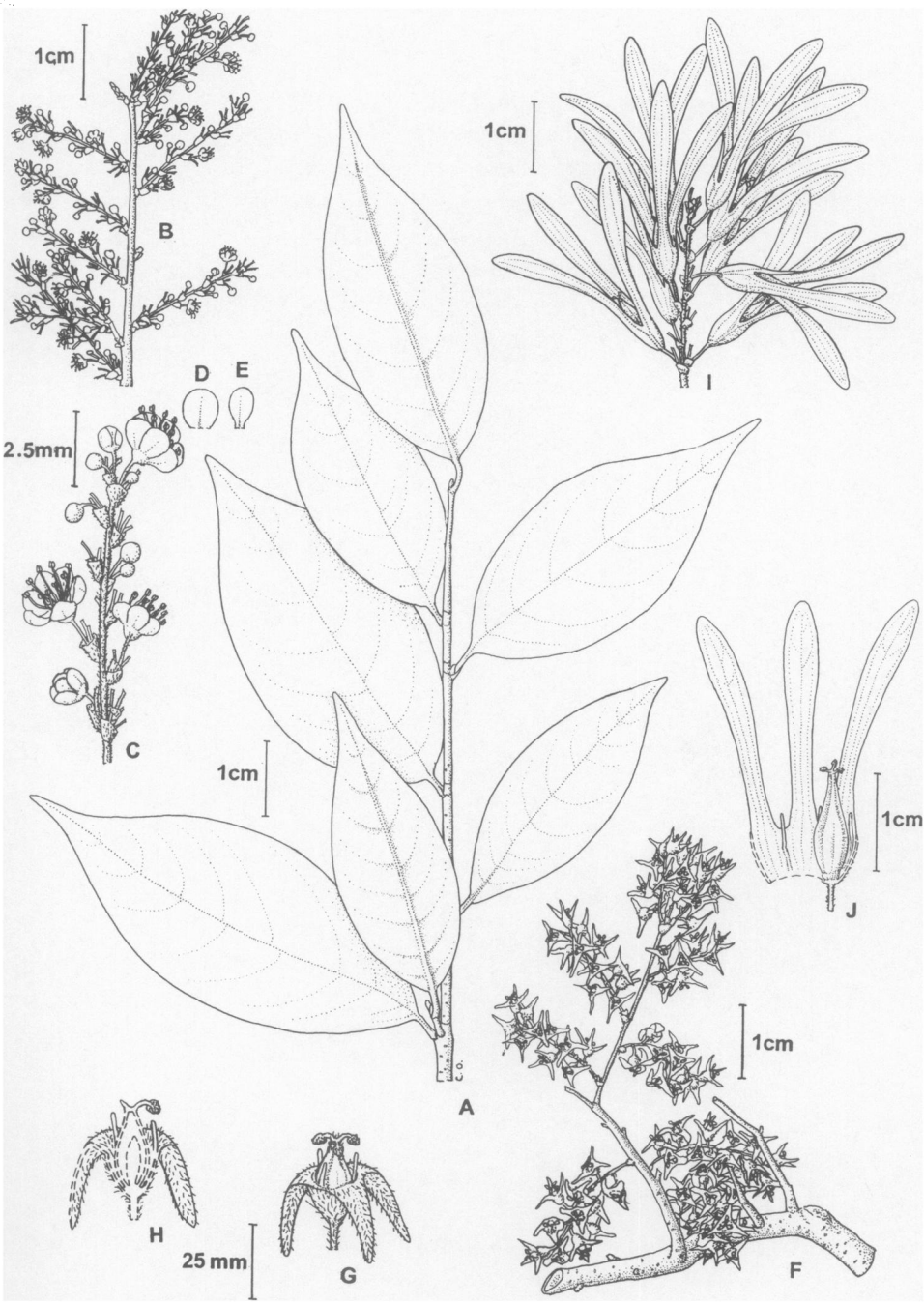

FIG. 21. *Ruprechtia costaricensis*. A. Branch. B. Male inflorescence. C. Male inflorescence (detail). D. Sepal of male flower. E. Petal of male flower. F. Female inflorescence. G. Female flower. H. Vertical section of female flower. I. Infructescence. J. Fruit with the sepals opened. (Based on: A, F–H, *Rueda, Dolmus & Prado 1433*; B–E, *Hartshorn 2244*; I, J, *Daubenmire 632*.)

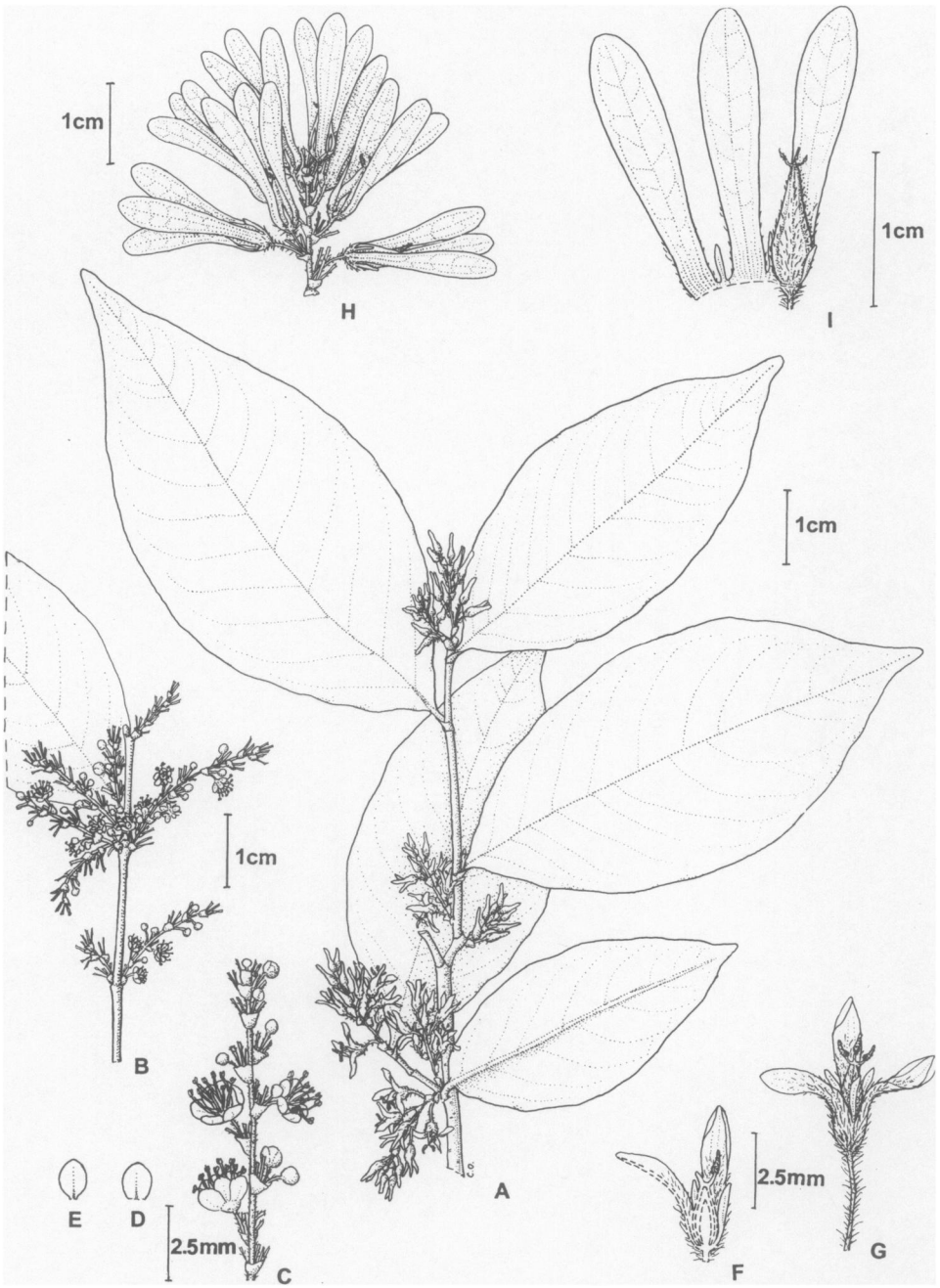

FIG. 22. *Ruprechtia nicaraguensis*. A. Flowering branch of female plant. B. Male inflorescence. C. Male inflorescence (detail). D. Sepal of male flower. E. Petal of male flower. F. Vertical section of female flower. G. Female flower. H. Infructescence. I. Fruit with the sepals opened. (Based on: A, F, G, *Standley 73744*; B–E, *Moreno 25088*; H, I, *Williams & Molina 10946*.)

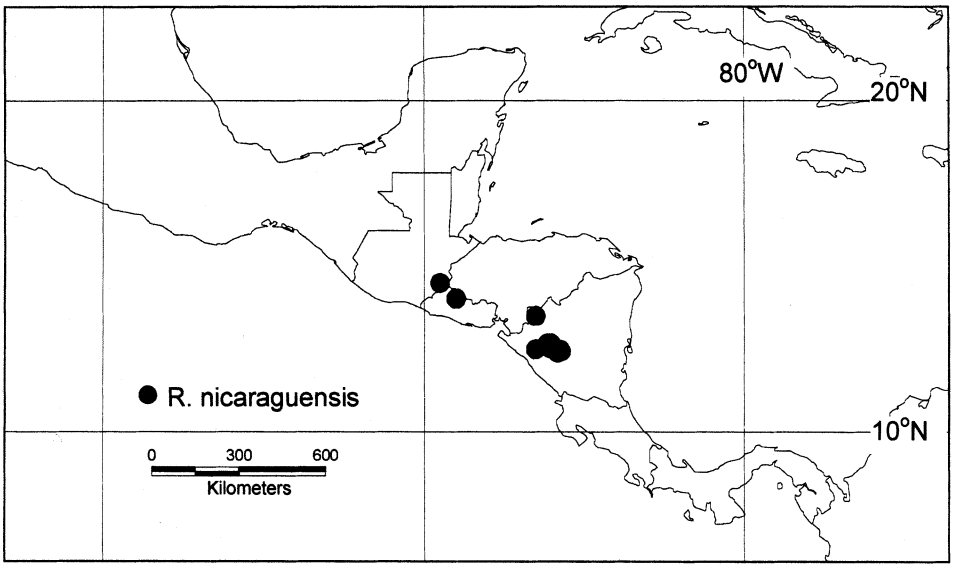

FIG. 23. Distribution of *Ruprechtia nicaraguensis*.

sunken adaxially, prominent abaxially, usually markedly more prominent than the faint, lax, reticulate-scalariform tertiary venation; almost glabrous adaxially, sparse to dense indumentum of short appressed hairs on the midrib and veins abaxially; glands absent; petioles 1–2 mm long, glabrous to sparsely hairy; ochreas 1–2 mm long, glabrous, caducous. Male inflorescences to 3 cm long, rather lax, internodes to 3–4 mm long, with a sparse to dense indumentum of erect silvery hairs; bracts 1–2 mm long, sparsely to densely hairy; bracteoles 1–1.5 mm long, sparsely hairy; pedicels 2–2.5 mm long, leaving 2–2.5 mm long stalks after the flowers have fallen, hairy; perianth white; sepals 2 mm long, obovate, very sparsely hairy; petals 2 mm long, obovate, very sparsely hairy; filaments to 2 mm long; anthers 0.5 mm long. Female inflorescences to 2.5 cm long, dense, with internodes to 0.5–3 long mm, with a short or long indumentum of erect silvery hairs; bracts 1–1.5 mm long, sparsely hairy; bracteoles 1–1.5 mm long, sparsely hairy; pedicels 3–6 mm long, leaving stalks 2–3 mm long after the flowers have fallen, densely hairy; perianth green, with a dense indumentum of silvery hairs abaxially; sepals 5–7 mm long, perianth tube 1.5 mm long, free parts of sepals linear; petals 2–2.5 mm long, free from the calyx, linear, glabrous, ciliate or sparsely hairy; staminodes 0.2–0.4 mm long, tooth-like; disk glabrous; ovary 2–3 mm long, densely hairy; stigmas 0.5–1.0 mm long, ovoid. Fruits red-brown; pedicels 4–7 mm long, leaving 2–4 mm long stalks after the fruits have fallen; sepals of mature fruits 23–32 mm long and 4–7 mm wide, perianth tube 1–1.5 mm long, sepals chartaceous with evident venation, obovate, not keeled, with an indumentum of appressed hairs at the base, sparsely hairy on the wings; petals 3–3.5 mm long, free from the calyx, linear; achene 8–10 mm long, three-lobed, smooth, more or less hairy, especially in the distal half. Figs. 2Q, 22.

Phenology. Male flowers: January, October–November; female flowers: October–December; fruits: May, November–January.

Distribution (Fig. 23). Guatemala (Chiquimula), Nicaragua (Boaco, Estelí, Managua, Matagalpa); dry forests, gallery forests; 50–900 m.

Vernacular name. Guayabo de monte (Nicaragua).

ADDITIONAL SPECIMENS EXAMINED. **Guatemala.** CHIQUIMULA: near divide on road from Zacapa to Chiquimula, *Standley 73706* (F), *73744* (F, US); between Ramírez and Cumbre de Chiquimula on road between Chiquimula and Zacapa, *Standley 74547* (F, US). **Nicaragua.** BOACO: 2 km al N de Boaquito, camino a Santa Lucía, 12°28′N, 085°44′W, *Moreno 18097A* (MEXU); Santa Cruz, Km 63 carretera al Rama, 12°24′N, 85°49′W, *Moreno 18615* (NY); sobre el Río Boaco o Fonseca, 3 km al SE de Boaquito, 12°26′N, 85°43′W, *Moreno 22494* (GH, MEXU); "San Diego," 9 km al N de Teustepe, 12°29′N, 85°48′W, *Moreno 25136* (GH, MEXU, NY); Hacienda San Antonio, carretera a Boaquito, 12°26′N, 85°44′W, *Moreno & Robleto 22814* (MEXU, NY); Boaquito, 12°29′N, 85°44′W, *Robleto 106* (NY).—MANAGUA: Km 51 de la Carretera Panamericana N, *Laguna 227* (MO); Km 64, km al W del Caserío "El Madroño," 12°32′N, 86°04′W, *Moreno 22546* (GH, MEXU); 8 km de carretera Managua Sébaco, camino a San Fransisco Libre, orillas de Estero Grande, 12°00′N, 086°00′W, *Sandino 373* (MEXU, MO).—MATAGALPA: 5 km N of Darío, *Harmon Fuentes 5026* (MO, US); Carretera Panamericana, de la cuesta El Venado, 4 km al E "Las Delicias," 12°41′N, 86°03′W, *Moreno 18349* (GH, MEXU); 6.5 km al S de Ciudad Darío, Soledad, 12°40′N, 86°08′W, *Moreno 25088* (GH, NY); at ford of Río Grande de Matagalpa on road to Terrabona, 12°38′N, 86°00′W, *Stevens 10923*, *11267* (MO, U).

The range of *R. nicaraguensis* partially coincides with those of *R. costaricensis* and *R. costata*. Female specimens are easily distinguished from *R. costaricensis,* because *R. nicaraguensis* has densely hairy ovaries and rather open flowers with a short perianth tube (1 mm) compared with the almost glabrous ovary and longer perianth tube (ca. 2 mm) of *R. costaricensis*. The fruit of *R. nicaraguensis* has an open appearance with a very short perianth tube (1 mm), and the petals and hairy achene are clearly visible between the sepals. The sepals of *R. costaricensis* are fused for 4–5 mm so that the petals are not visible, and the achenes are glabrous. Vegetatively the two species are rather similar, but can be distinguished by the indumentum of the leaves. In *R. costaricensis*, the leaves are almost glabrous with a few, 0.5 mm long, appressed hairs along the midrib on the underside, and sometimes with a few erect hairs on the lamina at the very base of the leaf beside the midrib on the underside or a few short hairs on the midrib above. In *R. nicaraguensis*, the leaves have an indumentum of very short (0.1–0.2 mm) upright hairs on the veins and sometimes also on the lamina; the abundance of these hairs is variable. Fertile specimens are easily distinguished from *R. costata*, which has much larger bracts in both male and female inflorescences, which appear catkinlike. The petioles are longer in *R. costata* (4–8 mm) than in *R. nicaraguensis* (1–2 mm). *Ruprechtia nicaraguensis* has fruits similar to those of *R. pallida*, but differs from it and *R. chiapensis* in its secondary venation, which is prominent on the lower surface.

17. Ruprechtia costata Meisner in DC., Prodr. 14: 180. 1856. *Magonia costata* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: NICARAGUA. Carazo: Jinotepe, *Friedrichstahl 1179* (holotype: W, destroyed; lectotype, here designated: F!; fragment ex W: NY! barcode 00260327).

Ruprechtia deamii B. L. Robinson, Proc. Amer. Acad. Arts. 43: 51. 1907. TYPE: GUATEMALA. Zacapa: Gualán, 420 ft, 11 Jan 1905, *Deam 231* (holotype: GH!; isotypes: F! MO! NY! US!).

Ruprechtia kellermanii Donnell Smith, Bot. Gaz. 47(4): 260. 1909.—TYPE: GUATEMALA. Zacapa: Gualán, 122 m, 12 Dec 1905, *Kellerman 5985* (holotype: US!; isotypes: GH! MO!).

Tree to 15 m tall. Bark brown, flaky; inner bark cinnamon-brown. Twigs solid, glabrous, lenticellate; brachyblasts absent. Laminas 4–19 cm long, 2–7.5 cm wide (length:width ratio 1.8–2.6), ovate to elliptic or oblong, occasionally obovate, apex acute to acuminate, base cuneate to rounded, margin smooth, crenate or rather irregular, some-

times slightly inrolled; midrib prominent adaxially, secondary veins 9–15, sometimes sunken adaxially, and with the lamina then bullate between the veins, secondary venation markedly more prominent than the faint, lax, reticulate tertiary venation; mature leaves generally glabrous, sometimes with a few upright hairs on midrib and veins abaxially; glands absent; petioles 4–8 mm long, glabrous to sparsely hairy; ochreas 3 mm long, caducous, glabrous to sparsely hairy. Male inflorescences to 9 cm long, very dense with internodes to ca. 1 mm long, with a dense indumentum of yellow-brown hairs; bracts 2.0–2.5 mm long, densely hairy; bracteoles 1.5–2 mm long, sparsely hairy; pedicels 1 mm long, leaving stalks 1 mm long after the flowers have fallen, hairy; perianth cream, brown or green; sepals 1.5 mm long, obovate, glabrous or sparsely hairy, ciliate; petals 1.5 mm long, obovate, glabrous or sparsely hairy, ciliate; filaments to 2 mm long; anthers 0.8 mm long. Female inflorescences to 5 cm long, dense, internodes to ca. 1 mm long, very rarely to 5 mm long, with a dense indumentum of short erect hairs; bracts 2.5 mm long, densely hairy; bracteoles 3–3.5 mm long, sparsely hairy; pedicels 3 mm long, leaving 2 mm long stalks after the flowers have fallen, hairy; perianth green, with a dense indumentum of yellow-brown hairs abaxially; sepals ca. 7 mm long, perianth tube 1.5 mm long, free parts of sepals linear; petals 2 mm long, scarcely adnate to the calyx, linear, glabrous or very sparsely hairy; staminodes 0.4 mm long, tooth-like; disk glabrous; ovary 3 mm long, very sparsely hairy at the apex only; stigmas 0.8 mm long, ovoid. Fruits pale brown; pedicels 3–4 mm long, leaving 2 mm long stalks after the fruits have fallen; sepals of mature fruits ca. 30 mm long and 5 mm wide, perianth tube 4–5 mm long, sepals chartaceous with evident venation, obovate, not keeled, with a dense indumentum of erect hairs at the base, sparsely hairy on the wings; petals 3 mm long, free from the calyx, linear; achene 9–10 mm long, three-lobed, smooth, glabrous or very sparsely hairy at the apex. Fig. 2N.

Phenology. Male flowers: October, December–March; female flowers: January; fruits: January, February, October.

Distribution (Fig. 24). Costa Rica (Puntarenas), El Salvador (Cuscutlán, La Libertad),

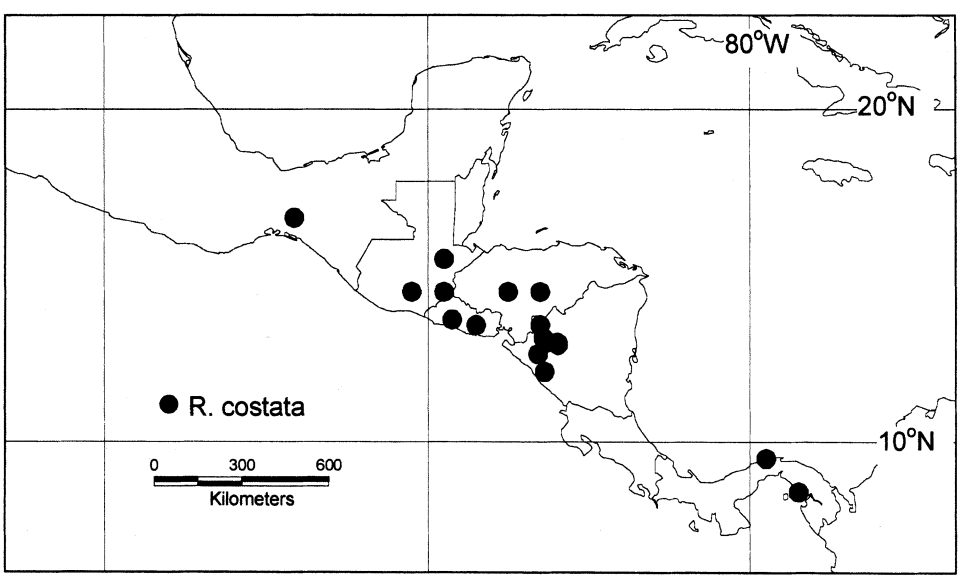

FIG. 24. Distribution of *Ruprechtia costata*.

Guatemala (Baja Verapaz, Zacapa), Honduras (Comayagua, Morazán), Mexico (Oaxaca), Nicaragua (Estelí, León, Matagalpa), Panama (Panamá); dry forests and thickets, gallery forests; 50–1200 m.

Vernacular names. Carreto, sangre de toro (Guatemala).

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** OAXACA: Mpio. San Miguel Chimalapa, Río Portomonedas ca. 1 km al N de Las Guayabitas y 3 km al N de Benito Juaréz, ca. 41 km en linea recta al N de San Pedro Tapanatepec, 16°44′N, 094°08′W, *Maya 4096* (MEXU).

Guatemala. BAJA VERAPAZ: Sierra de las Minas, near S. Agustín, *Kellerman 7819* (F).—ZACAPA: near divide on road from Zacapa to Chiquimula, *Standley 71978* (F); vicinity of Zacapa, *Standley 73569* (F). **El Salvador.** CUSCUTLÁN: Cerro de las Pavas, *Hernández s.n.* (MEXU).—LA LIBERTAD: Mpio. Antiguo Cuscutlán "Laderas de Laguna," *Cruz 220005* (F). **Honduras.** COMAYAGUA: vicinity of Comayagua, *Standley & Chacón 5897* (F, US).—FRANCISCO MORAZÁN: carretera a Suyapa, Tegucigalpa, *Nelson & Romero 4353* (AAU, BM); carretera a Suyapa, Tegucigalpa, *Nelson & Romero 4354* (MEXU); drainage of Río Yeguare, en las márgenes del Río de la Orilla, 14°N, 87°W, *Molina 2732* (F); in Quebrada de Suyapa near Suyapa, *Standley 14194* (F); camino viejo between Suyapa and Tegucigalpa, *Standley 25058* (F); Río de la Orilla, SE of El Zamorano, base of Cerro Majicarán, *Standley 25882* (F); near Suyapa, *Standley & Williams 497* (F, US); camino viejo between Suyapa and Tegucigalpa, *Williams & Molina 11042* (F, GH, MO); 5 km E of Tegucicalpa, *Williams & Molina 13643* (F, MO, US). **Nicaragua.** ESTELÍ: El Hondal, camino a Cerro Quiabu, de 4 a 5 km de Estelí, 13°07′N, 86°24′W, *Moreno 6089* (GH); El Hondal, 4 km al W de Estelí, 13°06′N, 86°23′W, *Moreno 19304* (GH); Salto de Estanzuela, 13°01′N, 86°21′W, *Moreno 21159* (GH, MEXU); "Las Camaras," entrada a San Nicolás, 12°59′N, 086°18′W, *Moreno 22573* (MEXU); Quebrada La Limonosa, camino al Quiabu, 12°06′N, 86°22′W, *Moreno 22630* (GH, MEXU); Estelí, *Standley 20352* (F).—LEÓN: Laguna Sulfatosa, 12°38′N, 86°34′W, *Moreno 5522* (U).—MATAGALPA: "El Eden," camino viejo a Jinotega, 12°58′N, 85°58′W, *Moreno 22913* (GH, MEXU); "El Eden," camino viejo a Jinotega, 12°58′N, 85°58′W, *Moreno 22914* (MEXU, NY); entre Waswali abajo y Waswali arriba, 12°55′N, 85°57′W, *Moreno & Robleto 22895* (GH, MEXU). **Panama.** PANAMÁ: Lago Bayano, Isla Maje, *Foster 3931* (F); Maje, Campamento Gorgas, Estación 2, *Mayo 632* (F, MO).

Ruprechtia costata is characterized by the male and female inflorescences, which both have short internodes and unusually prominent and pubescent bracts and bracteoles. The flowers of both sexes abscise at about the same length or shorter than the bracts, so that in contrast with other species of *Ruprechtia*, the pedicels are not readily visible after the flowers or fruits have fallen. For these reasons the inflorescences of both sexes can appear rather like catkins. The leaves have stout secondary veins, which are prominent on the lower surface, and sterile specimens could be confused with *R. nicaraguensis*; however, that species has shorter petioles (1–2 mm vs. 4–8 mm).

18. Ruprechtia chiapensis Lundell ex Standley & Steyermark, Fieldiana, Bot. 24(4): 134. 1946.—TYPE: MEXICO. Chiapas: Las Garzas, Jan 1939, *Matuda 2673* (holotype: F!; isotypes: A! GH! NY! US!).

Tree to 20 m tall. Bark smooth, grey. Twigs solid, glabrous, lenticellate; brachyblasts absent. Laminas 5–11 cm long, 2–6 cm wide (length:width ratio 1.8–2.5), elliptic to narrowly ovate, rarely oblong, apex acuminate, base rounded to attenuate, margin undulate, flat; midrib prominent adaxially; secondary veins 6–11; secondary venation rather faint and almost equally prominent adaxially and abaxially, scarcely more prominent than the faint, densely reticulate tertiary venation; glabrous adaxially, glabrous abaxially or hairy on the sides of the midrib at the base and on the adjacent lamina; glands absent; petioles 2–4 mm long, glabrous; ochreas 1–2 mm long, glabrous, caducous. Male inflorescences to 3 cm long, dense, internodes to 2 mm long, with a short indumentum of erect silvery hairs; bracts 0.5–1 mm long, appressed-hairy; bracteoles 1–1.5 mm long, sparsely hairy; pedicels 2 mm

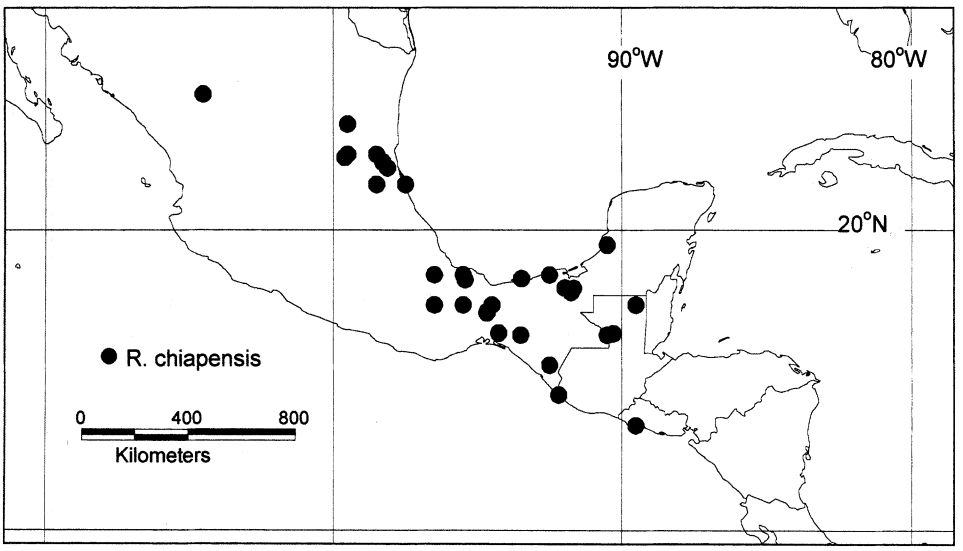

FIG. 25. Distribution of *Ruprechtia chiapensis*.

long, leaving 1.5 mm long stalks after the flowers have fallen, hairy; perianth yellow-green; sepals 2 mm long, obovate, glabrous or ciliate; petals 2 mm long, obovate, glabrous or ciliate; filaments to 2 mm long; anthers 0.7 mm long. Female inflorescences to 5 cm long, rather lax, internodes to 4 mm long, with a dense indumentum of minute hairs; bracts 1 mm long, sparsely hairy; bracteoles 1.5–2 mm long, hairy; pedicels 3–5 mm long, leaving 2–3 mm long stalks after the flowers have fallen, hairy; perianth yellow-green with a dense indumentum of appressed silvery hairs abaxially; sepals 5–7 mm long, perianth tube 1–2 mm long, free parts of sepals linear; petals 2–3 mm long, adnate to the calyx for to 0.5 mm, linear, glabrous; staminodes glabrous, tooth-like, prominent; disk glabrous; ovary 3–4 mm long, glabrous; stigmas to 1.2 mm long, elliptic to ovate. Fruits green, yellow-green, or occasionally reddish; pedicels 5 mm long, leaving 2–3 mm long stalks after the fruits have fallen; sepals of mature fruits 30–38 mm long and 5–7 mm wide, perianth tube 4–6 mm long sepals chartaceous with evident venation, obovate, not keeled, with a sparse indumentum of erect hairs at base, almost glabrous on the wings; petals 3–5 mm long, free from the calyx, linear; achene 8–13 mm long, three-lobed, smooth, glabrous. Fig. 2S.

Phenology. Male flowers: May, December–March; female flowers: February, March, June; fruits: January, March, April, June.

Distribution (Fig. 25). El Salvador (Sonsonate), Guatemala (Petén, San Marcos), Mexico (Campeche, Chiapas, Durango, Oaxaca, Tabasco, Veracruz); seasonally dry deciduous or evergreen tropical forests (selva baja, selva baja espinosa, selva mediana, dry phase of selva alta perennifolia), gallery forests, swamps, on clay and sandy soils; 0–2250 m.

Vernacular names. Aha uté, naranjillo, puchté, rosadillo (Mexico); Yaxnik (Guatemala).

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CAMPECHE: Km 30 desviación carretera Escarcega–Villahermosa rumbo a Palizada, 18°03′45″N, 091°58′00″W, *Chan 4708* (F); carretera Escarcega–Villahermosa desviación rumbo a Vista Alegre, Carmen, 18°03′N, 91°40′W, *Chan 6532* (MEXU, MO); Mpio. Champotón, a 20 km al SW de Champotón, camino Champotón–Cd. del Carmen, *Martínez 3064* (MEXU); Mpio. Palizada,

carr. rumbo a Palizada, Km 3, 17°55′N, 091°45′W, *Ortiz 815* (MEXU).—CHIAPAS: Mpio. Escuintla, Pampa Honda, *González Medrano 11249* (MEXU); Las Garzas, Acapetagua, *Matuda 2695* (F, GH, K, MEXU, MO, NY, US); Paderón, Tonala, *Matuda 16280* (F, K, US); Paderón, Tonala, *Matuda 16290* (MEXU, US); Las Brisas, Mapastepec, *Zavala 41* (MEXU).—DURANGO: a 35 km a el oeste de Durango en la carretera a Mazatlán, *Medrano 1389* (MEXU).—OAXACA: Km 10 carretera Tuxtepec a Valle Naciónal, *Brigada Dioscoreas 3298* (MEXU); cerca Ejido Benito Juárez (Fabr. Papel Sebastopol), S Tuxtepec, *Brigada Dioscoreas 3353* (MEXU); Mpio. Tuxtepec, Chiltepec, *Martínez 1325* (BM, MEXU, MO, NY); Tuxtepec, *Sousa 817* (MEXU); Temazcal, *Sousa* 1743 (MEXU).—SAN LUIS POTOSÍ: Mpio. Cd. del Maíz, Chupaderos, *Rivera 89* (MEXU).—TABASCO: Arroyo Levees, E side of Laguna Mecoacán, *Barlow 3/15A* (MEXU); Mpio. Comalcalco, Ranchería Cocohital, *Guzmán s.n.* (MEXU).—TAMAULIPAS: Mpio. Gómez Farías, nacimiento de Río Sabinas, a 5 km al N del Encino, *González Medrano 12297* (MEXU); along Río Sabinas, 3 km W of the town of Encino on Hwy 85, *LeDoux & Robertson 2522* (MO, NY); Rancho Los Alados, Cerro del Metate, *Martínez 296* (MO); habitat inter Atasta et Tamulte, *Rovirosa 758* (K, NY).—VERACRUZ: carretera Cd. Valles–Tampico a 15 km de Ebano S.L.P., *Chiang 70* (GH); a 38 km de Tepetzintla, hacia Tantoyuca, *Chiang 379* (F); Panuco, hacia Tampico, 6 km de Panuco, *Chiang 417* (F); 1 km al oeste del Pozo Chijol, 22°15′N, 98°17′W, *Chiang 422* (F, GH, MO); Km 0–2 del camino plan de Arroyos, Alvaro Obregón, Hidalgotitlán, 17°15′N, 94°40′W, *Dorantes 2863* (F, NY); Mpio. Panuco, orilla de Panuco, salida a Topila 26, 22°03′N, 098°07′W, *Gutiérrez 1681* (MEXU); Cosamaloapan, Cd. Alemán, *Hernández & Trigos 1068* (F); Cosamaloapan, Los Robles, *Hernández & Trigos 1071* (F, NY); Ebano, near Río Panuco, *LeSueur 527* (F); near Ebano on banks of Panuco, *LeSueur 591* (F, GH, US); Mpio. Jesús Carranza, Zona Uxpanapa, 1–3 km al NNW de Poblado 2, *Lorence et al. 3986* (F); Mpio. Santiago Tuxtla, vic. Pixixiapan, 2.5 km W of Tibernal and 20 km SW of Santiago Tuxtla, 18°20′N, 95°26′W, *Nee & Taylor 26457* (BM, F, NY); Mpio. Palizada, carr. rumbo a Palizada, Km 3, 17°55′N, 091°45′W, *Ortiz 815* (MEXU); 5 km S of Acayucan, S of junction with autopista, Km 69 on Hwy 185, 17°54′N, 94°56′W, *Pendry 948* (E, MEXU); Distr. Ozuluama prope Chacuaro, *Seler 597* (GH, US); Mpio. Jesús Carranza, 2 km N del poblado 2, 17°16′N, 94°40′W, *Vázquez et al. v–2414* (MEXU, NY), 17°14′N, 94°41′W, *Wendt et al. 3037* (MEXU, MO, NY).

Guatemala. PETÉN: Sayaxche, bordering Río Pasión, *Contreras 9581* (MO, US); Lake Petén Itza, on San Andrés road, *Contreras 9670* (MEXU); Río Pasión, San Juan Acul, *Lundell 18166* (F, MEXU, US); Río Subin, near mouth *Lundell 18167* (MO, US); Río Sayaxche, en el Km 72 de Santa Elena, *Ortiz 816* (F, MO, NY); en orillendo camino Sayaxche, Santa Elena, *Ortiz 817* (BM, F, US).—SAN MARCOS: Ocos, *Steyermark 37846* (F, NY).—LOCALITY UNKNOWN: *Steyermark 46298* (F). **El Salvador.** SONSONATE: Acajutla, *Hayes 458* (BM).

Ruprechtia chiapensis is apparently found in moister environments than the other Mexican and Central American species of *Ruprechtia*. Its most notable feature is found in dried leaves: the fine secondary and tertiary venation is almost equally prominent on both surfaces. *Ruprechtia pallida* also has venation that is equally prominent on both surfaces of the leaves, but the leaves are more obovate; also, the sepals are scarcely united at the base, so that the petals and achene are clearly visible within. *Ruprechtia chiapensis* is similar to *R. laevigata*, which has fruits with smaller sepals (20–30 mm vs. 30–38 mm) and secondary veins that are more prominent on the lower surface of the leaves.

19. Ruprechtia pallida Standley, Contr. U.S. Natl. Herb. 23: 250. 1922.—TYPE: MEXICO. Michoacán: Cayaco, 29 Mar 1903, *Nelson 6964* (holotype: US!; isotypes: GH! NY!).

Shrub or tree to 12 m tall. Twigs solid, glabrous or appressed-hairy; brachyblasts absent. Laminas 2.5–7.5 cm long, 1–3 cm wide (length:width ratio 2.0–3.6), obovate, oblong, or elliptic, apex acute to acuminate, base cuneate, rounded or attenuate, margin smooth or undulate, sometimes inrolled; midrib prominent adaxially, secondary veins 5–8 (–12), slender and usually scarcely more prominent abaxially than adaxially, scarcely more prominent than the faint, lax, reticulate tertiary venation; almost completely glabrous or densely and evenly hairy adaxially and abaxially; glands absent; petioles 2 mm long, sparsely to densely hairy; ochreas 2 mm long, appressed-hairy, caducous. Male inflorescences to 3 cm long, with a short indumentum of erect silvery or yellowish hairs;

rather lax, internodes to 4 mm long; bracts 0.5–1 mm long, densely hairy; bracteoles 1 mm long, glabrous or sparsely hairy, ciliate; pedicels sparsely 1.5–2 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, hairy; perianth red, sepals 1.5 mm long, obovate, sparsely hairy, ciliate; petals 1.5 mm long, obovate, sparsely hairy, ciliate; filaments to 2 mm long; anthers 0.7 mm long. Female inflorescences to 2 (rarely 5) cm long, rather lax, internodes to 3 mm long or occasionally inflorescence condensed, with a short indumentum of erect silvery hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1.5 mm long, glabrous to sparsely hairy; pedicels 2–3 mm long, leaving 1–1.5 mm long stalks after the flowers have fallen, hairy; perianth red with a dense indumentum of silvery hairs abaxially; sepals 4–8 mm long, perianth tube 1–1.5 mm long, free parts of sepals linear; petals 1–2 mm long, free from the calyx, linear, sparsely or densely hairy; staminodes to 0.2 mm long; disk glabrous or hairy; ovary 2–3 mm long, hairy in the distal half; stigmas 0.8–1.5 mm long, ovoid or linear. Fruits red-brown; pedicels 3–4 mm long, leaving 1.5–3 mm long stalks after the fruits have fallen; sepals of mature fruits 18–30 mm long and 4–7 mm wide, perianth tube 1–2 mm long, sepals chartaceous with evident venation, obovate, not keeled, appressed-hairy at the base, sparsely hairy on the wings; petals 3 mm long, free from the calyx, linear; achene 6–9 mm long, three-lobed, smooth, glabrous or sparsely hairy towards apex. Fig. 2T.

Phenology. Male flowers: January, March–May; female flowers: March, April, November; fruits: February–May.

Distribution (Fig. 26). Mexico (Guerrero, Jalisco, Michoacán); dry forests (selva baja caducifolia, selva mediana subcaducifolia, selva mediana subperennifolia), gallery forest, savannas, on sandy or clay soils; 0–400 m.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** GUERRERO: Mpio. Coyuca de Benítez, carretera Aguas Blancas–Tepetixtla, *Azuara 134* (MEXU); Mpio. Zihuatenejo, Bahía de Zihuatenejo, Playa la Ropa, 17°40′N, 101°34′W, *Castillo 6372* (MEXU); Mpio. Zihuatenejo, Bahía de Zihuatenejo, Playa la Majahua, 17°40′N, 101°34′W, *Castillo 6469* (MEXU); Mpio. Zihuatenejo, Bahía de Zihuatenejo, Barranca de la Ropa, al NE de la Playa la Ropa, 17°40′N, 101°34′W, *Castillo 6481* (MEXU); Mpio. José Azueta, al SO del caserío "La Vainilla,"

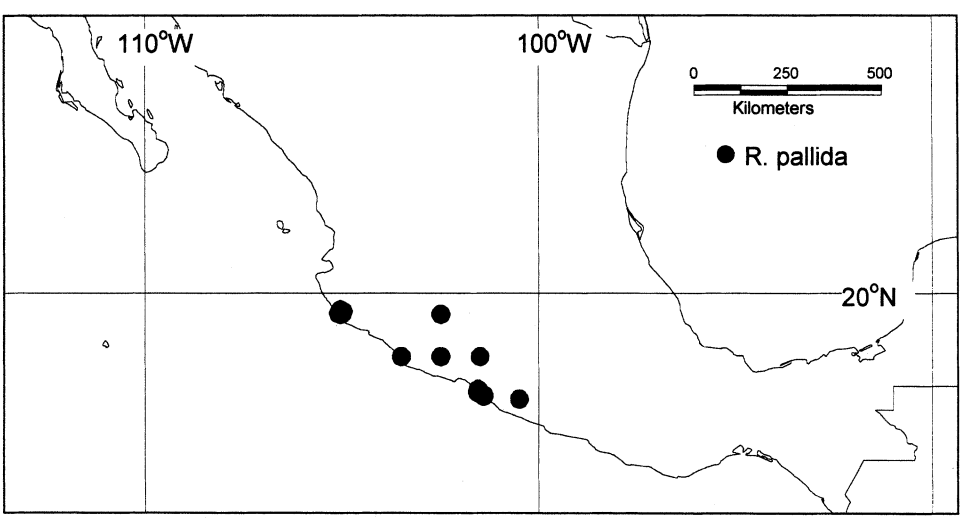

FIG. 26. Distribution of *Ruprechtia pallida*.

por la cañada, 17°42′00″N, 101°31′30″W, *Ruiz 384* (MEXU); Mpio. José Azueta, La Vainilla, *Gallardo 484* (MEXU); Mpio. José Azueta, lado NE el Cerro Viejo, Zihuatenejo 17°39′30″N, 101°32′13″W, *Gual 570* (MEXU); La Lagunilla, *Nelson 7005* (NY); Mpio. José Azueta, carretera a Cd. Altamirano, por la desv. que va a La Vainilla, Costa Grande, 17°43′40″N, 101°33′15″W, *Peralta 415* (MEXU); Mpio. Zihuatenejo, 2.72 km al S de Pantla, *Pérez 16* (MEXU); Mpio. Petatlán, 2 km NE de Coyuquilla, *Soto Núñez 12496* (F, K, MEXU, MO); Mpio. Petatlán, Coyuquilla, *Soto Núñez 12502* (F, K, MEXU); Mpio. Atoyac de Alvarez, El Quemado, *Turrubiarte 248* (MEXU).—JALISCO: Chamela, Estación de Biología, Vereda Ardilla, *Bullock 1510* (NY); La Huerta, Estación de Biología Chamela, *Lott 890* (F); La Huerta, Chamela 19°30′N, 105°03′W, *Lott 996* (GH, MEXU), *997* (NY); La Huerta, Chamela, *Magallanes 4350* (NY), *935* (AAU), *2888* (MO); Chamela, road along Río Chamela, near grounds of UNAM Instituto de Biología, 19°32′N, 105°05W, *van Rooden 721* (NY, U).—MICHOACÁN: Cachán, Dist. Coalcomán, *Hinton 15889* (BM, F, U); on slopes above the beach about 30 km W of Playa Azul on the main road towards Manzanillo, *Hughes 636* (MEXU); Cayaco, *Nelson 6964* (GH, NY); Tepalcatepec, *Rzedowski 16621* (MEXU, US); a 18 km al NW de Acalpican de Morelos, carr. Playa Azul a Coahuayana, *Soto Núñez & Torres 2726* (MEXU, MO, NY); Mpio. Lázaro Cardenas, en Mexcalhuacan a 45 km al NO de Playa Azul, *Soto Núñez & Torres 2757* (MO), *2759* (MEXU, MO, NY); Camino Playa Azul–La Peñas de Michoácan, *Villarreal 4226* (MEXU).

Ruprechtia pallida is characterized by its fruit, which has a short perianth tube, its sepals diverging so that the narrow, more or less hairy petal is visible, and by its small leaves with slender secondary veins and indistinct tertiary veins. The fruit is similar to that of *R. nicaraguensis*, but the latter has leaves with prominent secondary venation on the lower leaf surfaces. *Ruprechtia costaricensis* and *R. laevigata* also have prominent venation on the abaxial leaf surface and perianth tubes that enclose the achene. *Ruprechtia chiapensis* has leaves with slender secondary venation that is almost equally prominent on both leaf surfaces, but the perianth tube is longer and encloses the achene. *Ruprechtia fusca* and *R. standleyana* are easily distinguished by their very pronounced reticulate tertiary venation on the lower leaf surface.

20. Ruprechtia carina Pendry, Edinburgh J. Bot. 60: 27. 2003.—TYPE: VENEZUELA. Sucre: Peninsula de Paria, vicinity of Cristóbal Colón, 5 Jan–22 Feb 1923, *Broadway 3* (holotype: GH!; isotype: K! NY!).

Tree to 18 m tall. Bark smooth, grey. Twigs solid, lenticellate, glabrous; brachyblasts absent. Laminas 4–12 cm long, 2–6 cm wide (length:width ratio 1.7–3.0), ovate to elliptic, apex acuminate, acute, or obtuse, base rounded to cuneate, sometimes cordate, margin undulate, sometimes inrolled; midrib flat or prominent adaxially, secondary venation markedly sunken adaxially or almost as prominent adaxially as abaxially, secondary veins 8–12, rather faint on both surfaces or slightly sunken adaxially and more prominent abaxially, scarcely to markedly more prominent than the faint, densely reticulate tertiary venation; lamina glabrous adaxially, glabrous to evenly erect-hairy abaxially, midrib sometimes with appressed hairs abaxially; glands absent; petioles 4–10 mm long, glabrous or with a few appressed hairs or densely minutely hairy; ochreas 1–2 mm long, caducous or persistent, glabrous. Male inflorescences to 5–7 cm long, dense, internodes to 2 mm long, with a sparse indumentum of wavy hairs; bracts 1 mm long, sparsely appressed-hairy; bracteoles 1 mm long, sparsely appressed-hairy; pedicels 1.5–2 mm long, leaving 1–1.5 mm long stalks after the flowers have fallen, glabrous; sepals 1–1.5 mm long, ovate to oblong, glabrous, ciliate; petals 1–1.5 mm long, obovate, glabrous, ciliate; filaments to 2.5 mm long; anthers 0.4–0.5 mm long. Female inflorescences to 2 cm long, dense to rather lax, internodes to 1.5–4 mm long, with a short indumentum of erect straight or wavy hairs; bracts 1 mm long, appressed-hairy; bracteoles 1.5–2 mm long, appressed-hairy; pedicels

3–4 mm long, leaving 1–3 mm long stalks after the flowers have fallen, hairy; perianth red, densely appressed-hairy abaxially; sepals 6–8 mm long, perianth tube 3 mm long, free part of sepals oblong or slightly triangular, reflexed; petals 3–4 mm long, adnate to the calyx for 1–2.5 mm, the free part linear glabrous, ciliate; staminodes 0.3–0.7 mm long, tooth-like; disk glabrous; ovary 3–4 mm long, glabrous or densely hairy at the apex only; stigmas 0.9–1.5 mm long, ovoid. Fruits red; pedicels ca. 5 mm long, leaving 3–5 mm long stalks after the fruits have fallen; sepals of mature fruits 28–35 mm long and 7–8 mm wide, perianth tube 4–6 mm long, sepals chartaceous with evident secondary venation, obovate, slightly keeled, appressed-hairy, especially at the base, sparsely hairy on the wings; petals 4–8 mm long, adnate to the calyx for 3–4 mm long, free part linear; achene 8–10 mm long, three-lobed, smooth, glabrous or sparsely hairy at the apex. Figs. 2O, 27.

Phenology. Male flowers: January, February; female flowers: December–February; fruits: January, February, October–November.

Distribution (Fig. 28). Colombia (Magdalena), Venezuela (Aragua, Distrito Federal, Sucre); seasonally dry tropical forests; 200–1000 m.

Vernacular name. Volador (Colombia).

ADDITIONAL SPECIMENS EXAMINED. **Colombia**. MAGDALENA: without locality, *Bro. Elias 1107* (F). **Venezuela.** ARAGUA: selvas de Guamitas, PN Aragua, *Pittier & Nakichenovich 15642* (VEN); Carmen, *Williams 10406* (F, US, VEN).—DISTRITO FEDERAL: Peña de Mora, carretera de La Guaira, *Lugo 28* (VEN); Caracas Botanic Garden,10°30′N, 66°53,″ *Pendry 1040* (E, VEN); near zigzag road from Caracas to La Guaira, *Pittier 8694* (GH, NY, US).—SUCRE: vicinity of Cristóbal Colón, *Broadway 14* (GH, K, NY), *115* (GH), *145* (NY), *429* (K, NY, US), *690* (GH, NY).

Ruprechtia carina is most similar to *R. ramiflora*, and is named for the keel-like structures formed by the fusion of the petals with the inner surface of the calyx in female flowers and fruits. This is the most reliable character by which to distinguish it from the rather variable *R. ramiflora*. *Ruprechtia carina* differs from *R. curranii* in its larger fruits with more rounded bases (fruiting sepals 28–35 by 7–8 mm vs. 20–30 by 4–7 mm) and from *R. coriacea* in its shorter bracts (1 mm vs. 3–5 mm).

Although there are some differences in the leaves of collections from the Paria Peninsula in northeastern Venezuela (flat and chartaceous) and those from Caracas, Aragua, and Colombia (rather bullate and coriaceous), the fruits are very similar, and therefore only one species has been recognized. It would be interesting to investigate further the variation within this species.

21. Ruprechtia ramiflora (Jacquin) C. A. Meyer, Mém. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 6: 150. 1840. *Triplaris ramiflora* Jacquin, Select. stirp. amer. hist. 14. 1763. *Magonia ramiflora* (Jacquin) Kuntze, Revis. gen. pl. 2: 553. 1891. *Enneatypus ramiflorus* (Jacquin) Roberty & Vautier, Boissiera 10: 86. 1964.—TYPE: COLOMBIA. Bolívar: Mpio. Cartagena, Jardín Botaníco Guillermo Pineres, Feb 1980, *Cuadros 1096* (neotype, here designated: MO!).

Ruprechtia cumingii Meisner in DC., Prodr. 14: 179. 1856. *Magonia cumingii* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: COLOMBIA. North coast of Colombia and Panama, *Cuming 1148* (holotype: E! ex GL; isotype E!, fragment ex GL: NY!).

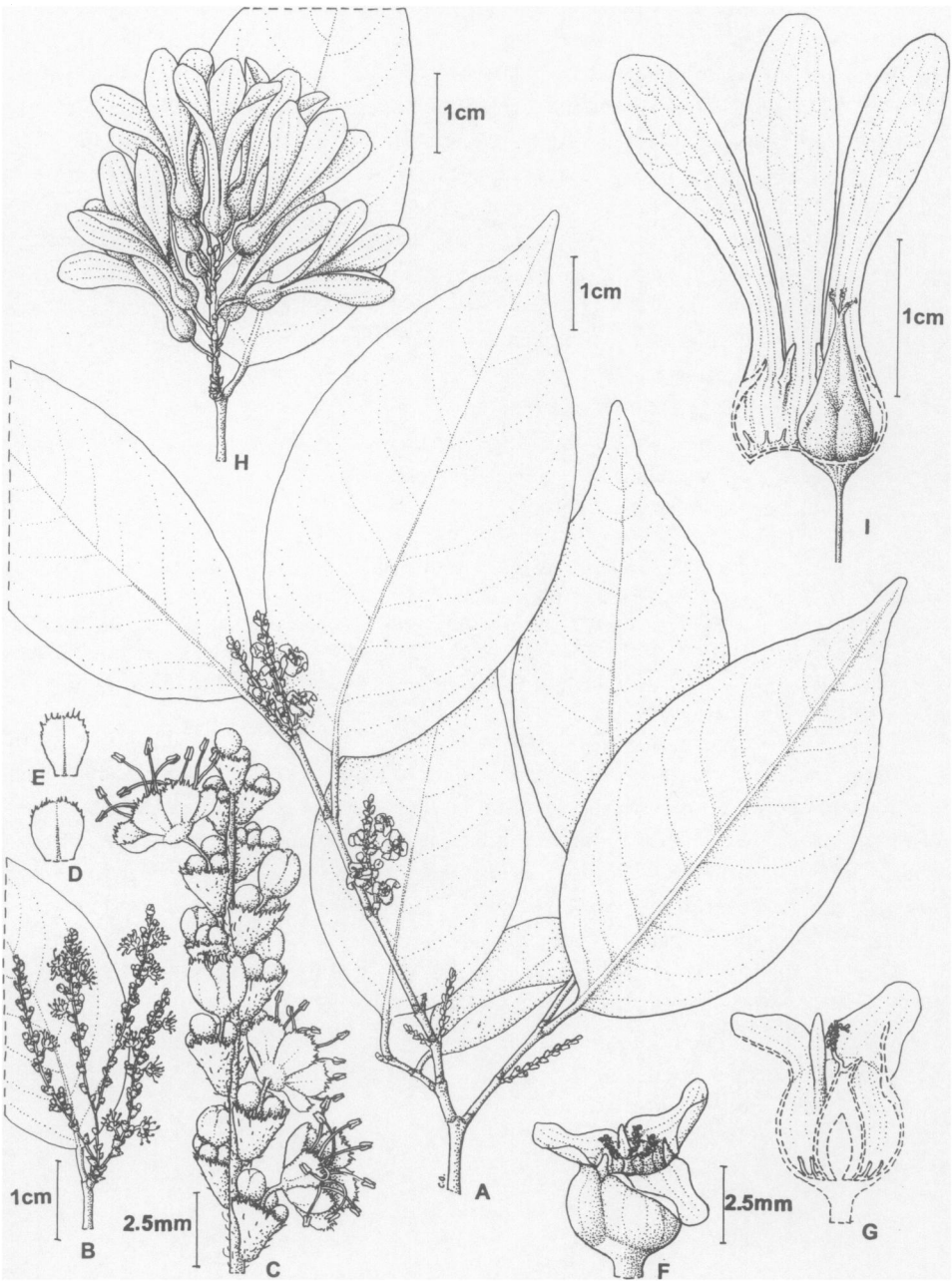

FIG. 27. *Ruprechtia carina*. A. Flowering branch with female inflorescences. B. Male inflorescence. C. Male inflorescence (detail). D. Sepal of male flower. E. Petal of male flower. F. Female flower. G. Vertical section of female flower. H. Infructescence. I. Fruit with the sepals opened. (Based on: A, F–I, *Broadway 3*; B–E, *Broadway 14*.)

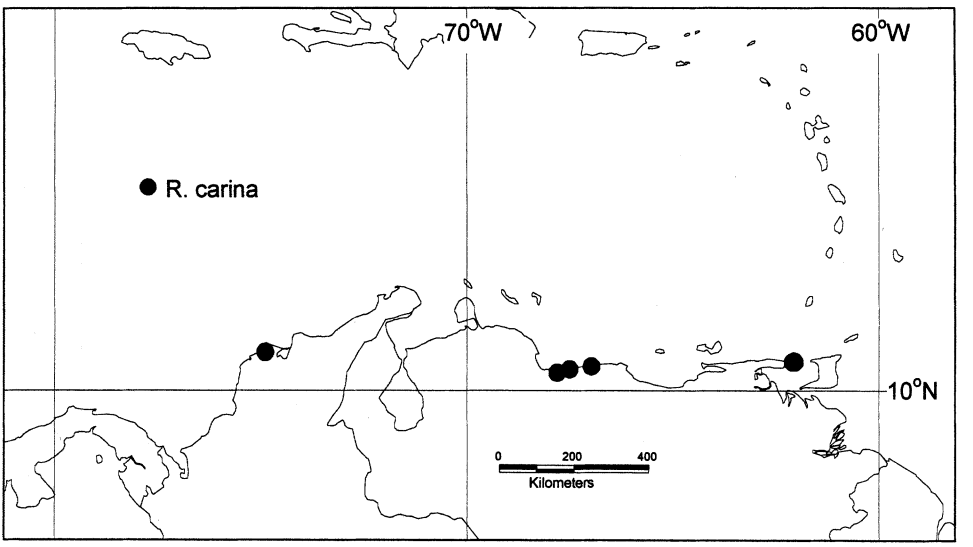

FIG. 28. Distribution of *Ruprechtia carina.*

Ruprechtia colorata Donnell Smith, Bot. Gaz. 47: 260. 1909.—TYPE: COLOMBIA. Atlántico: Savanilla, sea level, Feb 1896, *Donnell Smith s.n.* (holotype: US!; isotype: GH!).

Ruprechtia hamanii S. F. Blake, Contr. Gray Herb. 53: 31. 1918.—TYPE: VENEZUELA. Falcón: Estacadita, 25 Apr 1917, *Curran & Haman 766* (holotype: GH!; isotypes: NY! US!).

Ruprechtia oxyphylla S. F. Blake, Contr. U.S. Natl. Herb. 20: 238. 1919.—TYPE: COLOMBIA. Magdalena: hills above Santa Marta Bay, 30–90 m, Jun 1916, *Curran 388* (holotype: US!; isotype: GH!).

Ruprechtia howardiana Aymard & P. E. Berry, Novon 9: 313. 1999.—TYPE: VENEZUELA. Bolívar: Cerro Baraguan, occasional on northernmost slopes of cerro, 100–330 m, 13 Jan 1956, *Wurdack & Monaschino 41230* (holotype: VEN!; isotypes: F! HB, K! NY! P! US!).

Tree to 15 m tall. Bark grey, fissured; inner bark pink or purplish; wood pinkish. Twigs solid, glabrous; brachyblasts absent. Laminas 4–13 cm long, 2.5–6.5 cm wide (length:width ratio 1.5–2.7), obovate, oblong, or elliptic, apex obtuse to acuminate, base rounded or cordate, or more rarely cuneate; margin undulate, sometimes inrolled; midrib flat to raised adaxially, secondary veins 8–14, the secondary venation prominent abaxially, sometimes sunken adaxially and giving the leaf a bullate appearance, markedly more prominent than the rather lax, reticulate-scalariform tertiary venation; pubescence variable, from glabrous to erect-hairy across the entire upper and lower surfaces; rarely minutely gland-spotted abaxially; petioles 2–5 mm long, glabrous to densely short-hairy; ochreas 1–2 mm long, glabrous or hairy, caducous or somewhat persistent. Male inflorescences to 9 cm long, rather lax, internodes to 3 mm long, with a dense indumentum of short, erect hairs; bracts 1 mm long, densely appressed-hairy; bracteoles 1 mm long, appressed-hairy; pedicels 2–2.5 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth pale green, white, or cream; sepals

1.5–2.5 mm long, ovate or elliptic, ciliate, glabrous or with a few scattered hairs at the base; petals 1.5–2.5 mm long elliptic, ciliate, glabrous or with a few scattered hairs at the base; filaments to 2.5–3 mm long; anthers 0.5–0.9 mm long. Female inflorescences 0.5–3.5 cm long, dense, internodes ca. 0.5 mm long, with a dense indumentum of short erect hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1–1.5 mm long, densely appressed-hairy; pedicels 1.5–2 mm long, leaving 1 mm long stalks after the flowers have fallen, hairy; perianth red to purplish with a dense indumentum of erect silvery hairs abaxially; sepals ca. 6 mm long, perianth tube 2 mm long, free parts of sepals oblong to acuminate; petals 2–2.5 mm long, free or slightly adnate to calyx, elliptic to linear, sparsely ciliate to densely hairy; staminodes 0.5 mm long, tooth-like and glabrous or inconspicuous and the disk hairy; ovary 2–3 mm long, very sparsely hairy at the apex only; stigmas 0.8–1 mm long, linear. Fruits reddish ripening to pale green, white, cream or pale brown; pedicels 1.5–4 mm long, leaving 1–2 mm long stalks after the fruits have fallen; sepals of mature fruits 23–37 mm long and 5–6 mm wide, perianth tube 5–6 mm long, sepals chartaceous with evident venation, obovate, not keeled, densely erect-hairy at the base, sparsely hairy on the wings; petals 4 mm long, free from the calyx or adnate at the base, linear; achene three-lobed, smooth, 9–10 mm long, almost glabrous with a few sparse hairs towards the apex. Fig. 2X.

Phenology. Male flowers: March, July, August, November–January; female flowers: September, November–January; fruits: September, November–April.

Distribution (Fig. 29). Puerto Rico, Panama (Herrera), Colombia (Atlántico, Bolívar, Guajira, Magdalena, Santander), Venezuela (Amazonas, Anzoátegui, Bolivár, Cojedes, Falcón, Lara, Nueva Esparta, Sucre, Táchira, Zulia); dry forests, woodlands and scrub, savannas, occasionally in seasonally inundated areas; 0–1200 m.

Vernacular names. Bolaó, guayabo, guayabo volador, pastelillo, volador, volador hembra, volador macho (Colombia); arcornioco, candelito, candelo, caobano, cornioco, guatacare macho, mazamorra, zapatero (Venezuela).

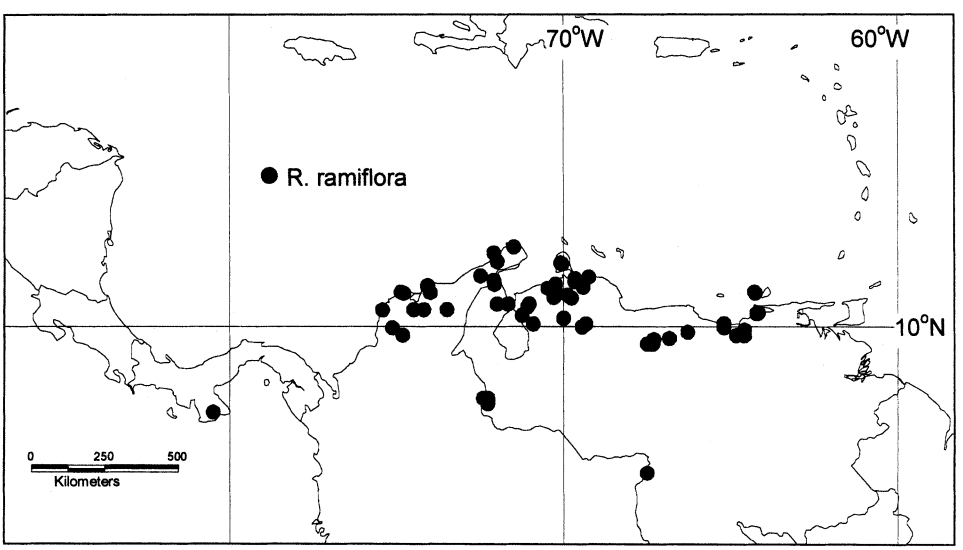

FIG. 29. Distribution of *Ruprechtia ramiflora*.

ADDITIONAL SPECIMENS EXAMINED. **Panama.** HERRERA: La Arena, *Tyson et al. 3157* (AAU, MO).

Colombia. ATLÁNTICO: *Bro. Elias 191* (F); Barranquilla and vicinity, *Bro. Elias 408* (NY); Piojo, Barranquilla, *Bro. Elias 703* (F, NY); Barranquilla, *Dugand 97* (F); Santa Rosa, near Barranquilla, *Dugand 215, 346* (F); entre Juanmina y Cuatrobocas, finca de "Bajoebula," *Dugand 4022* (NY); costa del Caribe, faja litoral entre Salgar y Sabanilla, *Dugand 5970* (NY).—BOLÍVAR: Mpio. Zambrano, 09°45′N, 74°50′W, *Cuadros 2555* (MO); Loma de los Colorados, near San Juan Nepomuceno, 09°58′N, 75°8′W, *Gentry & Cuadros 64798* (AAU, MO).—GUAJIRA: Mpio. Uribia, Arroyo Kutamahana near Uribia, *Bunch et al. 717* (MO); 5–8 km of Riohacha, *Cuatrecasas et al. 25445* (GH); aeropuertos entre el Municipio de Barrancas y el Municipio de Fonseca, *Fonnegra 1435* (MO); Cerro Carpinteros, *Fonnegra 1542* (NY); Cerro Iitojoro, Serranía de Macuira, 12°N, 71°W, *Sugden 136* (MO); trail from Nazaret to Arroyo Nazaret, Serranía de Macuira, 12°N, 71°W, *Sugden 175* (MO).—MAGDALENA: *Bro. Elias 1134* (F); Puerto Colombia, *Bro. Elias 1390* (F); Puerto Colombia, *Bro. Paul 892, 923* (F); El Paraíso, near Ponedera, *Dugand 307* (F); near Palmar–Ponedera trail, *Dugand 312* (F); Valle de Río Cesare (parte occidental), 10°00′N, 73°42′W, *Dugand 5524* (MO); Riochacha, *Hanbury-Tracy 291* (K, K); road from Valledupar towards Fundación, *Haught 3905* (F, GH, K); along road to S from Riohacha, *Haught 3914* (F, GH, K, M, NY); Mpio. Santa Marta, PN Natural Tayrona, Ensenada de Neguanje, *Lozano & Schnetter 2793* (NY); road to Bongo, Santa Marta region, *Record 42* (F, GH, NY); Don Jaca, Santa Marta region, *Record 67* (F, GH, NY); Santa Marta, *Smith 802* (BM, E, F, GH, K, MO, NY, P, U), *808* (NY), *1932* (BM, E, F, GH, K, MO, NY, P, U), *1935* (K, NY).—SANTANDER: Cordillera Oriental, Hoya del Río Chicamocha, entre Capitanejo y Enciso *Cuatrecasas et al. 9844* (F).—STATE UNKNOWN: Caesar valley, *Dawe 662* (K); Sierra Nevada, *Dawe 704* (K); Manati region, *Dugand 746* (F); Mar 1858, *Schott s.n.* (F). **Venezuela.** AMAZONAS: Depto. Atures, 8–9 km N de Puerto Ayacucho, sobre una laja granítica, a mano izquerda hacia El Burro, 05°43′N, 67°30′W, *Huber & Cerda 1506* (VEN).—ANZOÁTEGUI: Fundo Lagunitas de Flores, cerca del Caserío de Curataquiche, Barcelona, *Aristeguieta & Zabala 7012* (MO, VEN); Depto. Penalver, Mpio. Sucre, Riveras del Río Unare, Sector Conacal, 10°06′N, 65°12′W, *Castillo de Franca 2600* (GH, NY); Hato El Salado, Mpio. Caigua, camino de La Margarita y El Carito, *P. Chr. 11* (VEN); 37 km N of Anaco, *Steyermark et al. 106652* (MO, NY); Distrito Bruzual, 13 km W de Clarines, *Terán 334* (MO).—COJEDES: *Aristeguieta & Zabala 6896* (VEN).—FALCÓN: Dist. Democracia, alrededores de Buruica, quebrada Araguato entre Cerro Pozo Azul y Cerro Moporal, *Agostini & Agostini 1004* (F, MO, NY, VEN); Dist. Mauroa, Las Cabecitas, *Colma 311* (CORO, VEN); Cerro Zazarida, 11°19′N, 69°16′W, *Pendry 1035, 1036* (E); Dist. Miranda, Los Quemados, *Ruiz 269* (CORO, VEN); Dist. Buchivacoa, La Paz, *Ruiz 384* (CORO, VEN); Dist. Falcón, Peninsula de Paraguaná, El Hoyo, *Ruiz 703* (CORO, VEN), *704* (VEN); Dist. Zamora, Cujigacho, *Ruiz 1177* (VEN); Dist. Zamora, Sabana de La Cuchara, *Ruiz 1706* (VEN); Dist. Buchivacoa, Los Jabillos, *Ruiz 2217* (VEN); Dist. Colina, El Candil, extremo oriental de la Serranía de San Luis, *Ruiz 3256* (VEN); Dist. Miranda, Arenales, *Ruiz 3569* (CORO, VEN); Dist. Democracia, carretera Urumaco Pedregal, a 2 km desde Urumaco, *Ruiz & Rondón 3661* (VEN); Dist. Democracia, Río Lagarto, 3 km SE Mide, 16 km S Urumaco, *Wingfield 8539* (CORO); Dist. Buchivacoa, 4 km E de Mide, *Wingfield 8584* (CORO, GH); 1 km S de Mene de Maruoa, *Wingfield 13010* (CORO); Cerro Caujarao, 5 km S de la Catedral de Coro, cerca cumbre de la segunda fila desde el N (lado sur), *Wingfield 13888* (CORO); Dist. Buchivacoa, carretera Bariro–Guajiro a 10 km, ca. 35 km S de Dabajuro, *Wingfield et al. 472* (CORO, GH).—GUÁRICO: without locality, *Archer 3015* (US); cerca de Ortiz, *Aristeguieta 4439* (MO, NY, VEN); entre Camatagua y El Sombrero, *Aristeguieta 5988* (VEN); 3 km W of Paso Real along hwy between Altagracia de Orituco and Chaguaramas, *Davidse 4194* (MO, NY, VEN); Mpio. Chaguarama, 48 km S of Paso Real, 09°29′N, 66°08′W, *Pendry 1006* (E); Mpio. Chaguarama, 40 km S of Paso Real on the road to Paso Real, 09°33′N, 66°06′W, *Pendry 1012* (E); between Ortiz and El Sombrero, *Pittier 11297* (NY, VEN).—LARA: near Centro Comercial "Los Leones," Barquisimeto, *Gentry et al. 10995* (AAU, MO); vicinity of Barquisimeto, *Pittier 11190* (GH, NY, P, VEN); entre el Río Tocuyo y Carora, *Pittier 12612* (F, NY, VEN); 1 league from Barquisimeto, *Saer 61* (VEN); Quebrada la Ruesga; alrededores del Caserío Tin-Tin, *Trujillo 6949* (NY).—NUEVA ESPARTA: without locality, *Bernardi 2491* (NY); 11°00′N, 064°00′W, *Ginés 2493* (US); Isla Margarita, San Francisco (Macanao), *Hoyos 4697* (CAR, VEN).—SUCRE: Cerro Conolado, Cumaná, *Cumana 1290* (PORT, VEN); carretera Cumaná, El Tacal, alrededores de El Tacal, *Ruiz et al. 4658* (F); Laguna de Patos, 3.5 km al SW de Cumaná, en frente de Hotel Cumangoto, *Steyermark et al. 108536* (NY, VEN).—TÁCHIRA: Colina de Mirador, 5 km W de San Cristóbal, *Bono 4129* (MO), *4372* (VEN); entre Caneyes y Toituna hacia El Topón, W de San Cristóbal, *Bono 5047* (MO); Colina de Mirador, 6 km W de San Cristóbal, *Bono 5711* (VEN); Dist. Lobatera, carretera San Cristóbal–Lobatera, entre la carretera San Cristóbal–La Fria y Lobatera, *Bunting 5296* (GH, VEN); Cerro La Cabrera, Ureña, *Tamayo 3703* (VEN).—ZULIA: Maracaibo–El Moján, *Aristeguieta 2042* (NY, VEN); Fundo "Matalpo," Dist. Maracaibo, Mpio. Jésus Enrique Lossada, entre Cuatro Bocas y La Paz, *Aristeguieta et al. 6830* (VEN); Dist. Paez, carretera Carrasquero–Misión de Guana-Guarero, 4 km de Guarero, *Bunting 5268* (GH, VEN); Dist. Miranda, via El Guanabano–El Consejo, *Bunting 8617* (NY); Dist. Paez, carretera entre Misión de Guana y Guarero, en Km 15 a lo largo de la carretera, *Bunting & Aristeguieta*

6061 (GH, NY); Dist. Baralt, carretera Maracaibo–Carora en Km 4 al W de El Venado, *Bunting & Aristeguieta 6114* (GH, NY); Dist. Bolívar, carretera Sabana de la Plata–Palito Blanco, *Bunting & Fucci 6663* (GH, NY, VEN); Dist. Miranda, El Mecocal, *Nucette 39* (VEN).

Cultivated. Puerto Rico. Mayagüez, TARS plot 18, *Liogier 35294*, *35381* (NY). **USA.** Florida: Dade Co., Coral Gables, Montgomery Foundation (introduced from Venezuela), *Annable 2777* (NY).

Ruprechtia ramiflora is a widespread, common, and rather variable species which is most likely to be confused with *R. curranii*. It differs in that its leaves are usually more or less hairy and rarely glandular, the pedicels of the female inflorescences are to 2 mm long (more than 3 mm in *R. curranii*), the perianth tube of the fruit is 5–6 mm long (3–5 mm in *R. curranii*), and the indumentum of fruits and infructescence is longer, denser, and more erect. Two other species that grow in the same area as *R. ramiflora* are *R. coriacea* and *R. carina*. *Ruprechtia coriacea* has longer bracts on the catkinlike female inflorescences (3–5 mm vs. 1–1.5 mm) and longer and more densely hairy sepals on the fruits (34–43 mm vs. 23–37 mm). *Ruprechtia carina* is close to *R. ramiflora*, but its petals are adnate to the perianth tube, forming three keel-like structures in the female flowers and fruits, whereas in *R. ramiflora* the petals are free or scarcely adnate and do not form similar structures.

There are several noteworthy features of the distribution of *R. ramiflora*. It is the only species that has been collected in both South America and Central America, with a single collection found in Panama. The collections from the USDA Tropical Agriculture Research Station in Puerto Rico most likely represent cultivated trees. There are some differences between these specimens and most field-collected material of *R. ramiflora*. The sepals of the mature fruits of the Puerto Rican specimens are rather short (26 mm vs. 23–37 mm) and the perianth tube is very rounded and constricted about the apex of the achene, but these attributes fall within the range of variation encountered in *R. ramiflora*. It would, however, be interesting to obtain molecular data from these individuals.

Although *R. ramiflora* is primarily found in dry forest regions, *Wurdack & Monachino 41230* and *Huber & Cerda 1506* are from patches of shrubby vegetation resulting from unusual edaphic conditions in moist forest areas. Both collections are male and the former was described as *R. howardiana*. Again, I believe that these collections are encompassed by the range of variation of *R. ramiflora* and prefer to keep them within this species.

Because no suitable type material for *Triplaris ramiflora* Jacq. was found during this study, neotypification is necessary. The collection *Cuadros 1096* has been selected, because it comes from Cartagena, one of the two localities mentioned in the protologue of *T. ramiflora*. Whilst a collection from a Botanic Garden is not ideal, as there may be doubt about the origin of the individual, it is likely that the tree was either growing wild within the Garden or was collected nearby. It is therefore considered to be the collection most representative of the type locality. *Ruprechtia ramiflora* is a rather variable species, and it is preferable that the neotype should come from the region of the type locality.

22. Ruprechtia coriacea (Karsten) S. F. Blake, Contr. U.S. Natl. Herb. 20: 239. 1919. *Triplaris coriacea* Karsten, Fl. columb. 2: 131, t. 169. 1866. *Magonia coriacea* (Karsten) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: VENEZUELA. "Llanos de Barcelana," *Moritz 586* (lectotype, here designated: B-101001719!).

Tree to 12 m tall. Bark rough, fissured. Twigs solid, glabrous or appressed-hairy; brachyblasts absent. Laminas 6–15 cm long, 2.5–6.5 cm wide (length:width ratio 2.0–3.0), elliptic or slightly obovate, apex acute, acuminate or rarely obtuse, base cuneate to rounded, margin slightly undulate, sometimes inrolled; midrib flat to prominent adaxi-

ally, secondary veins 10–15, prominent abaxially and impressed adaxially, markedly more prominent than the lax, scalariform tertiary venation, the leaves sometimes rather bullate, abaxially glabrous or with a few appressed hairs on the midrib and veins, occasionally densely hairy abaxially; sometimes minutely gland-spotted abaxially; petioles 2–4 mm long, glabrous or hairy; ochreas 2–4 mm long, hairy, sometimes tuberculate, persistent. Male inflorescences to 3 cm long, dense, internodes 0.5–1 mm long, with a dense indumentum of both long and short, erect, wavy hairs; bracts 1.5–3 mm long, densely appressed-hairy; bracteoles 1.5–3 mm long, densely appressed-hairy; pedicels 1 mm long, leaving 1 mm long stalks after the flowers have fallen, hairy; perianth yellowish, sepals 1.5–2 mm long, elliptic, cucullate, densely hairy at the base, ciliate; petals 1.5–2 mm long, obovate, hairy at the base, ciliate; filaments to 3–4.5 mm long; anthers 0.6–0.9 mm long. Female inflorescences to 4 cm long, dense, internodes ca. 0.5 mm long, with a dense indumentum of erect wavy hairs; bracts 3–5 mm long, densely hairy; bracteoles 4–6 mm long, densely appressed-hairy; pedicels 3 mm long, leaving 2 mm long stalks after the flowers have fallen, hairy; perianth reddish with a dense indumentum of long, erect, silvery hairs abaxially; sepals 9–12 mm long, perianth tube 3–4 mm long, free parts of sepals linear; petals 4 mm long, adnate to the calyx at the base, linear, hairy; staminodes to 1 mm long, tooth-like; disk hairy; ovary 2 mm long, densely hairy; stigmas 2 mm long, linear. Fruits red to pale brown; pedicels 4 mm long, leaving 4 mm long stalks after the fruits have fallen; sepals of mature fruits 34–43 mm long and 7–8 mm wide, perianth tube 4–5 mm long, sepals chartaceous with evident venation, obovate, not keeled, with a dense indumentum of long erect hairs at base, sparsely hairy on the wings; petals 7 mm long, free from the calyx or adnate at the base, linear; achene 9–10 mm long, three-lobed, smooth, sparsely hairy at base, denser towards apex. Fig. 2P.

Phenology. Male flowers: December–March; female flowers: February; fruits: February, March.

Distribution (Fig. 30). Venezuela (Aragua, Distrito Federal, Falcón, Guárico, Trujillo, Yaracuy); dry forests and scrub; 50 m–1400 m.

Vernacular names. Chupón, guayabo faisán, quisanda.

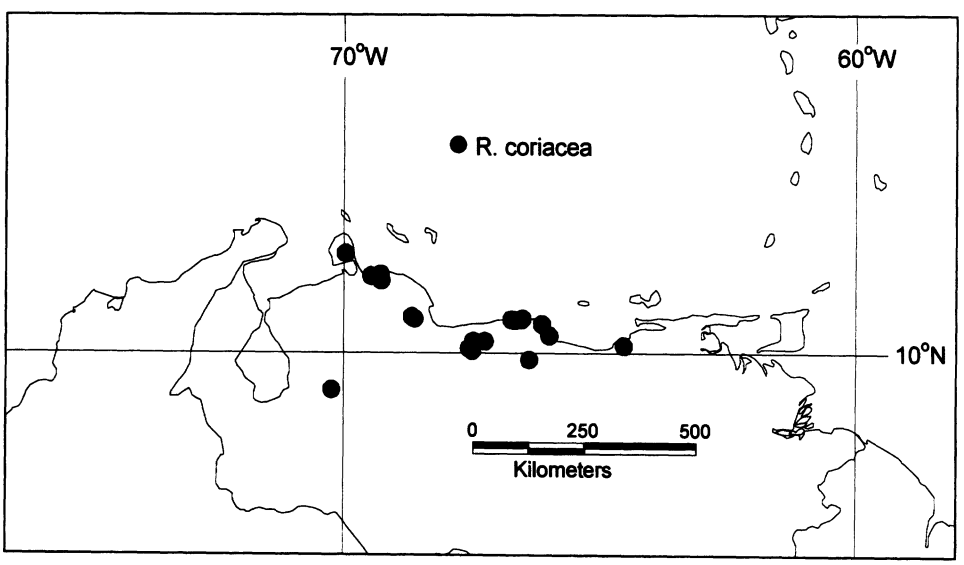

FIG. 30. Distribution of *Ruprechtia coriacea*.

ADDITIONAL SPECIMENS EXAMINED. **Venezuela.** ARAGUA: playa N de Turmero, *Matos 1090* (VEN); along the road between Cagua and Villa de Cura, *Pittier 13560* (F, MO, US, VEN); Cordillera Interior, entre El Paují y El Socorro, al sur de El Consejo, 10°13′N, 67°14′W, *Steyermark & Gonzales 118057* (GH); San Francisco, *Williams 12344* (F, GH, K, VEN).—DISTRITO FEDERAL: road between Caracas and Cabo Blanco, *Archer 3070* (NY); Osma, 1 km de Osma (Las Caracas), *Gibson 6880* (VEN); Depto. Vargas, seaward slopes east of Osma, *Steyermark & Espinoza 106879* (GH, NY, VEN); Camurí Grande, above Playa Los Angeles, Cordillera Costal, *Wood 451* (NY).—FALCÓN: Fila Barigua, cumbre arriba de Guaibacoa, 25 km E of Coro, *Wingfield 12135* (CORO); Cerro Zazarida, 46 km ESE de Coro, *Wingfield 12523* (CORO); Cerro Santa Ana, arriba de Moruy, Paraguaná, *Wingfield & Sugden 8480* (CORO, GH).—GUARICO: Altagracia de Orituco–Aimara, *Aristeguieta 6052* (NY).—MIRANDA: Fundo El Jobo, cerca Los Canales, Río Chico, *Aristeguieta & Agostini 2731* (VEN); Santa Lucia, *Killip & Tamayo 37034* (F, US); El Carenero, *Pittier 11012* (GH, NY, US, VEN).—TRUJILLO: Carache, *Tamayo s.n.* (VEN).—YARACUY: Yumare, selvas de Yumare, Colonia I. á N., *Bernardi 6999* (K); Reserva Forestal "Río Tocuyo," en la quebrada El Charalito, *Blanco 945* (VEN).—STATE UNKNOWN: *Pittier 7781* (GH).

Ruprechtia coriacea is easily distinguished from the other dry forest species of northern South America by its long bracts (3–5 mm vs. to 2.5 mm), which give the inflorescence a catkinlike appearance, and by the long sepals on its fruits (34–43 mm vs. to 37 mm), which are densely hairy, especially at the base. It is most similar in appearance to *R. ramiflora* but the sepals are longer (34–43 mm vs. 23–37 mm).

The specimen *Moritz 586* at B (B101001719) has been selected as the lectotype. After his return from collecting in South America, Karsten spent most of his career in Berlin, where he was Professor of Botany from 1856 to 1868 and from 1872 until his death in 1908. The label of *Moritz 586* bears the locality name "Barcelana," implying that it was one of the specimens referred to in the protologue of *Triplaris coriacea*: "Habitat regiones arides et calides Venezuelae in provinciis Barzelona et Caracas observata." I have found no other 19th century specimens of *Ruprechtia* from this locality.

23. Ruprechtia curranii S. F. Blake, Contr. Gray Herb. 53: 30. 1918.—TYPE: CURAÇAO. Hofje Abau, 27 Feb 1917, *Curran & Hamman 189* (holotype: GH!; isotypes: NY! US!).

Ruprechtia concinna Pittier, Trab. Mus. Comercial Venezuela 1. 1927.—TYPE: VENEZUELA. Carabobo: between El Sanchón and El Palito, 13 Sep 1926, *Pittier 12209* (holotype: VEN, presumed lost; isotypes: A! F! G, M! MO! NY! US!; photo of G isotype, Field Museum negative no. 27774: F! MO!).

Tree to 8 m tall. Bark pale grey, slightly fissured; inner bark dark red-brown. Twigs solid, glabrous, lenticellate; brachyblasts sometimes present. Laminas 3.5–10 cm long, 2–6 cm wide (length:width ratio 1.7–2.7), elliptic or obovate, apex acute to acuminate, base acute, rounded or rarely cordate; margin smooth or undulate, sometimes inrolled; midrib flat or prominent adaxially, secondary veins 7–12, more prominent abaxially than adaxially, markedly more prominent than the faint, densely reticulate tertiary venation; abaxially glabrous or occasionally with a few hairs on the midrib or veins; minutely gland-spotted abaxially; petioles 1–3 mm long, glabrous; ochreas 1–1.5 mm long, glabrous or sparsely hairy, usually persistent. Male inflorescences to 3 cm long, rather lax, internodes to 2–3 mm long, with a sparse indumentum of short, wavy hairs; bracts 1–1.5 mm long, sparsely appressed-hairy; bracteoles 1–1.5 mm long, sparsely appressed-hairy; pedicels 2–3 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth off-white; sepals 1.5 mm long, cucullate, glabrous with minutely ciliate margins; petals 1.5 mm long, obovate, slightly cucullate, glabrous with minutely

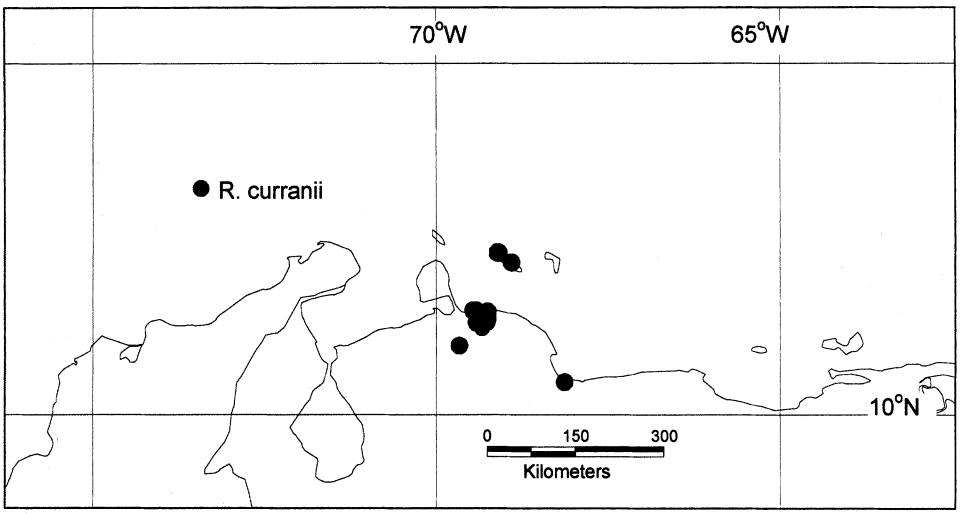

FIG. 31. Distribution of *Ruprechtia curranii.*

ciliate margins; filaments to 4 mm long; anthers 0.5 mm long. Female inflorescences ca. 1 cm long, dense, internodes to 0.5–2 mm long, with a dense indumentum of short erect hairs; bracts 1 mm long, sparsely appressed-hairy; bracteoles sparsely appressed-hairy, 1–1.5 mm long; pedicels ca. 3 mm long, leaving 2 mm long stalks after the flowers have fallen, hairy; perianth color unknown, with a sparse indumentum of appressed silvery hairs outside; sepals ca. 9 mm long, perianth tube 2 mm long, free parts of sepals oblong to obovate; petals 3 mm long, free from the calyx, acuminate, glabrous, ciliate; staminodes to 0.7 mm long; disk hairy; ovary 3 mm long, very sparsely hairy at the apex only; stigmas 1–2 mm long, linear. Fruits pale brown; pedicels 3–5 mm long, leaving 1–2 mm long stalks after the fruits have fallen; sepals of mature fruits 20–30 mm long and 4–7 mm wide, perianth tube 3–4 mm long, sepals chartaceous with evident venation, obovate, not keeled, with a short, erect indumentum, sparsely hairy on the wings; petals 3 mm long, free from the calyx, linear or bristle-like; achene 7–9 mm long, three-lobed, smooth, almost glabrous with a few sparse hairs towards the apex. Fig. 2W.

Phenology. Male flowers: August, October; female flowers: October; fruits: February, March, August, October, December.

Distribution (Fig. 31). Curaçao, Venezuela (Carabobo, Falcón); dry forests, sometimes in moist forests and gallery forests; 0–500 m.

Vernacular name. Mangel di sabana (Curaçao).

ADDITIONAL SPECIMENS EXAMINED. **Curaçao.** *Arnoldo 1067* (U); Soto, *Arnoldo 1094* (U), *1095* (U), *2269* (NY), *3618* (GH, NY); *Boldingh 4993* (U), *5139* (U), *5024* (NY); Noordkaut, *Boldingh 5255* (NY, U); *Boldingh 5298*, *5509* (U); Noordkaut, *Curran & Haman 220* (GH, NY, P, US); Plantage Noordkaut, *Stoffers 172* (NY, U); Christoffelberg, *Stoffers 237* (GH, K, NY, U), *Stoffers 1133* (GH), *Wingfield 6967* (CORO), *Wingfield 6975* (CORO).

Venezuela. FALCÓN: Cerro Mampostal, *Gonzales 1082* (U, VEN); Pueblo Zazarida, 22 km SSE of Puerto Cumarebo, 11°19′N, 69°16′W, *Liesner & González 6032* (NY, U); Fundo La Ceiba, *Mendoza 20* (CORO); valley of Río Ricoa, E side of Sierra San Luis, 1.9 km upstream from Las Dos Bocas, 11°18′N, 69°26′W, *Pendry 1033* (E, VEN); Dist. Miranda, Cerro Bruno Lugo, *Ruiz 258* (VEN); Cujigacho, 50 km E of Coro between Cerro El Caballo and boca del Río Ricoa, *Ruiz 1177* (GH); Dist. Zamora, Qda. Manglar, *Ruiz 1292* (VEN); Dist.

Zamora, Sabana de la Cuchara, *Ruiz 1706* (CORO); Dist. Colina, a lo largo del Río Ricoa, S de Las Dos Bocas, 11°19′N, 69°25′W, *Steyermark & Gonzales 113627* (GH); Sierra San Luis, valle del Río Ricoa, 3 km arriba de Las Dos Bocas, *Wingfield 11090* (CORO); Cerro Mampostal, ladera E entre San Francisco y San Juan, *Wingfield 12257* (CORO); Cerro Piritu, 61 km E de Coro, *Wingfield 12404* (CORO); Fila Sacaragua, 43 km ESE de Coro, *Wingfield 13633* (CORO).

Ruprechtia curranii is close to the rather variable *R. ramiflora* (no. 21), but can be distinguished from it by the following combination of characters: minute dark glands on the underside of glabrous leaves, tertiary venation usually indistinct and not prominent abaxially, pedicels of female inflorescences longer than 3 mm (to 2 mm in *R. ramiflora*), perianth tube in fruit 3–5 mm (5–6 mm in *R. ramiflora*), and indumentum on fruits and infructescence with fewer and shorter hairs. The other two species of the northern South American dry forests are *R. coriacea* and *R. carina*, which are distinguished from *R. curranii* as follows. *Ruprechtia coriacea* has larger leaves, which are often bullate, longer bracts on the female inflorescences (3–5 mm vs. 1 mm), giving them a catkinlike appearance, and longer and more densely hairy sepals on the fruits (34–43 mm vs. 20–30 mm). *Ruprechtia carina* also has larger sepals on the fruits (28–35 mm), and its petals are adnate to the perianth tube, forming three keel-like structures in the female flowers and fruits.

24. Ruprechtia tenuiflora Bentham, London J. Bot. 4: 629. 1845. *Triplaris tenuiflora* (Bentham) Endlicher, Gen. pl. suppl. 4(2): 55. 1847. *Magonia tenuiflora* (Bentham) Kuntze, Revis. gen. pl. 2: 553. 1891. *Enneatypus tenuiflorus* (Bentham) Roberty & Vautier, Boissiera 10: 86. 1964.—TYPE: BRAZIL. Amazonas: Pedrero on the Rio Negro, 1840, *Schomburgk 924* (holotype: K!; isotypes: BM! E! G, NY! P! U!, fragment of G isotype: F!, photo of G isotype, Field Museum photograph 27777: F! MO!).

Shrub or tree to 8 (rarely 18) m tall. Twigs solid, glabrous, lenticellate, rarely densely erect-hairy when young; brachyblasts sometimes present. Laminas 3–11 cm long, 1.5–5 cm wide (length:width ratio 1.7–2.7), ovate or elliptic, sometimes somewhat oblong or obovate, apex acute to acuminate, base rounded to cuneate, rarely cordate, margin undulate, sometimes slightly inrolled; midrib, secondary and tertiary venation almost as prominent adaxially as abaxially, secondary veins 6–11, only slightly more prominent than the rather faint, densely reticulate tertiary venation; glabrous adaxially and abaxially, rarely densely erect-hairy abaxially across whole surface; glands absent; petioles 2–5 mm long, glabrous, rarely densely erect-hairy; ochreas 0.5 mm long, rarely persistent, glabrous. Male inflorescences to 3–6 cm long, rather lax, internodes to 3–4 mm long, with a short indumentum of erect, wavy hairs; bracts 0.5–1 mm long, appressed-hairy, ciliate; bracteoles appressed-hairy, 1–1.5 mm long; pedicels 1.5–2 mm long, leaving ca. 1 mm long stalks after the flowers have fallen, sparsely to densely hairy; perianth white, sepals 1–1.5 mm long, ovate, somewhat cucullate, hairy; petals 1–1.5 mm long, ovate to oblong, hairy along midvein, ciliate; filaments to 2–4 mm long; anthers 0.6–0.8 mm long. Female inflorescences to 1–7 cm long, dense to lax, internodes to 1–6 mm long, with a short indumentum of erect, wavy hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1.5–2 mm long, appressed-hairy; pedicels 3–3.5 mm long, leaving 1–2.5 mm long stalks after the flowers have fallen, sparsely to densely hairy; perianth green with a dense indumentum of appressed or short erect hairs abaxially; sepals 4–8 mm long, perianth tube

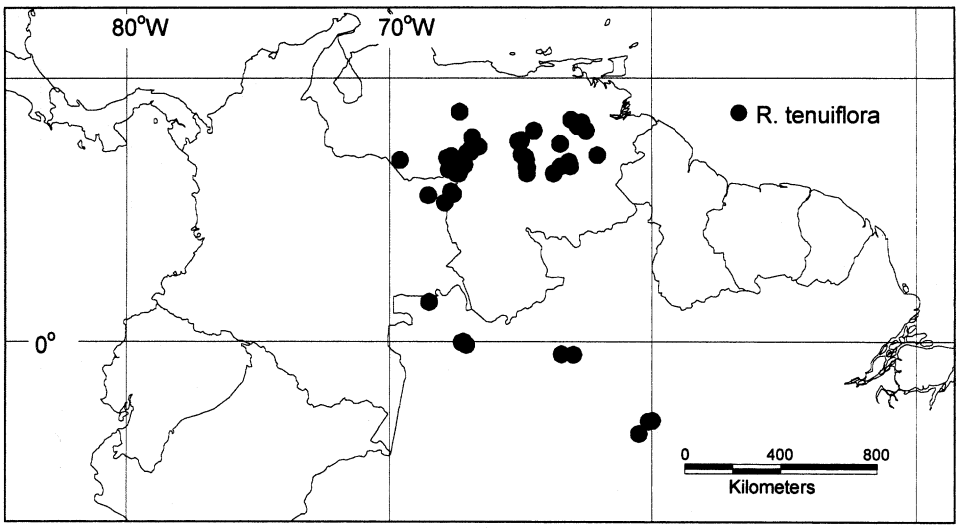

FIG. 32. Distribution of *Ruprechtia tenuiflora*.

1.0–1.5 mm long, free part of sepals linear or very narrowly ovate, acute; petals 1–2 mm long, adnate to the calyx at the base, elliptic or linear, hairy; staminodes inconspicuous; disk glabrous; ovary 3–4 mm long, densely, evenly hairy; stigmas 0.8–1 mm long, linear. Fruits green or brown; pedicels 2–4 mm long, leaving 1–1.5 mm long stalks after the fruits have fallen; sepals of mature fruits 10–14 mm long and 1–2 mm wide, perianth tube ca. 1 mm long, sepals coriaceous with obscure secondary venation, linear, with the margins slightly recurved, not keeled, densely minutely hairy; petals 1–2 mm long, free from the calyx, elliptic or bristle-like; achene 6–10 mm long, three-lobed, smooth, sparsely hairy with a denser indumentum on angles or evenly densely hairy. Fig. 2AG.

Phenology. Fertile material has been collected throughout the year, but especially from January through June.

Distribution (Fig. 32). Brazil (Amazonas), Colombia (Vichada), Guyana, Venezuela (Amazonas, Anzoátegui, Apure); in gallery forests of savannas or lowland rain forests, in seasonally flooded forests (várzea and igapó) and dry land forests (terra firme); 0–300 m.

Vernacular names. Guácimo negro, muelle gallina, para-pájaro, par kamatatà (Venezuela).

ADDITIONAL SPECIMENS EXAMINED. **Colombia.** VICHADA: Parque Nacional Natural "El Tuparro," Río Tuparro, 05°15′N, 67°54′W, *Zarucchi & Barbosa 3471* (F, GH, K, MO, NY, U); Parque Nacional Natural "El Tuparro," La Linea Roja, S of Río Tomo, 05°32′N, 68°32′W, *Zarucchi & Barbosa 3674* (AAU, K, MO, NY), *3683* (GH, NY). **Venezuela.** AMAZONAS: Río Orinoco behind Puerto Ayacucho airport, 05°40′N, 67°40′W, *Gentry & Stein 46362* (F, MO, NY); Dept. Atures, Puerto Ayacucho, end of road from airport to Río Orinoco, 05°35′N, 67°35′W, *Plowman 13491* (F, NY, U).—ANZOÁTEQUI: Laguna y Caño Mamo, entre Soledad y Los Barrancos, 40 km al oeste de San Felíx, *Colonnello 1194* (CAR, MO, PORT), *1197* (CAR), *1198* (CAR, MO, PORT), *1225* (MO, PORT); Río Mapire, afluente norte del Río Orinoco Medio, 08°N, 64°30′W, *Rosales & Valles 112* (GH).—APURE: Distrito San Fernando, just E El Guamal on the bank of Río Apurito, 07°44′N, 66°51′W, *Davidse & González 12090* (K, MO, VEN); between the Río Cinaruco near the mouth of Caño San Miguel and the S part of the Galerias de Cinaruco, 06°33′N, 67°17′W, *Davidse & González 12269A* (U, VEN); Dist. Pedro Camejo, S bank of Río Cinaruco near mouth of unnamed large laguna E of Laguna Larga, 06°22′N, 67°22′W, *Davidse & González 12418* (MO, VEN); Dist. Pedro Camejo, 3 km ESE of Paso Cinaruco along the banks of Río Cinaruco, 06°22′N, 67°28′W, *Davidse & González 12431* (MO); Dist. Pedro Camejo, 27 km WSW

of Paso de Cinaruco along banks of Río Cinaruco, 06°31′N, 67°45′W, *Davidse & González 12579* (MO); Dist. Pedro Camejo, ca. 4–5 km downstream from the mouth of the Río Cinaruco at its junction with Río Orinoco, N bank, 06°42′N, 67°09′W, *Davidse & González 12636* (VEN); Dist. Pedro Camejo, 2.5 km upstream from the mouth of the Río Capanaparo at its junction with the Río Orinoco W of the Isla La Urbana, 07°10′N, 67°03′W, *Davidse & González 12678* (MO, VEN); Dist. Pedro Camejo, Río Capanaparo between caños La Pica and La Guardia, 14 km SW of Uranon, 06°54′N, 67°18′W, *Davidse & González 12830* (MO, VEN); Dist. Pedro Camejo, 11 km E of Paso de Pablo and ca. 2 km ENE of Fundo Picachón on banks of Río Capanaparo, 07°02′N, 67°39′W, *Davidse & González 12866* (MO, VEN), *12934* (MO, U); Dist. Pedro Camejo, 4 km NE of El Betún along Río Capanaparo, 06°58′N, 67°49′W, *Davidse & González 13020* (MO, VEN); Dist. San Fernando, bank of Río Orinoco N of Isla Urbana and Isla Catarrosa, 07°12′N, 66°55′W, *Davidse & González 13152* (MO, VEN); Dist. San Fernando, mouth of Río Arauca, at its intersection with the Río Orinoco, 07°24′N, 66°36′W, *Davidse & González 13251* (MO); Dist. San Fernando, banks of Río Arauca, 5 km ESE of Guirimita, 07°22′N, 66°46′W, *Davidse & González 13267* (MO), *13345* (MO, U, VEN); Dist. San Fernando, banks of Río Arauca, 5 km SW of El Faro, 07°19′N, 66°54′W, *Davidse & González 13463* (MO, PORT, VEN); Dist. Rómulo Gallegos, Laguna del Termino, on Hato San Felipe, 18 km SSW of Elorza, 06°53′N, 69°36′W, *Davidse & González 16062* (GH, MO, PORT).—BOLÍVAR: Pto. Ordaz–San Felíx, márgenes del Río Caroní, *Aristeguieta 5276* (F, MO, NY, U, VEN); Mpio. Piar, Hato la Chara, 08°00′N, 62°31′W, *Fernández 3081* (MO); Paso de Caruachi, lado del Río Caroní, 75 km al E de Ciudad Bolívar, 08°10′N, 62°50′W, *Holst et al. 1966* (MO, VEN); Mpio. Cedeño, bajo Río Sipao, affluente al bajo Río Caura, 07°36′10″N, 65°05′57″W, *Knab-Vispo 901*, *902* (PORT); near Maracapa on Río Paragua, 06°49′N, 63°10′W, *Liesner & González 5657* (MO); Las Trincheras, Caura arriba, *Lopez-Palacios et al. 4667* (NY); Parque "Punta Vista," Puerto Ordaz, 08°19′N, 62°41′W, *Rosales et al. 583* (GH); Mpio. Aripao, Raudal El Pescado, 06°53′N, 64°48′W, *Rosales et al. 1411* (MO); Mpio. Aripao, aguas arriba del raudal Surapire, 06°22′N, 64°46′W, *Rosales et al. 1457* (MO, MYF); Río Paragua, a la altura de "Dando y Dando," 06°38′N, 63°29′W, *Stergios 10049* (MO, NY, PORT); medio Río Paragua, en los alrededores de Campamento Turumban, 06°22′N, 63°45′W, *Stergios 10799* (MO, PORT); Río Chiguao, en los alrededores de "El Araguaney," 06°38′N, 63°07′W, *Stergios 10941* (MO, NY, PORT, VEN); Mpio. Piar, Baio Caroní, 07°04′N, 62°05′W, *Valera 195* (PORT); Mpio. Sucre. Boca de Nichare, 06°35′N, 64°47′W, *Velasco 211* (NY, PORT); Mpio. Sucre, Jabillal, 07°05′N, 64°58′W, *Velazco 225* (MO, PORT); en la orilla de una laguna seca en la Sabana de la Paragua, *Williams 12584* (F, K); en la margin de una laguna resecada en la estación seca en la Sabana de la Paragua, *Williams 12624* (F, K, VEN).—GUÁRICO: alrededores del Caño, a 30 km de La Estación, via Cazorla, *Aristeguieta 5069* (NY); márgenes Caño Realito a unos 30 km E de Calabozo, via Cazorla, *Aristeguieta & Agostini 4590* (MO, NY, U); Caño Herrera, 56 km S of Calabozo, *Pendry 1014* (E); Caño Realito, 30 km S of Calabozo, *Pendry 1022* (E); Hato Parmana, Comisión Borrachera, 1955, *Tamayo s.n.* (K). **Guyana.** *Schomburgk 957* (BM, E, GH, K, P); *Schomburgk s.n.* (G). **Brazil.** AMAZONAS: Rio Negro, Vista Alegra, *Cavalcante 508* (GH); Manaus, Igarape da Cachoeira Grande, *Ducke 1230* (K, MO, NY); Rio Negro opposite Manaus, *Keel & Guedes 271* (K, U); Taruma Grande, 1 km from junction of Rio Negro and Igarape Taruma, 03°02′S, 60°08′W, *Keel & Guedes 290* (GH, NY, U), *291* (GH, K, MO, NY, U); vicinity of Manaus, Taruma Grande, N from junction of Rio Negro and Igarape Taruma, *Keel et al. 180* (GH, NY, U); Igarape above Barcelos, *Maguire et al. 60037* (GH, K, MO, NY); Rio Negro, Vaupes, praia, *Murça Pires 538* (NY); in ripa Rio Negro, *Riedel 1518* (NY), 1828, *Riedel s.n.* (NY); Encontro das Aguas, perto de Manaus, margem esquerda, *Rodrigues & Lima 3405* (NY); Pedrero, *Spruce 924* (K); in vicinibus Barra, *Spruce 1135* (K); prope San Gabriel da Cachoeira, ad Rio Negro, *Spruce 2236* (BM, K, NY, P); Rio Negro, near Ilha Arara, *Steward et al. 342* (K, NY); Rio Negro, near Ilha Providência, *Steward et al. 513* (GH); near Lagas, mouth of R. Negro, *Traill 685* (K); Marapata, *Traill 686* (K, P); Rio Negro, *Ule 5987* (K).

Ruprechtia apurensis, *R. brachysepala*, *R. brachystachya*, *R. maracensis*, *R. tangarana*, and *R. tenuiflora*, which are all found in riverine forests of the Amazon and Orinoco Basins, are vegetatively so similar that they cannot be reliably distinguished in the absence of mature fruits. *Ruprechtia tenuiflora* differs from the other lowland, riverine species as follows: *R. apurensis* has oblong, obtuse sepals, which are 4 mm wide (vs. to 2 mm wide); *R. brachysepala* has ovate or deltate sepals (vs. linear), which are 3 mm or more wide; *R. brachystachya* has ovate, cucullate sepals, which enclose the achene tightly; *R. maracensis* has longer (18–30 mm vs. 10–14 mm), obovate sepals; *R. tangarana* has reflexed sepals with strongly inrolled margins.

Either of the two specimens cited by Bentham in the protologue for *R. tenuiflora*

could serve as lectotypes. *Schomburgk 924* has been chosen, because it is from a female plant whilst *Schomburgk 957* is a male specimen.

25. Ruprechtia apurensis Pendry, Edinburgh J. Bot. 60: 30. 2003.—TYPE: VENEZUELA. Apure: San Fernando de Apure, Caño Caramacate, 4 Apr 1969, *Aristeguieta 7067* (holotype: A!; isotypes: F! NY! VEN!).

Tree to 8 m tall. Bark fissured, grey. Twigs solid, glabrous, sometimes lenticellate; brachyblasts sometimes present. Laminas 3–10 cm long, 2–7.5 cm wide (length:width ratio 1.3–2.5), elliptic to obovate, apex acute to shortly acuminate, base rounded to cuneate, margin smooth to undulate, sometimes inrolled; midrib flat or slightly prominent adaxially, secondary veins 8–12, almost equally prominent adaxially and abaxially, only slightly more prominent than the faint, densely reticulate tertiary venation; the midrib glabrous to densely short-hairy at the base adaxially, sometimes with appressed hairs abaxially, lamina glabrous adaxially and abaxially; glands absent; petioles 5–7 mm long, glabrous or hairy on the upper surface; ochreas 1–1.5 mm long, sparsely hairy, more or less persistent. Male inflorescences to 3 cm long, dense, internodes to 2 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 1–1.5 mm long, appressed-hairy; bracteoles 1.5 mm long, sparsely hairy; pedicels 1.5–2 mm long, leaving ca. 0.5 mm long stalks after the flowers have fallen, sparsely hairy; perianth cream, sepals 1.5–2 mm long, elliptic, cucullate, sparsely hairy outside; petals 1.5 mm long, ovate, glabrous; filaments to 2.5 mm long; anthers 0.6 mm long. Female inflorescences to 4 cm long, lax, with internodes to 5 mm long, with a dense indumentum of semi-erect wavy hairs; bracts 1.5 mm long, densely appressed-hairy; bracteoles 1.5–2 mm long, appressed-hairy; pedicels 2–3 mm long, leaving 1–1.5 mm long stalks after the flowers have fallen, hairy; perianth color unknown, with a dense indumentum of appressed silvery hairs abaxially; sepals 5 mm long, perianth tube 1 mm long, free parts of sepals acuminate; petals ca. 1.5 mm long, adnate to the calyx at the base, linear, sparsely hairy; staminodes inconspicuous; disk glabrous; ovary 3 mm long, hairy in the distal half; stigmas 1.2 mm long, narrowly triangular. Fruits green; pedicels 2–3 mm long, leaving 1–1.5 mm long stalks after the fruits have fallen; sepals of mature fruits 12 mm long and 4 mm wide, not forming a perianth tube, sepals coriaceous with obscure venation, oblong, not keeled, minutely hairy, especially at the base, sparsely hairy on the wings; petals 1.5 mm long, free from the calyx, slightly hairy; achene 10 mm long, three-lobed, smooth, very sparsely hairy. Figs. 2AD, 33.

Phenology. Male flowers: March, April; female flowers: May; fruits: April.

Distribution (Fig. 34). Venezuela (Apure, Bolívar, Delta Amacuro); gallery forests; ca. 50 m.

Vernacular name. Pata e' garza.

ADDITIONAL SPECIMENS EXAMINED. **Venezuela.** APURE: San Fernando de Apure, Caño Caramacate, *Pendry 1030* (E).—BOLÍVAR: Puerto Ordaz–San Felíx, *Aristeguieta 5271* (F, MO, NY, U, VEN); márgenes del Río Caroní, Pto. Ordaz–San Felíx, *Aristeguieta 5294* (F, MO, NY); Mpio. Heres, Puente Angostura, 08°15′N, 63°35′W, *Chacón 637* (MO).—DELTA AMACURO: Santa Catalina, *Rusby & Squires 417* (GH, K, M, MO, NY).

Ruprechtia apurensis is most similar to *R. tenuiflora* whose fruit also have oblong, coriaceous fruiting sepals; however, *R. apurensis* lacks the inrolled margins usually seen in *R. tenuiflora*, and its sepals are obtuse and much wider (4 mm vs. 1–2 mm). It is

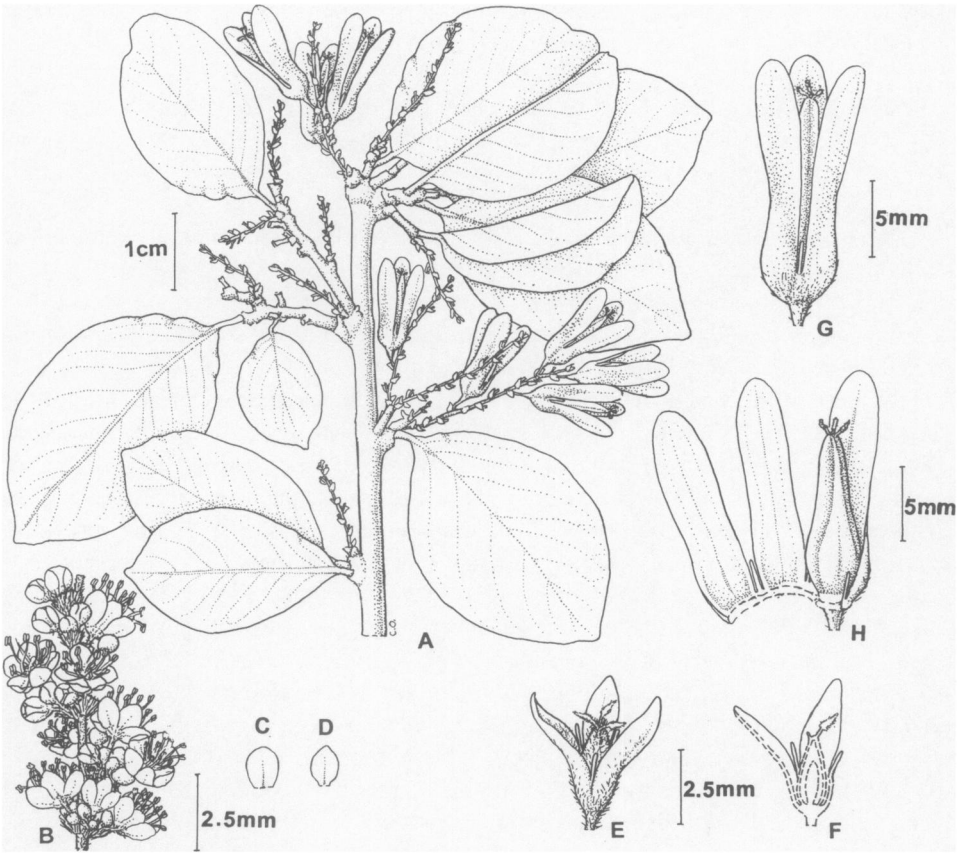

FIG. 33. *Ruprechtia apurensis.* A. Fruiting branch. B. Male inflorescence. C. Sepal of male flower. D. Petal of male flower. E. Female flower. F. Vertical section of female flower. G. Fruit. H. Fruit with the sepals opened. (Based on: A, G, H, *Aristeguieta & Zabala 7067*; B–D, *Aristeguieta 5271*; E, F, *Rusby & Squires 417*.)

distinguished from the other species of *Ruprechtia* found in moist habitats as follows: *R. brachysepala* has coriaceous, more or less deltate, acute sepals; *R. brachystachya* has coriaceous, ovate, cucullate sepals, which completely enclose the achene; *R. cruegeri* has chartaceous, obovate sepals; *R. maracensis* has longer (18–30 mm vs. 12 mm), obovate, coriaceous sepals; *R. tangarana* has reflexed, coriaceous sepals with strongly inrolled margins.

Ruprechtia apurensis has dense, heavy wood, which is used for musical instruments, furniture, and cudgels. As a result it has apparently been heavily exploited at its type locality, and it is now hard to locate individuals (F. Viera, pers. comm.).

26. Ruprechtia salicifolia (Chamisso & Schlechtendal) C. A. Meyer. Mém. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 6: 150. 1840. *Triplaris salicifolia* Chamisso & Schlechtendal, Linnaea 3: 56. 1828. *Magonia salicifolia* (Chamisso & Schlechtendal) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. "Brasilia meridionalis," 1845, *Sello s.n.* (lectotype, here designated: B-101001705 p.p.!, female specimen; isolectotypes: C! E! K! NY!).

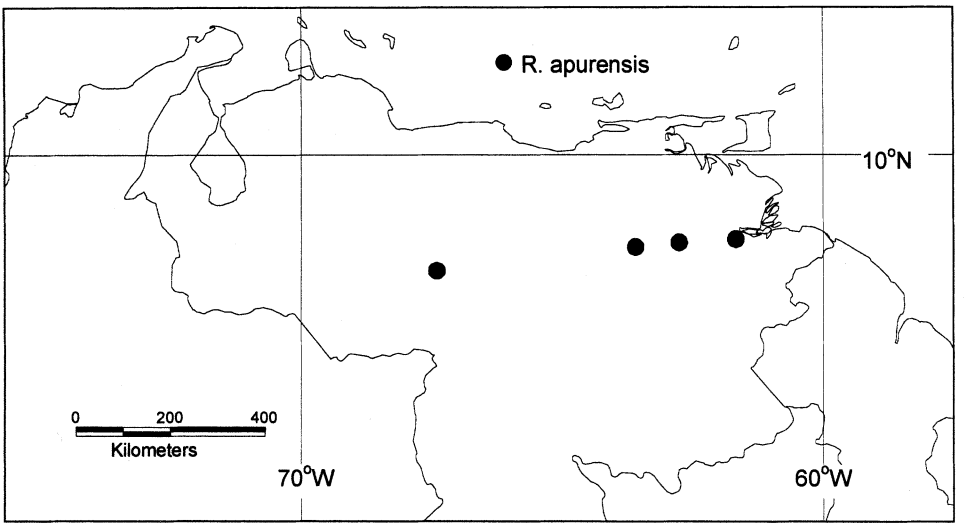

FIG. 34. Distribution of *Ruprechtia apurensis*.

Thicket-forming shrub or tree to 8 m tall. Bark smooth, grey. Twigs solid, glabrous, lenticellate; brachyblasts absent. Laminas 4.5–11 cm long, 1–2 cm wide (length:width ratio 3.9–7.2), narrowly ovate, apex acute, base cuneate to rounded, margin entire or slightly undulate, sometimes inrolled; midrib flat or prominent adaxially, secondary veins 5–17, almost equally prominent adaxially and abaxially, only slightly more prominent than the lax, faint, reticulate tertiary venation; glabrous adaxially and abaxially; glands absent; petioles 2–3 mm long, glabrous; ochreas ca. 0.5 mm long, very early caducous, glabrous. Male inflorescences to 3–7 cm long, rather lax, internodes to 4–5 mm long glabrous or with a sparse indumentum of short, wavy hairs; bracts 1–2 mm long, sparsely appressed-hairy, ciliate; bracteoles 1–1.5 mm long, glabrous to very sparsely hairy; pedicels 1.5–3 mm long, leaving 1–2 mm long stalks after the flowers have fallen, glabrous; perianth white or yellow; sepals 1.5–2 mm long, obovate or elliptic, cucullate, glabrous and minutely ciliate; petals 1.5–2 mm long, obovate or elliptic, ciliate; filaments to 2–2.5 mm long; anthers 0.7–0.8 mm long. Female inflorescences to 3–4 cm long, dense to lax, internodes to 2–5 mm long, glabrous or with a sparse indumentum of short, wavy hairs; bracts 1–2 mm long, with a sparse, wavy indumentum, ciliate; bracteoles 1.5–2.5 mm long, appressed-hairy; pedicels 2.5–4 mm long, leaving 1–3 mm long stalks after the flowers have fallen, glabrous; perianth white, glabrous or with a sparse indumentum abaxially; sepals 3–4 mm long, perianth tube 0–0.5 mm long, sepals ovate or elliptic, cucullate, with the apex slightly reflexed; petals 1.5 mm long, free from the calyx, broadly obovate or elliptic, glabrous, ciliate; staminodes inconspicuous; disk glabrous or hairy; ovary 1.5–2 mm long, glabrous; stigmas 0.6–0.8 mm long, ovoid. Fruits greenish white or pale brown; pedicels 6–9 mm long, leaving 2–3 mm long stalks after the fruits have fallen; sepals of mature fruits 10–12 mm long and 4–5 mm wide, perianth tube ca. 1 mm long, sepals coriaceous with obscure venation, elliptic or obovate, strongly cucullate and imbricate, not keeled, glabrous; petals 3–3.5 mm long, free from the calyx, elliptic; achene 9 mm long, three-lobed, smooth, glabrous. Fig. 2AF.

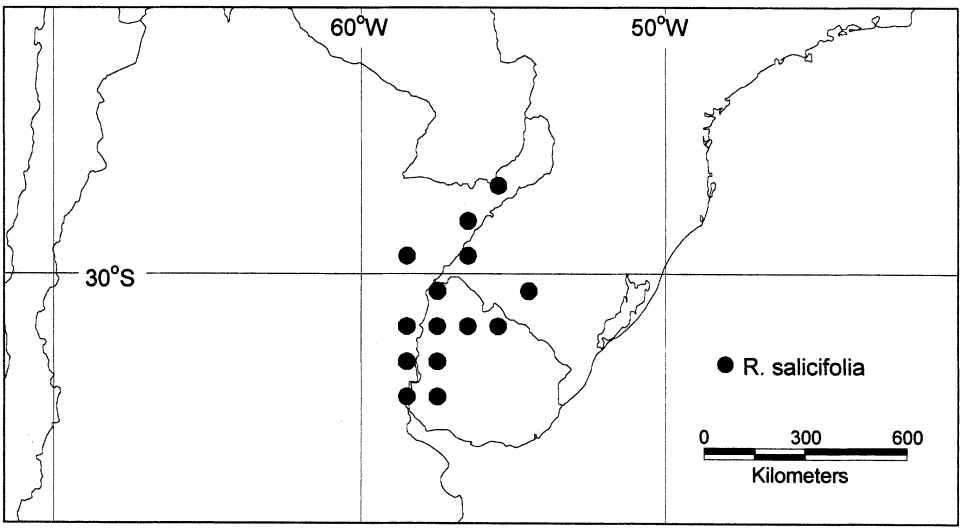

FIG. 35. Distribution of *Ruprechtia salicifolia*.

Phenology. Male flowers: December–February; female flowers: December, January; fruits: January–April.

Distribution (Fig. 35). Argentina (Corrientes, Entre Ríos, Misiones), Brazil (Rio Grande do Sul), Uruguay (Artigas, Durazno, Paysandú, Salto, Tacuarembo); gallery forests and riverside thickets, apparently always associated with water, recorded from clay and sand soils; 0–100 m.

Vernacular name. Viraró (Argentina, Uruguay).

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** RIO GRANDE DO SUL: Mpio. Rosario do Sul, Rosario do Sul, Rio Santa María, *Krapovickas, Cristóbal & Quarin 22824* (MO), S. Gabriel, *Rambo 25650* (MO); Quarai, Jarau, *Rambo 26353* (F, MO, U). **Argentina.** CORRIENTES: *Bonpland 966* (P); Depto. San Martín, Torrent, boca Río Cuay Grande y Uruguay, *Ibarrola 1697* (NY); Depto. San Martín; La Cruz boca Riós Ageuxpey y Uruguay, *Ibarrola 1782* (GH, NY); Depto. San Martín; Estación Japeyu (costa Uruguay), *Ibarrola 1876* (NY); Depto. San Martín, Japeyu al sur, *Ibarrola 1932* (GH, NY); Mercedes, *Parodi 6348* (GH); Depto. Curuzu Cuatia, Ea. María Azucena, Ruta 25, 46 km W de Curuzu Cuatia, *Schinini & Ahumada 13918* (F); Depto. Alvear, Ruta 40 y Río Aguapey, *Schinini et al. 16807* (K); Depto. Monte Caseros, 8 km S de Labougle, costa del Río Uruguay, *Schinini et al. 17586* (F, K).—ENTRE RÍOS: Qualequaychu, *Burkart 4260* (F, K); Concordia, Puerto Yerua, *Burkart 29307* (F, MO); Depto. Federación, Río Mocoreta, *Burkart & Gamerro 21711* (MO, NY); Concepción del Uruguay, La Salamanca, *Gamerro 1075* (F, P); Concepción del Uruguay, barrancas del río, *Hicken 3708* (K); Concepción del Uruguay, Feb 1877, *Lorentz s.n.* (BM, F, GH, K); Concepción del Uruguay, *Pedersen 4734* (NY); Federación, Barra del Mocoreta, *Peterson 8140* (GH, K); Federación, Salto Grande, *Troncoso 1531* (NY).—MISIONES: Barra Margarita, *Bertoni 728* (NY); Barra Margarita, alto Uruguay, orilla de río, *Bertoni 736* (NY); Depto. San Javier, costa del Río Uruguay, *Bertoni 2484* (AAU). **Uruguay.** ARTIGAS: Bella Unión, Jan 1948, *Castellanos s.n.* (MO, P); San Gregorio, *Del Puerto & Borsani 2427* (K); Bella Union, *Herter 84479* (F, MO, NY, U).—DURAZNO: Río Yi, *Herter 83167* (GH, NY, P).—PAYSANDÚ: 20 km W of Quebracho, Ea. las Correntinas, *Pedersen 15876* (F); Río Uruguay y arroyo Guabiyu, Saladero, *Rosengurtt et al. 10596* (F).—SALTO: Paso de Piedra, *Pedersen 15688* (F, NY); Arerungua, Picada de Peceyra, *Rosengurtt b1015* (F).—TACUAREMBO: 7 km N Tacuarembo, 103 km S of Brazilian border in direction of Paysandú, *Aronson 7879* (K).—DEPTO. UNKNOWN: bord du Río Negro pres du Hercules, *Gilbert 219* (K); *Legrand 176* (F); *McOwan 48* (K); banda oriental del Uruguay, *Saint-Hilaire 108* (NY); 1816–21, *Saint-Hilaire s.n.* (NY, MO).

Ruprechtia salicifolia is unmistakable because of its long, narrowly ovate leaves, which have the highest length:width ratio in the genus (3.9–7.2). Its fruits are similar to

those of *R. brachysepala*; in both species the short, cucullate sepals tightly enclose the achene. The two species are readily separated by leaf shape; in *R. brachystachya* the length:width ratio does not exceed 2.7.

27. Ruprechtia brachystachya Bentham, London J. Bot. 4: 630. 1845. *Triplaris brachystachya* (Bentham) Endlicher, Gen. pl. suppl. 4(2): 55. 1847. *Magonia brachystachya* (Bentham) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: GUYANA. Pirara, etc., 1841–2, *Schomburgk 345(541)* (holotype: K!; isotypes: BM! F! W, photo of W isotype, Field Museum negative no. 31196: F! MO!; fragment ex Herb. Shuttleworth: NY!).

Shrub or tree to 6 m tall. Bark smooth, grey. Twigs solid, glabrous; brachyblasts absent. Laminas 4–8 cm long, 1.5–3 cm wide (length:width ratio 1.7–2.7), elliptic to ovate or oblong, apex acute to acuminate, base cuneate to rounded, margin more or less undulate, sometimes inrolled; midrib prominent adaxially, secondary veins 7–12, almost equally prominent adaxially and abaxially, and only slightly more prominent than the faint, reticulate tertiary venation; glabrous adaxially and abaxially; glands absent; petioles 3–7 mm long, glabrous; ochreas ca. 0.4 mm long, caducous or persistent, glabrous or hairy. Male inflorescences to 2.5 cm long, rather lax, internodes to 3 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 1 mm long, appressed-hairy, ciliate; bracteoles 1.5 mm long, sparsely hairy; pedicels 2 mm long, leaving ca. 0.5 mm long stalks after the flowers have fallen, sparsely hairy; perianth cream; sepals 1.5 mm long, obovate, cucullate, ciliate and with hairs along midvein; petals 1.5 mm long, obovate, cucullate, ciliate and with hairs along midvein; filaments to 4 mm long; anthers 0.7 mm long. Female inflorescences to 1–2.5 cm long, rather dense, with internodes to 1–3 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 0.5–2 mm long, with a dense appressed to erect indumentum; bracteoles 1 mm long, sparsely hairy; pedicels ca. 2 mm long, leaving 0.5–1 mm long stalks after the flowers have fallen, densely short, erect-hairy; perianth pink, densely erect-hairy abaxially; sepals ca. 4 mm long, perianth tube 1 mm long, free parts of sepals broadly or narrowly ovate, somewhat cucullate, sometimes imbricate; petals 1–2 mm long, adnate to the calyx at the base, linear, hairy, ciliate; staminodes inconspicuous; disk glabrous; ovary ca. 3 mm long, densely hairy; stigmas 1–1.5 mm long, narrowly ovoid to linear. Fruits green; pedicels 2–3 mm long, leaving 0.5 mm long stalks after the fruits have fallen; sepals of mature fruits 10–15 mm long and 4–5 mm wide, perianth tube 1–2 mm long, sepals coriaceous with obscure tertiary venation, ovate, strongly cucullate and imbricate, not keeled, minutely erect-hairy, sparsely hairy on the wings; petals 2–2.5 mm long, adnate to the calyx at the base, linear; achene 8 mm long, three-lobed, smooth, hairy all over distal half or only in the grooves in the distal half. Fig. 2AE.

Phenology. Male flowers: March; female flowers: March; fruits: March.

Distribution (Fig. 36). Brazil (Roraima), Guyana; riverine forests in evergreen rain forest areas, recorded from sandy and peaty soils, 50–100 m.

ADDITIONAL SPECIMENS EXAMINED. **Guyana.** Rupununi Savanna, Mountain Point, near ranch of Shirley Humphries, along Sawariwau River, 02°58′N, 59°39′ W *Jansen-Jacobs et al. 502* (K, NY, U); without locality, *Schomburgk s.n.* (K). **Brazil.** RORAIMA: Ilha de Maracá, Furo de Santa Rosa, at N tip of the island, Cachoeira Tipurema, *Edwards 2661* (K, NY); Ilha de Maracá, Mpio. Alto Alegre, SEMA Estação, Furo Panana de Firmino of Rio Uraricuera on S side of island, 03°24′N, 61°26′W, *Hopkins et al. 731* (GH); Ilha de Maracá, north side, Igarapé opposite entrance of Rio Trairão into Rio Santa Rosa, 03°30′N, 61°42′W, *Lewis 1548* (E, K, NY, U);

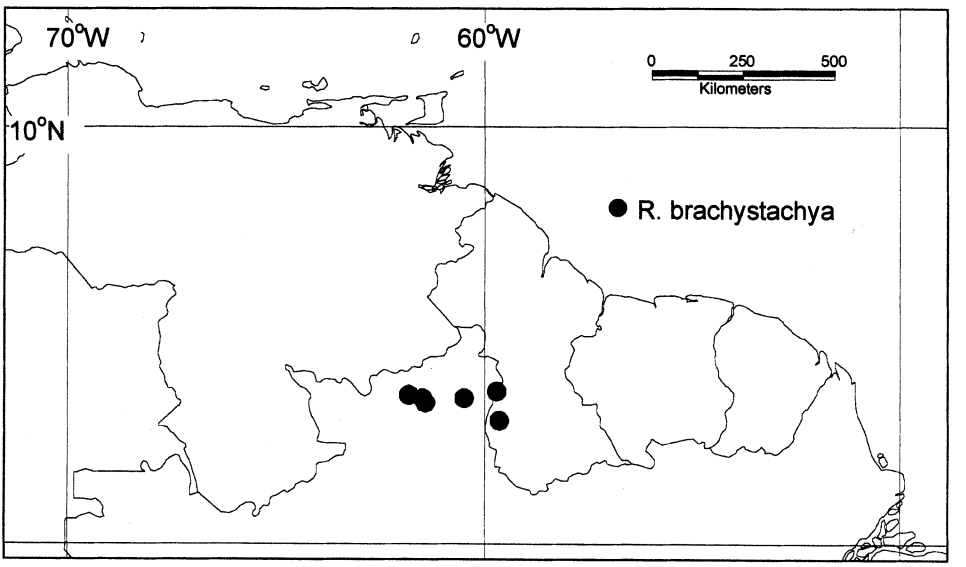

FIG. 36. Distribution of *Ruprechtia brachystachya.*

Ilha de Maracá, 3.5 km da Casa de Maracá, 03°35′N, 61°50′W, *Stannard & Arrais 762* (E, K, NY); Rio Branco, bei S. Bento, *Ule 7879* (K).

With the ovate, cucullate sepals that completely enclose the achene, the fruits of *R. brachystachya* could only be mistaken for those of *R. salicifolia*. The two species are easily distinguished by their leaves; *R. salicifolia* has very narrowly ovate leaves with a length:width ratio of at least 3.5, whilst those of *R. brachystachya* are elliptic, oblong, or ovate, with a ratio no greater than 2.7.

28. Ruprechtia tangarana Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 74. 1940.—TYPE: Peru. Loreto: Gamitanacocha, Río Mazán, 100–125 m, 25 Jan 1935, *Schunke 115* (holotype: F!; isotypes: A! NY! US!).

Shrub or tree to 10 m tall. Twigs glabrous, lenticellate, sometimes hollow; brachyblasts absent. Laminas 5–23 cm long, 2.5–9 cm wide (length:width ratio 2.0–3.2), elliptic, sometimes oblong or slightly ovate or obovate, apex acuminate, base rounded to cuneate, margin more or less undulate, occasionally inrolled; midrib flat or prominent adaxially, secondary veins 10–16, somewhat more prominent abaxially, usually markedly more prominent than the faint densely reticulate tertiary venation; glabrous adaxially and abaxially, though the midrib occasionally with a few appressed hairs; glands absent; petioles 3–8 mm long, glabrous; ochreas 0.5–1 mm long, persistent or caducous, glabrous. Male inflorescences to 3–9 cm long, rather dense with internodes to 1–2 mm long, with a minute indumentum of erect, wavy hairs; bracts 1 mm long, appressed-hairy, ciliate; bracteoles 1.5 mm long, glabrous to appressed-hairy; pedicels 2–3 mm long, leaving 1–2 mm long stalks after the flowers have fallen, glabrous to minutely hairy; perianth green or yellow; sepals 1.5 mm long, elliptic, glabrous or very sparsely hairy; petals 1.5 mm long, oblong, glabrous or very sparsely hairy; filaments to 3–3.5 mm long; anthers 0.5 mm long.

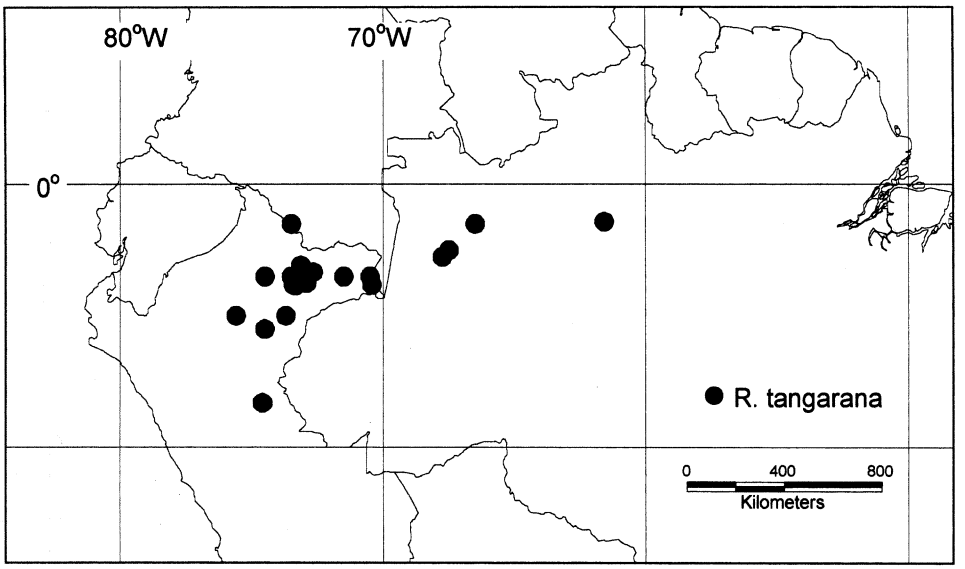

FIG. 37. Distribution of *Ruprechtia tangarana.*

Female inflorescences to 2–4 cm long, very dense to rather lax, internodes to 1–2 mm long, with an indumentum of minute, erect, wavy hairs; bracts 1 mm long, densely appressed-hairy; bracteoles 2.5–4 mm long, appressed-hairy; pedicels ca. 1.5 mm long, leaving 0.5–1 mm long stalks after the flowers have fallen, glabrous to hairy; perianth green with appressed silvery hairs abaxially; sepals 4–5 mm long, perianth tube 0.5–1 mm long, free part of sepals oblong or ovate, acute with a prominent keel abaxially; petals ca. 2 mm long, elliptic or linear, free from the calyx, sparsely hairy, ciliate; staminodes ca. 0.2 mm long, tooth-like; disk glabrous; ovary 3–3.5 mm long, sparsely hairy; stigmas 1–1.5 mm long, linear. Fruits green to cream or pink; pedicels 1.5–2.5 mm long, leaving 1–1.5 mm long stalks after the fruits have fallen; sepals of mature fruits 8–11 mm long and 3–4 mm wide, perianth tube ca. 1 mm long, sepals coriaceous with obscure secondary venation, obovate, reflexed, keeled, especially at the base, and with an inrolled margin, sparsely appressed-hairy; petals 2.5–3 mm long, free from the calyx, linear to elliptic; achene 6–8 mm long, three-lobed, smooth, sparsely hairy though sometimes denser along edges and in sulci. Fig. 2AH.

Phenology. Male flowers: January, April; female flowers: February–April; fruits: January–July.

Distribution (Fig. 37). Brazil (Amazonas), Colombia (Amazonas), Peru (Loreto); lowland rainforest, seasonally inundated or not (terra firme), river and lake margins; 50–200 m.

Vernacular names. Tangarana, tangarana blanca, tangarana negro (Peru).

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** AMAZONAS: Mpio. Limoeiro (Japura), Rio Japura margem direita a sede do municipio a localidad de Matupiri, 01°30′S, 66°30′W, *Cid 7076* (F, GH, K, NY); Tonantins, Paraná de Tonantins, *Ducke 1582* (F, GH, NY); Rio Negro, S of the mouth of the Rio Jauaperi, 01°25′S, 61°35′W, *Mori & Gracie 22488* (NY); Rio Solimões, Tonantins, Paraná de Tonantins, *Mori et al. 9045* (GH, NY, U).

Colombia. AMAZONAS: Trapecio amazónico, Amazon river watershed, Loreto-Yacú River, *Schultes 7135* (GH, K), *7140* (NY); Puerto Nariño and vicinity, along lower Río Loreto-Yacú, *Zarucchi & Schultes 1035* (GH, K).—CAQUETA: Río Caquetá, Araracuara, *Lindeman 7203* (U).

Peru. LORETO: Alto Amazonas. Quebrada Nucuray, a media hora arriba de la boca de la quebrada en Johnson 40 hp, 04°59′S, 75°35′W, *Díaz & Ruiz 910* (GH, MO); Prov. Requena, Cocha Inicahu abajo de S. Hevrera, margen izquierda del Río Ucayali, *Encarnación 1240, 1253* (MO, NY); Florida, Río Putamayo, at mouth of Río Zubineta, *Klug 2057* (BM); Lower Ucayali river, 8 km SW of Jenaro Herraro village, 04°59′S, 73°42′W, *Kvist & Freitas 851* (AAU); Prov. Maynas, Dtto. Iquitos, Río Momón, (trib. Río Nanay), vicinity Caserío Miraflores, *McDaniel & Rimachi 21054* (NY); Maynas, Dtto. Indiana, Quebrada Yanayacu, from Sacarita to Bombanaje, *McDaniel & Rimachi 23701* (F, MO); Lower Río Ampiyacu, N of Río Marañón, *Prance et al. 24683* (NY, U); Maynas, Iquitos, Caserío Momoncillo, margen izquierda del Río Momón, 10 km de la boca en el Río Nanay, *Revilla 283* (AAU); Maynas, Dtto. Iquitos, Río Momón, (trib. Río Nanay) Quebrada de Momoncillo, *Rimachi 2834* (NY); Prov. Maynas. Dtto. Iquitos. Río Momón (trib. Río Nanay), *Rimachi 3309* (MO, NY); Maynas, Dtto. Punchana, Río Momón, hasta el Caserío de Santa Rosa, *Rimachi 10932* (NY); Maynas, Río Nanay, Puerto Alemandras, 03°48′S, 73°25′W, *Ruiz 1517* (AAU, K, MO); Gamitanococha, Río Mazán, *Schunke 255* (GH, NY); Ucayali Dept., Lago Yarinacocha near Pucallpa, 08°19′S, 74°35′W, *Stein & Kallunki 3932* (F, NY); Maynas, San Alejandro, Río Napo, margen izquierda, 03°20′S, 72°40′W, *Vázquez & Jaramillo 65* (MO); Maynas, San Alejandro, Río Napo, margen izquierda, 03°20′S, 72°40′W, *Vázquez & Jaramillo 91* (MO); Maynas, Esperanza, Río Tahuayo, 03°05′S, 73°08′W, *Vázquez & Jaramillo 1274* (MO); Requena, Yarina (Río Tapiche), 03°05′S, 73°08′W, *Vázquez & Jaramillo 4879* (MO, NY); Maynas, Dtto. Indiana, Quebrada Yanayacu, afluente derecho del Río Manati, 03°45′S, 72°55′W, *Vázquez & Jaramillo 11589* (AAU, MO); Maynas, Río Itaya (cerca Iquitos), 03°50′S, 73°20′W, *Vázquez et al. 1738* (AAU).

Ruprechtia tangarana is distinctive with its short, coriaceous, obovate sepals, which are strongly reflexed at the apex, keeled in the basal part, and have inrolled margins. None of the other species of riverine habitats has fruits with this sepal morphology. *Ruprechtia maracensis* is similar vegetatively; its fruits also have coriaceous sepals, which are rather reflexed, but they are very much larger (18–30 mm long and 5–7 mm wide vs. 8–11 mm long and 3–4 mm wide).

29. Ruprechtia brachysepala Meisner in Martius, Fl. bras. 5(1): 57. 1855. *Magonia brachysepala* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Pará: in vicinibus Santarém, Nov–Mar 1849–50, *Spruce s.n.* (lectotype, here designated: M!, photo, Field Museum negative no. 6504: F! MO! NY!; fragment: NY!; isotypes: BM! E! G! NY!).

Ruprechtia amentacea Meisner in Martius, Fl. bras. 5(1): 56. 1855. *Magonia amentacea* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Amazonas: in vicinibus Barra, Prov. Rio Negro, Dec–Mar 1850–51, *Spruce s.n.* (lectotype, here designated: G!, fragment: NY!; isotypes: BM! E! GH! M!; photo of M isotype, Field Museum negative no. 6503: F! MO! NY!).

Ruprechtia latifolia Huber, Bol. Mus. Paraense Nat. Hist. 5: 345. 1909.—TYPE: BRAZIL. Pará: Prainha, 18 May 1903, *Ducke 3635* (holotype: MG, photo: F!; isotype: G!, photo, Field Museum negative no. 8491: F! GH! MO! NY!).

Ruprechtia marowynensis Eyma, Recueil Trav. Bot. Néerl. 32: 224. 1935.—TYPE: SURINAME. Marowijne River near Armina Falls, 12 Aug 1933, *Lanjouw 525* (lectotype, here designated: U-U0005710!; isolectotypes: K! U-0005711!).

Ruprechtia nitida Brandbyge, Nordic J. Bot. 10(2): 158. 1990.—TYPE: BRAZIL. Pará: Mpio. Oriximiná, Río Trombetas, próximo a Cachoeira Porteira, 60 m, 3 Jul 1980, *Martinelli 7272* (holotype: K!; isotypes: A! NY!).

Shrub or tree to 12 m tall, occasionally growing as a liana. Twigs solid, glabrous, lenticellate, sometimes with a few appressed hairs; brachyblasts absent. Laminas 4–13 cm long, 2–6 cm wide (length:width ratio 1.6–3.2), elliptic, ovate or oblong, apex acuminate or acute, base rounded to cordate, rarely cuneate, margin undulate, occasionally slightly inrolled; midrib flat or prominent adaxially, secondary veins 7–12, secondary venation almost as prominent adaxially as abaxially, usually only slightly more prominent than the faint, densely reticulate tertiary venation; glabrous adaxially and abaxially, occasionally with a few appressed hairs along midrib abaxially; glands absent; petioles 3–7 mm long, glabrous or occasionally with a few appressed hairs; ochreas to 0.8 mm long, rarely persistent, glabrous. Male inflorescences to 2–4 cm long, dense to rather lax, internodes to 1–3 mm long, with a short indumentum of erect, wavy hairs; bracts 0.5–1 mm long, appressed-hairy, ciliate; bracteoles 1–1.5 mm long, sparsely hairy; pedicels 1–1.5 mm long, leaving ca. 0.5 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth greenish white, sepals 1.5 mm long, oblong or ovate, somewhat cucullate, glabrous or with a few hairs along midvein; petals 1.5 mm long, oblong, glabrous; filaments to 3–4 mm long; anthers 0.5–0.7 mm long. Female inflorescences to 2–5 cm long, dense to lax, internodes to 1–5 mm long, with a dense indumentum of erect, wavy hairs; bracts 0.5–1 mm long, densely appressed-hairy; bracteoles 1.2–2.5 mm long, appressed-hairy; pedicels 1–2 mm long, leaving 0.5–1 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth green, glabrous to densely appressed-hairy abaxially; sepals 2.5–3.5 mm long, perianth tube 0.5–1 mm long, free part of sepals ovate, acute; petals 1.5–2 mm long, free from the calyx, linear or elliptic, glabrous to hairy; staminodes inconspicuous; disk glabrous; ovary 1.5–2 mm long, glabrous to densely hairy; stigmas 0.7–1.1 mm long, linear, occasionally ovoid. Fruits green; pedicels ca. 2 mm long, leaving ca. 1 mm long stalks after the fruits have fallen; sepals of mature fruits 10–13 mm long and 3–6 mm wide, perianth tube 1–1.5 mm long, sepals coriaceous with obscure secondary venation, ovate, not keeled, glabrous to pubescent, more sparsely hairy on the wings; petals 1.5–3 mm long, free from the calyx, linear; achene 5–8 mm long, three-lobed, smooth, glabrous to sparsely hairy. Fig. 2AI.

Phenology. Fertile material has been collected throughout the year, but especially February–July.

Distribution (Fig. 38). Argentina (Chaco, Corrientes, Formosa), Bolivia (El Beni, Pando, Santa Cruz), Brazil (Amazonas, Mato Grosso, Mato Grosso do Sul, Pará, Roraima), French Guiana, Guyana, Paraguay (Central, Cordillera, Paraguarí), Suriname; riverine and seasonally flooded forests (várzea and igapó), on clay and sandy soils; 50–300 m.

Vernacular names. Soucou-andou (Guyana); bietahoedoe (Suriname).

ADDITIONAL SPECIMENS EXAMINED. **Guyana.** Devil Hole, Cuyuni River, *Fanshawe in Forest Department 5617* (K, NY); Mazaruni River, *Forest Department 7133* (K); Rupununi Savanna, Mountain Point, near ranch of Shirley Humphries, along Sawariwau River, 02°58′N 59°39′ W *Jansen-Jacobs et al. 502* (K, NY, U); Oko Creek, Cuyuni River, *Tutin 350* (BM, K). **Suriname.** Bank of Sara Creek, 5 km S of Abontjeman, *Donselaar 1521* (U); *Dumortier s.n.* (U); on islet in Marowijne River near the Armina Falls, *Lanjouw & Lindeman 2002* (K, NY, U); ad ripas fluv. Marowijne, *Lanjouw & Lindeman 2051* (K, NY, U), *2070* (F, K, MO, NY, U); on bank of Oelemari River, 03°06′N, 54°33′W, *Wessels Boer 985* (GH, NY, U), *985a* (GH, NY, U). **French Guiana.** Fleuve Tampoc a 500 m en aval du Saut Tampoc, *Granville B4837* (K, P); Riv. Mana, Crique Tamanoir, *Halle 574* (NY, U); Fleuve Maroni, entre Kaiapou et Papaichton, *Sastre & Moretti 4012* (NY, P). **Brazil.** AMAZONAS: Mpio. Careiro, *Coelho & Freitas 1819* (NY); Manaus, Igarape da Cachoeira Grande, *Ducke 439* (F, GH, K, MO, NY); Rio Negro, Barcellos, *Ducke 7164* (BM); along Rio Negro between Manaus and São Gabriel, at junction with Rio Branco, E of Carvoeiro, 01°25′S, 61°10′W, *Poole 1644* (GH); Manaus, Maua road, *Prance et al. 11587*

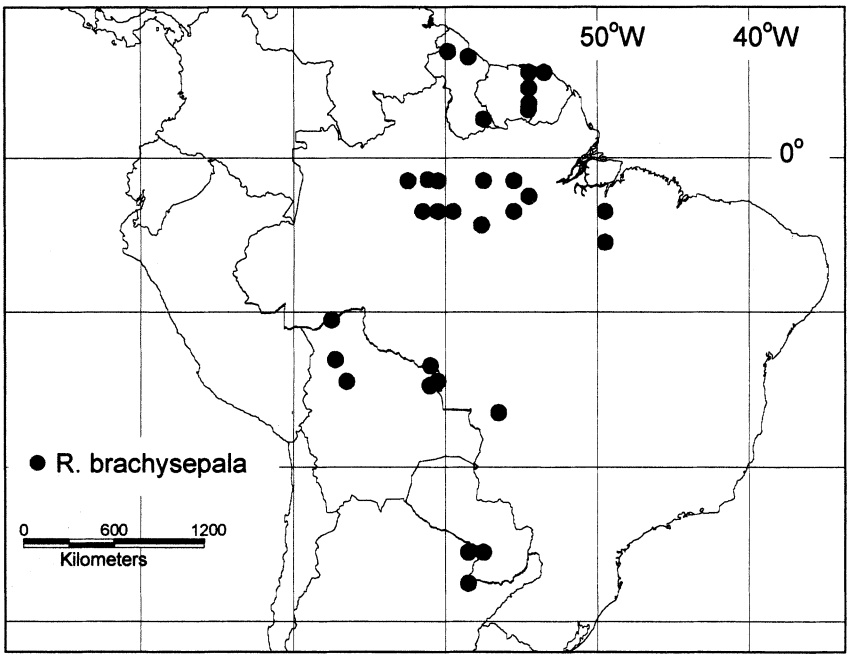

FIG. 38. Distribution of *Ruprechtia brachysepala*.

(F, K, M, NY, U); Rio Purus, Beruri, Lago Beruri, *Silva 831* (NY); in vicinibus Barra, Prov. Rio Negro, *Spruce 231* (NY), *1135* (K, P), *6503* (F, MO); Mpio. Maues, basin of Rio Maues, along Rio Parauari, 04°23′S, 57°38′W, *Zarucchi 3057* (GH, K).—MATO GROSSO: Serra Ricardo France, Rio Guapore, *Windisch 1563* (AAU).—MATO GROSSO DO SUL: Transpantaura, Pousada das Aras 28 km de Pocone, *Krapovickas & Cristóbal 43094* (K).—PARÁ: Rio Mapueira, 1–2 km upstream from Rio Trombetas, *Campbell et al. 22399* (K, MO, NY); Mpio. Oriximina, Rio Mapuera entre as Cach. Paraiso Grande e Maracaja, *Cid 7676* (K, NY); Mpio. Oriximina, Rio Trombetas, margem direita do longo do rio, entre o Posto IBDF e cachoeira Porteira, *Cid et al. 1024* (GH, NY); Mpio. Oriximina, Rio Trombetas, margem esquerda, em frente a Mineracão Sta. Patricia, *Cid et al. 1331* (NY), *1335* (GH); Mpio. Oriximina, Rio Trombetas, margem esquerda, *Cid et al. 1379* (GH, K, NY); Mpio. Oriximina, Rio Trombetas, margem direita ao norte de Pôrto Trombetas, *Cid et al. 1728* (GH, K, NY); Boa Vista on the Tapajos River, *Dahlgren & Sella 111* (F); Oriximina, *Kubitzki 82-45*, *82-46* (NY); Oriximina, 5 km oberhalb der Stadt am linken Ufer des Rio Trombetas, *Kubitzki et al. 84-214* (M), *84-216* (M, NY); Tucuri, margem esquerda de Rio Tocantíns trecho entro a cidade de Tucuri e o Posto da FUNAI (Tribo Assurini), *Lisboa et al. 1431* (NY); Tucuri, margem esquerda de Rio Tocantíns, praia do Breu Branco, *Lisboa et al. 1525* (NY); Mpio. Oriximina. Rio Trombetas, Ilha Jacitara, 4 km SE de Oriximina, *Martinelli 6991* (F, GH, NY); Maraba, Serra dos Carajas, margem do Rio Itacaiunas, *Silva et al. 1977* (GH, NY); Tucuri, Breu Branco, margem do Rio Tocantíns, *Silva et al. 1438*, *1443* (GH); in vicinibus Santarém, *Spruce 737* (K, P).—RORAIMA: R. Catrimani, boca do R. Univini, *Pires et al. 14097* (GH).—STATE UNKNOWN: *Burchell 9088* (K, P), *9257* (K, NY). **Bolivia.** EL BENI: Prov. Gral. Ballivian, Espíritu, zona de influencia del Río Yacuma, *Beck 5278* (GH, MO); Prov. Gral. Ballivian, Espíritu, bajando el Río Yacuma desde Puerto Espíritu, *Beck 15112* (AAU); Prov. Gral. Ballivian, Espíritu, zona de influencia del Río Yacuma, *Beck 15306* (MO).—LA PAZ: Iturralde, Luisita, 13°05′S, 67°15′W, *Beck & Haase 10154* (AAU, MO); Iturralde, Luisita, W del Río Beni 13°05′S, 67°15′W, *Beck & Haase 10161* (AAU).—PANDO: Manuripi, junto a Puerto Rico, riberas del Río Manuripi, *Casas 8441* (F, MO, NY).—SANTA CRUZ: 14°46′S, 61°03′W, *Guillen & Coria 1588* (GH); Velasco, 14 km S del Estación Flor de Oro, cerca Río Iténez, PN Noel Kempff Mercado, 13°30′S, 61°00′E, *Perry 804* (GH). **Paraguay.** CENTRAL: Ita Enramada, Asunción, *Schinini 4253* (F, GH); Ita Enramada, Asunción, *Schinini 4255* (F, GH).—CORDILLERA: Río Salado, *Soria 2101* (AAU).—PARAGUARÍ: Ruta 1 y Río Tebuicuary, *Schinini 21052* (F).—DEPATMENT UNKNOWN: bords du Río Manduvira, *Balansa 2061* (K, P); *Bonpland s.n.* (P). **Argentina.** CHACO: San Fernando, Isla Antequera, *Krapovickas & Cristóbal 12714* (MO).—CORRIENTES: Depto. Empedrado, Estancia "Las Tres Marías," *Peder-*

sen 14822 (MO); Depto. San Cosme, Río Paraná y Ayo, San Juan, *Schinini & Quarin 11493* (AAU); Depto. Capital, Costa Río Paraná, *Tressens & Schinini 3224* (K, F).—FORMOSA: without locality, *Jorgensen 1919* (MO), *2000* (GH); Pilcomayo, *Pedersen 10077* (K, NY, P, U).

Ruprechtia brachysepala is a widespread and rather variable species, which has simple, narrowly to broadly ovate sepals. The other lowland, riverine species of *Ruprechtia* differ from it as follows: the fruits of *R. apurensis* have oblong, obtuse sepals, which are 4 mm wide (vs. deltate, acute, 3–6 mm wide); *R. brachystachya* has ovate, cucullate sepals that enclose the achene tightly (vs. sepals that do not enclose the achene); *R. maracensis* has longer (18–30 mm vs. 10–13 mm), obovate, coriaceous sepals; *R. tangarana* has reflexed sepals with strongly inrolled margins (vs. simple, flat sepals), and often has larger leaves (5–23 cm vs. 4–13 cm long); *R. tenuiflora* has narrower (1–2 mm vs. 3–6 mm), oblong sepals.

Where their geographical ranges overlap, *R. brachysepala* and *R. tenuiflora* may be very difficult to distinguish in the absence of mature fruits. This is illustrated by *Spruce s.n.* from Barra, the type of *R. amentacea* Meisner, which Cocucci included within *R. tenuiflora*. He was followed in this by Howard and Brandbyge in their annotation of type specimens in GH and G. I believe that this Spruce collection should be included within *R. brachysepala*; in the most mature flowers the sepals show more of a tendency to develop into the ovate sepals characteristic of *R. brachysepala* rather than the linear sepals of *R. tenuiflora*.

Brandbyge (1990) described *R. nitida* and distinguished it from *R. brachysepala* by its narrower, non-deltate calyx lobes. There are specimens that have narrow sepals, but having examined all the available material of *R. brachysepala* I consider that there is no clear distinction between these two taxa. For example, both sepal shapes are present on the immature fruits on *Cid & Ramos 1024* (NY).

The Spruce specimen at Munich was chosen as the lectotype, because fragments from it are found on a sheet of fragments at New York stamped "Meisner Herbarium." A packet on the sheet is annotated in Meisner's hand: "Ruprechtia brachysepala nob. (20 Jun. 53.) in Hb. Acad. Monac. In vicinibus Santarem prov Parà, Nov–Mart. 1849–50. Coll. R. Spruce. No. 523! Rupprechtia.sp. nov. etc." The number 523 is in a different hand from "Rupprechtia sp. n.," which appears on this label and those of all the apparent duplicates in other herbaria. It therefore appears that this number was added after distribution, and all of these specimens are considered isolectotypes.

30. Ruprechtia maracensis Brandbyge, Nordic J. Bot. 10(2): 155. 1990.—TYPE: BRAZIL. Roraima: SEMA Ecological Reserve, Ilha de Maracá, 25 Jun 1987, *Milliken & Bowles 377* (holotype: AAU!; isotypes: E! K! NY!).

Tree to 35 m tall. Bark grey-brown. Twigs solid or hollow, glabrous, lenticellate, appressed-hairy when young; brachyblasts absent. Laminas 6–16 cm long, 3–10 cm wide (length:width ratio 1.5–2.5), elliptic to oblong, occasionally slightly obovate, apex obtuse or acute, sometimes slightly acuminate, base rounded or cuneate, margin undulate, usually inrolled; midrib prominent adaxially, secondary veins 10–17, prominent abaxially, markedly more prominent than the lax, reticulate-scalariform tertiary venation; lamina glabrous or very sparsely hairy abaxially, the midrib and veins glabrous to densely minutely appressed-hairy abaxially, glabrous above; glands absent; petioles 3–8 mm long, glabrous; ochreas not seen, very early caducous and not leaving a persistent ring. Male

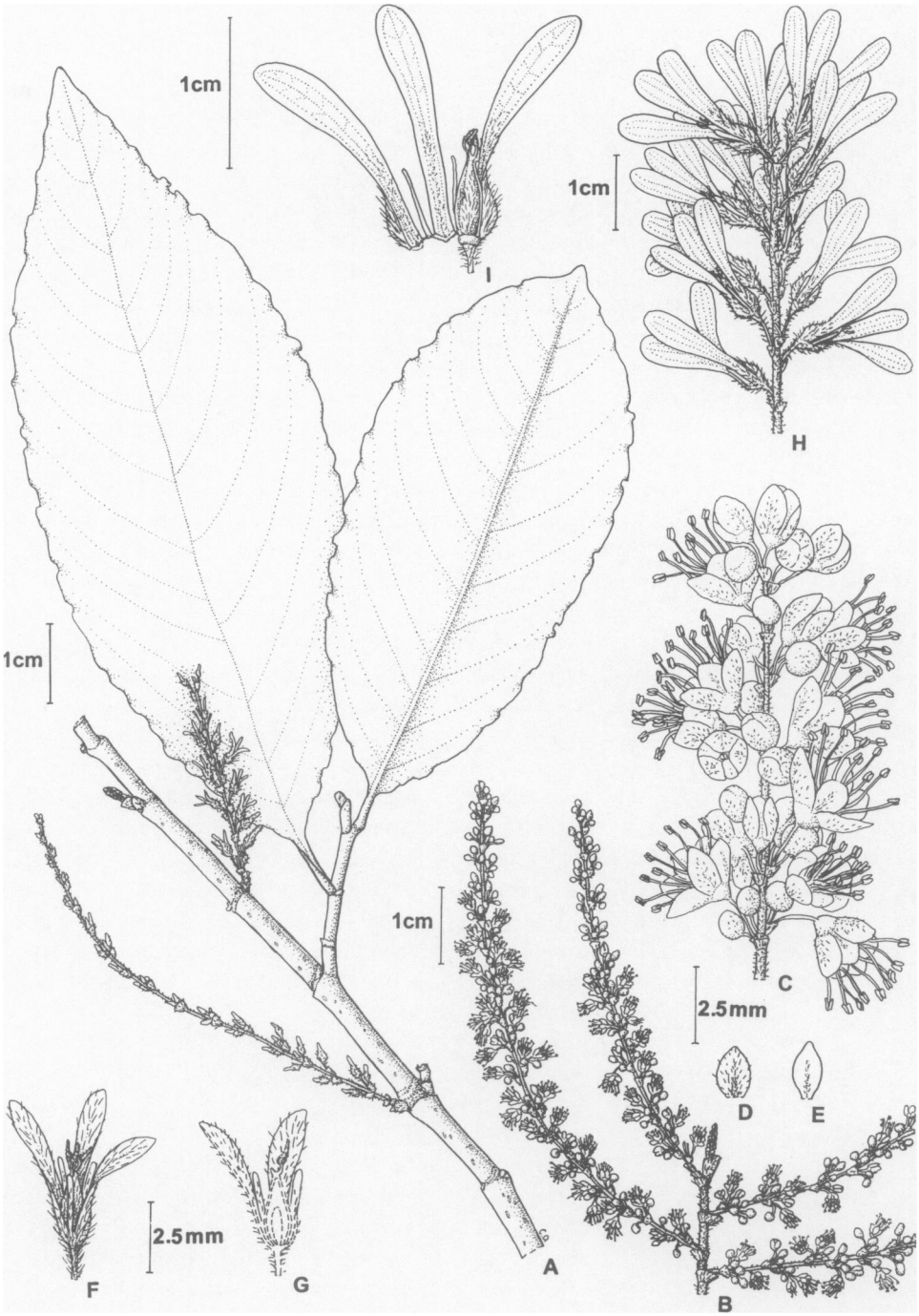

FIG. 39. *Ruprechtia maracensis.* A. Flowering branch with female inflorescences. B. Male inflorescence. C. Male inflorescence (detail). D. Sepal of male flower. E. Petal of male flower. F. Female flower. G. Vertical section of female flower. H. Infructescence. Fruit. I. Fruit with the sepals opened. (Based on: A, F–I, *Vázquez & Jaramillo 9130*; B–E, *Ayala et al. 3390*.)

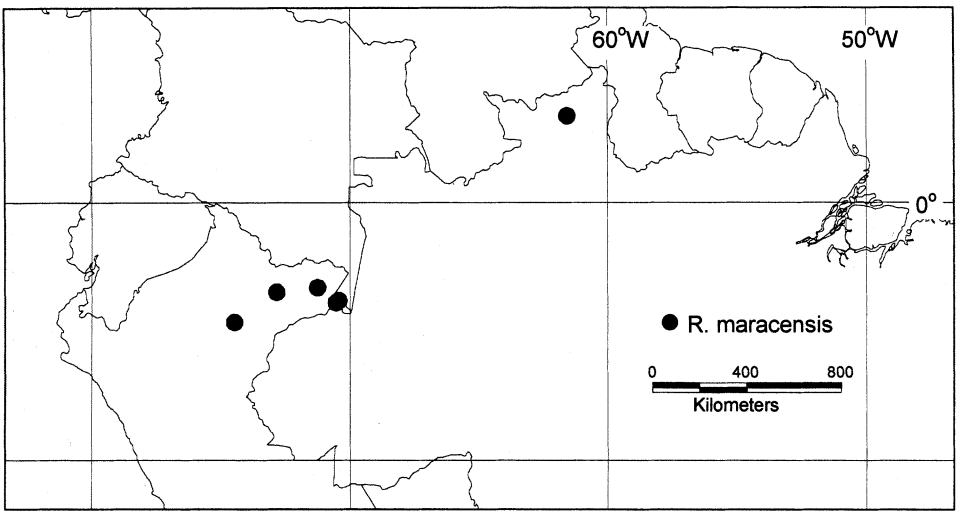

FIG. 40. Distribution of *Ruprechtia maracensis*.

inflorescences to 11–12 cm long, lax, internodes to 5–7 mm long, with a dense indumentum of short erect, wavy hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 2–3 mm long, glabrous to hairy; pedicels 3–4 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, hairy; perianth color unknown, sepals 2 mm long, ovate to elliptic, cucullate, evenly hairy; petals 2 mm long, elliptic, with at least a few hairs along the midvein, ciliate; filaments to 3–4.5 mm long; anthers 0.8–0.9 mm long. Female inflorescences to 7–15 cm long, lax, internodes to 3–6 mm long, with a dense indumentum of minute, semi-erect, wavy hairs; bracts 1–2 mm long, densely appressed-hairy; bracteoles to 4 mm long, appressed-hairy; pedicels 2–4 mm long, leaving 1–2 mm long stalks after the flowers have fallen, hairy; perianth green, with a dense indumentum of appressed grey hairs abaxially; sepals 6–7 mm long, perianth tube 0.5 mm long, sepals linear to ovate; petals 3–3.5 mm long, free from the calyx, linear, hairy, ciliate; staminodes inconspicuous; disk glabrous; ovary 3 mm long, densely hairy; stigmas 1.2–1.5 mm long, linear. Fruits white; pedicels 2–5 mm long, leaving 0.5–2.5 mm long stalks after the fruits have fallen; sepals of mature fruits 18–30 mm long and 5–7 mm wide, perianth tube 1–1.5 mm long, sepals obovate, coriaceous with the midrib prominent on the abaxial surface forming a prominent keel at the base, secondary venation obscure to evident, densely appressed-hairy at the base, sparsely hairy on the wings; petals 5–7 mm long, free from the calyx, linear; achene 7–8 mm long, three-lobed, smooth, hairy, denser towards apex. Figs. 2AC, 39.

Phenology. Male flowers: May; female flowers: May, June; fruits: March, May, August.

Distribution (Fig. 40). Brazil (Roraima), Colombia (Amazonas), Peru (Loreto); riverside forests and seasonally flooded lowland rain forests; 50–200 m.

Vernacular name. Tangarana (Peru).

ADDITIONAL SPECIMENS EXAMINED. **Colombia.** AMAZONAS: Puerto Nariño and vicinity, along lower Río Loreto-Yacú, *Zarucchi & Schultes 1021* (GH, K). **Peru.** LORETO: Caballo Cocha (Sacarita do Caballo Cocha), 03°54′S, 70°32′W, *Ayala et al. 3390* (NY); Río Samiria, near mouth, 04°40′S, 74°28′W, *Gentry et al. 38180* (MO); Maynas, Dtto. Punchana, Río Momón from Balcón to Cocha de Mosombiti, *McDaniel et al. 32812* (MO); Maynas, Pebas, quebrada "tuye" margen derecha del Río Ampiyacu, a 3 km del pueblo, *Revilla 568* (MO); Maynas, Dtto. Indiana, Yanamono-Explorama Lodge, 03°30′S, 72°50′W, *Vázquez & Jaramillo 9130* (AAU, F, NY).

Ruprechtia maracensis is most likely to be confused with *R. cruegeri*, the other large-leafed, tall species of riverine habitats. *Ruprechtia cruegeri* differs in its smaller (17–20 mm vs. 18–30 mm), chartaceous sepals and more northerly distribution, from Trinidad through the Llanos of Venezuela to northern Colombia. Brandbyge (1989) identified *Gentry et al. 38180* from western Peru as *R. cruegeri*, but I believe that this collection is more similar to *R. maracensis*. *Ruprechtia tangarana* is vegetatively similar to *R. maracensis*, but its fruits have very much more strongly reflexed and much smaller sepals (8–11 mm long and 3–4 mm wide vs. 18–30 mm long and 5–7 mm wide).

31. Ruprechtia cruegeri Grisebach ex Lindau, Notizbl. Königl. Bot. Gart. Berlin 1(6): 214. 1896.—TYPE: TRINIDAD. Les Efforts Estate, 1864, *Crueger 2697* (lectotype, here designated: B!; isotype: F!).

Tree to 25 m tall. Bark grey, fissured. Twigs lenticellate, glabrous or densely appressed-hairy; sometimes hollow; brachyblasts occasionally present. Laminas 7–13 cm, 4–7.5 cm wide (length:width ratio 1.7–2.3), oblong, elliptic, or obovate, apex obtuse and sometimes abruptly acuminate, base rounded, cuneate, or occasionally cordate, margin undulate or smooth, sometimes inrolled; midrib prominent adaxially, secondary veins 9–15, the secondary venation prominent abaxially, sometimes sunken adaxially and giving the leaf a bullate appearance, usually markedly more prominent than the rather faint, lax, scalariform tertiary venation; pubescence variable, from glabrous to erect-hairy on both surfaces, or hairy only on midrib and veins; glands absent; petioles 5–15 mm long, glabrous to densely short-hairy; ochreas to 10 mm long, densely short- to long-hairy, very early caducous. Male inflorescences to 3–6 cm long, lax, internodes to 3–5 mm long, with a dense indumentum of short wavy hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1–1.5 mm long, glabrous to sparsely hairy; pedicels 1.5–2 mm long, leaving 1 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth white, sepals 1.5–2 mm long, elliptic to ovate, slightly cucullate, glabrous to sparsely hairy, ciliate; petals 1.5–2 mm long, elliptic to obovate, glabrous to sparsely hairy, ciliate; filaments to 3 mm long; anthers 0.6–0.7 mm long. Female inflorescences to 5–11 cm long, lax, internodes to 5–8 mm long, with a dense indumentum of short, erect, wavy hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 1.5–2 mm long sparsely hairy; pedicels 2–5 mm long, leaving 1–3 mm long stalks after the flowers have fallen, hairy; perianth pale green with a dense indumentum of appressed, grey hairs abaxially; sepals 5–6 mm long, perianth tube 1–2 mm long, free parts of sepals linear; petals 3 mm long, free from the calyx, linear, glabrous to hairy; staminodes inconspicuous; disk glabrous; ovary ca. 4 mm long, densely hairy at the apex; stigmas 0.5–1.5 mm long, linear. Fruits pale green to yellow or brown; pedicels 2–5 mm long, leaving 1–3 mm long stalks after the fruits have fallen; sepals of mature fruits 17–24 mm long and 3–5 mm wide, perianth tube 1–2 mm long, sepals chartaceous with evident venation, obovate, not keeled, densely appressed-hairy at the base, sparsely hairy on the wings; petals 2.5–3 mm long, free from the calyx, linear; achene 5–8 mm long, three-lobed, smooth, hairy in the distal half. Fig. 2V.

Phenology. Male flowers: April, July, September; female flowers: September, October, December; fruits: July, September, October, December.

Distribution (Fig. 41). Trinidad, Colombia (Bolívar, Magdalena), Venezuela (Apure, Barinas, Bolívar, Guárico, Monagas); moist forests, swamp forests, and seasonally inundated forests; 0–200 m.

Vernacular names. Lagunero, palo de agua (Venezuela); palo preto (Colombia).

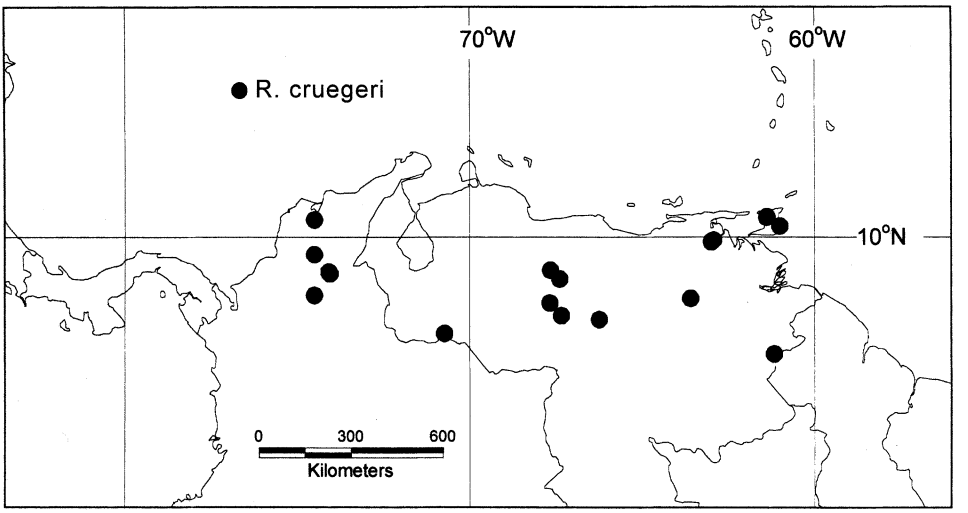

FIG. 41. Distribution of *Ruprechtia cruegeri*.

ADDITIONAL SPECIMENS EXAMINED. **Trinidad.** Government House grounds, St. Ann's, *Broadway 2416* (K, MO, NY, US), *2417* (GH, K, MO, NY, P, US); Guapo, *Crueger 278* (K, NY); Arima, 1900, *Dannouse s.n.* (NY); ca. 1 km on Ravine Sable Road from Longdenville, *Johnson et al. 1066* (BM); without locality, *Krug & Urban 2697* (F); Pointe-a-Pierre, *Williams 13087* (GH, K, NY).

Colombia. BOLÍVAR: Mpio. Achi, Corregimiento La Raya, Ciénaga La Raya, en bosque alrededor de Ciénaga Grande, refugio "El Paraíso," 3–4 h de Caucasia, sobre el Río Cauca, 08°20′N, 74°30′W, *Callejas et al. 4394* (NY); Mpio. San Martín de Loba, camino al puerto, *Cuadros 3765, 3790* (MO); Caño Chacagua, north to Los Piñones, Isla de Mompos, *Curran 263* (F), *Curran 270* (GH); Mpio. San Martín de Loba; Correg. "La Ribona," Reserva Natural "El Garcero," Finca "La Ribona," 09°00′N, 74°05′W, *Ramírez & Villa 4668* (MO).—MAGDALENA: El Paraíso, near Ponedera, *Dugand 385* (F).—SUCRE: Ciénaga de Machado, cerca de la laguna, *Idrobo & Cleef 6629* (U). **Venezuela.** APURE: "La Garciera," entre San Fernando y Arichuna, *Aristeguieta & Zabala 7050* (GH, VEN); Caño Yeguara, 19 km E of San Fernando airport, *Pendry 1027, 1028, 1029* (E, VEN).—BARINAS: cerca de Guasdualito, *Bernardi 1096* (VEN).—BOLÍVAR: Mpio. Heres, paseo Orinoco, 08°15′N, 63°35′W, *Díaz 2961* (MO, NY); Mpio. Heres, paseo Orinoco, 08°15′N, 63°35′W, *Díaz 2962* (MO); Reserva Forestal Imataca, carretera Casa Blanca–San Martín de Turumbán (sector Río Cuyuní, Anacoco), *Stergios et al. 5854* (GH, MO, NY, VEN).—GUÁRICO: Río Orituco, cerca de la "Estación Biológica de los Llanos" a unos 20 km de Calabozo, *Aristeguieta 7326* (VEN); Estero de Camaguán, *Aristeguieta 7792* (VEN); márgenes del Río Tizuado cerca de Guardatinaja, *Aristeguieta & Zabala 7031* (GH, NY, VEN); Depto. Miranda, Calabozo, Río Orituco, *Castillo 138* (VEN); a orillas del Orinoco, cerca de Cabruta, *Ortiz & Ramia 2184* (VEN).—MONAGAS: Guarapiche Forest Reserve, Caño Colorado, *Breteler 5143* (NY, VEN); La Hormiga vicinity, between La Pica and Caño Colorado east of Maturin, *Wurdack & Monachino 39493* (NY).

Ruprechtia cruegeri shares with *R. maracensis* a riverine habitat and large, oblong leaves in which the secondary venation is prominent abaxially; however, *R. maracensis* has fruits with coriaceous (vs. chartaceous), longer sepals (18–30 mm vs. 17–24 mm). Venezuelan and Colombian material of *R. cruegeri* has usually been identified as *R. ramiflora*, but it is easily distinguished from that species by its fruits, which have smaller sepals (17–24 mm vs. 23–37 mm) and a shorter perianth tube (1–2 mm vs. 5–6 mm). *Ruprechtia cruegeri* has the chartaceous sepal morphology typical of dry forest species, but its ecology is more akin to that of the species with coriaceous sepals, which are found in moist environments, such as gallery forests. Brandbyge (1989) placed *Gentry et al. 38180* in *R. cruegeri*, and commented on the unusual disjunction of the species, from

Trinidad to western Peru; however, I assign the Gentry collection to *R. maracensis*. As circumscribed here, *R. cruegeri* extends from Venezuela, through the moist forests of Bolívar and the gallery forests of the Llanos, into northern Colombia. *Ruprechtia cruegeri* is a conspicuous, tall tree in the Llanos region, where its distinctive pale green foliage is visible from some distance.

32. Ruprechtia lundii Meisner in Martius, Fl. bras. 5(1): 54. 1855. *Magonia lundii* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Rio de Janeiro, Sep 1833, *Lund s.n.* (holotype: G, fragment: NY!, photo, Field Museum negative no. 7416: F! MO! NY!). [The sheet at G bears two collections, *Lund s.n.* and *Lund 578.*].

Triplaris macrocalyx Casaretto, Nov. stirp. bras. 79. 1842.—TYPE: BRAZIL. Rio de Janeiro: "in sylvulis maritimis (vulgo restingas) prope Taypú," *Casaretto 1789* (holotype: TO!; isotype: TO!).

Tree to 8 m tall. Twigs lenticellate, glabrous, hollow; brachyblasts present. Laminas 7–17 cm long, 3–6 cm wide (length:width ratio 2.3–2.8), ovate, obovate, elliptic, or oblong, apex acute to acuminate, base rounded to cuneate, margin undulate, flat or slightly inrolled; midrib prominent or flat adaxially, secondary veins 9–17, secondary venation only slightly more prominent than the tertiary venation, secondary and tertiary venation almost as prominent adaxially as abaxially, tertiary venation densely reticulate, prominent; lamina glabrous adaxially and abaxially; glands absent; petioles 3–6 mm long, glabrous; ochreas 2–3 mm long, glabrous, persistent. Male inflorescences to 2.5 cm long, dense, internodes to 1 mm long, with a sparse indumentum of short, erect, wavy hairs; bracts 0.5–1 mm long, glabrous or very sparsely appressed-hairy; bracteoles 1–1.5 mm long, glabrous to sparsely hairy, ciliate; pedicels 2.5–3 mm long, leaving stalks 2–2.5 mm long after the flowers have fallen, glabrous; perianth green; sepals ca. 2.5 mm long, oblong, glabrous; petals ca. 2.5 mm long, ovate, glabrous; filaments to 4 mm long; anthers 1.0 mm long. Female inflorescences to 2–2.5 cm long, dense, internodes to 2–3 mm long, glabrous or with a sparse indumentum of short, erect, wavy hairs; bracts 0.5–1.5 mm long, glabrous or sparsely appressed-hairy; bracteoles 1–1.5 mm long, glabrous or sparsely appressed-hairy; female flowers not seen. Fruits brown; pedicels 6–9 mm long, leaving 3–6 mm long stalks after the fruits have fallen, glabrous; sepals of mature fruits 30–45 mm long and 5–9 mm wide, perianth tube 3–4 mm long, sepals chartaceous with evident secondary venation, oblong to slightly acuminate, not keeled, glabrous; petals 5–6 mm long, adnate to the calyx for 1–2 mm, ovate or elliptic; staminodes ca. 0.5 mm, tooth-like; disk sparsely hairy; achene 9–10 mm long, three-lobed, smooth, glabrous; stigmas 0.8–1.0 mm, linear. Fig. 2Y.

Phenology. Fruits: August, September, November.

Distribution (Fig. 42). Brazil (Rio de Janeiro); moist forest (mâta atlantica) and coastal forest on sand (restinga); 0–100 m.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** RIO DE JANEIRO: Restinga de Grumari, *Araujo 109* (AAU); Rio, *Glaziou 13134* (K); Distrito Federal, Sacopan entre os morros Salgueirinho e Jardim Botânico, Gavéa, *Kuhlmann 6135* (NY); *Luschnath s.n.* (MO); *Saint-Hilaire 111* (P); *Schott 4562* (F, NY), *7416* (F).

Ruprechtia lundii is similar to *R. latifunda*, but differs from it in the shape of the calyx of the fruits. In *R. latifunda* the base of the calyx is broad and obtuse, whereas in *R. lundii* it is narrower and pointed, and tapers toward the pedicel. *Ruprechtia lundii* has narrower

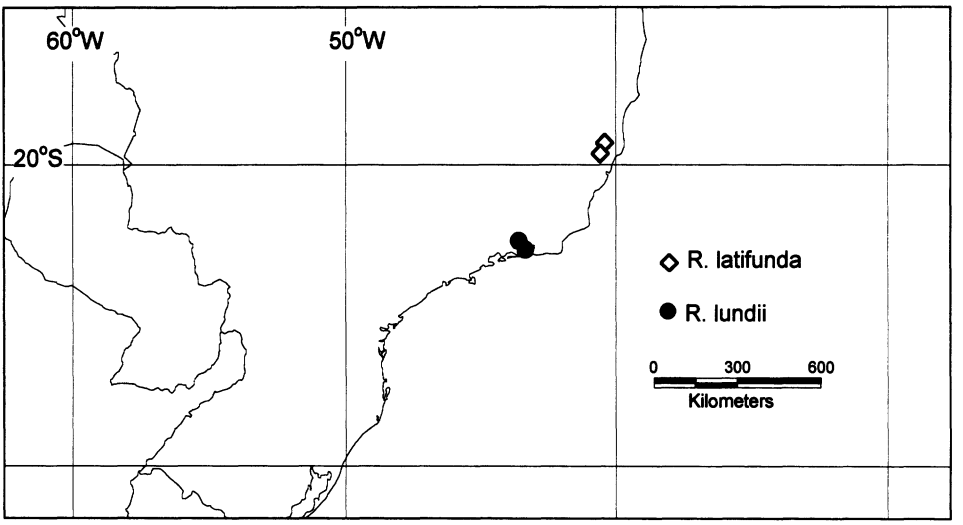

FIG. 42. Distribution of *Ruprechtia lundii* and *R. latifunda*.

sepals than *R. latifunda* (up to 9 mm vs. to 11 mm) and shorter pedicels (up to 9 mm vs. to 11 mm). *Ruprechtia laurifolia*, also from southeastern Brazil, is a liana, and its fruits are covered in appressed hairs.

Publication of Casaretto's name *Triplaris macrocalyx* predates Meisner's *R. lundii*, but the epithet cannot be transferred to *Ruprechtia,* because it has been used in *Ruprechtia macrocalyx* Huber, a synonym of *R. obidensis*.

33. Ruprechtia latifunda Pendry, sp. nov.—TYPE: BRAZIL. Espírito Santo: Fazenda Santa Angelica, gated dirt road to right at 9 km from church in Bananal on paved road from Bananal to Novo Brasil, ca. 19°09′–19°10′S, 40°23′W, 21 Apr 1995, *Kallunki, Pirani & Fernandes 700* (holotype: NY!; isotype: AAU!).

Affinis Ruprechtiae lundii Meisner sed fundo fructus rotundato non cuneato distinguitur.

Shrub or tree to 24 m tall. Twigs lenticellate, glabrous or appressed-hairy, occasionally hollow; brachyblasts absent. Laminas 5–14 cm long, 2–6 cm wide (length:width ratio 2.1–2.9), obovate, elliptic, apex acuminate, base rounded to cuneate, sometimes decurrent, margin undulate, flat; midrib prominent adaxially, secondary veins 7–11, secondary and tertiary venation almost as prominent adaxially as abaxially, tertiary venation densely reticulate, prominent; lamina glabrous adaxially and abaxially, midrib sometimes with appressed hairs abaxially; glands absent; petioles 2–4 mm long, glabrous or with a few appressed hairs; ochreas usually persisting as a ring of tissue 0.5–1.1 mm long, but occasionally persisting entire, 6–8 mm long, glabrous or hairy. Male inflorescences to 2 cm long, dense, internodes to 2 mm long, with a sparse indumentum of short, erect, wavy hairs; bracts 1 mm long, glabrous; bracteoles 1 mm long, glabrous; male flowers not seen. Female inflorescences to 2 cm long, dense, internodes to 2–3 mm long, glabrous or with a sparse indumentum of short, erect, wavy hairs; bracts 0.5–1.5 mm long, glabrous or sparsely appressed-hairy; bracteoles 1–1.5 mm long, glabrous or sparsely appressed-hairy; pedicels 6–11 mm long, leaving 2–5 mm long stalks after the flowers have fallen, glabrous; perianth

green, glabrous; sepals 7–13 mm long, perianth tube 2 mm long, free part of sepals obtuse, slightly triangular; petals 2–3 mm long, adnate to the calyx for 1–1.5 mm, the free part ovate or elliptic, glabrous; staminodes 0.2–0.5 mm long, to 1.0 mm long in fruit, tooth-like; disk glabrous or hairy; ovary 1.5–2 mm long, glabrous; stigmas 0.7–0.8 mm long, ovoid. Fruits green; pedicels 8–11 mm long, leaving 3–5 mm long stalks after the fruits have fallen; sepals of mature fruits 30–45 mm long and 6–12 mm wide, perianth tube 4–6 mm long, sepals chartaceous with evident secondary venation, oblong to slightly obovate, not keeled, glabrous; petals 4–6 mm long, adnate to the calyx for 3–4 mm, ovate or elliptic; achene 9–10 mm long, three-lobed, smooth, glabrous. Figs. 2AB, 43.

Phenology. Female flowers: January, February; fruits: April, October.

Distribution (Fig. 42). Brazil (Espírito Santo); moist forests (mata atlântica).

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** ESPIRITO SANTO: RF Linhares-CVRD. Aceiro G. Santos, lado direito, *Folli 306* (GH); RF Linhares-CVRD. Flamengo, ant. X-1, Km 17, lado direito, *Folli 598, 663* (GH); RF Linha res-CVRD, proximo a Estrada 142 Talhão 401, *Spada 184* (AAU).

Ruprechtia latifunda is named for the broad base of the calyx of the fruits. It is similar to *R. lundii*, but differs in its fruits, which have broader sepals (up to 12 mm vs. 8 mm) with a longer perianth tube (4–6 vs. 2 mm) and a broad, blunt base in contrast to the fruits of *R. lundii* in which the calyx tapers to the pedicel. *Ruprechtia laurifolia* is also found in southeastern Brazil and has similarly sized fruits, but it is a liana and its fruits are densely hairy. The narrow distribution *R. latifunda* is remarkable.

34. Ruprechtia obidensis Huber, Bol. Mus. Paraense Nat. Hist. 5: 344. 1909.—TYPE: BRAZIL. Pará: Obidos, capueira, 31 Jul 1902, *Ducke 2899* (holotype: MG, photo, Field Museum negative no. 2899: F!, fragment: F!; isotype: BM!).

Ruprechtia apetala var. *sprucei* Meisner, Mart. Fl. Bras. 5(1): 57. 1855.—TYPE: BRAZIL. Pará: circa Santarém, Jun 1850, *Spruce 639* (holotype: G, photo, Field Museum negative no. 7414: F! GH! M! NY!).

Ruprechtia macrocalyx Huber, Bol. Mus. Paraense Nat. Hist. 5: 345. 1909.—TYPE: BRAZIL. Pará: Faro, capoeira, 27 Aug 1907, *Ducke 8540* (holotype: MG, fragment and Field Museum photograph: F!; isotype: G, fragment: F!; photo, Field Museum negative no. 8493: F! GH! MO! NY!). [The sheet at G bears two collections *Ducke 8539* and *Ducke 8540*.].

Ruprechtia scandens Rusby, Mem. New York Bot. Gard. 7: 237. 1927.—TYPE: BOLIVIA. El Beni: Huachi, head of the Beni River, 1800 ft, 18 Aug 1921, *Rusby & White 972* (lectotype, here designated: NY-00260320!; isolectotypes: GH!, NY-00260319! US!).

Coccoloba zernyi Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 18. 1940. *Ruprechtia zernyi* (Standley) R. A. Howard, J. Arnold Arbor. 61: 390. 1960.—TYPE: BRAZIL. Amazonas: Taperinha, near Santarém, 13 Aug 1927, *Zerny 890* (holotype: F!).

Liana. Twigs hollow, appressed-hairy, glabrescent; brachyblasts absent. Laminas 5–17 cm long, 2–8 cm wide (length:width ratio 1.9–2.9), elliptic to ovate or obovate, apex acuminate, base cuneate to rounded, sometimes decurrent, margin undulate, sometimes inrolled; midrib prominent adaxially, secondary veins 8–18, more or less sunken adaxially with the lamina bullate between the veins, tertiary venation lax, reticulate, faint; lamina

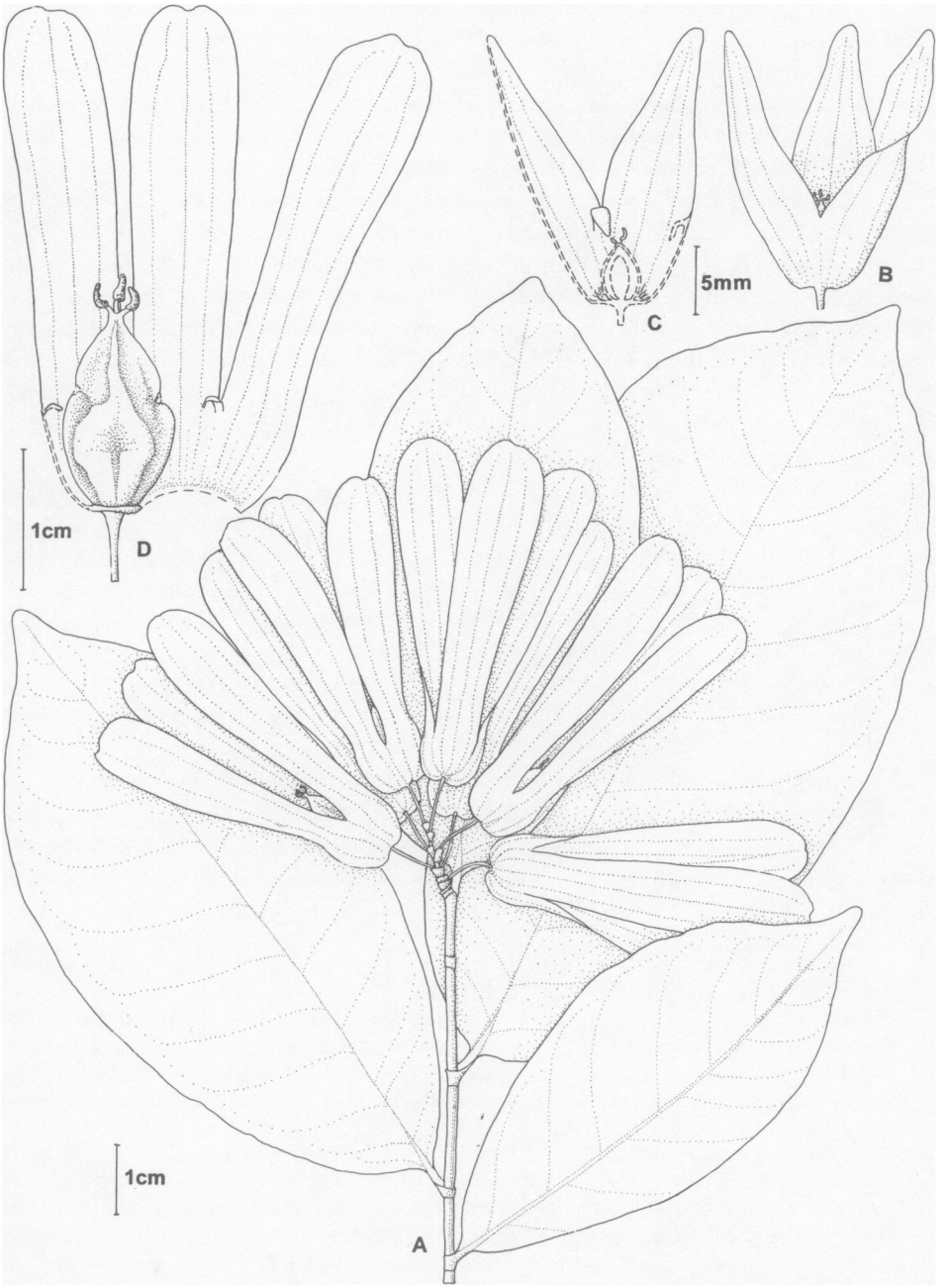

FIG. 43. *Ruprechtia latifunda.* A. Fruiting branch. B. Female flower. C. Vertical section of female flower. D. Fruit with the sepals opened. (Based on: A, D, *Kallunki et al. 700*; B, C, *Spada 184*.)

glabrous to evenly erect-hairy abaxially, midrib with appressed hairs abaxially, secondary veins with erect hairs, glabrous to sparsely hairy adaxially, denser on midrib; glands absent; petioles 3–14 mm long, sparsely to densely appressed-hairy; ochreas 1–5 mm long, more or less appressed-hairy, persistent. Male inflorescences to 15–20 cm long, lax, internodes to 5–7 mm long, with a short, erect indumentum of straight or wavy hairs; bracts 1–1.5 mm long, densely appressed-hairy; bracteoles 2 mm long, appressed-hairy; pedicels 2.5–3.5 mm long, leaving 2.5–3.5 mm long stalks after the flowers have fallen, hairy; perianth red; sepals 1.5 mm long, ovate, densely hairy; petals 1.5 mm long, ovate to obovate or oblong, sparsely hairy, denser on midvein, ciliate; filaments to 1 mm long; anthers 0.4–0.6 mm long. Female inflorescences to 6–14 cm long, lax, internodes to 2–8 mm long, with a short, erect indumentum of straight or wavy hairs; bracts 1.5 mm long densely appressed-hairy; bracteoles 2–3 mm long appressed-hairy; pedicels 1.5–2.5 mm long, leaving 1.5–2.5 mm long stalks after the flowers have fallen, hairy; perianth dark red to purplish green with appressed silvery or golden hairs abaxially, especially at the base; sepals 6–9 mm long, perianth tube 3 mm long, free part of sepals oblong or acuminate; petals 4.5–5 mm long, adnate to the calyx for 2–2.5 mm, the free part elliptic or linear, glabrous and ciliate to minutely hairy; staminodes 0.5–0.8 mm long, bristle-like; disk glabrous; ovary 2–3 mm long, glabrous; stigmas ca. 1 mm long, linear. Fruits green, the sepals sometimes red-tipped; pedicels ca. 2.5 mm long, leaving 2.5 mm long stalks after the fruits have fallen; sepals of mature fruits 40–55 mm long and 7–11 mm wide, perianth tube 11–12 mm long, sepals chartaceous with evident secondary venation, obovate to oblong, not keeled, appressed-hairy, more sparsely hairy on the wings; petals 16–20 mm long, adnate to the calyx for 8–13 mm, the free part elliptic or ovate; achene 13–15 mm long three-lobed, smooth, glabrous. Fig. 2AA.

Phenology. Male flowers: February, June–September; female flowers: February, August, September; fruits: September, October.

Distribution (Fig. 44). Bolivia (El Beni, Pando), Brazil (Acre, Pará, Rondônia), Venezuela (Trujillo); in secondary growth and on forest margins in non-flooded areas of lowland rain forest (terra firme); 100–900 m.

ADDITIONAL SPECIMENS EXAMINED. **Venezuela.** TRUJILLO: between Quebrada Seca bridge and Motatán R., *Pittier 13299* (F, GH, M, MO, NY, VEN), *13302* (F, GH, MO, NY, VEN). **Brazil.** ACRE: near mouth of Rio Macauhan (tributary of Rio Yaco), *Krukoff 5791* (BM, F, GH, K, M, MO, NY, U); 37 km from Rio Branco–Santa Rosa road, *Lowrie et al. 386* (NY).—AMAZONAS: Manaus, entrada do Aleixo, *Ducke 738* (MO, NY); Urucara, S. Sebastião, *Silva 1820*, *1824* (GH); Rio Acre, *Ule 9350* (K, U).—PARA: *Cid et al. 2493* (F, GH, K, NY); Obidos, 01°S, 59°W, *Ducke 2901* (BM, F, GH, MO, NY); Faro, 02°11′S, 56°14′W, *Ducke 8539* (BM, F, GH, MO, NY); *Ducke 19542* (K, P, U); Taperinha bei Santarém, *Ginzberger & Zerny 914*, *915*, *916* (F); Rio Trombetas, Oriximini, estrada da gruta, *Silva 1702* (GH); in vicinibus Santarém, *Spruce 903* (K, MO, P), Jun 1850, *Spruce s.n.* (BM, E, GH, NY).—RONDÔNIA: margem de Estrada Belmonte, *Cordeiro 603* (GH); basin of Rio Madeira, trail from W bank of Rio Madeira, 2 km below mouth of Rio Abuna, *Prance et al. 6043* (GH, K); Serra near Namorado Novo watershed between Rio Curuquete and Rio Madeira at Abuna, *Prance et al. 14709* (K, M, MO, NY, P). **Bolivia.** El BENI: Huachi, head of Beni River, Aug 1921, *Rusby & White s.n.* (K).—LA PAZ: S Yungas, basin of Río Bopi, San Bartolome (near Calisaya), *Krukoff 10126* (GH, K, NY, U).—PANDO: Manuripi; barraca de Humaitá, camino a bosque de castanas, Río Madre de Dios, *Moraes 355* (AAU); Prov. Manuripi, along Río Madre de Dios, Humaitá, 12°01′S, 68°15′W, *Nee 31672* (AAU); Prov. Madre de Dios, along Río Madre de Dios, Sena, 11°28′S, 67°14′W, *Nee 31754* (AAU).

Ruprechtia obidensis is likely to be confused only with *R. laurifolia*, the other liana in the genus. They differ in their leaves and inflorescences: *R. obidensis* lacks the yellow reticulation seen on the underside of the leaves of *R. laurifolia* and has a less dense indu-

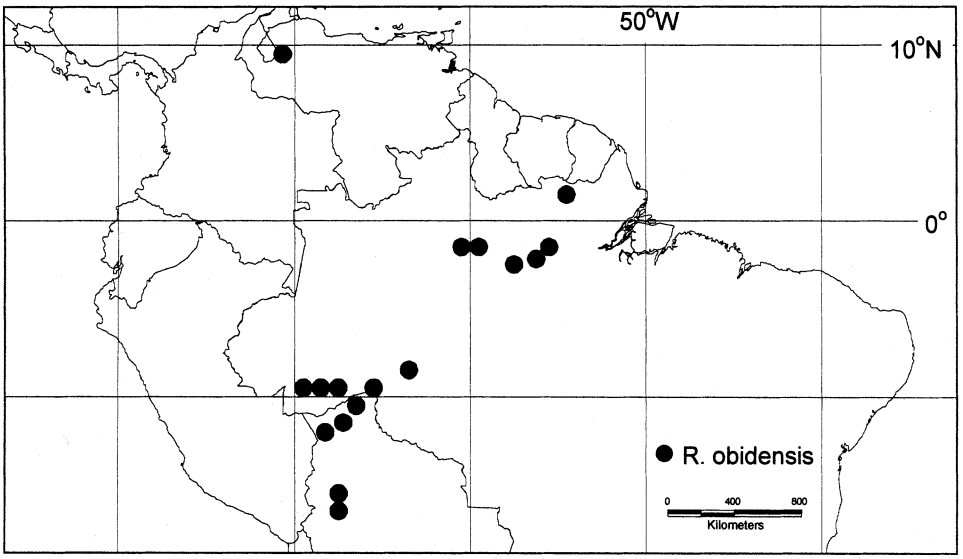

FIG. 44. Distribution of *Ruprechtia obidensis*.

mentum on the male and female inflorescences. The pedicels of *R. obidensis* are longer than the bracts, and their remains are obvious after the flowers have fallen, unlike in *R. laurifolia*, in which pedicels are shorter than the bracts.

From the limited data available on phenology it appears that the collections from Venezuela (*Pittier 13299*, *13302*; in flower in February) indicate the reverse seasonality to those of the southern hemisphere, which flower between June and October. This disjunct distribution is remarkable; the Venezuelan collections are from the opposite side of the Andes from the specimens from the Amazon Basin; and it would be interesting to examine the amount of genetic variation between these populations. *Lowrie 386* from Acre, Brazil, is unusual, because a vestigial stamen is present opposite each of the three sulci of the achenes. No other female specimen of *Ruprechtia* has been found to have similar stamens.

The sheet at NY that has been designated as the lectotype for *Ruprechtia scandens* Rusby was selected because it includes the original field notes.

35. Ruprechtia laurifolia (Chamisso & Schlechtendal) C. A. Meyer, Mém. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 6: 150. 1840. *Triplaris laurifolia* Chamisso & Schlechtendal, Linnaea 3: 55. 1828.—TYPE: BRAZIL. "Brasilia aequinoctialis," *Sello s.n.* (lectotype, here designated: B-101001716!).

Magonia scandens Vellozo, Fl. flum. 165. 1825. *Triplaris scandens* (Vellozo) Cocucci, Revista Fac. Ci. Exact. 19: 361. 1957.—LECTOTYPE, here designated: Vellozo's illustration, Flora fluminensis icones 4: t. 60.

Liana. Twigs hollow, lenticellate, glabrous or appressed-hairy; brachyblasts absent. Laminas 4–21 cm long, 1–6 cm wide (length:width ratio 2.3–3.8), elliptic to obovate or ovate, apex acute to acuminate, base cuneate, sometimes decurrent, margin undulate, occasionally slightly inrolled; midrib prominent adaxially, secondary veins 10–16, sometimes

slightly sunken with the lamina bullate between the veins, tertiary venation densely reticulate, slightly prominent adaxially and abaxially; lamina glabrous adaxially and abaxially, midrib sometimes with appressed hairs abaxially, secondary veins occasionally with a few scattered hairs; glands absent; petioles 2–10 mm long, glabrous or with a few appressed hairs; ochreas 2–5 mm long, persistent, glabrous or sparsely hairy. Male inflorescences to 6–8 cm long, rather lax, internodes to 2–3 mm long, with a dense indumentum of erect, wavy hairs; bracts 1.5–2.5 mm long, sparsely to densely appressed-hairy; bracteoles 2–2.5 mm long, appressed-hairy; pedicels 2–3 mm long, leaving 1.5–2.5 mm long stalks after the flowers have fallen, glabrous to sparsely hairy; perianth red, sepals 2–2.5 mm long, oblong or obovate, sparsely to densely hairy; petals 2–2.5 mm long, obovate to oblong, sparsely hairy, ciliate; filaments to 1 mm long; anthers 0.5 mm long. Female inflorescences to 10–12 cm long, lax, internodes to 5–6 mm long, with a dense indumentum of erect, wavy hairs; bracts 2–2.5 mm long, densely appressed-hairy; bracteoles 2.5–4 mm long, densely appressed-hairy; pedicels 2 mm long, leaving 2 mm long stalks after the flowers have fallen, minutely erect-hairy; perianth red, with appressed silvery or golden hairs abaxially, especially at the base; sepals 11–12 mm long, perianth tube 3–3.5 mm long, free part of sepals oblong; petals 6 mm long, adnate to the calyx for 2.5 mm, the free part elliptic, glabrous; staminodes 1.5 mm long, to 2.0 mm long in fruit, bristle-like; disk glabrous; ovary 3 mm long, glabrous; stigmas ca. 1 mm long, ellipsoid. Fruits green with red sepals; pedicels 2–3 mm long, leaving 2–3 mm long stalks after the fruits have fallen; sepals of mature fruits 33–40 mm long and ca. 8 mm wide, perianth tube 8–11 mm long, sepals chartaceous with evident secondary venation, oblong to slightly elliptic, appressed-hairy, more sparsely hairy on the wings; petals sepaloid, variable, 17–30 mm long, adnate to the calyx for 10–12 mm; achene 10–13 mm long, three-lobed, smooth, glabrous. Fig. 2Z.

Phenology. Male flowers: July–September; female flowers: July–October; fruits: June, August.

Distribution (Fig. 45). Brazil (Minas Gerais, Rio de Janeiro); moist forest (mata atlântica) and coastal forest on sand (restinga); 0–500 m.

Additional Specimens Examined. **Brazil.** Minas Gerais: Mpio. Tombos, Fazenda da Cachoeira, *Barreto 1545*, *1568* (F).—Rio de Janeiro: Floresta do Covanca Jacarepaguá, *Duarte 4885* (AAU); Floresta do Covanca Jacarepaguá, *Duarte & Pereira 4823* (AAU); locality unknown, *Gardner 5593* (BM, K); Rio de Janeiro, *Glaziou 6703*, *8905*, *12116* (K, P); without locality, *Graham s.n.* (K); Rio de Janeiro, *Miers 3753* (K, P); without locality, *Pereira 7106* (BM, K); circa Rio de Janeiro, *Riedel s.n.* (NY); Rio de Janeiro, *Riedel 672* (GH, NY); without locality, *Saint-Hilaire 119* (K, P), *200* (P), *289* (P); Rio Janeiro, *Schott 4561* (F); Restinga do Grumari, *Sucre 3512* (AAU); Restinga do Pero, Cabo Frio, *Sucre 3674*, *Sucre 3677* (AAU); Rio de Janeiro, *Weddell 479* (GH, NY, P).—State Unknown: *Clausen 2024* (MO, U); *Claussen s.n.* (US); *Luschnath s.n.* (MO); *Martius 67* (K); *Sello 631* (BM); *Sello s.n.* (K); *Tweedie 11081* (K); 1837, *Tweedie s.n.* (K).

Ruprechtia laurifolia is similar to *R. obidensis*, the other species of liana in the genus, but they can be distinguished vegetatively by the yellow reticulation of the leaves in *R. laurifolia*. *Ruprechtia laurifolia* has a denser indumentum on the male and female inflorescences; its pedicels are shorter than the bracts, and their remains are therefore not obvious after the flowers have fallen, whilst in *R. obidensis* the pedicels are clearly visible after the flowers have fallen. Two other species of *Ruprechtia* grow in southeastern Brazil, *R. lundii* and *R. latifunda*. Both are trees, and their fruits are glabrous.

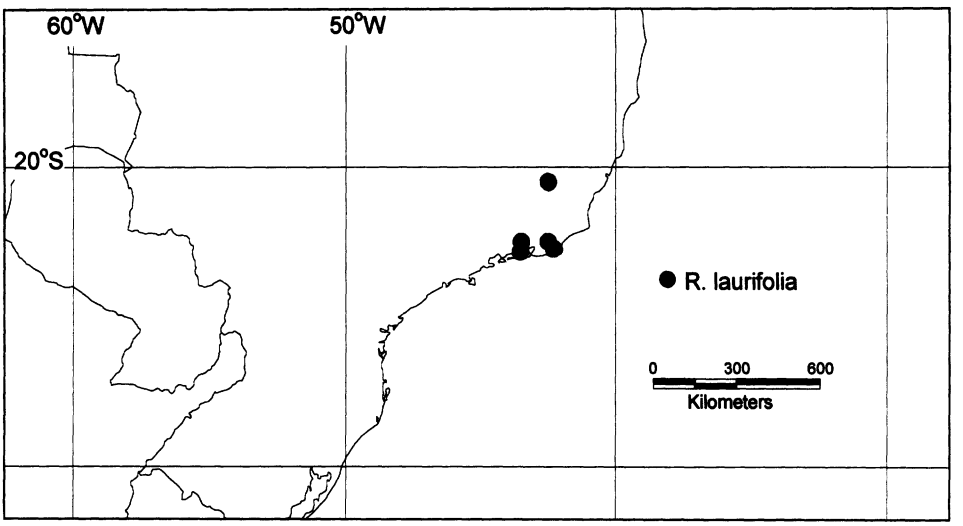

FIG. 45. Distribution of *Ruprechtia laurifolia*.

36. Ruprechtia crenata (Casaretto) R. A. Howard, J. Arnold Arbor. 66: 504. 1985. *Triplaris crenata* Casaretto, Nov. stirp. bras. 80. 1842.—TYPE: BRAZIL. Rio de Janeiro: in sylvis circa Rio de Janeiro, *Riedel 567* (lectotype, here designated: TO!; isotype: TO!).

Ruprechtia carpinoides Meisner in Martius, Fl. bras. 5(1): 58. 1855. *Magonia carpinoides* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Rio de Janeiro, Jan 1838, *Riedel s.n.* (lectotype, here designated: G, photo, Field Museum negative no. 7413: F! GH! MO! NY!; isotype: NY!).

Tree to 15 m. Twigs solid, densely ferruginous hairy when young; brachyblasts present. Laminas 4–9 cm long, 2–5 cm wide (length:width ratio 1.7–2.0), ovate to obovate, apex acute to acuminate, base cuneate to rounded, margin crenate, inrolled; midrib prominent adaxially, secondary veins 10–12, sunken with the lamina bullate between the veins, markedly more prominent than the laxly reticulate-scalariform tertiary venation; lamina sparsely hairy adaxially, more densely hairy abaxially, midrib and secondary venation densely ferruginous adaxially, more sparsely hairy abaxially; glands absent; petioles 2–3 mm long, densely ferruginous; ochreas 4–7 mm long, persistent or caducous, appressed-hairy. Male inflorescences to 3 cm long, dense, internodes to 2 mm long, with a dense indumentum of erect, wavy hairs; bracts to 1.0 mm long, densely appressed-hairy; bracteoles to 1.0 mm long, appressed-hairy; pedicels 2–2.5 mm long, leaving 1.5–2 mm long stalks after the flowers have fallen, sparsely to densely hairy; perianth red, sepals 1.5 mm long, obovate, densely hairy; petals 1.5 mm long, obovate to elliptic, sparsely hairy along midrib, ciliate; filaments to 2 mm long; anthers 0.5 mm long. Female flowers and fruits unknown.

Phenology. Male flowers: January.

Distribution. Brazil (Rio de Janeiro); forest.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** RIO DE JANEIRO: *Glaziou 12115* (P); *Glaziou 19761* (K, P); *Riedel 1025* (G, photo, Field Museum negative no. 27771 at MO).

Ruprechtia crenata may be conspecific with *R. fagifolia*, but its leaves are more markedly bullate, and the young twigs, petioles, and veins have a very conspicuous dense, erect, orange-brown indumentum. Resolution of doubts about the status of this species awaits collection of good female material.

37. Ruprechtia glauca Meisner in Martius, Fl. bras. 5(1): 59. 1855. *Magonia glauca* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891.—TYPE: BRAZIL. Bahia: Serra Açuruá, *Blanchet 2848* (holotype: NY!; isotypes: BM! G! MO! P!, photo of G isotype, Field Museum negative no. 27775: F! MO!).

Tree. Twigs solid, glabrous; brachyblasts present. Laminas 2.5–6 cm long, 1–2.5 cm wide (length:width ratio 2.0–2.5), obovate to elliptic, apex obtuse, base cuneate, margin smooth, inrolled; midrib prominent adaxially, secondary veins 4–8, almost equally prominent adaxially and abaxially, markedly more prominent than the faint, densely reticulate tertiary venation; glabrous, glaucous adaxially and abaxially; glands absent; petioles 2–3 mm long, glabrous; ochreas ca. 2 mm long, caducous, appressed-hairy. Male inflorescences to 1 cm long, dense, internodes to 2 mm long, with a sparse indumentum of erect, wavy hairs; bracts to 1.0 mm long, sparsely appressed-hairy; bracteoles to 1.0 mm long, sparsely hairy; pedicels 2 mm long, leaving 1.5 mm long stalks after the flowers have fallen, sparsely hairy; perianth color unknown, sepals 1.5 mm long, ovate, sparsely hairy, ciliate; petals 1.5 mm obovate, glabrous, ciliate; filaments to 1 mm long; anthers 0.5 mm long. Female flowers and fruits unknown.

Ruprechtia glauca is known only from the type collection, a male specimen. Cocucci (1961) placed *R. glauca* within *R. laxiflora* and noted that the leaves are slightly smaller than usual. Because such glaucous, obovate leaves have not been seen in other specimens of *R. laxiflora*, and the inflorescence is more compressed (internodes to 3 mm vs. internodes to 5 mm), I consider *R. glauca* to be distinct from *R. laxiflora*. In maintaining this distinction I follow Brandbyge (1990), who made an extensive SEM study of the cuticles of *R. laxiflora* and *R. glauca*, and found that the glaucous appearance of the leaves of *R. glauca* is caused by crystalloid wax platelets of a type not seen in *R. laxiflora*.

EXCLUDED NAMES

Ruprechtia sect. *Euruprechtia* Bentham (non Meisner) in Bentham & Hooker, Gen. pl. 3: 105. 1880.—This name is not validly published; see Articles 21.3 and 32.1 (b) of the Code (Greuter et al. 2000).

Ruprechtia sect. *Euruprechtia* Meisner (non Bentham) in Martius, Fl. bras. 5(1): 54. 1855.—This name is not validly published; see Articles 21.3 and 32.1 (b) of the Code (Greuter et al. 2000).

Ruprechtia sect. *Hexasepalae* Meisner in DC., Prodr. 14: 179. 1856.—This name is not validly published, because Meisner included all three names that Meyer listed when he proposed the genus; see Article 22.2 of the Code (Greuter et al. 2000).

Ruprechtia apetala subsp. *bahiaensis* T. Rich & R. Harley, in sched. [*Harley 21460*; *R. fagifolia*].

Ruprechtia martii Meisner in Martius, Fl. bras. 5(1): 58. 1855. *Magonia martii* (Meisner) Kuntze, Revis. gen. pl. 2: 553. 1891. = *Triplaris americana* L. I have seen a fragment of the holotype at NY (herbarium database number 00260324).

Ruprechtia mexicana Rose, in sched. [*Palmer 1710, 1782*; *R. fusca*].

Ruprechtia nutantiflora Kuhlmann, in sched. [*Kuhlmann 6135*; *R. lundii*].

Ruprechtia recordii Standley, in sched. [*Record 42*; *R. ramiflora*].

Ruprechtia riedelii Hauk, in sched. [*Riedel 672*; *R. laurifolia*].

Ruprechtia simulans L. B. Smith & R. M. Klein, in sched. [*Reitz & Klein 17013*; *R. paranensis*].

Ruprechtia splendens Standley ex Reko, Bol. Soc. Bot. México 6: 18. 1948.—This name was not validly published, because it was not accompanied by a Latin description. Cocucci (1961) proposed Reko's taxon as *Ruprechtia standleyana*.

Triplaris scandens Schott ex Meisner, Mart. Fl. Bras. 5(1): 54. 1855, pro syn.

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APPENDIX 1

VOUCHER SPECIMENS USED IN THE SAMPLING OF MOLECULAR DATA AND GENBANK ACESSIONS

Refer to the species treatments for locality details. An asterisk (*) indicates that DNA was extracted from a herbarium specimen; a dagger (†) indicates that DNA was extracted from leaf material dried by silica gel at the time of collection.

Species	Locality	Voucher	Genbank Accession
Ruprechtia albida [1]	Peru, La Libertad	*Alayo 88* (MO)*	AY256537
Ruprechtia albida [2]	Peru, La Libertad	*Young 1202* (F)*	AY256538
Ruprechtia aperta [1]	Peru, Cajamarca	*Pennington 812* (E)†	AY256522
Ruprechtia aperta [2]	Peru, Amazonas	*Bridgewater S2725* (E)†	AY256556
Ruprechtia aperta [3]	Peru, Piura	*Bridgewater S2815* (E)†	AY256555
Ruprechtia apetala [1]	Bolivia, La Paz	*Pendry 624* (E)†	AY256532
Ruprechtia apetala [2]	Bolivia, Cochabamba	*Pendry 735* (E)†	AY256533
Ruprechtia apetala [3]	Bolivia, Cochabamba	*Pendry 727* (E)†	AY256534
Ruprechtia apurensis	Venezuela, Apure	*Pendry 1030* (E)†	AY256547
Ruprechtia brachysepala	Argentina, Corrientes	*Tressens & Schinini 3224* (F)*	AY256539
Ruprechtia carina	Venezuela, Distrito Federal	*Pendry 1040* (E)†	AY256553
Ruprechtia chiapensis	Mexico, Vera Cruz	*Pendry 948* (E)†	AY256524
Ruprechtia costaricensis	Costa Rica, Puntarenas	*Rojas & Zuniga 148* (MO)*	AY256540
Ruprechtia cruegeri [1]	Trinidad	*Johnson et al. 1066* (BM)*	AY256521
Ruprechtia cruegeri [2]	Venezuela, Apure	*Pendry 1027* (E)†	AY256549
Ruprechtia curranii	Venezuela, Falcón	*Pendry 1033* (E)†	AY256541
Ruprechtia fagifolia	Brazil, Bahia	*Thomas et al. 9637* (NY)*	AY256536
Ruprechtia fusca [1]	Mexico, Oaxaca	*Pendry 814* (E)†	AY256529
Ruprechtia fusca [2]	Mexico, Oaxaca	*Pendry 823* (E)†	AY256542
Ruprechtia fusca [3]	Mexico, Oaxaca	*Pendry 835* (E)†	AY256531
Ruprechtia fusca [4]	Mexico, Jalisco	*Pendry 868* (E)†	AY256530
Ruprechtia laevigata [1]	Mexico, Oaxaca	*Torres 527* (E)*	AY256525
Ruprechtia laevigata [2]	Mexico, Oaxaca	*Pendry 843*(E)†	AY256527
Ruprechtia laevigata [3]	Mexico, Oaxaca	*Pendry 848* (E)†	AY256526
Ruprechtia laevigata [4]	Mexico, Oaxaca	*Torres 480* (E)*	AY256544
Ruprechtia laxiflora	Argentina, Santa Fe	*Prado s.n.* 17.10.1999 (E)†	AY256535
Ruprechtia pallida	Mexico, Michoacán	*Soto Núñez & Torres 2726* (MO)*	AY256528
Ruprechtia ramiflora [1]	Panama, Herrera	*Tyson, Dwyer & Blum 3157* (MO)*	AY256523
Ruprechtia ramiflora [2]	Venezuela, Guárico	*Pendry 1006* (E)†	AY256551
Ruprechtia ramiflora [3]	Venezuela, Guárico	*Pendry1012* (E)†	AY256554
Ruprechtia ramiflora [4]	Venezuela, Falcón	*Pendry 1035* (E)†	AY256552
Ruprechtia ramiflora [5]	Venezuela, Falcón	*Pendry 1036* (E)†	AY256550
Ruprechtia ramiflora [6]	Venezuela, state unknown	*Annable 2777* (NY)*	AY256545
Ruprechtia tangarana	Peru, Maynas	*Rimachi 10932* (NY)*	AY256543
Ruprechtia tenuiflora [1]	Venezuela, Guárico	*Pendry 1014* (E)†	AY256546
Ruprechtia tenuiflora [2]	Venezuela, Guárico	*Pendry 1022* (E)†	AY256548
Ruprechtia triflora [1]	Bolivia, Santa Cruz	*Pendry 650* (E)†	AY256559
Ruprechtia triflora [2]	Argentina, Formosa	*Prado s.n.* 22/12/1999 (E)†	AY256560
Triplaris caracassana	Venezuela, Distrito Federal	*Pendry 1004* (E)†	AY256558
Triplaris cf. *peruviana*	Peru, San Martín	*Bridgewater S2776* (E)†	AY256557
Triplaris gardeneriana	Brazil, Minas Gerais	*Ratter 3233* (E)*	AY256520

APPENDIX 2

REGIONAL KEYS TO THE SPECIES OF RUPRECHTIA

The first key in each region is based on characters from female flowers and fruits, and will be the most reliable method for identifying specimens of *Ruprechtia*. Sterile and male material can be identified to species or groups of species using the second key for each region. Since most species of *Ruprechtia* are vegetatively variable and distribution data should be used with caution, it is always advisable to match specimens with fertile female material from the same area.

1. MEXICO AND CENTRAL AMERICA

A. Key to specimens with female flowers and/or fruits.

1. Leaves with prominent densely reticulate tertiary venation below, sometimes sunken above.
   2. Sepals of fruits 30–38 mm long; achene surface rugose. 13. *R. standleyana*.
   2. Sepals of fruits 23–30 mm long; achene surface smooth. 12. *R. fusca*.
1. Leaves with tertiary venation flat or scarcely prominent on both surfaces.
   3. Perianth tube of fruits 1–2 mm long, the sepals spreading so that the petals and achene are clearly visible.
      4. Ovary hairy in the upper part only; secondary veins 5–8, very rarely up to 12; secondary venation almost equally prominent above and below, the upper and lower surfaces appearing similar. 19. *R. pallida*.
      4. Ovary densely hairy all over; secondary veins 8–15; secondary venation more prominent below than above, the upper and lower surfaces appearing different. 16. *R. nicaraguensis*.
   3. Perianth tube of fruits 3–6 mm long, the petals not visible, or only the tips.
      5. Bracts subtending partial inflorescences 2 mm long; inflorescence dense, the main axis often scarcely visible between the bracts and partial inflorescences, giving a catkin-like appearance. 17. *R. costata*.
      5. Bracts subtending partial inflorescences 1 mm long; inflorescence open, the main axis clearly visible between the bracts and partial inflorescences.
         6. Secondary veins 6–11, scarcely more prominent below than above when the leaves are dry, so that the upper and lower surfaces of the leaves appear similar. 18. *R. chiapensis*.
         6. Secondary veins 9–15, more prominent below than above when the leaves are dry, so that the upper and lower surfaces of the leaves appear very different.
            7. Female inflorescences with pedicels to 2 mm long; perianth tube in fruit 5–6 mm long. 21. *R. ramiflora*.
            7. Female inflorescences with pedicels longer than 3 mm; perianth tube in fruit 3–5 mm long.
               8. Secondary veins 6–10, often only slightly prominent below; sepals of fruits 20–25 mm, united for 4–5 mm, diverging about the apex of the achene; Costa Rica and Nicaragua. 15. *R. costaricensis*.
               8. Secondary veins 10–15, usually very prominent below; sepals of fruits 20–30 mm, united for 3–4 mm, constricted about the apex of the achene; Mexico. 14. *R. laevigata*.

B. Key to sterile specimens and those with male flowers.

1. Leaves with prominent densely reticulate tertiary venation below, sometimes sunken above. 12. *R. fusca*, 13. *R. standleyana*.
1. Leaves with tertiary venation flat or slightly prominent on both surfaces, not sunken above.
   2. Secondary venation almost equally prominent above and below, the upper and lower surfaces appearing similar.
      3. Leaves usually elliptic or ovate, more rarely oblong, 5–11 cm long. 18. *R. chiapensis*.
      3. Leaves usually obovate, more rarely oblong or elliptic, 2.5–7.5 cm long. 19. *R. pallida*.
   2. Secondary venation more prominent below than above, the upper and lower surfaces appearing different.
      4. Petioles 4–8 mm long. 17. *R. costata*.
      4. Petioles to 3 (rarely to 6) mm long.

5. Trees or shrubs of Mexican dry forests. 14. *R. laevigata.*
5. Trees or shrubs of Central American dry forests from Guatemala to Costa Rica.
6. Sparse indumentum of long, appressed hairs on midrib on underside of leaf. 15. *R. costaricensis.*
6. Sparse indumentum of short, erect hairs on midrib on underside of leaf.
7. Leaves obovate to elliptic, the apex usually obtuse; Panama. 21. *R. ramiflora.*
7. Leaves ovate to elliptic, the apex usually acute; Nicaragua and Guatemala. 16. *R. nicaraguensis.*

2. Brazil

A. Key to specimens with female flowers and/or fruits.

1. Leaves glaucous below. 37. *R. glauca.*
1. Leaves not glaucous below.
2. Leaves bullate, densely evenly hairy below, midrib and veins densely ferruginous hairy above, margin crenate; young twigs densely ferruginous hairy. 36. *R. crenata.*
2. Leaves not as above.
3. Fruiting sepals coriaceous, their secondary and tertiary venation rather obscure.
4. Sepals of fruits 18–30 mm long. 30. *R. maracensis.*
4. Sepals of fruits up to 15 mm long.
5. Sepals of fruits 2 mm wide or less. 24. *R. tenuiflora.*
5. Sepals of fruits more than 3 mm wide.
6. Leaves very narrowly ovate, length:width ratio more than 3.5. 26. *R. salicifolia.*
6. Leaves elliptic, ovate, or oblong, length:width ratio less than 3.5.
7. Achene enclosed and concealed within the cucullate sepals. 27. *R. brachystachya.*
7. Achene visible between the divergent sepals.
8. Sepals ovate to deltate, apex not reflexed, margin flat. 29. *R. brachysepala.*
8. Sepals obovate, the apex reflexed, margin revolute. 28. *R. tangarana.*
3. Fruiting sepals chartaceous, their secondary and tertiary venation evident.
9. Lianas.
10. Sepals of fruits to 33–40 mm long; bracts 2–2.5 mm long; staminodes 1.5 mm long. 35. *R. laurifolia.*
10. Sepals of fruits to 40–55 mm long; bracts 1.5 mm long; staminodes up to 1 mm long. 34. *R. obidensis.*
9. Trees or shrubs.
11. Female inflorescences less than 1 cm long; partial inflorescences 1-flowered; leaves tightly clustered on brachyblasts (short side shoots with condensed internodes). 1. *R. triflora.*
11. Female inflorescences at least 1 cm long; partial inflorescences 2- or 3-flowered; leaves rather evenly spaced along twig, rarely clustered on brachyblasts.
12. Sepals of fruits spathulate, scarcely united at the base, diverging with the three-angled achene clearly visible within.
13. Sepals of fruits 30–36 mm long. 11. *R. paranensis.*
13. Sepals of fruits 14–24 mm long. 10. *R. laxiflora.*
12. Sepals of fruits obovate or oblong; perianth tube at least 1 mm long; achene three-lobed.
14. Sepals of fruits oblong, at least 30 mm long by 6 mm wide, pedicel 8–11 mm long, staminodes 0.2–0.5 mm long.
15. Base of calyx pointed, tapering to pedicel. 32. *R. lundii.*
15. Base of calyx obtuse, rounded, not tapering to pedicel. 33. *R. latifunda.*
14. Sepals of fruits obovate, up to 25 long by 5 mm wide; pedicel 4–7 mm long; staminodes inconspicuous.
16. Leaves with prominent, densely reticulate tertiary venation below. 8. *R. exploraticis.*
16. Leaves with lax, scarcely prominent tertiary venation below. 9. *R. fagifolia.*

B. Key to sterile specimens and those with male flowers.

1. Leaves glaucous below. 37. *R. glauca.*
1. Leaves not glaucous below.
   2. Lianas.
      3. Leaves with tertiary venation yellow below. 35. *R. laurifolia.*
      3. Tertiary venation same color as lamina below. 34. *R. obidensis.*
   2. Trees or shrubs.
      4. Tertiary venation densely reticulate and very prominent below. 8. *R. exploraticis.*
      4. Tertiary venation lax or dense, faint or somewhat prominent below.
         5. Secondary and tertiary venation more prominent below than above.
            6. Leaves often clustered on brachyblasts (short side shoots with condensed internodes). 1. *R. triflora.*
            6. Leaves rather evenly spaced along twig, rarely clustered on brachyblasts.
               7. Leaves bullate, densely evenly hairy below, midrib and veins densely ferruginous-hairy above, margin crenate; young twigs densely ferruginous-hairy. 36. *R. crenata.*
               7. Leaves not as above.
                  8. Leaves 5–23 cm long; trees of Amazonian riverine forests. 28. *R. tangarana*, 30. *R. maracensis.*
                  8. Leaves 3–13 cm long; trees of deciduous and semideciduous forests.
                     9. Leaves broadly oblong, elliptic or obovate, length:width ratio 1.4–1.8, rarely to 2.7; from Bahia and Minas Gerais. 9. *R. fagifolia.*
                     9. Leaves elliptic or ovate, length:width ratio 1.8–2.9; from Paraná, Santa Catarina. 11. *R. paranensis.*
         5. Secondary and tertiary venation almost equally prominent above and below.
            10. Leaves very narrowly ovate, length:width ratio more than 3.5. 26. *R. salicifolia.*
            10. Leaves elliptic, ovate, or oblong, length:width ratio less than 3.5.
               11. Trees of Amazonian riverine forests. 24. *R. tenuiflora*, 27. *R. brachystachya*, 29. *R. brachysepala.*
               11. Trees from outside Amazon Basin.
                  12. Leaves 2.5–7.5 cm long; widespread species of dry forests from Paraiba to Rio Grande do Sul. 10. *R. laxiflora.*
                  12. Leaves 5–14 cm long; species of moist forest (mata atlantica) and coastal forest on sand (restinga), Rio de Janeiro, Minas Gerais. 32. *R. lundii.*
                  12. Leaves 5–14 cm long; species of moist forest (mata atlantica), Espírito Santo. 33. *R. latifunda.*

3. Colombia and Venezuela

A. Key to specimens with female flowers and/or fruits.

1. Fruiting sepals coriaceous, their secondary and tertiary venation rather obscure.
   2. Sepals of fruits 18–30 mm long. 30. *R. maracensis.*
   2. Sepals of fruits up to 15 mm long
      3. Sepals of fruits 2 mm wide or less. 24. *R. tenuiflora.*
      3. Sepals of fruits more than 3 mm wide.
         4. Sepals of fruits oblong, the apex not reflexed and the margin flat. 25. *R. apurensis.*
         4. Sepals of fruits obovate, the apex reflexed and the margin revolute. 28. *R. tangarana.*
1. Fruiting sepals chartaceous, their secondary and tertiary venation evident.
   5. Lianas. 34. *R. obidensis.*
   5. Trees or shrubs.
      6. Perianth tube of fruits to 2 mm long, not enclosing achene; tree of riverine habitats. 31. *R. cruegeri.*
      6. Perianth tube of fruits longer than 2 mm, enclosing achene; tree or shrub of dry forests.
         7. Bracts of female inflorescences more than 3 mm long. 22. *R. coriacea.*
         7. Bracts of female inflorescences less than 2 mm long.
            8. Petals adnate to the perianth tube, forming 3 prominent keel-like structures. 20. *R. carina.*
            8. Petals free or scarcely adnate to the perianth tube.

9. Female inflorescences with pedicels to 2 mm long, perianth tube in fruit 5–6 mm long, sepals densely erect hairy at base; leaves usually without glands below. 21. *R. ramiflora*.
9. Female inflorescences with pedicels longer than 3 mm, perianth tube in fruit 3–4 mm long sepals sparsely appressed hairy at base; leaves with minute dark brown glands below, visible at 10× magnification. 23. *R. curranii*.

B. Key to sterile specimens and those with male flowers.

1. Secondary and tertiary venation almost equally prominent above and below. 25. *R. apurensis*, 24. *R. tenuiflora*.
1. Secondary and tertiary venation more prominent below than above.
   2. Lianas. 34. *R. obidensis*.
   2. Trees or shrubs.
      3. Leaves 5–23 cm long; trees of riverine, swamp, or gallery forests.
         4. Leaves 5–23 cm long; trees of riverine forest of Amazon Basin. 28. *R. tangarana*, 30. *R. maracensis*.
         4. Leaves 7–13 cm long; trees of swamp forests and gallery forests of Llanos and northern Colombia. 31. *R. cruegeri*.
      3. Leaves 4–15 cm long; trees of dry forests.
         5. Leaves minutely gland-spotted below, almost completely glabrous, not bullate. 23. *R. curranii*.
         5. Leaves rarely with glands, more or less hairy, frequently bullate. 20. *R. carina*, 21. *R. ramiflora*, 22. *R. coriacea*.

4. Ecuador and Peru

A. Key to specimens with female flowers and/or fruits.

1. Fruiting sepals coriaceous, their secondary and tertiary venation rather obscure; trees of riverine habitats.
   2. Sepals of fruits 8–11 mm long, 3–4 mm wide. 28. *R. tangarana*.
   2. Sepals of fruits 18–30 mm long, 5–7 mm wide. 30. *R. maracensis*.
1. Fruiting sepals chartaceous, their secondary and tertiary venation evident; tree and shrub of dry forests.
   3. Perianth tube of fruits greater than 2 mm long, urceolate and enclosing the achene. 7. *R. jamesonii*.
   3. Perianth tube of fruits up to 2 mm long, the sepals diverging and not enclosing the achene.
      4. Leaves glabrous and glaucous below. 4. *R. albida*.
      4. Leaves glabrous or hairy below, not glaucous.
         5. Sepals of fruits at least 25 mm long, united for ca. 2 mm. 6. *R. peruviana*.
         5. Sepals of fruits less than 25 mm long, scarcely united.
            6. Sepals of fruits elliptic to narrowly obovate, 3–5 mm wide. 3. *R. aperta*.
            6. Sepals of fruits broadly obovate, 7–9 mm wide. 5. *R. obovata*.

B. Key to sterile specimens and those with male flowers.

1. Leaves glaucous below. 4. *R. albida*.
1. Leaves not glaucous.
   2. Leaves 5–23 cm long; trees of riverine forest of Amazon Basin. 28. *R. tangarana*, 30. *R. maracensis*.
   2. Leaves 2.5–8 cm long; trees of coastal and Andean dry forests.
      3. Leaves 2.5–6 cm long; ochreas to 20 mm, very early caducous; trees of coastal dry forests. 7. *R. jamesonii*.
      3. Leaves 3–8 cm long; ochreas to 2 mm, more or less persistent; trees of Andean dry forests.
         4. Petioles 2–4 mm long. 3. *R. aperta*, 5. *R. obovata*.
         4. Petioles 3–7 mm long. 6. *R. peruviana*.

5. Bolivia, Argentina, Paraguay and Uruguay

A. Key to specimens with female flowers and/or fruits.

1. Fruiting sepals coriaceous, their secondary and tertiary venation rather obscure.
   2. Sepals cucullate, tightly enclosing achene; leaves narrowly ovate, length:width ratio more than 3.5. 26. *R. salicifolia*.

2. Sepals deltate, not enclosing the achene; leaves elliptic, ovate, or oblong, length:width ratio less than 3.5. 29. *R. brachysepala.*

1. Fruiting sepals chartaceous, their secondary and tertiary venation evident.
   3. Lianas; sepals of fruits 40–55 mm long. 34. *R. obidensis.*
   3. Trees or shrubs; sepals of fruits less than 35 mm long.
      4. Sepals spathulate, scarcely united at the base, achene three-angled. 10. *R. laxiflora.*
      4. Sepals obovate, perianth tube at least 1 mm, achene three-lobed.
         5. Leaves with prominent, densely reticulate tertiary venation below. 8. *R. exploraticis.*
         5. Leaves with lax, scarcely prominent tertiary venation below.
            6. Petals of female flower to 2.5 mm long; inflorescence less than 1 cm long; leaves tightly clustered on brachyblasts (short side shoots with condensed internodes). 1. *R. triflora.*
            6. Petals absent or to 0.5 mm long in the female flower; inflorescence more than 2 cm long; leaves rather evenly distributed along the twig, rarely clustered on brachyblasts. 2. *R. apetala.*

B. Key to sterile specimens and those with male flowers.

1. Lianas; twigs hollow. 34. *R. obidensis.*
1. Trees or shrubs; twigs solid.
   2. Secondary and tertiary venation more prominent below than above.
      3. Leaves with prominent, densely reticulate tertiary venation below. 8. *R. exploraticis.*
      3. Leaves with lax, scarcely prominent tertiary venation below.
         4. Leaves often clustered on brachyblasts (short side shoots with condensed internodes); trees or shrubs of chaco forest. 1. *R. triflora.*
         4. Leaves rather evenly spaced along twig, rarely clustered on brachyblasts; trees or shrubs of Andean dry forest. 2. *R. apetala.*
   2. Secondary and tertiary venation almost equally prominent above and below.
      5. Leaves very narrowly ovate, length:width ratio 3.9–7.2. 26. *R. salicifolia.*
      5. Leaves elliptic, ovate, or oblong, length:width ratio less than 4.0.
         6. Leaves elliptic to ovate, length:width ratio 2.5–4.0; trees of riverine forests in dry forest regions. 10. *R. laxiflora.*
         6. Leaves elliptic, obovate or oblong, length:width ratio 1.6–3.2; trees of riverine forests in moist forest regions. 29. *R. brachysepala.*

NUMERICAL LIST OF THE SPECIES

1. R. triflora
2. R. apetala
3. R. aperta
4. R. albida
5. R. obovata
6. R. peruviana
7. R. jamesonii
8. R. exploraticis
9. R. fagifolia
10. R. laxiflora
11. R. paranensis
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14. R. laevigata
15. R. costaricensis
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17. R. costata
18. R. chiapensis
19. R. pallida
20. R. carina
21. R. ramiflora
22. R. coriacea
23. R. curranii
24. R. tenuiflora
25. R. apurensis
26. R. salicifolia
27. R. brachystachya
28. R. tangarana
29. R. brachysepala
30. R. maracensis
31. R. cruegeri
32. R. lundii
33. R. latifunda
34. R. obidensis
35. R. laurifolia
36. R. crenata
37. R. glauca

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