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MONOGRAPH OF
THE GENUS RUSSELIA
(SCROPHULARIACEAE)

MARGERY C. CARLSON

FIELDIANA: BOTANY

VOLUME 29, NUMBER 4

Published by

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Biology

Monograph of the Genus *Russelia*

History of the Genus

The genus *Russelia* was described by N. J. Jacquin (14) in 1760. It was named for an English physician and naturalist, Dr. Alexander Russell, of Aleppo, Syria. The type species, *R. sarmentosa*, was collected in woods and dense shrubby areas near Havana, Cuba. Jacquin distinguished the genus from others of the Scrophulariaceae by the four didynamous stamens, 5-parted calyx, cylindrical tubular corolla, one-loculed capsule, and numerous seeds. He gave a more complete description of the species later (15).

A. L. de Jussieu (16) later described the genus in more detail and noted that the capsule has two locules rather than one.

Between 1799 and 1832, ten new species were described, and in 1838, George Don (9) studied the family, divided it into tribes, and placed *Russelia* in his Tribe 1, Scrophulariaeae. He described briefly nine of the eleven species then known.

G. Bentham wrote the account of the genus in A. de Candolle's Prodrumus (1), placed *Russelia* in the tribe Cheloneae, and listed five species. He regarded *R. alata* as a doubtful species and later (2) placed it in the genus *Anetanthus* of the Gesneriaceae.

Hemsley (13) studied the Scrophulariaceae and included *Russelia* as a Mexican and Central American genus with five shrubby species, reducing all the other then-known taxa to synonymy.

B. L. Robinson (26) studied the genus in 1900 and stated: "Bentham's extreme reduction of species is ill-advised; at least a dozen species may be recognized with advantage." He presented the first key to thirteen species (three of which were described as new) based on the characters of the stem, namely: winged, sharply angled, 4-angled, 6-angled, or subterete. He made *R. juncea* synonymous with *R. equisetiformis*, *R. retrorsa* with *R. polyedra*, and *R. paniculata* with *R. multiflora*, and he made *R. verticillata* a form of *R. multiflora*. He did not include *R. coccinea*, which had been described by Wettstein (40) in 1891. Robinson continued to describe new species (27-31) until 1909, but apparently never made another intensive study of the genus.

Hallier (12) did not remove *R. alata* from the genus but placed it in the tribe Gratioliae, while all other species remained in the Cheloneae.

In 1920, F. W. Pennell (23) studied the Scrophulariaceae of Colombia, and gave a key to the tribes and sub-tribes. He described *Russelia colombiana* Penn., the only species known from Colombia, and placed it in the tribe Antirrhinoideae, sub-tribe Russelieae, distinguished by having the posterior lobes of the corolla external in the bud, the corolla red, nearly regular, tubular, the short lobes nearly equal, the stigma capitate, the capsule dehiscent to the base septically and filled with slender hairs among the seeds, the seeds reticulate, not winged, the leaves whorled in threes, the stem with six angles, and the inflorescence in axillary cymes, two pedicels of each being terminal to the primary peduncle.

Paul C. Standley (36) gave a key to 17 species, with short descriptions of each. Again, the main distinctions were based on the nature of the stem—whether angled or terete. He reduced several species to synonymy as follows: *syringaefolia* to *floribunda*; *juncea* to *equisetiformis*; *paniculata* to *multiflora*; *deamii* to a form of *verticillata*; *retrorsa* to *polyedra* and both of these probably to *ternifolia*; and *furfuracea* to *tepicensis*.

In 1945, C. L. Lundell (20) stated that the genus *Russelia* had been neglected by taxonomists and that many undescribed species had been pigeon-holed. An extensive series of herbarium material necessary for a revision of the genus was not available to him, but he described ten new species and one new variety.

Since 1945, the only work on the genus has been the manuscript of the *Flora of Guatemala* by Paul C. Standley and Julian A. Steyermark (37). They give a key to six species known from Guatemala.

A recent paper by J. W. Thieret (39) gives an account of the tribes and genera of the Scrophulariaceae in Central America and follows Pennell by placing *Russelia* alone in the sub-tribe Russelieae, distinguished by densely packed hairs among the seeds in the capsule.

Several species of *Russelia* were introduced into Europe from Mexico in the early 1800's and became popular greenhouse and garden plants, which were reported as easy of cultivation and propagation from cuttings. Their almost perpetually blooming, showy, crimson flowers and their pendent habit of growth made them especially desirable for hanging baskets in greenhouses. *R. equisetiformis* (*R. juncea*), the rushy *Russelia*, was introduced into Berlin and Munich about 1830 by Count Karwinski, and soon

afterward into England. *R. sarmentosa*, *multiflora*, *floribunda*, *rotundifolia*, and the horticultural varieties, *Lemoinei* (*R. juncea* × *R. sarmentosa*) and *elegantissima*, are mentioned in Edwards' *Botanical Register*, 1836, and in the *Journal of the Royal Horticultural Society*, 1851. The plants are known by the vernacular names of "coral plant," "coral blow," "rain of fire" (*lluvia de fuego*) and "ear-rings of the cook" (*aretes de la cocinera*).

Chromosome numbers of $n=10$ have been reported for *R. equisetiformis* and *R. rotundifolia* (10).

ABBREVIATIONS

F	Chicago Natural History Museum
GH	Gray Herbarium, Harvard University
LUND	Lundell Herbarium
M	Botanische Staatssammlung, Munich
MEXU	National Herbarium, Institute of Biology, National University of Mexico
MICH	University of Michigan Herbarium
MO	Missouri Botanical Garden Herbarium
NY	New York Botanical Garden Herbarium
PA	Academy of Natural Sciences, Philadelphia
SMU	Southern Methodist University Herbarium
UC	University of California Herbarium
US	United States National Herbarium

Acknowledgments

My gratitude is extended to Dr. Paul C. Standley for suggesting the problem, to Dr. Julian Steyermark for his help and criticism of the manuscript, and to Dr. Theodor Just for permission to work at Chicago Natural History Museum. Grants from the American Philosophical Society, Philadelphia, the Garden Club of Evanston, Illinois, and the Sarah Gildersleeve Fife Memorial Fund, New York, made possible two collecting trips to study the genus in Mexico and parts of Central America. The following institutions lent their collections of *Russelia*: Academy of Natural Sciences, Philadelphia; Gray Herbarium; Lundell Herbarium; Missouri Botanical Garden; Munich Herbarium; National Herbarium, University of Mexico; New York Botanical Garden; Southern Methodist University; University of Michigan; University of California; United States National Herbarium. To the curators of these organizations I give sincere thanks.

Morphology

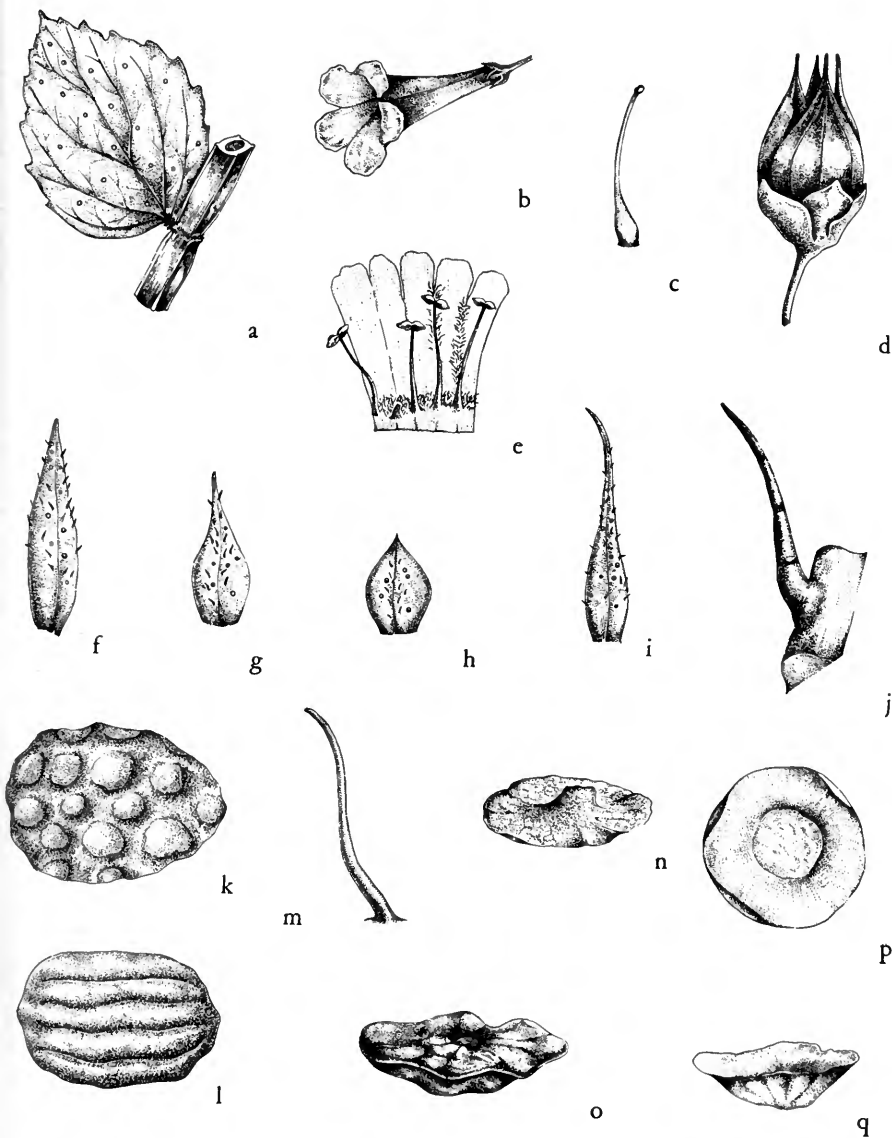
Plants.—The plants are perennial, suffrutescent or fruticose, erect or with branches bending over at the tips, in some species scandent or trailing. The stems may be from 0.5 to 5 or 6 meters long and up to 1 cm. in diameter at the base. Some species branch profusely, others only slightly.

Roots.—The perennial root system is not extensive. Adventitious roots are produced at the nodes of the stems when they lie on the ground.

Stems.—The stems are somewhat woody at the bases, becoming herbaceous toward the upper parts. They may be terete, at least at the base, or variously angulate, in most species with thickened ridges extending lengthwise on the internodes. The ridges on the angles may be narrow and inconspicuous (*R. coccinea*) or wide and prominent (*R. obtusata*), and in *R. tetraptera* the ridges are on wing-like extensions of the angles. The spaces between the angles may be convex or flat, with (fig. 7, *a*) or without striations. In some species the stems are glabrous, in others variously pubescent.

Leaves.—The leaves may be opposite or verticillate, thin and membranaceous or thick and coriaceous, sessile or petiolate, and are exstipulate. Those of *R. equisetiformis* are caducous. They may be ovate (fig. 7, *a*), ovate-lanceolate, oblanceolate, or orbicular, with apices acuminate, acute, or obtuse, and bases cuneate, obtuse, truncate, or cordate. The margins are entire in four species and are serrate, dentate, crenate or deeply incised in all others. The main veins may be more or less impressed on the upper side and more or less prominent on the lower side, and the smaller veins may be inconspicuous or conspicuously reticulate. The leaves may be glabrous or variously pubescent, and with or without resinous dots.

Pubescence.—The hairs are uni- or multicellular (fig. 7, *j*, *m*), sparse or numerous, long (1.6 mm., *R. pubescens*) or short (0.02–0.05 mm., *R. obtusata*), straight (*R. rotundifolia*) or intertwined in a woolly mat (*R. villosa*). Those on the stem may be present principally on the angles (*R. maculosa*), principally between the angles (*R. villosa*), or on the entire stem (*R. retrorsa*). The hairs on the angles of *R. retrorsa* have swellings at the base which sometimes become conspicuous callosities. The hairs on the leaves may be on either or both surfaces; they are principally on the veins of the lower surface in *R. rotundifolia*, between the veins on the upper surface of *R. retrorsa*, and on the veins and also between them in *R. villosa*.



S.H. Grove

FIG. 7. a, Stem and leaf, *R. sarmentosa*; $\times 1$. b, Flower, *R. sarmentosa*; $\times 2$. c, Pistil, *R. sarmentosa*; $\times 2$. d, Capsule, *R. syringaeifolia*; $\times 4$. e, Corolla, interior, showing didynamous stamens, staminode, hairs along margins of median ventral lobe and near insertion of stamens, *R. sarmentosa*; $\times 2$. f-i, Sepals, $\times 4$: f, *R. jaliscensis*; g, *R. sarmentosa*; h, *R. cuneata*; i, *R. maculosa*. j, Hair, *R. retrorsa*; $\times 500$. k, l, Seeds, $\times 50$: k, *R. tetraptera*; l, *R. rugosa*; m, Hair, *R. pringlei*; $\times 500$. n-q, Resinous dots or scales, $\times 500$: n, *R. standleyi*; o, *R. sarmentosa*; p, *R. jaliscensis*; q, *R. retrorsa*.

Most species have the margins of the leaves and calyx lobes ciliate, especially the pubescent ones. Gland-tipped hairs are present on all parts, including the external surface of the corolla in *R. rotundifolia*, *maculosa*, *longispala*, and *coccinea* forma *stipitata*.

Resinous dots.—Resinous dots or scales are present on many species. They may be circular or somewhat irregular in outline (fig. 7, *p*), flattened against the surface (fig. 7, *o*), raised (fig. 7, *q*) or sunken into the surface. They may be white, brown, yellow, or translucent. They are attached at the center. They range in diameter from 0.1 mm. in *R. tepicensis* to 0.3 mm. in *R. jaliscensis*, and may be scattered, as on the leaf of *R. sarmentosa* (fig. 7, *a*), or crowded, as in *R. tepicensis*. They may be present on the stems, petioles, peduncles, pedicels, calyx lobes, and one or both surfaces of the leaves. Often they are deciduous, leaving pits.

Petioles.—The petioles may be absent (*R. rotundifolia*), or up to 8 mm. in length (*R. polyedra*), glabrous or pubescent, and with or without resinous dots. The ridges on the angles of the stem extend up the sides of the petioles for several millimeters. Usually a line of hairs extends across the node, joining the bases of the petioles. When the blade falls, the base of the petiole remains appressed to the stem.

Inflorescences.—The inflorescences are axillary, one to three from the axil of a leaf, on the main stem, or on floriferous branches. The leaves (bracts) on the floriferous branches may be gradually reduced in size toward the tip, or much reduced all along. The inflorescences may be sessile as in *R. rugosa*, or with peduncles up to 4 cm. long as in *R. equisetiformis*, compact or spreading, and with few or many flowers. The flowers may be arranged in simple or complex dichasia (cymes). The pedicels are usually slender. Both peduncles and pedicels may be glabrous or pubescent, with or without resinous dots. The bractlets of the inflorescences are linear or lanceolate, sessile, usually with hairs and sometimes with resinous dots as well.

Calyx.—The persistent calyx is 5-parted almost to the base, with the lobes ovate (fig. 7, *h*), ovate-lanceolate, or lanceolate (fig. 7, *f*), the apex acute, acuminate, subulate (fig. 7, *g*), cuspidate (fig. 7, *i*) or mucronate (fig. 7, *h*), usually with membranaceous margins, and glabrous or pubescent on the dorsal side, sometimes only on the midrib or margin, and with or without resinous dots.

Corolla.—The corollas (fig. 7, *b*) are generally red, but may be cerise, or mottled red, pink and white, as in *R. maculosa*, and are

externally glabrous, except in *R. rotundifolia*, *maculosa*, *longisepala*, and *coccinea* forma *stipitata*, which have gland-tipped hairs. The corollas are tubular, slightly bilabiate, the mouth not spreading, except in *R. polyedra*, *verticillata*, and *staleyae*, in which they are funnellform. The upper (dorsal) lip is emarginate, the lower (ventral) has three rounded lobes about 2–3 mm. in length. The upper lobes are usually slightly shorter than the lower. The tube ranges in length from 6–7 mm. (*R. tepicensis*) to 25 mm. (*R. equisetiformis*). In all species except *R. equisetiformis*, flat, unicellular, yellow hairs with rounded tips occur along the inner side of the median lower lobe for about two-thirds of the length of the tube, these sometimes being visible in the open throat, and similar shorter, smaller, flat hairs occur on the inner surface of the tube near the insertion of the stamens.

Stamens.—The four stamens are didynamous, included, two of them 1 or 2 mm. longer than the other two (fig. 7, *e*). The filaments are attached above the base of the corolla tube, the longer ones slightly above the shorter. Hairs similar to those on the inner surface of the tube near the attachment of the stamens are often present on the bases of the filaments. The anthers are almost spherical or are oval and divaricate. A short (1–2 mm.) staminode with no anther is present in all species except *R. equisetiformis*, in which it is 8 mm. long and has an abortive anther.

Pistil.—The pistil (fig. 7, *c*) is shorter than the tube of the corolla. The stigma is not divided. The ovary is 2-loculed, with enlarged placentae in each locule. The ovules are numerous and anatropous.

Fruit.—The capsule (fig. 7, *d*) is globose or ovate, and glabrous; the dehiscence is septical. The style is persistent, at least for a time, but if it falls off it leaves a beak on the capsule. The lobes of the persistent calyx are usually shorter than the capsule (fig. 7, *d*) but sometimes almost equal it in length (*R. coccinea*).

After fertilization, the surface cells of the placentae between the developing seeds elongate to form hairs which become longer than the seeds and densely packed in the locules. This character is distinctive for the genus.

Seeds.—The seeds are small (the largest, 0.5 mm. long, 0.3 mm. wide), brown or black, elliptical or oval, reticulate, pitted, or with elongate ridges on the surface (fig. 7, *k, l*).

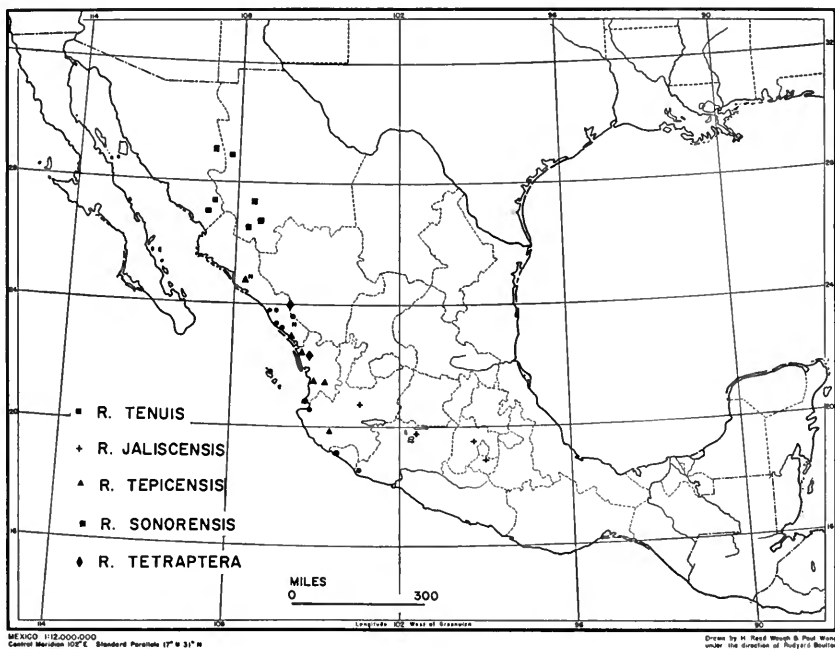
Habitat.—The plants grow in thickets along roadsides, along the margins of rivers and lakes, in fields, in forests, and on rocky



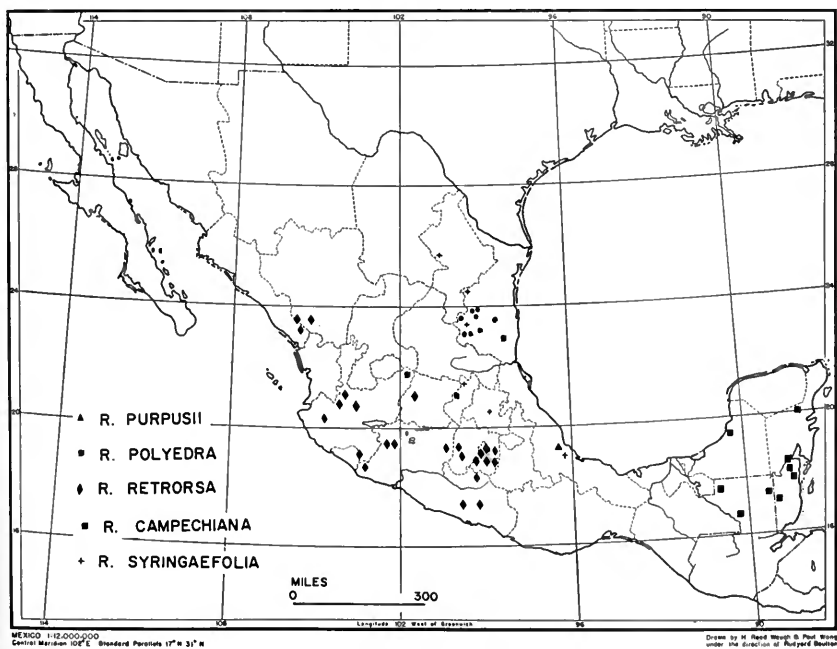
MAP 1. Distribution of three species and one variety of *Russelia*.

cliffs. The habitats of the individual species are given with the descriptions of the species.

Distribution.—Three species are widely distributed, namely: *R. coccinea*, extending southeastward from northeastern Mexico to western Guatemala (Map 1); *R. retrorsa*, extending in a broad belt in central-western Mexico, from Sinaloa to Morelos and Guerrero (Map 3); and *R. sarmentosa*, extending from Cuba and Vera Cruz to Colombia (Map 1). Several species seem to be endemic to rather localized areas, for example: *R. acuminata*, to the departments of Quezaltenango and San Marcos, Guatemala (Map 1); *R. campechiana*, to the Yucatan Peninsula, British Honduras and Petén, Guatemala (Map 3); *R. sonorensis*, to the states of Chihuahua and Sonora, Mexico (Map 2); *R. sarmentosa* var. *nicaraguensis* to Nicaragua (Map 1); *R. tenuis*, *tepicensis* and *tetraptera* to a strip of Pacific coastal area between Sinaloa and northern Guerrero (Map 2).



MAP 2. Distribution of five species of *Russelia*.



MAP 3. Distribution of five species of *Russelia*.

KEY TO SPECIES, VARIETIES, AND FORMS

- A1. Plants rush-like; branches slender, numerous, verticillate; inflorescences 2-flowered; interior of corolla lacking hairs Subgenus *Juncirusselia*
Main stems terete, with 8-12 inconspicuous ridges; branches 4-6-angled, with ridges on the angles; leaves small, caducous; peduncles 2.5-3 cm. long, ascending. 1. *R. equisetiformis*
- A2. Plants not rush-like; branches not numerous at the nodes, usually opposite or ternate; inflorescences with more than 2 flowers; interior of corollas with flattened hairs. Subgenus *Eurusselia*
- 1a. Leaves with entire margins, or with an occasional tooth.
- 2a. Stems appearing terete but with ridges.
- 3a. Vegetative parts of plant velutinous. 2. *R. purpusii*
- 3b. Vegetative parts of plant glabrous. 3. *R. elongata*
- 2b. Stems 4-angled, ridges on the angles.
- 4a. Petioles 7-9 mm. long; corollas 11-13 mm. long. 4. *R. campechiana*
- 4b. Petioles 3-5 mm. long; corollas 15-25 mm. long. 5. *R. syringaefolia*
- 1b. Leaves with serrate, dentate or crenate margins.
- 5a. Stems and/or their ridges glabrous, or essentially so (*R. obtusata* may appear glabrous, but has microscopic pubescence) (p. 242).
- 6a. Stems terete or subterete, or, if apparently angulate, not sharply so, with ridges inconspicuous or poorly developed, the sides between the ridges convex.
- 7a. Not resinous-lepidote on any part.
- 8a. Leaves long-elliptic, bases cuneate. 3. *R. elongata*
- 8b. Leaves ovate, bases truncate. 6. *R. teres*
- 7b. Resinous-lepidote on some part.
- 9a. Resinous-lepidote on both sides of leaves.
- 10a. Resinous-lepidote on calyx lobes; resinous dots prominent on younger leaves, sunken and inconspicuous on older leaves. 7. *R. acuminata*
- 10b. Not resinous-lepidote on calyx lobes; resinous dots on leaves prominent. 8. *R. lanceifolia*
- 9b. Resinous-lepidote on lower sides of leaves, not on upper sides or on calyx lobes.
- 11a. Inflorescences with less than 10 flowers; margins of leaves deeply incised-dentate. 9. *R. laciniata*
- 11b. Inflorescences, except those toward top of stems, with more than 10 flowers; margins of leaves not deeply incised-dentate.
- 12a. No stipitate glands present. 10. *R. coccinea*
- 12b. Stipitate glands on peduncles, pedicels, calyx lobes and interior and exterior of corollas. 11. *R. coccinea* f. *stipitata*
- 6b. Stems sharply angled, or, if apparently subterete, with prominent ridges, the sides between the ridges flat.
- 13a. Calyx lobes broadly lanceolate, gradually tapering from base to apex, 5-7 mm. long.
- 14a. Corollas 16-25 mm. long; calyx lobes 5 mm. long; leaves with large (diam. 0.3 mm.) scattered resinous dots on both sides. 12. *R. jaliscensis*
- 14b. Corollas 9-11 mm. long; calyx lobes 6-7 mm. long; leaves with few small sunken resinous dots only on the lower sides. 13. *R. longisepala*

- 13b. Calyx lobes ovate, not gradually tapering from base to apex, less than 5 mm. long.
- 15a. Main stems with wing-like extensions of the angles, the wings 1 mm. wide, ridged on the margins of the wings. 14. *R. tetraptera*
- 15b. Stems without wing-like extensions of the angles, ridged on the angles, or, if with wings, these less than 0.5 mm. wide and ridged on the margins of the wings.
- 16a. Leaves obovate or rhombic-oblong, the widest part above the middle, apices obtuse, bases sharply cuneate, blades attenuate to their attachment; calyx lobes mucronate. 15. *R. cuneata*
- 16b. Leaves and calyx lobes not as above.
- 17a. Not resinous-lepidote on any part.
- 18a. Petioles 3-4 mm. long; peduncles more than 5 mm. long.
23. *R. sarmentosa* f. *eglandulata*
- 18b. Petioles 1-2 mm. long; peduncles less than 5 mm. long.
- 19a. Leaves broadly ovate or rotund, apices acute or obtuse, bases truncate or cordate. 16. *R. floribunda*
- 19b. Leaves narrowly ovate, apices acuminate, bases widely cuneate or obtuse.
18. *R. chiapensis*
- 17b. Resinous-lepidote on some part.
- 20a. Calyx lobes not resinous-lepidote.
- 21a. Both sides of leaves resinous-lepidote. 19. *R. standleyi*
- 21b. Lower sides of leaves resinous-lepidote, upper sides with no resinous dots or very few.
- 22a. Leaves mostly finely reticulate-veined, glabrous; peduncles glabrous, 8-12 mm. long; pedicels glabrous, 7-10 mm. long. 20. *R. leptopoda*
- 22b. Leaves not prominently reticulate-veined, short-pubescent, particularly on the upper side; peduncles pubescent, 3-7 mm. long; pedicels pubescent, 2-6 mm. long. 21. *R. tenuis*
- 20b. Calyx lobes resinous-lepidote.
- 23a. Leaves on main stems more than 2 cm. long.
- 24a. Leaves ovate, apices acute or obtuse, bases truncate or rounded.
- 25a. Leaves on main stems mostly less than 6 cm. long; calyx lobes to 4 mm. long, acuminate. 22. *R. sarmentosa*
- 25b. Leaves on main stems mostly more than 6 cm. long; vegetative parts, excepting sometimes veins on the lower side of leaves, glabrous; calyx lobes to 5 mm. long, long-cuspidate. 27. *R. sarmentosa* var. *oaxacensis*
- 24b. Leaves ovate-elliptic or ovate-lanceolate, apices acuminate, bases cuneate.
- 26a. Resinous dots numerous on both sides of leaves and on calyx lobes; leaves deeply serrate. 28. *R. oxyphylla*
- 26b. Resinous dots few or none; leaves shallowly serrate. 29. *R. longifolia*
- 23b. Leaves on main stems less than 2 cm. long.
- 27a. Corollas tubular; ridges on angles of stems narrow; petioles 2.5-3 mm. long.
30. *R. sonorensis*
- 27b. Corollas funnellform; ridges on angles of stems wide; petioles 4-8 mm. long.
- 28a. Corollas 15-20 mm. long; canaliculate between the ridges which extend downward from sides of petiole. 51. *R. polyedra*
- 28b. Corollas 7-10 mm. long; not canaliculate on sides of stem below attachment of petioles. 32. *R. verticillata*

- 5b. Stems (at least those of the present year's growth) and/or their ridges pubescent.
- 29a. Stems terete or subterete, or, if apparently angulate, not sharply so, with ridges inconspicuous or poorly developed and sides between ridges convex.
- 30a. Corollas pubescent externally.
- 31a. Leaves sessile, rotund or subrotund, bases cordate, clasping; inflorescences many-flowered; peduncles 8-17 mm. long.
- 32a. Older stems slightly pubescent, younger ones more so . . . 33. *R. rotundifolia*
- 32b. All stems heavily pubescent 34. *R. rotundifolia* f. *velutina*
- 31b. Leaves petiolate, ovate, bases cuneate; inflorescences few-flowered; peduncles lacking.
- 33a. Margins of leaves crenate-serrate, surfaces and veins on lower surface pilose with septate hairs; calyx lobes 5-7 mm. long 35. *R. rugosa*
- 33b. Margins of leaves sharply serrate, all parts covered with short, gland-tipped hairs; calyx lobes 8-10 mm. long 36. *R. steyermarkii*
- 30b. Corollas glabrous externally.
- 34a. Not resinous-lepidote on any part 37. *R. pubescens*
- 34b. Resinous-lepidote on leaves and calyx lobes.
- 35a. Leaves truncate or subcordate at base; corollas 6-8 mm. long.
38. *R. tepicensis*
- 35b. Leaves cuneate at base; corollas 9-11 mm. long 39. *R. furfuracea*
- 29b. Stems sharply 4-10-angled, or, if apparently subterete, the ridges prominent and sides between ridges flat or concave.
- 36a. Stems with thin wing-like extensions of the angles, these 1 mm. wide, at least on the main stems, and ridges on the margins of the wings; corollas maculate 40. *R. maculosa*
- 36b. Stems with no wing-like extensions of the angles, or if with wing-like extensions these less than 0.5 mm. wide, and ridges on the angles; corollas red.
- 37a. Ridges and striations of stems roughened by swollen bases of hairs, these often becoming callosities 41. *R. retrorsa*
- 37b. Ridges and striations of stems not roughened by swollen bases of hairs or callosities.
- 38a. Stems microscopically pubescent, the hairs scarcely visible to the naked eye (0.02-0.05 mm. long) 43. *R. obtusata*
- 38b. Stems pubescent with longer hairs, readily visible to the naked eye.
- 39a. Pubescence densely woolly and matted, especially between the ridges, white or cinereous.
- 40a. Leaves 1.5-3.5 cm. long, 1-3 cm. wide; peduncles 10 mm. long.
44. *R. pringlei*
- 40b. Leaves 5-10 cm. long, 4-6 cm. wide; peduncles 1 mm. long or lacking;
45. *R. villosa*
- 39b. Pubescence not densely woolly or matted, not white or cinereous.
- 41a. Leaves not resinous-lepidote.
- 42a. Leaves narrowly ovate or obovate, bases cuneate.
- 43a. Hairs short, dense, velvety; calyx lobes mucronate 46. *R. ternifolia*
- 43b. Hairs longer, not dense or velvety; calyx lobes acuminate . . 18. *R. chiapensis*
- 42b. Leaves broadly ovate, bases truncate or cordate.

- 44a. Inflorescences lax, peduncles 10–20 mm. long, pedicels 8–10 mm. long; corollas 12–14 mm. long. 47. *R. conzattii*
- 44b. Inflorescences closely flowered, peduncles and pedicels 4–6 mm. long; corollas 10–12 mm. long. 17. *R. floribunda* var. *pubescens*
- 41b. Leaves, at least the younger ones, resinous-lepidote on one or both sides.
- 45a. Calyx lobes not resinous-lepidote.
- 46a. Leaves with teeth 5–7 mm. long. 48. *R. grandidentata*
- 46b. Leaves with teeth less than 5 mm. long.
- 47a. Inflorescences lax; petioles of larger leaves slender, 5 mm. long. 49. *R. hintoni*
- 47b. Inflorescences closely flowered; petioles less than 5 mm. long.
- 48a. Stem hairs on flat sides and on ridges. 41. *R. retrorsa*
- 48b. Stem hairs on flat sides; ridges glabrous.
- 49a. Ridges of stems 0.2 mm. broad. 21. *R. tenuis*
- 49b. Ridges of stems 0.5 mm. broad. 42. *R. retrorsa* f. *nudicostata*
- 45b. Calyx lobes resinous-lepidote.
- 50a. Leaves resinous-lepidote mostly on upper sides. 26. *R. sarmentosa* var. *nicaraguensis*
- 50b. Leaves resinous-lepidote on both sides.
- 51a. Leaves on main stems more than 3 cm. long.
- 52a. Stem hairs chiefly on angles. 24. *R. sarmentosa* f. *pubescens*
- 52b. Stem hairs on both flat sides and ridges. 25. *R. sarmentosa* f. *velutina*
- 51b. Leaves on main stems 2.5 cm. long or less.
- 53a. Corollas tubular.
- 54a. Leaves densely resinous-lepidote; corollas 13–16 mm. long. 31. *R. sonorensis* var. *pubescens*
- 54b. Leaves sparsely resinous-lepidote; corollas 11–12 mm. long. 50. *R. parvifolia*
- 53b. Corollas funnellform.
- 55a. Corollas 15–20 mm. long, petioles 6–8 mm. long. 51. *R. polyedra*
- 55b. Corollas 11–12 mm. long, petioles 1 mm. long. 52. *R. staleyae*

List of Species

Russelia Jacquin, Enum. Pl. Carib. 6. 1760.

Plants somewhat woody, shrubby or scandent, with terete or angulate stems, usually ridged, and striate between the ridges; leaves exstipulate, opposite or verticillate; inflorescences axillary, cymose, usually pedunculate, and with one, two or more series of pedicels; calyces deeply 5-parted, persistent; corollas tubular or funnellform, slightly irregular, the upper lip emarginate, the lower lip 3-lobed; stamens 4, didynamous, inserted 1–2 mm. above the base of the corolla; staminode usually short; ovary 2-loculed; fruit a globose capsule, loculicidally dehiscent, with enlarged placentae bearing numerous hairs among the many, small, wingless seeds.

Subgenus *Juncirus* Carlson, subgen. nov.

A. Plantae junciformes; ramis tenuibus numerosis verticillatis; inflorescentiis 2-floris; corollis intus glabris.

Type species: *Russelia equisetiformis* Schl. & Cham.

1. *Russelia equisetiformis* Schl. & Cham. *Linnaea* 6: 377. 1831. *R. juncea* Zucc. *Flora* 15, Beibl. 2: 99. 1832.

Plants about 1 meter tall, suffruticose, profusely branched, rush-like (resembling *Equisetum*), with small, caducous leaves; branches verticillate below, opposite above, spreading; stems green, glabrous, 4-12-angled, with prominent ridges on angles and striations between them, upper stems very slender; internodes 5-7 cm. long; lower leaves verticillate, 3-6 in a whorl, ovate or elliptical, acute, larger ones with one or a few large teeth on each side, 8.5-15 mm. long, 6-9 mm. wide; upper leaves smaller, opposite, linear, entire, both surfaces glabrous, with few circular resinous dots, veins not prominent; petioles 3-4 mm. long, often remaining appressed to stem when leaves fall; inflorescences near top of plant, opposite or verticillate, 1-2-flowered; bractlets small, linear, with few resinous dots; peduncles 3-4 cm. long, pedicels 1-1.5 cm. long, both slender, glabrous; calyx lobes broadly ovate, acute or mucronate, 2-3 mm. long, glabrous, no resinous dots, not spreading; corollas red, 1.5-2.5 cm. long, outer surface glabrous, dorsal lobe deeply notched, 3 ventral lobes about the same length as dorsal; stamens to 18 and 20 mm. long, extending to mouth of corolla tube, without hairs on filaments; anthers orbicular, divaricate, or somewhat pendulous; staminodes very short (0.5-0.7 mm.); pistils 18 mm. long; style apiculate; capsules globose, 3-6 mm. in diameter; persistent calyx covers lower third of capsule; persistent style to 15 mm. long; seeds small, oval, warty, light brown, among white hairs which fill the capsule.

Type: From Papantla, Vera Cruz, Mexico, in sunny places, *Schiede & Deppe 1187* (GH).

Blooms throughout the year. Introduced into Berlin and Munich by Count Karwinski and from there into Britain in 1833. Usually an ornamental plant cultivated in greenhouses and in gardens in tropical parts of the world. Known as "coral" or "lluvia de coral" in Spanish-speaking countries.

Zuccarini says that *R. juncea* is distinguishable from *R. equisetiformis* by its "graceful, pendulent stems, glandulose-punctate leaves, calyx lobes short, mucronate, and corolla twice as long," but J. M. Greenman examined the material in the Berlin Herbarium and found no satisfactory differences between them. After examining 120 specimens, I agree with this conclusion. The species differs from other species in having slender, rush-like stems, small caducous leaves, long corolla tubes and no hairs along the inside of the ventral lobe or at the base near the attachment of the stamens.

Although the collectors have not always indicated, most of the collections are cultivated plants. Besides the many specimens from Mexico and Central America, collections have been made in the West Indies, Panama, South America, the Pacific Islands, China,

India, the Malay Peninsula and Borneo. Even in the United States, the plant has been collected in Michigan, Ohio and Missouri, as well as in the southern states of Florida and Texas.

Subgenus **Eurusselia** Carlson, subgen. nov.

AA. Plantae non junciformes; ramis oppositis vel ternatis; inflorescentiis 3-vel multi-floris; corollis intus pubescentibus.

Type species: *Russelia sarmentosa* Jacq.

2. **Russelia purpusii** Brandegee, Univ. Calif. Publ. Bot. 4: 385. 1913.

Plants shrubby, branched; stems appearing terete, but with inconspicuous ridges and no striations between the ridges, all densely velutinous on and between the ridges; internodes 3.5–5 cm. long; leaves opposite, broadly ovate, apex acuminate, base truncate or subcordate, 6–7 cm. long, 3.5–4.5 cm. broad, margin entire, recurved, upper surface with few short hairs, more on margin and veins, lower surface with more hairs, especially on veins, velvety to the touch, hairs multicellular, straight, 0.06 mm. long, upper leaves smaller, lanceolate, bract-like; petioles 5–6 mm. long, pubescent; inflorescences axillary and terminal; primary peduncles 2–4 cm. long, pubescent, bearing a pair of leaf-like bracts and spreading cymes, each 3–6-flowered; bractlets small, linear, pubescent; secondary peduncles 7–10 mm. long, pedicels slightly longer, both pubescent; calyx lobes ovate, apices acute or acuminate, 3 mm. long, with no hairs or glands; corolla red, tubular, glabrous on the outside, 15–17 mm. long, dorsal lobe 1.5 mm. long, slightly notched, ventral lobes slightly longer and more narrow, flat unicellular hairs along inside of median ventral lobe; stamens 8 and 10 mm. long; anthers rounded, divaricate; staminode 3–4 mm. long, bases of filaments and inside of corolla tube near their insertion densely covered with flat hairs; pistil 10–11 mm. long; capsule ovate, acuminate, 6 mm. to base of persistent style, which is 8 mm. long with knob-like stigma; persistent calyx lobes cover lower half, or less, of capsule; seeds numerous, small, black.

Type: Rocky forests at Baños del Carrizál, Vera Cruz, Mexico, August, 1912, C. A. Purpus 6039 (UC).

The only pubescent species with entire leaves (Map 3).

Mexico, Vera Cruz: Purpus 6039 (F, MO, NY, UC, US).

3. **Russelia elongata** Carlson, sp. nov. Plate 1.

Planta suffruticosa, 1–1.5 m. alta; ramis teretibus 4–multi-costatis glabris; foliis verticillatis ramorum inferiorum caducis; laminis lanceolatis vel anguste ellipticis 1–2.5 cm. longis 2–8 mm. latis, apice acuminatis, basi cuneatis, parce serratis, glabris; petiolis tenuibus 2–3 mm. longis glabris; inflorescentiis verticillatis axillaribus 3–5-floris; bracteolis lanceolatis glabris; pedunculis 3–8 mm. longis glabris; pedicellis 2 mm. longis glabris; sepalis 3 mm. longis ovatis longe acuminatis glabris; corollis 13–15 mm. longis tubulatis, lobis apice patulis; staminibus 4 vel 5 mm. longis; antheris orbicularibus divaricatis; staminodiis 1 mm. longis; pistillis 7 mm. longis; capsulis 3 mm. longis; seminibus ovalibus.

Plants suffruticose, 1–1.5 meters tall; stems terete, 4–many-ribbed, some of the ribs wider than others, glabrous; leaves verticillate, caducous from the lower parts of stems; blades lanceolate or long-elliptic, 1–2.5 cm. long, 2–8 mm. wide, apices acuminate, bases cuneate, margins of larger leaves with few shallow teeth each side, smaller ones with none, glabrous both sides, not resinous-lepidote; petioles slender, 2–3 mm. long, glabrous; inflorescences verticillate, axillary, 3–5-flowered; bractlets linear, glabrous; peduncles 3–8 mm. long, glabrous; pedicels 2 mm. long, glabrous; calyx lobes 3 mm. long, ovate, long-acuminate, glabrous; corollas 13–15 mm. long, narrowly tubular, spreading at top, upper lip scarcely emarginate, lower lobes 2 mm. deep, 2 mm. broad, barbate within along median ventral lobe and at base near insertion of stamens; stamens 4 and 5 mm. long; anthers orbicular, divaricate; staminodes 1 mm. long; pistils 7 mm. long; capsules 3 mm. long; seeds oval, brown.

Type: Rocky cliffs, shady side, Sapopa Canyon, Río Mayo, Sonora, February 8, 1935, *H. S. Gentry 1287* (F).

Distinguished from *R. coccinea* by the small, elongate leaves, often in whorls of 4 or 5, caducous from lower parts of stems; the few-flowered inflorescences, also verticillate in the axils of the verticillate leaves; and the narrowly tubular corollas spreading at the top.

Mexico, Sonora: Sapopa Canyon, Río Mayo, *Gentry 1287* (F, GH, MEXU, MICH, MO, NY, UC).

4. ***Russelia campechiana*** Standl. Contr. U. S. Nat. Herb. 23: 1309. 1924.

Plants suffrutescent or scandent, branching, 1.5 meters tall; stems 4-angled, ridges conspicuous, scattered short appressed hairs; internodes 5–7 cm. long; leaves opposite, ovate-lanceolate, 5–7 cm. long, 2.5–4 cm. broad, coriaceous, lustrous on upper surface, glabrous, entire, margin reflexed, apex acuminate, base rounded, minute impressed glandular dots on lower surface; petioles 7–9 mm. long, older grooved on upper side, pubescent especially at base; inflorescences toward top of stem, axillary, cymose, compact, many-flowered; bracts petiolate, like leaves but smaller; bractlets linear, pubescent; peduncles 5–10 mm. long, pedicels shorter, both pubescent; calyx lobes ovate, subulate-acuminate, the tips sometimes recurved, short hairs on costa and margin, 3.5 mm. long, no glandular dots; corolla red, tube 11–13 mm. long, dorsal lobe not notched, 3.5 by 2.5 mm., ventral lobes 3 by 1.5 mm., densely bearded with yellow hairs on inside of median lobe, especially at throat, and at base near attachment of stamens; stamens 9 and 10 mm. long, hairs dense on bases of filaments; anthers oval, divaricate; staminode 3–4 mm. long, knob on top; pistil 10.5 mm. long; capsule globose, 1 cm. long including beak; seeds small, black.

Type: Apazote, near Yohaltúm, Campeche, Mexico, December 20, 1900, *E. A. Goldman 467* (US).

Other collections in flower from December to July. Distribution: Yucatan Peninsula and neighboring Petén, Guatemala, and British Honduras (Map 3).

Mexico, Yucatan: Coba, Quintana Roo, *Lundell & Lundell 7850* (LUND, PA). Campeche: Apazote, *Goldman 467* (US); Tuxpeña, *Lundell 1112* (F, LUND, MO, NY, PA, US), *1338* (F, GH, LUND, MICH, NY).

Guatemala, Petén: La Libertád, *Aquilar 464* (MICH); Yal'och, *Bartlett 12852* (F, MICH, PA); Laguna Perdida, *Lundell 1644* (MICH, US).

British Honduras: El Cayo, *Bartlett 11999* (F, MICH), *Chanek 231* (F, MICH, PA); Corozál, *Gentle 385* (F, MICH, US), *647* (F, MICH, PA); Maskall Pine Ridge, *Gentle 1140* (F, GH, MICH, MO, NY, PA); El Cayo, *Gentle 2175* (GH, MICH, PA); Vaca, *2269* (GH, LUND); Honey Camp, *Lundell 576* (F, GH, MICH, PA, US); Jacinto Hills, *Schipp 5653* (F, GH, MICH, MO, NY).

5. *Russelia syringaefolia* Schl. & Cham. *Linnaea* 6: 376. 1831. *R. subcoriacea* Robinson & Seaton, *Proc. Amer. Acad.* 28: 113. 1893.

Plants suffrutescent, scandent, branching, 5 meters tall; stems 4-sided, with ridges on angles, inconspicuous striations between ridges, glabrous; internodes 5-8 cm. long, generally shorter than the leaves; leaves opposite, ovate, apices acute or acuminate, bases rounded or cordate, margins entire, with thickened edges, 5-8 cm. long, 4-6 cm. broad, subcoriaceous, firm, waxy above, glabrous, minutely pitted on lower sides, main veins deeply impressed on upper side, prominent on lower side; petioles 3-5 mm. long, thick, glabrous or slightly pubescent, bases connected with a line, sometimes pubescent; inflorescences axillary, sometimes two from the same axil, cymose, many-flowered; bracts petiolate, like leaves but smaller, sometimes pubescent; peduncles and pedicels 8-10 mm. long, pubescent; bractlets linear, pubescent; calyx lobes ovate, apices acute or acuminate, 3-4 mm. long, glabrous; corollas 15-25 mm. long, scarlet, but cerise within tube, densely bearded with flat, yellow hairs along inside of median ventral lobe, especially at throat, and at base of tube near attachment of stamens; stamens didynamous, 14 and 16 mm. long, bearded below; anthers oval, divaricate; staminode 4 mm. long; pistil 15-18 mm. long; capsule long-ovate, acute, 8-12 mm. long, enclosed at base by calyx; seeds 0.8 by 0.5 mm., surface rough, hairs among seeds to 0.07 mm. long.

Type: Papantla, Vera Cruz, Mexico, December, *Schiede & Deppe 1186* (Vienna).

The species blooms throughout the year and grows on rocky cliffs, up to elevations of 1,000 meters. It is related to *R. campechiana*. The specimens described as *R. subcoriacea* often have larger leaves and flowers, but seem to agree with *R. syringaefolia* in all other respects (Map 3).

Mexico, Tamaulipas: Adelaida Canyon, near Ciudad Victoria, *Bonner 37* (F); Jaumave, near Nogales, *von Rozynski 729* (F, NY).

Nuevo Leon: Dulces Nombres, *Meyer & Rogers 2664* (F, MO, PA). San Luis Potosí: El Salto, near Antiguo Morelos, *Bonner 31* (F), *Carlson 2762* (F); above Tamazunchale, km. 355, *Carlson 2781* (F), s.n. (F); Tamasopo Canyon, *Pringle 5086* (GH); Río de las Gallinas, *Purpus 5327* (GH, NY). Hidalgo: near Chapulhuacán, *Lundell & Lundell 12396, 12398, 12649* (LUND, SMU). Vera Cruz: *Purpus 2378* (GH, MO, NY, UC, US), *8063* (UC). Oaxaca: *Orcutt 3299* (MO); Barita de San José, Tolosa, *Deam 41* (GH, US). Location not given: *Liebman 9434* (NY, US), *Salasar s.n.* (MEXU).

6. *Russelia teres* Lundell, Field and Lab. 13: 20. 1945.

Plants suffruticose, 1 meter high; stems and branches terete, with extremely narrow, inconspicuous ridges, minutely puberulent at base of stems and at nodes, otherwise glabrous; internodes to 12 cm. long; leaves opposite or ternate; petioles to 2.5 mm. long, hirtellous; blades ovate or ovate-lanceolate, to 6 cm. long, 3.8 cm. wide, apices acuminate, bases truncate or shallowly cordate, margins obscurely crenulate-serrate, sparsely short-hairy on the veins on both surfaces, not resinous-lepidote, short ciliate, finely reticulate-veined, costa and primary veins plane above, rather prominent below; inflorescences axillary, many-flowered; bractlets linear, sparsely hirtellous; peduncles 2-4 mm. long; pedicels 3-4 mm. long; calyx lobes 5 mm. long, ovate, with long subulate tips, somewhat reflexed, glabrous except for a few hairs along keel and tip, no resinous dots; corollas red, tubular, slightly spreading at the top, 7-9 mm. long, upper lobe subentire, lower lobes 2 mm. long, glabrous externally, barbate within on median ventral lobe and near insertion of stamens; stamens 4 and 5 mm. long, barbate at base; anthers oval, divaricate; staminodes 1 mm. long; pistils 5 mm. long; capsules and seeds not seen.

Type: In woods, Coalcomán, Michoacán, Mexico, November 11, 1941, *G. B. Hinton 16127* (SMU).

This species seems to be related to *R. pubescens* but differs in the shape of the leaves and in the lack of the long soft hairs which are characteristic of that species. Also, the calyx lobes of *R. teres* are more narrow and have longer subulate tips than those of *R. pubescens*. In some respects *R. teres* resembles *R. coccinea*, but the ridges on the stems are less conspicuous and no resinous dots are present on any part of the former.

Mexico, Michoacán: Hacienda Coahuayula, *Emrick 181* (F); Coalcomán, *Hinton 16127* (GH, LUND, SMU, US).

7. *Russelia acuminata* Carlson, sp. nov. Plate 1.

Planta suffruticosa, 2-5 m. alta; ramis subteretibus vel inconspicue 4-6-angularibus, glabris; foliis oppositis vel ternatis, petiolatis, petiolis 2-4 mm. longis, hirtellis, laminis ovato-lanceolatis, 6-9 cm. longis, 3-4.5 cm. latis, apice acuminato-attenuatis, basi cuneatis vel acutis, crenato-serratis, resinoso-lepidotis, venis prin-

capalibus pubescentibus; inflorescentiis cymosis, 15–25-floris; pedunculis 10–15 mm. longis, glabris, parce resinoso-lepidotis; pedicellis 5–7 mm. longis, glabris; sepalis ovatis, 3.5–4.5 mm. longis, aristatis, resinoso-lepidotis; corollis coccineis, 12–16 mm. longis; filamentis didynamis, 9 vel 11 mm. longis; antheris divaricatis; pistillis 12 mm. longis; capsulis ovoideis, 4 mm. longis; seminibus numerosis, minutis.

Plants suffruticose, 2–5 meters long, scrambling or drooping from cliffs; stems subterete or with 4–6 angles slightly ridged, glabrous, not resinous lepidote; leaves opposite or ternate, the blades 6–9 cm. long, 3–4.5 cm. broad, ovate-lanceolate, cuneate to acute at base, acuminate-attenuate at apex, crenate-serrate, more resinous dots on the lower than on the upper side, somewhat reticulate-veiny, minutely pubescent on the main veins, on both upper and lower sides; petioles 2–4 mm. long, pubescent, especially on upper side; inflorescences laxly cymose, with 15–25 flowers; peduncles 10–15 mm. long, glabrous, sometimes sparsely resinous-dotted; pedicels 5–7 mm. long, glabrous; bractlets linear, pubescent; sepals 3.5–4.5 mm. long, ovate with long, acuminate tips, densely resinous-dotted at base, slightly hairy at tips; corollas red, tubular, 12–16 mm. long, externally glabrous, internally densely bearded with yellow hairs on median lower lobe and at base near attachment of stamens; ventral lobes 3 mm. long, 2 mm. wide, dorsal lobe slightly emarginate, slightly shorter than the ventral; stamens 9 and 11 mm. long; staminode 0.5 mm. long; anthers oval, divaricate; pistils 12 mm. long; capsules ovoid, 4 mm. long, with beak; seeds numerous, small, black.

Type: Slender drooping stems somewhat woody, attaining length of 2 meters, pendent from cliffs in the gorge of Río Samalá, near Santa María de Jesús, Dept. Quezaltenango, Guatemala, at an elevation of 1,670 meters, August 6, 1934, *Alex. F. Skutch 951* (PA).

Other collections are from Quezaltenango and San Marcos, at elevations of 1,200–2,000 meters (Map 1). In flower from January to October. It is similar to *R. coccinea* (L.) Wetts., but differs in having leaves generally longer for their width, with long-acuminate apices; inflorescences more spreading and with fewer flowers per inflorescence; and resinous dots on the calyx lobes as well as on both sides of the leaves. F. W. Pennell gave this species an herbarium name, but no description was ever published.

Guatemala, Quezaltenango: Río Samalá, near Santa María de Jesús, *Skutch 951* (F, PA), *Palmer 1448* (PA); Finca Moca, *Skutch 2085* (F, NY, PA, US); Calahuaché, *Standley 67099* (F, PA); El Muro, below Santa María de Jesús, *Standley 67165* (F, NY, PA), *67275* (F); moist cliff, Río Samalá, near Santa María de Jesús, *Standley 84737* (F), *84762* (F), *84856* (F), *86690* (F), *87111* (F), *87129* (F); Finca Pirineos, lower south-facing slopes of Volcán Santa María, *Steyermark 33214* (F). San Marcos: Between Finca El Porvenir and Loma Corona, Volcán Tajumulco, *Steyermark 37727* (F, PA).

8. *Russelia lanceifolia* Lundell, Field and Lab. 13: 14. 1945.

Plants suffrutescent, 2 meters tall; stems subterete, inconspicuously 6-angled with narrow ridges on the angles, sparsely pubescent at first, then becoming glabrous; leaves opposite or ternate, thin, membranaceous, ovate-lanceolate, light green above, paler below, 7.5 by 3.5 cm., apices acute, bases cuneate, sparsely pubescent on both surfaces at first, especially on veins on lower side, sparingly resinous-lepidote on both surfaces with translucent dots, margins coarsely serrate-dentate, 4-7 teeth on each side, basal one-third entire, ciliate, costa and veins slightly impressed above, prominent and white beneath; petioles slender, 4-8 mm. long, densely pubescent on upper side; inflorescences axillary, cymose, 3-9-flowered; bractlets subulate, ciliate; peduncles 1-6 mm. long; pedicels 4-6 mm. long, sparsely pubescent; calyx lobes ovate, acuminate, subulate above the middle, 4 mm. long, keeled, ciliate, sparsely hairy, not resinous-lepidote; corollas red, cylindrical, 13-17 mm. long, lobes spreading, glabrous externally, barbate within on lower lobe; filaments glabrous; staminodes 0.8 mm. long; capsules ovoid, 4 mm. long, with persistent style; seeds 0.3 mm. long, light brown.

Type: Mountain-side near km. 157, Taxco, Guerrero, Mexico, altitude 1,700 meters, August 1, 1943, *C. L. & A. A. Lundell 12317* (SMU).

No flowers are present on the type specimen. Lundell says it is closely allied to *R. coccinea*.

Mexico, Guerrero: *Lundell & Lundell 12317* (LUND, MICH, SMU).

9. *Russelia laciniata* Standl. & Steyerl. Field Mus. Bot. 22: 379. 1940.

Plants shrubby, branching, to almost 1 meter tall; stems slender, terete, with striations, no ridges on older stems, very narrow ridges on younger stems, pale green, glabrous; internodes elongate, 4-5 cm. long; leaves opposite, thin, membranaceous, light grass-green both sides, 5-8 cm. long, 2-5 cm. wide, ovate or rhombic-ovate, acuminate or long-acuminate, base wide-cuneate or subrotund, margin deeply incised-dentate, the teeth triangular, sharply acuminate, the tips somewhat recurved, veins prominent, especially on the lower side, few small, resinous dots on the lower side, none on the upper; petioles less than 2 mm. long, minutely pilose or puberulent, remaining and somewhat spreading after the blades fall, giving the stem a nodose appearance; inflorescences axillary, few-flowered; peduncles 8-10 mm. long, pedicels the same or longer, both glabrous; calyx lobes 4-7 mm. long, lanceolate or ovate, cuspidate-acuminate, glabrous; capsule ovoid, glabrous, brown, 6 mm. long, tip a rigid beak, 3 mm. long; seeds 0.3-0.4 mm. long, light brown, reticulate-ridged on surface. No information about the corolla is available.

Type: Above Finca El Porvenir, along Río Cabús, to within 2 miles of Cueva de las Palomas, south-facing slopes of Volcán Tajumulco, Dept. San Marcos, Guatemala, altitude 1,300-1,500 meters, March 16, 1940, *J. A. Steyerl 37982* (F).

Standley and Steyermark (38) state, "The material is incomplete, only 2 flowers in fruiting state being present on the specimens. The foliage is so unlike that of any other *Russelia* we have seen, especially in its deeply laciniate leaf margins with somewhat outcurved lacinations, that we have no hesitancy in describing the plant as a new species."

Guatemala, San Marcos: Finca El Porvenir, *J. A. Steyermark* 37982 (F).

10. *Russelia coccinea* (L.) Wettstein, Engl. & Prantl IV, 3b: 62. 1897. *Scrophularia coccinea* L. Sp. Pl. 1: 621. 1753. *Russelia multiflora* Sims, Linnaea 6: 376. 1831; Curt. Bot. Mag. 37: t. 1528. 1813. *R. paniculata* Mart. & Gal. Bull. Acad. Brux. 12, II: 19. 1845. *R. serratifolia* Lundell, Field and Lab. 13: 17. 1945.

Plants 3 meters tall with many stems not able to support themselves; stems to 8 mm. in diameter at base, subterete, but with narrow ridges and striations between the ridges, glabrous, internodes 8–10 cm. long; leaves opposite or verticillate, ovate-lanceolate, apices acute or acuminate, bases truncate or subcordate, serrate, glabrous except for a few multicellular hairs on the upper side and on the veins on the lower side, many small yellowish depressed resinous dots on the lower side which make papillae on the upper side; petioles 4–5 mm. long, glabrous; inflorescences one or two from an axil, near the ends of the branches, cymose and sometimes appearing racemose, flowers numerous (15 or more); peduncles 5–8 mm. long, slightly pubescent; pedicels 3–5 mm. long, slightly pubescent; bractlets linear, pubescent, ciliate; calyx lobes ovate-lanceolate, setaceous, membranaceous, margins becoming purple, a few hairs on the midrib and tip, no resinous dots; corollas 10–12 mm. long, the upper lip slightly notched, the lower lip 3-lobed, the lobes 3 mm. long, slightly longer than the upper; flat hairs on the inner side of the median ventral lobe of the corolla, and shorter flat hairs near the attachment of the stamens; two stamens 5 mm. long, the other two 6 mm. long; anthers divaricate; staminodes small (1 mm. long); pistils 7–8 mm. long; capsules 3 mm. long, excluding beak, globose, no longer than the persistent calyx lobes; seeds 0.3 mm. long, black, embedded in hairs which fill the capsule.

Type: Near Tancanhuitz, San Luis Potosí, Mexico, *E. Seler* 705 (GH).

Figures are given by Paxton (Mag. Bot. 16: 163. 1849) and Sims (35). The species grows in damp thickets, woods, and fields at altitudes of 20–2,100 meters. It blooms throughout the year. It is distributed from Tamaulipas, Mexico, to Guatemala (Map 1). It is often cultivated in greenhouses and gardens.

Mexico, Tamaulipas: Barranca de Chavastla, Jaumave, *von Rozyński* 759 (F). San Luis Potosí: Tamajundede, *Aguirre & Reko* 312 (NY); near Tamazunchale, *Carlson s.n.* (F), 2779 (F), 2782 (F), 2787 (F), *Kenoyer* 822 (F, MO), *Lundell & Lundell* 12401, 12402,

12406, 12422, 12650, 12651 (LUND, MICH, SMU); near Xilitla, *Rowell 3171* (SMU); near Tancanhuitz, *Seler 705* (GH, US). Vera Cruz: Banks of Mexican railroad, above Fortín, *Barnes & Land 660* (F, PA); near Consequila, *Purpus 8567* (US); hillsides, Chavarillo, *Barnes, Chamberlain & Land 47* (F); Orizaba, *Botteri 28* (GH); Córdoba, *Bourgeau 1983* (GH, US); near Río Tonto, Tezonapa, *Carlson 1305* (F); Zacuapan, *Purpus 6316* (UC), *6242* (UC); laguna, near city of Vera Cruz, *Greenman 73* (F, GH), *82* (F, GH); Córdoba, *Greenman 185* (F, GH, NY); Puente de San Miguel, *Langman 3433* (MEXU, PA); Orizaba, *Müller 1369* (NY), *4098* (NY, US); Catemaco, *Nelson 385* (US); Córdoba, *Orcutt 3139* (F, GH, MO, US); Perez, *Orcutt 6556* (US); Barranca de Metlac, *Pringle 6081* (GH, MO, NY, PA, UC, US); Córdoba, *Purpus 436* (MO, UC, US); Corral de Piedras, *Purpus 5749* (F, GH, MO, NY, UC, US); San Andres Tuxtla, near Matarapán, *Seler 4965* (GH); Coatzacoalcos River, Fortuno, *Williams 8521* (F, PA). Michoacán: Cerro de las Naglas, Morélia, *Arsène s.n.* (F, US). Puebla: Near Metlatoyuca, *Goldman 62* (GH, US). Oaxaca: Cantón de Huatusco, *Conzatti 835* (GH); Wartenberg, near Tantoyuca, Huasteca, *Ervendberg 223* (GH, NY, PA), *263* (GH, NY); Chiltepec and vicinity, Tuxtepec, *Martínez-Calderón 391* (F, GH, UC, US), *472* (GH, LUND, UC, US); north of Tuxtepec, *Nelson 319* (US). Chiapas: Barranca between San Fernando and Chalona, *Langman 3825* (PA); between San Fernando and Plan de Ayala, west of Tuxtla Gutierrez, *Langman 3916* (PA); Santa Elena, Acapetahua, *Matuda 17251* (F); Jilguero, Escuintla, *Matuda 17273* (F); Santa Rosa Tonalá, *Matuda 17336* (F).

Guatemala, Chimaltenango: Champerín, *Johnston 1743* (F). Retalhuleu: Río Samalá, *Shannon 271* (US); along road between Retalhuleu and Adintal, *Standley 87796* (F); on road between San Sebastián and Santa Cruz Mulua, *Standley 88178* (F). Suchitepequez: Along Río Madre Vieja above Patulúl, *Standley 62200* (F). Escuintla: Between Río Jute and Río Pantaleon, on road between Escuintla and Santa Lucía Cotz, *Standley 63592* (F, PA); along Río Michatoya, southeast of Escuintla, *Standley 89070* (F).

Cuba, Cienfuegos: Harvard Tropical Garden, Soledad, cultivated, *Jack 4074* (US).

West Indies, Trinidad: Woodbrook, cultivated, *Broadway 8006* (MO).

China, Canton: cultivated, *Chun 6982* (NY).

11. *Russelia coccinea* f. *stipitata* Carlson, f. nov. *R. glandulifera* Lundell, Field and Lab. 13: 12. 1945.

A var. *coccinea* recedit pedunculis, pedicellis, sepalis et corollis extus et intus dense stipitato-glandulosis.

The form resembles the species except that the peduncles, pedicels, calyx lobes and the exterior and interior of the corollas are densely covered with stipitate glands.

Type: Tututepec, Oaxaca, Mexico, April 12, 1940, *L. H. Bailey 604* (SMU).

The form appears in widely separated localities. Pennell recognized this taxon as a species and named it *R. glandulosa*, but his name and description were not published.

Mexico, Oaxaca: Tututepec, *Bailey 604* (LUND, SMU). Chiapas: Siltepec, *Matuda 136* (MICH, PA, US).

Guatemala, Guatemala: Pacaya, Amatitlán, *Mart 1961* (GH, MICH, NY, PA, US).

12. *Russelia jaliscensis* Robinson, Proc. Amer. Acad. 35: 319. 1900. *R. deamii* Robinson, Proc. Amer. Acad. 36: 474. 1901.

Plants suffrutescent, copiously branched, 1–1.6 meters tall; stems 4–6-angled, narrow ridges on angles, striations on flat sides, glabrous; internodes 3–8 cm. long; leaves thin, membranaceous, opposite, ovate, elliptic or ovate-lanceolate, apex acute or obtuse, base cuneate, margin sharply serrate, ciliate, 2–3.5 cm. long, half as broad; usually with sparse appressed multicellular hairs, but sometimes glabrous, and usually with large (0.3 mm.) resinous dots, more on the upper than on the lower side, sometimes deciduous; veins not prominent; petioles 2 mm. long, pubescent, bases remaining after the blades fall; inflorescences axillary, 1–3-flowered; bractlets linear, pubescent; peduncles 4–8 mm. long, pedicels 5–10 mm. long, both slender, usually pubescent, not resinous-lepidote; calyx lobes 5 mm. long, lanceolate, gradually tapering from base to apex, apices acute, ciliate, sometimes with a few hairs on the midrib and with resinous dots; corollas scarlet, 16–25 mm. long, externally glabrous, internally bearded with flat hairs along the median ventral lobe and at the base near the insertion of the stamens; upper lip emarginate, lower lobes slightly longer than the upper, 2–3 mm. long, rounded, somewhat spreading; stamens didynamous, 14 and 16 mm. long, with a few flat hairs at the base; anthers ovoid, divaricate; staminodes 2–3 mm. long; pistils 10–17 mm. long; capsules 5–6 mm. long, globose; seeds oval, brown, 0.5 mm. long, 0.3 mm. wide.

Type: From a canyon near Guadalajara, Jalisco, Mexico, June, 1886, *E. Palmer 126* (GH).

The species grows at altitudes from 900 to 1,600 meters, and flowers from January to August. Its distribution is shown on Map 2. It is recognized by the thin leaves, with large resinous dots on both

sides; the long calyx lobes, gradually tapering from base to apex; and the long tubular flowers.

Mexico, Durango: San Ramón, *Palmer 149* (GH, NY, US). Jalisco: Guadalajara, *Palmer 126* (GH, MEXU, PA), *Pringle 2568* (F, GH, MEXU, MO, NY, US), *8657* (F, GH, MO, NY, PA, UC, US), *Russell & Souviron 18* (US). Michoacán: Morelia, Cerro Azúl, *Arsène s.n.* (F, US); Rincón, *Arsène s.n.* (US); Dos Tetecos, *Arsène s.n.* (US). Morelos: Cuernavaca, *Carlson 3119* (F), *Deam s.n.* (F, MICH, MO), *Lyonnet 608* (GH, MO, NY, US), *Pringle 8934* (F, GH, MEXU, MO, NY, PA, UC, US). Guerrero: Pino Mina, *Hinton 10465* (F, GH, MO, NY, US). Mexico: Limón, *Rusby 9* (NY); between Toluca and Mexico City, *Rusby 12* (NY, US).

13. *Russelia longisepala* Carlson, sp. nov. Plate 2.

Planta suffruticosa, 3–5 dm. alta; ramis 4–6-angularibus, angulis incrassatis, glabris; foliis oppositis, ellipticis, apice acutis, basi cuneatis, serratis, latis supra et venis infra parce adpresso-pubescentibus, infra parce resinoso-lepidotis; petiolis 1 mm. longis, pubescentibus; inflorescentiis 2–4-floris; pedunculis 8 mm. longis, glabris; pedicellis 3–5 mm. longis, glabris; sepalis 6–7 mm. longis, lanceolatis, costa pubescenti; corollis 9–11 mm. longis; filamentis 7 vel 8 mm. longis; staminodiis 2 mm. longis; pistillis 7–8 mm. longis; capsulis 8 mm. longis, elongatis; seminibus ovalis, numerosis.

Plants suffruticose, 3–5 dm. tall; stems 4–6-angled, narrow ridges on the angles, glabrous except at ends of branches; internodes 2–5 cm. long; leaves opposite, elliptic, apices acute, bases cuneate, serrate; upper sides and veins of lower sides of younger leaves sparsely short-appressed-pubescent, lower sides sparsely resinous-lepidote; smaller veins not evident; petioles 1 mm. long, pubescent; inflorescences 2–4-flowered; bractlets long-oval; peduncles 8 mm. long, glabrous; pedicels 3–5 mm. long, glabrous; calyx lobes 6–7 mm. long, lanceolate, gradually tapering from base to apex, margins red-purple, pubescent in narrow line along midrib; corollas 9–11 mm. long, lobes 4 mm. long, spreading, barbate on inner side of ventral lobe near mouth, not at base; stamens 7 and 8 mm. long; staminode 2 mm. long; pistils 7–8 mm. long; capsules elongate, 8 mm. long; seeds oval, brown, numerous.

Type: Tamahú, Alta Vera Paz, Guatemala, altitude 1,300 meters, April, 1908, *H. von Tuerckheim 2249* (NY).

Distinguished by the long, gradually tapering calyx lobes and the spreading 2-lipped corolla, with lobes longer than in most species.

Guatemala, Alta Vera Paz: Tamahú, *von Tuerckheim 2249* (GH, NY, US).

14. *Russelia tetraptera* Blake, Proc. Biol. Soc. Wash. 33: 120. 1920.

Plants fruticose; stems 4–5 mm. thick at base, with opposite branches, gray-green, sharply 4-angled, flat or concave with striations between the angles; angles

with corky-margined wings 1 mm. wide on the main stems, reduced above to mere ridges, glabrate or puberulent and sometimes hispidulous on the flat sides; internodes 5–14 cm. long; leaves thin, opposite, 2.5–6.5 cm. long, 2–5 cm. wide, ovate, apices obtuse or acutish, bases truncate-rounded or slightly cordate, crenate-serrate or dentate with rounded or acute teeth; upper surface deep green, sparsely incurved hispidulous or glabrescent, few glandular punctations; lower surface scarcely paler, sparsely incurved hispidulous along 3–4 pairs of prominent veins, profusely dotted with large (0.3 mm.) saucer-shaped glandular scales; petioles 3–7 mm. long, densely puberulous; inflorescences axillary, often 2 or 3 from the same axil, cymose, spreading, with numerous flowers; bractlets linear, pubescent; peduncles 2–5 mm. long, pedicels 1.5–5 mm. long, both hispidulous with slightly curved hairs; calyx lobes 3–4.5 mm. long, ovate, green, pale at margins, 1–5-ribbed, sparsely hispidulous along costa, narrowed into short filiform-subulate tips, usually with no glandular dots; corollas 10–11 mm. long, externally glabrous, barbate within with 1-celled flat hairs along ventral side of tube and at base near insertion of stamens; upper lip emarginate, lower slightly longer, 3-lobed, lobes equal, oblong-ovate, rounded, 2 mm. long; stamens 6 and 8 mm. long; anthers oval, divaricate; staminodes 0.8 mm. long; pistils 9 mm. long; capsules subglobose, glabrous, 3.5 mm. long; seeds small, ovoid, brown, surface with reticulate ridges.

Type: Tepic, Nayarit, Mexico, altitude 300–900 meters, January 5–February 6, 1892, *E. Palmer s.n.* (US).

Flowers from October to February; readily distinguished by its 4-winged stem and the compact inflorescences with numerous flowers (Map 2).

Mexico, Sinaloa: Cerro Colorado, *Gentry 5121* (GH, LUND, MO, NY); Sierra Tacuichamona, *Gentry 5657* (LUND); Hacienda Chele, Rosario, *Lamb 479* (GH, NY); Santa María, Culiacán, *Ortega 6605* (GH, PA, US). Nayarit: Cerro del Cruz, *Collins & Kempton 21* (US); San Blas, *Ferris 5416* (US); Tepic, *Barclay s.n.* (GH), *Gregg 997* (MO), *Jones 23217* (MO, UC); San Blas, *Maltby 2* (US); Tepic, *Palmer s.n.* (US); Acajoneta, *Rose, Standley & Russell 14313* (PA, US). Jalisco: 2 miles north of La Resolana, about 20 miles southwest of Autlán, *McVaugh 10180* (MICH); Sierra du Nayarit, *Diquet s.n.* (NY).

15. *Russelia cuneata* Robinson, Proc. Amer. Acad. 44: 613. 1909.

Plants fruticose, 1 meter tall, sparsely branched; stems mostly 4-angled, sometimes 6-angled, with prominent ridges on the angles, flat, with fine striations between the ridges, sometimes with sparse hairs, and brown or black spotted; internodes 5–10 cm. long; leaves usually opposite, 6–10 cm. long, 4–5 cm. broad, rhombic-oblong or obovate, apices obtuse, bases cuneate, crenate-serrate on upper one-half or two-thirds; blades with a few multicellular hairs, especially on the veins on the lower side, and with minute glandular scales, more numerous on the lower than on the upper side, these early deciduous, leaving brown or black spots, smaller veins prominently reticulate; blades sharply attenuate almost to point of

attachment and the ridges of the stem extending upward on the sides of the very short petiole; inflorescences one or two from an axil, cymose, spreading, 10-15 flowers except at the upper nodes; bractlets small, linear, pubescent; peduncles 5-20 mm. long, pedicels 4-10 mm. long, both with hairs and glandular dots; calyx lobes ovate, short-cuspidate or mucronate, 3-4 mm. long, glabrous, ridged, with or without glandular dots; corollas 10-12 mm. long, lobes of lower lip 2 mm. long, lobes of upper lip shorter, slightly emarginate, inside of corolla with large (1.05 mm. long) flat hairs in upper part of tube, shorter ones near attachment of stamens; stamens 5 and 6 mm. long; anthers rounded, divaricate; staminodes 0.3 mm. long; capsules ovoid, light brown, 3 mm. long; styles persistent, 6-7 mm. long; persistent calyx lobes one-half length of capsules.

Type: From El Ocote, Michoacán, Mexico, altitude 300 meters, December, 1898, *E. Langlassé 723* (GH).

Mexico, Colima: Alzada, *Orcutt 4674* (F). Michoacán: El Ocote, *Langlassé 723* (GH); Huizontla, Coalcomán, *Hinton 16057* (GH, LUND, US); Aquila, Coalcomán, *Hinton 16129* (GH, UC, US); Hacienda Coahuayula, *Emrich 177* (F). Guerrero: Placeres Camerón, Mina, *Hinton 9188* (GH, US); Vallecitos, Monte de Oca, *Hinton 11393* (GH, US), *11585* (GH, US).

16. ***Russelia floribunda*** H.B.K. Nov. Gen. et Sp. 2: 359. 1817.
R. ovatifolia Lundell, Field and Lab. 13: 16. 1945.

Plants suffrutescent, 1-3 meters tall; stems 4-6-angled, with slightly thickened ridges on the angles, striations on the flat sides, glabrous except for a line of hairs at the nodes; internodes of the main stems 8-10 cm. long; leaves rigid-membranaceous, subsessile, 5-7 cm. long, 4-6 cm. wide, opposite or occasionally ternate, broadly ovate, apices usually obtuse but often acute, bases usually cordate but sometimes truncate or rounded, serrate or crenate, with the primary veins somewhat impressed on the upper side, somewhat prominent and sometimes sparsely pubescent on the lower side, the surfaces scurfy; petioles 1-2 mm. long, sometimes slightly pubescent; inflorescences axillary, profusely branched, many-flowered; peduncles and pedicels 4-5 mm. long, glabrous; bractlets linear, ciliate; calyx lobes 3 mm. long, ovate, acuminate-subulate, glabrous or with few hairs on midrib, no resinous dots; corollas red, tubular, or slightly spreading at the mouth, 10-12 mm. long, externally glabrous, upper lip emarginate, lower lip 3-partite, lobes 2 mm. long, rounded, tube bearded with flat hairs on inside of lower lobe and at base near attachment of stamens; stamens 6 and 8 mm. long, inserted 1 mm. above base of tube; anthers orbicular, divaricate; staminodes 0.3 mm. long; pistils 8-9 mm. long; ovary conical, glabrous; style filiform, glabrous, included; capsules 3-5 mm. long, subglobose, style persistent, at least for a time; seeds many, very small, oblong, subangulate, dark, wrinkled.

Type: Between Papagallo and Venta de Tierra Colorada rivers, Guerrero, Mexico, *Humboldt & Bonpland s.n.* (Herb. Mus. Paris). Only a photograph of the type specimen was seen.

Related to *R. rotundifolia*, but differs in having less coriaceous leaves, less prominent reticulations of the smaller veins, shorter peduncles and no stipitate glands on the exterior of the corollas.

Mexico, Guerrero: Tierra Colorada, *Humboldt & Bonpland s.n.* (Herb. Mus. Paris); 63 miles northeast of Acapulco, *Carlson 3108* (F); Acahuizotla, *Lundell & Lundell 12597* (LUND, SMU).

17. *Russelia floribunda* var. *pubescens* Carlson, var. nov.

A var. *floribunda* recedit ramis, pedunculis, pedicellis, petiolis et laminis praesertim venis infra pubescentibus.

Similar to the species, except that the stems, both angles and flat sides, the petioles, the peduncles, the pedicels and the leaves, especially the veins on the lower sides, have a short, sometimes dense pubescence.

Type: Between Pié de la Cuesta and Coyuca, 14.6 miles northwest of Acapulco, Guerrero, Mexico, about sea level, January 21, 1955, *M. C. Carlson 3081* (F).

Mexico, Guerrero: Acapulco, *Carlson 3049* (F), *3079* (F), *3081* (F), *Langman 3360* (MEXU, PA), *Palmer 252* (F, GH, MO, NY, PA, UC, US); km. 417-422, *Lundell & Lundell 12580, 12581, 12582* (LUND); km. 373, *Lundell & Lundell 12595* (LUND).

18. *Russelia chiapensis* Lundell, Field and Lab. 13: 12. 1945.

Plants suffruticose; stems 4-6-angled, ridged on the angles, glabrous or pubescent; internodes 3-4.5 cm. long; leaves opposite or ternate; blades chartaceous, narrowly ovate, up to 7 cm. long, 4 cm. wide, apices acute or acuminate, bases broadly cuneate or obtuse, serrate, costa and primary veins impressed above, prominent below, sparsely or densely pubescent; secondary veins reticulate, with or without resinous dots; petioles 3 mm. long or less, glabrous; calyx lobes ovate, 3-3.2 mm. long, acuminate, glabrous except for a few hairs along the keel; corollas 12-13 mm. long, barbate in tube on lower side and at base near attachment of stamens; stamens 6 and 8 mm. long; pistils 10 mm. long; capsules subglobose, 5.5 mm. long, apiculate; seeds minute, numerous.

Type: Mt. Ovando, Chiapas, Mexico, December, 1937, *E. Matuda 2088* (SMU).

Similar to *R. floribunda* except for the longer and narrower leaf, not at all cordate.

Mexico, Chiapas: Mt. Ovando, *Matuda 2088* (MICH, SMU), *2088A* (MICH, SMU), *2563* (MICH, SMU); Fraylesca, near Siltepec, *Matuda 5188* (LUND); Mt. Pasitar, *Matuda 1643* (MICH).

19. *Russelia standleyi* Carlson, sp. nov. Plate 2.

Planta suffruticosa, 1 m. alta; ramis principalibus 6-angularibus, ramis secundariis 4-angularibus, angulis incrassatis, glabris, flavoviridibus; foliis oppositis vel ternatis; laminis 1-2.5 cm. longis, 8-12 mm. latis, apice acutis vel obtusis, basi cuneatis vel truncatis, serratis, ciliatis, venis non prominentibus,

venis infra parce pubescentibus, utrinque parce resinoso-lepidotis; petiolis 2 mm. longis, supra pubescentibus; inflorescentiis 3-5-floris; pedunculis 5-18 mm. longis, glabris; pedicellis 5-7 mm. longis, glabris; sepalis ovatis, longo-acuminatis, glabris, e glandulosis, marginibus purpureis; corollis 10-12 mm. longis, tubulosis; filamentis 9 vel 10 mm. longis; pistillis 10 mm. longis; capsulis globosis, 4 mm. longis; seminibus reticulatis.

Plants suffruticose, 1 meter tall; main stems 6-angled, branches 4-angled, angles thickened, glabrous, yellow-green; leaves opposite or ternate; blades 1-2.5 cm. long, 8-12 mm. wide, apices acute or obtuse, bases cuneate or truncate, serrate with few large teeth, ciliate, both surfaces glabrous with few large (0.3 mm. diam.) resinous scales; veins not prominent, somewhat pubescent on lower side; petioles 2 mm. long, pubescent on upper side; inflorescences 3-5-flowered; peduncles 5-18 mm. long, glabrous; pedicels 5-7 mm. long, glabrous; calyx lobes 3 mm. long, broadly ovate at base, long-acuminate at tip, glabrous, without glands, the margins purple; corollas 10-12 mm. long, barbate within on ventral lobe; stamens 9 and 10 mm. long; staminodes 1.3 mm. long, with knob at top; pistils 10 mm. long; capsules globose, 4 mm. long; seeds reticulate.

Type: Mountains along road between Jalapa and San Pedro Pinula, Dept. Jalapa, Guatemala, altitude 1400-1800 meters, November 12, 1940, *P. C. Standley 77093* (F).

Guatemala, Jalapa: *Standley 77067* (F), *77093* (F), *76941* (F).

20. *Russelia leptopoda* Lundell, Field and Lab. 13: 15. 1945.

Plants shrub-like, 0.3 meters high; stems and branches rather slender, 6-angled, glabrous; leaves opposite; petioles slender, 2.5 mm. long, white-villous on upper side, at least when young; blades very thin, 1-3 cm. long, 0.6-1.5 cm. wide, ovate or ovate-elliptic, apices obtuse, bases rounded or obtuse, dentate with 3-4 teeth on each side, glabrous except for a few hairs along the midvein on upper surface, resinous dots on lower side, an occasional one on upper, finely reticulate-veined; inflorescences cymose, usually 3-flowered; peduncles 8-12 mm. long, pedicels 7-10 mm. long, both slender, glabrous; bractlets linear-lanceolate, ciliate; calyx lobes 4 mm. long, ovate, subulate, glabrous, not resinous-lepidote; corollas 13-15 mm. long, tubular, stipitate glands and flat hairs within on lower lobe and near base, upper lip emarginate, 2 mm. long, lower lobes slightly longer; stamens 7 and 8 mm. long; anthers oval, divaricate; staminodes 1 mm. long; pistils 8 mm. long; capsules globose, 3 mm. long; seeds small, numerous.

Type: Ocorla, Coalcomán, Michoacán, Mexico, in woods, altitude 900 meters, June 25, 1939, *G. B. Hinton 13845* (SMU).

Mexico, Michoacán: Ocorla, Coalcomán, *Hinton 13845* (F, GH, LUND, MO, PA, US).

21. *Russelia tenuis* Lundell, Field and Lab. 13: 19. 1945.

Plants suffrutescent, 1-2 meters tall; stems sharply 4-6-angled, with narrow (0.2 mm. broad) ridges on the angles and striations on the flat sides, the ultimate branches very slender, almost filiform, sparsely hirtellous at first, especially on the flat sides and near the nodes; bases of petioles connected by a pubescent line;

leaves opposite or ternate; petioles 2–5 mm. long, pubescent; blades thin, ovate or ovate-elliptic, up to 4 cm. long, 2.5 cm. wide, the apex acute or obtuse, the base obtuse or truncate, entire, the rest of the margin rather coarsely serrate-dentate, 4–6 teeth on each side, sparsely pubescent with short hairs, especially on the upper surface, small, scattered, resinous dots, sunken on lower surface, often with protuberances on upper surface opposite depressions on lower; costa and principal veins slightly impressed above, somewhat prominent below, usually 3 on each side; inflorescences cymose, axillary, usually 4–10-flowered; peduncles 3–7 mm. long, pedicels slender, 2–6 mm. long, both rather densely pubescent with short, curved hairs; bractlets linear, pubescent; calyx lobes 3 mm. long, ovate, acuminate, few short hairs along keel, occasionally with few resinous dots; corollas red, tubular, slightly wider at mouth, 10–15 mm. long; upper lip emarginate, lower lobes 2 mm. long; corolla externally glabrous, internally barbate on lower side and at base near attachment of stamens; stamens 7 and 9 mm. long; anthers oval, divaricate; staminodes 0.3 mm. long; pistils 8.5 mm. long; capsules 3 mm. long; seeds small, ovoid, brown.

Type: From Aquila, Coalcomán, Michoacán, Mexico, hanging from cliffs, March 24, 1941, *G. B. Hinton 15841* (SMU).

Other collections are from the states to the north along the Pacific (Map 2), on rocky hills above the ocean, at elevations of 25–200 meters. In bloom from October to March. According to J. G. Ortega, called “*arete*” in Mazatlán, Sinaloa.

Mexico, Sinaloa: northwest base of Cerro Colorado, *Gentry 5189* (GH, MO, NY); La Nevaría, north of Mazatlán, *Mexia 98* (MO, UC); La Noría, *Mexia 225* (MO, UC), *225½* (UC); La Nevaría, north of Mazatlán, *Mexia 1097a* (GH, UC, US); Mazatlán, *Gregg 1185* (MO), *Ortega 4637* (US), *6491* (PA, US), *6760* (F, PA), *Rose, Standley & Russell 13701* (PA, US), *Wright 1203* (F, MO, UC, US); Capule, *Ortega 6062* (US). Nayarit: María Madre Island, *Ferris 5614* (MO, US); Punta Mita, *Howell 10397* (MICH, US); María Madre Island, *Maltby 114* (US), *Nelson 4289* (GH, US). Jalisco: Jayamita, *Jones 394* (US); south of Puerto Vallarta, *Mexia 1122* (F, MICH, MO, NY, US). Michoacán: Aquila, Coalcomán, *Hinton 15841* (LUND, SMU, US). Colima: Manzanillo, *Palmer 954* (GH, NY, PA, US). Durango: Tamazula, *Gentry 5235* (F, GH, MO, NY, UC).

22. *Russelia sarmentosa* Jacquin emend. Carlson. *R. sarmentosa* Jacquin, Enum. Pl. Carib. 6, 25. 1760; Selec. Stirp. Amer. Hist. 178. 1763. *R. colombiana* Pennell, Proc. Acad. Sci. Phil. 72: 186. 1920. *R. flavoviridis* Blake, Contr. U. S. Nat. Herb. 24: 22. 1922. *R. tabacensis* Lundell, Contr. Univ. Mich. Herb. 6: 59. 1941.

Plants suffruticose, branching, 1–2 meters tall, erect or later reclining; stems all 4-angled or main stems 6-angled, branches 4-angled, the angles often extended as wings 0.1–0.5 mm. wide, with thickened ridges on the angles or on the margins of the wings, the flat sides striate, usually glabrous but sometimes slightly pubescent, and occasionally sparsely resinous-lepidote; internodes 5–13 cm. long; leaves rigid-membranaceous, 1.5–8 cm. long, 1–5 cm. wide, opposite or ternate, ovate or broadly ovate, apices acute or obtuse, bases truncate, subcordate or rounded, margins serrate, dentate, or crenate, 5–9 teeth on each side, upper surface glabrous and somewhat lustrous or sparsely pubescent with multicellular hairs, lower surface glabrous or with hairs on the main veins, both surfaces with yellowish or brownish resinous dots, these sometimes numerous, sometimes few, secondary veins prominently reticulate; petioles 2–3 mm. long, hairs on each side and in a band across the node between their bases; inflorescences cymose, 1–3 from each axil, 3- to many-flowered; peduncles 4–18 mm. long, glabrous or slightly pubescent, sometimes with a few resinous dots; pedicels 5–8 mm. long, glabrous or slightly pubescent, often with resinous dots, especially at the top; bractlets linear or lanceolate, ciliate; calyx lobes 4 mm. long, ovate, long-acuminate, sometimes with hairs along the midrib and with few or numerous resinous dots; corollas 10–15 mm. long, tubular, mouth slightly spreading, upper lip emarginate, lower lip 3-partite, lobes 3 mm. long, 2 mm. wide, rounded at apex, flat hairs on interior of median lower lobe and smaller similar hairs near insertion of stamens; stamens 6 and 8 mm. long; anthers ovoid, divaricate; staminodes 1–3 mm. long, with knob on top; pistils 9–11 mm. long; ovary ovate-oblong, attenuate to style; capsules globose, 3–4 mm. long; calyx persistent, lobes little more than half as long as capsules; seeds numerous, small, surface rough, embedded in hairs which fill the capsule.

Type: From woods and dense shrubby areas near Havana, Cuba, *Jacquin s.n.*, date unknown.

The type specimen was not seen, but a number of collections from near Havana have been examined. Some of these agree with *Jacquin's* description, which states that *R. sarmentosa* has 4-angled stems and 3-flowered inflorescences. However, other specimens from the same locality have 6-angled stems and inflorescences with many flowers, although they agree with *Jacquin's* description in other respects. This discrepancy has led to confusion.

I have studied numerous specimens from Mexico, Central America, and Panama which are similar to those from Cuba. All have 4- or 6-angled stems, with ridges of similar thickness on the angles, opposite or ternate leaves of about the same shape, short petioles, similar resinous dots on both sides of the leaves and on the calyx lobes, and similar flowers. The specimens differ in the size of the leaves, the amount of pubescence, the number of flowers on an inflorescence, and the length of the peduncles. However, no consistent differences in these characters could be found and attempts to separate the plants into species or even into varieties were fruitless.

F. W. Pennell separated *R. colombiana* from *R. sarmentosa* on the basis of its 6-angled stems, larger, ternate leaves and longer peduncles. However, even the type collection is variable in these respects, as some of the stems are 4-angled and some of the inflorescences have 3 flowers, and it agrees with Jacquin's description of *R. sarmentosa* in other respects. Therefore, I cannot agree with Pennell's separation of *R. colombiana*.

Pennell also thought that the specimens from Panama should be placed in a species different from *R. colombiana* because of their geographical separation, and that certain specimens with broadly ovate leaves and large teeth, from Yucatan, Mexico, should be given specific status, although he did not publish descriptions of these. Here, too, I disagree with Pennell.

R. flavoviridis, described by S. F. Blake from a specimen from eastern Guatemala, and *R. tabacensis*, described by C. L. Lundell from a specimen from Tabasco, Mexico, fit the description of *R. sarmentosa* as emended by Carlson. They were separated chiefly because of their 6-angled stems and many-flowered inflorescences.

I have concluded that *R. sarmentosa* is a variable and widely distributed species, ranging from Cuba, Tabasco and Yucatan, Mexico, to Panama and Colombia (Map 1), and it is, therefore, emended to include all the specimens listed below.

Cuba: Rocky banks near sea, near Havana, *Curtis 753* (F, GH, MO, NY, PA, US); Cojimár, *Hermann 5067* (NY), *Hitchcock s.n.* (F), *Killip 13816* (US), *Leon 10656* (NY); Playa de Marianao, *Palmer & Riley 854* (US). Location not given, *Auber 13* (GH), *Robbins s.n.* (GH).

Mexico, Yucatan: Izamál, *Gaumer 403* (F, MO, NY, PA, US); Calotmúl, *Gaumer 1746* (GH); Cozumél, *Garnier s.n.* (PA); near Dzitas, *Lundell & Lundell 7354* (F, GH, PA, US); Peto, *Steere 2287* (F, MICH, MO). Campeche: Tuxpeña, *Lundell 1331* (F, US). Quintana Roo: Dzitnup trail, Coba, *Lundell & Lundell 7849* (PA); Lake Chichancanab, *Gaumer & sons 23660* (F, MO, NY, PA, US), *Steere 2484* (MICH). Vera Cruz: Mirador, *Liebmann 9426* (NY, US); Zacuapan, *Purpus 2378* (F, GH, MO, NY, UC, US); Totutla, *Purpus 10833* (US). Tabasco: Estapilla, Tenosique, *Matuda 3524* (F, MICH). Oaxaca: Monte Alban, *Smith 1100* (GH); Mena, *Mell s.n.* (NY); Chivela, *Mell 38* (US), *Orcutt 3299* (F, GH, MO, US).

British Honduras, El Cayo: *Bartlett 11516* (F), *Lundell 6131* (MICH); Pine Ridge, Duck Run, *Bartlett 11531* (MICH, NY); Vaca, *Gentle 2248* (GH, MICH, PA); San Agustín, *Lundell 6728*

(MICH), 6925 (MICH), 6928 (MICH). Maskall: Pine Ridge, *Gentle* 952 (GH, MICH, NY), *O'Neil* 8739 (GH, MICH, NY); Honey Camp, *Lundell* 526 (F, GH, NY, PA, US), 526B (MO), *Meyer* 117 (F), *Record* s.n. (US). Fresh Water Creek Reserve: *Pelly* 15 (F). Location not given: *Forestry Dept.* 22 (F), *Peck* s.n. (GH).

Guatemala, Izabál: Los Amates, *Kellerman* 5164 (US), 7609 (F, NY); Quirigua, *Standley* 23891 (US), 24508 (GH, NY, US), 72264 (F), 72282 (F); Izabál, *Steyermark* 38497 (F). Chiquimula: El Rincón, *Standley* 74660 (F), 74754 (F); East Vera Paz and Chiquimula, *Watson* 474a (GH). Escuintla: Río Guacalate, *Standley* 58262 (F, PA); Escuintla, *Standley* 63944 (F, PA); Finca Monterrey, *Standley* 64578 (F, PA); Río Guacalate, *Standley* 89384 (F, PA). Jutiapa: Jutiapa, *Standley* 75484 (F), 75705 (F, PA), 75953 (F, PA); La Pava, *Standley* 77591 (F); Ovejero, *Standley* 77615 (F). Santa Rosa: Los Verdes, *Standley* 60401 (F, PA); Oratorio, *Standley* 60668 (F); Cuilapán, *Standley* 77716 (F); Laguna Los Pinos, *Steyermark* 52174 (F). Sacatepequez: Barranca Hondo, *Standley* 60235 (F), 60277 (F); Dueñas, *Standley* 63289 (F, PA); Barranca Hondo, *Standley* 64947 (F), 88923 (F). Alta Vera Paz: Trece Aguas, *Cook & Doyle* 21 (US); Finca Mocca, *Johnson* 144 (NY, US); Concepción, *Johnston* 550 (F, PA), *Steyermark* 45281 (F, PA); Parramos, *Johnston* 1561 (F); Tortuga, *Steyermark* 44626 (F). Location not given: *Heyde* 525 (US).

Honduras, Morazán: Río Yeguaré, *Glassman* 1559 (F); El Jicarito, *Miller* s.n. (F); Zamorano, *Rodriguez* 150 (F), *Standley* 1666 (F, PA); Tanque, *Rodriguez* 862 (F); Chauite, *Rodriguez* 924 (F); Hoya Grande, *Williams & Molina* 12252 (F, GH); Tatumbla, *Williams & Molina* 13290 (F). Santa Barbara: Los Dragos, *Standley & Lindlie* 7416a (F).

El Salvador, Ahuachapán: Ahuachapán, *Standley* 20037 (US), 20099 (US), *Standley & Padilla* 2478 (F), 2495 (F, PA), 2840 (F). Santa Ana: near Metapán, *Carlson* 789 (F). La Libertad: west of Santa Tecla, *Carlson* 170 (F). San Salvador: San Salvador, *Calderón* 184 (GH, US), 827 (US); Los Planes, *Carlson* 24 (F); San Salvador, *Renson* 172 (NY, US), *Standley* 19288 (GH, US), 22722 (GH, US), 23312 (GH, NY, US), 23565 (GH, NY, US), *Velasco* 9007 (US). San Vicente: San Vicente, *Standley & Padilla* 3454 (F). Location not given: *Choussy* 13 (US).

Costa Rica, San José: San Ramón, *Brenes* 232 (F), 532 (F), 14408 (GH, US), 17004 (F); San José Highway, *Rowlee & Rowlee* 134 (US);

El General, *Skutch 4134* (MO, NY, US); Camino del Hatillo, *Standley 32188* (US); Alajuelita, *Tonduz 8775* (US). Cartago: Las Concavas, *Cooper 39* (F, NY); Livingston, *Rowlee & Stork 686* (NY, US); Turrialba, *Skutch 4670* (F, GH, MO, NY, US); Dulce Nombre, *Standley 35904* (US). Guanacaste: Libería, *Dodge, Alfaro & Thomas 6245* (GH, MO, PA); Potrero, *Dodge & Thomas 6434* (MO); Nicoya, *Pittier 13650* (US). Alajuela: El Coyolár, *Standley 40070* (US); Alajuela, *Smith P2371* (GH). Puntarenas: Delta Río Esquinas, *Allen 5624* (F); Puntarenas to Desmonte, *Pittier 498* (US); Golfito de Osa, *Brenes 803* (F). Heredia: Heredia, *Williams 16039* (F). Not located by provinces: Vertiente del Pacífico, *Biolley 17331* (GH, US); Salinas Bay, *Elmore E11* (MICH); Barbe, *León 459* (F); San Lucas, *Orozco 236* (F); Tucurique, *Rowlee & Stork 846* (NY, US); Cerro de Protti, *Solis 328* (F); Jesús María, *Stork 3328* (F); Río Tiliri, *Tonduz 7326* (US).

Panama, Canal Zone: Tranquilla, *Dodge & Allen 17324* (MO, UC); Salamanca, *Dodge, Steyermark & Allen 16967* (MO); Balboa Heights, *Greenman & Greenman 5024* (GH, MO); Paraíso, *Hayes 36* (NY); Cerro Ancón, *Heriberto 130* (US), *Macbride & Featherstone 2771* (PA), *Paul 149* (US); vicinity of Ancón, *Piper 6021* (PA, US); Río Grande, near Culebra, *Pittier 2125* (NY, US); Ancón Hill, *Standley 26325* (US); Balboa, *Standley 26478* (US), *27000* (US), *29313* (US); Pueblo Nuevo, *White 297* (MO); Penonome and vicinity, *Williams 185* (US). Taboga Island: *Celestino 53* (US), *Killip 3192* (US), *Macbride 2771* (F, PA, US), *Standley 27904* (US), *Woodson, Allen & Seibert 1477* (GH, MICH, MO, NY). Coclé: El Valle, *Allen 92* (GH, MO), *1156* (MO, PA), *2270* (US). Veraguas: Santiago, *Allen 1081* (GH, MO, PA, US). Chiriquí: Cerro Vaca, *Pittier 5384* (US); Río Chiriquí Viejo Valley, *White 77* (GH, MO, PA). Panama: Juan Díaz, *Cornman 2025* (US); Old Las Cruces Trail, *Standley 29141* (US).

Colombia, Santa Marta: *Smith 1361* (F, GH, NY, PA, US).

23. *Russelia sarmentosa* forma *eglandulata* Carlson, forma nov.

A var. *sarmentosa* recedit laminis et sepalis eglandulosis.

Similar to the species except that the leaves and calyx lobes are eglandulate, or with only an occasional resinous dot.

Type: In thicket on river bank and plains, vicinity of Siguatepeque, Comayagua, Honduras, altitude 1050 meters, July 1, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5572* (F).

Honduras, Comayagua: Siguatepeque, *Rodriguez 2704* (F), *Standley 55919* (F, US), *56230* (F, US), *Standley & Chacón 6244* (F), *6489* (F), *Yuncker, Dawson & Youse 5572* (F, GH, MICH, MO, US); Comayagua, *Standley & Chacón 5241* (F), *5525* (F), *6221* (F).

El Salvador, La Unión: *Standley 20883* (GH, MO, NY, US).

Panama, Chiriquí: Paso Ancho to Monte Lirio, *Allen 1582* (GH, MO, NY, PA, US); Bajo Mono, Boquete, *Davidson 472* (F, GH, MO, US).

Guatemala, Zacapa: Santa Rosalia, *Steyermark 29308* (F, PA).

24. *Russelia sarmentosa* forma *pubescens* Carlson, forma nov.

A var. *sarmentosa* recedit caulium costis pubescentibus, petiolis pedunculis pedicellis laminis sepalis pubescentibus.

Similar to the species, but with hairs on the angles of the stems, on the petioles, peduncles and pedicels, more dense on the leaves, especially on the veins, and on the calyx lobes.

Type: El Cayo District, Mt. Pine Ridge, Vaquero, British Honduras, July–August, 1936, *C. L. Lundell 6869* (PA).

Mexico, Vera Cruz: Jalapa, *MacDaniels 818* (F).

British Honduras, El Cayo: Mt. Pine Ridge, Vaquero, *Lundell 6868* (MICH, NY, PA), *6869* (GH, LUND, NY, PA, US), *Bartlett 11716* (MICH), *Lundell 6706* (MICH). Toledo: Cow Pen, *Gentle 4060* (GH, MO, NY).

Guatemala, Chiquimula: *Lehmann 1722* (US). Alta Vera Paz: Secanquím, *Cook & Griggs 305* (US), *Goll 99* (US), *143* (US); Serranquitché, *Donnell-Smith 1642* (GH, US); Finca Volcán, *Wilson 251* (F). Petén: La Libertad, *Aguilar M194* (F, LUND); Uxactúm, *Bartlett 12263* (PA, US), *12665* (MICH). Quiché: Nebaj, *Skutch 1770* (F, PA, US). Huehuetenango: Finca Soledad, *Steyermark 49555* (F).

Honduras, Morazán: Zamorano, *Rodriguez 3150* (F), *3151* (F), *Standley 1349* (F), *Williams & Molina 10051* (F, UC, US); Las Mesas, *Molina 964* (F), *Williams & Molina 10118* (F, UC, US); Las Artillas, *Williams & Molina 14330* (F, US); Santa Clara Creek, *Williams & Molina 15843* (F); San Antonio de Occidente, *Standley 487* (F); Tegucigalpa, *Von Hagen 1210* (F, NY). Olancho: Guaimaca, *Molina 3078* (F). El Paraíso: Guinope, *Molina 3350* (F, US), *Rodriguez 1698* (F). Santa Barbara: San Pedro Sula, *Thieme 5384* (GH, NY, PA, US). Amapala: Isla Tigre, *Standley 20722* (US). Province unknown: Cuyamel, *Carleton 462* (US).

El Salvador, San Vicente: San Vicente, *Standley 21630* (GH, NY, US), *Standley & Padilla 3353* (F).

Costa Rica, San José: La Urura, *Biolley 71* (F); Hatillo, *Solis 82* (F); Las Pavas, *Standley 36033* (GH, US); Santa Ana, *León 871* (F); San Lucas, *Orozco 333* (F); Las Concavas, *Lankester K6* (F). Guanacaste: Tilarán, *Brenes 12696* (F); Hacienda Santa María, *Dodge & Thomas 6223* (GH, PA), *6223a* (MO). Province unknown: Tacares, *Valerio 283* (F); Escosu, *Solis 366* (F).

25. ***Russelia sarmentosa* forma *velutina*** Carlson, forma nov.

A var. *sarmentosa* recedit ramis petiolis pedunculis pedicellis laminis dense velutinis.

Similar to the species, but with all vegetative parts densely velutinous.

Type: Seine Bight, British Honduras, November 25, 1930, altitude 1 meter, along sea beaches, *W. A. Schipp 671* (GH).

British Honduras: Seine Bight, *Schipp 671* (GH, MICH, MO, NY, US).

Guatemala, Guatemala: *Aguilar 68* (F). Santa Rosa: Santa Rosa, *Heyde & Lux 2943* (GH, NY, US); La Joya de Limón, *Standley 78254* (F). Alta Vera Paz: Lanquín, *Steyermark 44056* (F, PA). Petén: La Libertad, *Lundell 2457* (F, MICH), *3507* (F, MICH).

El Salvador, Santa Ana: Santa Ana, *Standley 20412* (GH, US).

26. ***Russelia sarmentosa* var. *nicaraguensis*** Carlson, var. nov.

A var. *sarmentosa* differt praecipue foliis subtus non resinoso-lepidotis vel parce resinoso-lepidotis, nervis subtus dense pubescentibus, caulis angulis incrassatis pubescentibus, atque foliis juvenilibus subtus punctis nigris minutis instructis.

Similar to the species except that the thickened angles of the stem are usually pubescent, the veins on the lower sides of the leaves are densely pubescent, no resinous dots, or only an occasional one, are found on the lower sides of the leaves, and minute black pits are sometimes conspicuous on the lower sides of the leaves, especially on the younger ones.

Type: southwest slopes of Santiago Volcano, near Masaya, Nicaragua, altitude 300–480 meters, July 5, 1923, *W. R. Maxon 7434* (US).

The absence of resinous dots on the lower sides of the leaves and dense pubescence on the angles of the stems and on the leaves, especially on the veins of the lower sides, seem to be characteristic of most of the specimens from Nicaragua. F. W. Pennell also recognized this difference. The distribution is shown on Map 1.

Nicaragua, Esteli: Somoto, *Morley 753* (GH, US). Chinandega: Volcan El Viejo, *Baker 101* (GH, MO), *880* (US), *2168* (GH). Carazo: Vicinity of Jintepe, *Standley 8443* (F). Masaya: Masaya, *Baker 197* (GH, MO, NY), *580* (US), *2215* (GH); southwest slopes of Santiago Volcano, *Maxon 7434* (US), *7654* (PA, US), *7665* (PA, US). Managua: Managua, *Chaves 63* (US), *Garnier 58* (PA), *267* (US), *4297* (GH), *René 12* (US), *69* (US); Casa Colorada, south of Managua, *Maxon, Harvey & Valentine 7366* (PA, US), *7451* (US); Sierra de Managua, near El Crucero, *Standley 8184* (PA). Grenada: Mt. Mombacho, *Grant 761* (GH). Chontales: San Miguelito, *Shank & Molina 4583* (US); vicinity of Juigalpa, *Standley 9437* (F), *9449* (F), *9486* (F). Lake Nicaragua: Ometepe Island, *Shimek & Smith 20* (MEXU, MO, US), *Smith s.n.* (MO). Jinotega: southwest of Jinotega, *Standley 10109* (F); Cerro Sialci, *Standley 10595* (F). No location given: *Herndon s.n.* (US), *Wright s.n.* (GH, US).

Costa Rica, Guanacaste: Tilarán, *Brenes 168* (F); Catalina, *Stork 2788* (F, MICH).

Panama: Location not given, *Bigelow s.n.* (NY).

27. *Russelia sarmentosa* var. *oaxacensis* Carlson, var. nov.
Plate 3.

Planta suffruticosa, 3-4 m. alta, ramis striatis 4-6-angularibus, angulis parce incrassatis, glabris, parce resinoso-lepidotis; foliis oppositis; petiolis 2-3 mm. longis, glabris; laminis ovatis, 5-9 cm. longis, 3-5.5 cm. latis, apice acutis, basi truncatis, crenatis, glabris, infra punctis minutis resinosis impressis, supra resinosis et papillosis, supra venis impressis, infra prominentibus, glabris; inflorescentiis multifloris; pedunculis 3-8 mm. longis, glabris; pedicellis 4-6 mm. longis, glabris; sepalis 5 mm. longis, ovatis, longe acuminatis, dense resinoso-lepidotis; corollis 10-12 mm. longis; filamentis didynamis, 7 vel 8 mm. longis; pistillis 10 mm. longis; capsulis globosis, 4 mm. longis; seminibus parvis numerosis.

Plants suffruticose, 3-4 meters high, main stems 6-angled, the angles sometimes extended as wings, ridges on the angles or on the margins of the wings; branches 4-angled with narrow ridges on the angles, striations between the ridges, glabrous, with scattered resinous dots; leaves somewhat coriaceous, lustrous, opposite; petioles 2-3 mm. long, glabrous; blades ovate, 5-9 cm. long, 3-5.5 cm. wide, apices acute, bases truncate or sometimes broadly cuneate, crenate or shallowly serrate, glabrous, both surfaces with small resinous dots depressed on lower side and with papillae on upper side opposite the depressions; main veins impressed on the upper side, prominent on the lower; smaller veins prominently reticulate; inflorescences one or two from an axil, cymose or pseudo-racemose, with numerous flowers; peduncles 3-8 mm. long, glabrous; pedicels 4-6 mm. long, glabrous; calyx lobes 5 mm. long, ovate, long-acuminate, densely resinous-lepidote; corollas 10-12 mm. long, upper lip slightly emarginate, lower lobes somewhat longer, 1.8 mm. long, bearded with flat hairs along the ventral lobe and at the base near the attachment of the stamens; stamens 7 and 8 mm. long, with hairs at the

base; anthers ovoid, divaricate; staminodes 1 mm. long; pistils 10 mm. long; capsules globose, 4 mm. long; seeds small, numerous, black.

Type: Trail Yaveo to Río Yaveo, District of Choapam, Oaxaca, Mexico, altitude 450 meters, March 17, 1938, *Mexia* 9164 (US).

This variety is distinguished by the large crenate leaves with numerous resinous dots, especially on the lower sides, and papillae on the upper sides; the long-tipped calyx lobes, densely resinous-lepidote; and the numerous flowers per inflorescence. According to *Mexia*, it has long whip-like branches which are eaten by stock. Pennell recognized the taxon, but did not publish a description.

Mexico, Oaxaca: Choapam, *Nelson* 857 (US); Yaveo, *Mexia* 9164 (F, GH, LUND, MO, NY, US); Ubero, *Williams* 9251 (F), 9254 (F, PA), 9321 (F, PA); Almoloya, *Williams* 9848 (F); Tolosa, *Deam* s.n. (GH, MICH, US). Vera Cruz: Minatitlan, *Mell* s.n. (NY), *Smith* 418 (MO); Fortuno, *Williams* 9056 (F, PA). Tabasco: Teapa, *Rovirosa* 893 (PA); Lomas de San Sebastian, *Rovirosa* 418 (PA, US), 151 (PA). Location not given: *Johnson* 115 (NY).

28. *Russelia oxyphylla* Lundell, Contr. Univ. Mich. Herb. 7: 51. 1942.

Plants herbaceous; stems 6-angled, with thickened ridges on the angles, densely hairy at the nodes but sparsely pubescent or glabrous otherwise, the basal internodes of the ultimate branches flattened on the inner side; leaves ternate, membranaceous, ovate to ovate-lanceolate, 2.5-5 cm. long, 1.6-2.8 cm. wide, apex acuminate, base sharply but broadly cuneate, margin above cuneate base deeply dentate-serrate, teeth 3-4 mm. long, sparsely pubescent with short hairs along main veins on both surfaces and on margin, many resinous dots on under surface, fewer on upper; costa and primary veins slightly impressed above, conspicuous beneath, 5 or 6 on each side; veinlets prominently reticulate; petioles 1 mm. long or lacking; inflorescences axillary, few-flowered (2-6); bractlets linear, hirtellous; peduncles 4-ribbed, 3-6 mm. long; pedicels slender, to 8 mm. long, with few resinous dots; calyx lobes resinous-punctate, with few hairs on midrib, lobes ovate, 3.4-4.2 mm. long, apex subulate, ciliate, base subcordate or rounded; corollas red, tubular, 12 mm. long, externally glabrous, sparingly short-barbate within on apical two-thirds of lower side of tube and at base near insertion of stamens, the emarginate upper lobe 2.3 mm. long, the lower lobes oblong, elliptic, 3 mm. long, rounded at apex; stamens didynamous, 6 and 7 mm. long; anthers ovoid, divaricate; staminodes 4 mm. long; no fruits available.

Type: From Forest Reserve, near crossing of Cruces Trail and Madden Dam road, Canal Zone, Panama, flowering, June 29-July 12, 1940, *H. H. Bartlett & T. Lasser* 16349 (MICH).

The species is related to *R. sarmentosa* Jacq. and may be a variety of it, but differs in having more lance-elliptic leaves, broadly

cuneate at the base, shorter peduncles, and fewer flowers per inflorescence.

Panama: Canal Zone, Forest Reserve, *Bartlett & Lasser 16349* (MICH).

29. *Russelia longifolia* Carlson, sp. nov. Plate 3.

Planta suffruticosa, 1–1.5 m. alta; ramis 4–6-angularibus, glabris, striatis, angulis alatis, incrassatis; foliis oppositis vel ternatis; petiolis 2–3 mm. longis, glabris vel parce pubescentibus; laminis 7–10 cm. longis, 3–4 cm. latis, ovato-lanceolatis vel ellipticis, apice longe acuminatis, basi cuneatis, serratis, glabris, laminis novellis parce resinoso-lepidotis; venis secundariis tenuiter reticulatis; inflorescentiis cymosis, 5–7-floris; pedunculis 10–12 mm. longis, glabris; pedicellis 5–8 mm. longis, glabris; sepalis 3–4 mm. longis, ovatis, glabris, basi parce resinoso-lepidotis; corollis 12–14 mm. longis; filamentis didynamis 8 vel 10 mm. longis; antheris divaricatis; pistillis 10–11 mm. longis; capsulis 3–4 mm. longis, globosis; seminibus parvis, numerosis.

Plants suffruticose, 1–1.5 meters tall; stems 4–6-angled, wings on the angles, ridges on the margins of the wings; leaves thin, membranaceous, opposite or ternate; petioles 2–3 mm. long, glabrous or slightly pubescent; blades 7–10 cm. long, 3–4 cm. wide, ovate-lanceolate or elliptic, apices long-acuminate, bases cuneate, sharply serrate, glabrous; young leaves with resinous dots on both sides, deciduous from older leaves; primary veins prominent on lower side, sometimes purple red, secondary veins finely reticulate; inflorescences cymose, 5–7-flowered; peduncles 10–12 mm. long, glabrous; pedicels 5–8 mm. long, glabrous; sepals 3–4 mm. long, ovate, apex long-acuminate, glabrous, few resinous dots at the base, ridges along the keel; corollas 12–14 mm. long, ventral lobes 2.5 mm. long, 1.5 mm. wide, dorsal lip slightly shorter, slightly emarginate, barbate along median ventral lobe and slightly so near base; stamens 8 and 10 mm. long; staminodes 3 mm. long; anthers divaricate; pistils 10–11 mm. long; capsules 3–4 mm. long, globose; seeds small, numerous.

Type: On a rocky cliff along the Danto River, slopes of Mt. Cangrejal, vicinity of La Ceiba, Dept. Atlantida, Honduras, July 30, 1938, *T. G. Yuncker, J. M. Koepper & K. A. Wagner 8719* (F).

Honduras, Atlantida: La Ceiba, *Yuncker, Koepper & Wagner 8719* (F, GH, MO, NY, US).

Guatemala, Izabál: Río Dulce, near Livingston, *Steyermark 39398* (F, PA).

30. *Russelia sonorensis* Carlson, sp. nov. Plate 4.

Planta suffruticosa, 1 m. alta; ramis gracilibus 4–6-angularibus, angulis incrassatis striatis glabris; foliis oppositis vel ternatis, ramorum inferiorum caducis; laminis parvis (4–15 mm. longis) ovatis, apice acutis, basi truncatis vel obtusatis glabris utrinque dense resinoso-lepidotis; petiolis 2.5–3 mm. longis, glabris; inflorescentiis 3–5-floris; bracteolis linearibus pubescentibus; pedunculis 2–15 mm. longis, glabris; pedicellis 4–6 mm. longis, parce pubescentibus; sepalis 2.5–3 mm.

longis, ovatis, apice acutis parce pubescentibus dense resinoso-lepidotis; corollis 13-16 mm. longis; staminibus 9 vel 10 mm. longis; staminodiis 2 mm. longis; pistillis 11 mm. longis; capsulis 3 mm. longis; seminibus ovalibus.

Plants suffruticose, 1 meter tall; stems slender, 4-6-angled, the angles thickened, striate on the flat sides, glabrous; leaves opposite or ternate, those on lower parts of stems caducous; blades small (4-15 mm. long), ovate, apices acute, bases truncate or obtuse, glabrous, both sides densely resinous-lepidote; petioles 2.5-3 mm. long, glabrous; inflorescences 3-5-flowered; bractlets linear, pubescent; peduncles 2-15 mm. long, glabrous; pedicels 4-6 mm. long, slightly pubescent; sepals 2.5-3 mm. long, ovate, acute, slightly pubescent along costa, densely resinous-lepidote; corollas 13-16 mm. long, ventral lobes 2 mm. long, 2 mm. wide, dorsal lip emarginate, slightly shorter, interior barbate along median ventral lobe and at base near insertion of stamens; stamens 9 and 10 mm. long; staminodes 2 mm. long; pistils 11 mm. long; capsules 3 mm. long; seeds oval.

Type: From rock crevices, hill slope, Guasaremos, Río Mayo, Chihuahua, Mexico, August 10, 1936, *H. S. Gentry 2374* (GH).

Distinguished by the leafless lower stems and the small leaves on the ultimate branches at the time of flowering. According to Gentry, the plant, called "pa-ah," is cooked in water and drunk as a tea for fevers (Map 2).

Mexico, Chihuahua: Guasaremos, Río Mayo, *Gentry 2374* (GH, MO, UC); Barranca de Cobre, *Hewitt 14* (GH); Mojarachic, *Knoblock 5623* (F); Río Aros, *Le Sueur 1381* (F, GH); location not given, *Palmer 249* (GH, US). Sonora: Los Conejos, Río Mayo, *Gentry 1128* (F, MO); Caramechí, Río Mayo, *Gentry 1193* (F, GH, MO); San Pedro de las Cuevas, *Wiggins 7511* (MICH, UC, US). Sinaloa: San Blas, *Jones 23169* (MO, NY, UC). Hidalgo: Jacala, *Edwards 816* (F), *Fisher 45184* (SMU).

31. *Russelia sonorensis* var. *pubescens* Carlson, var. nov.

A var. *sonorensis* recedit ramis folisque pubescentibus.

Differs from the species in that the stems and leaves are pubescent.

Type: Alamos, Sonora, Mexico, March 13, 1910, *J. N. Rose, P. C. Standley & P. G. Russell s.n.* (US).

Mexico, Sonora: Alamos, *Drouet & Richards 3943* (F), *Gentry 851M* (MICH), *Rose, Standley & Russell s.n.* (US).

32. *Russelia verticillata* H.B.K. Nov. Gen. et Sp. 2: 360. 1817. *R. ephedroides* Benth. Pl. Hartw. 69. 1840.

Plants suffruticose; stems with the sides below the attachment of the leaves extending downward from the base of the petiole to the next node as broad ridges

with narrow depressions between, these ridges usually flat but sometimes grooved or concave, in which case the stem appears 6-8-angulate, with thickenings on the angles; stems striate or not striate, usually glabrous but sometimes pubescent, often yellow-green; branches frequently verticillate, slender; internodes 4-6 cm. long; leaves verticillate, caducous, especially from the main stems; blades 0.3-0.6 mm. long, subrotund, apices obtuse, bases sharply cuneate, margins with 1 or 2 teeth, glabrous, resinous-lepidote on both sides; petioles 4-6 mm. long, glabrous or hirtellous; inflorescences axillary, verticillate, cymose, with 3-10 flowers; peduncles 2-4 mm. long or lacking, glabrous or hirtellous; pedicels 3-5 mm. long, hirtellous; calyx lobes 4 mm. long, ovate-lanceolate, acuminate, hirtellous; corollas red, 7-10 mm. long, gradually but slightly widening from base to mouth, upper lip rotund, emarginate, lower lip 3-partite, lobes suborbicular, bearded along inside of ventral lobe and at base; stamens didynamous, 6 and 8 mm. long, inserted at base of corollas, bases of filaments dilated, glabrous; anthers oblong, divaricate; staminodes 0.5 mm. long; ovary conical, glabrous, attenuated into the style; styles filiform, glabrous, as long as the corollas; stigmas slightly thickened; capsules globose or conical, glabrous; seeds small, numerous.

Type: Near Speluncam, Puente de la Madre de Dios, Hidalgo, Mexico, no date given, *Kunth s.n.* (Herb. Mus. Paris).

The type of this taxon has not been examined, but two photographs, one of a specimen cited as the type in the herbarium of the Museum of Paris, the other of a specimen in the Berlin Herbarium, are at hand. Both of these specimens are poor and it has been difficult to determine which collections are referable to this species. It is evident that the species has not been understood and, as a result, it has been a "catch-all" for hundreds of specimens. Most of the specimens that have been identified as *verticillata* belong to other species.

I have concluded, at least tentatively, until the opportunity arises to study the type specimen, that *R. verticillata* and *R. ephedroides* are the same. An isotype of *R. ephedroides* and other collections which are similar are at hand. These fit the rather incomplete description of *R. verticillata*.

R. verticillata, with its verticillate branches and very small, often caducous leaves, gives the general appearance of *R. equisetiformis* but differs in its uniquely ridged stems and its much smaller flowers, more than two per inflorescence, which are barbate within the corolla.

Mexico, Vera Cruz: Orizaba, *Balls 4272* (GH), *Botteri 123* (GH), *293* (GH), *Bourgeau 2163* (GH), *Le Roy 153* (NY), *Mohr 307* (US), *Purpus 1276* (F, NY, UC); Yavijea, *Galeottii 1109S* (F); Nogales, *Matuda 1144* (MICH, PA). Oaxaca: Hacienda de Santa Ana, *Hartwig 501* (NY); Río Zia, *Liebman s.n.* (NY, US).

33. *Russelia rotundifolia* Cav. Icones 5: 9. pl. 415. 1799.

Plants fruticose, erect, branching, 1.5 meters tall; stems subterete or obscurely 4-sided, ridges on the angles very narrow, tomentose or glabrescent; internodes 4-6 cm. long; leaves coriaceous, opposite, 5-7 cm. long, 4-6 cm. broad, sessile, clasping, subrotund, apex obtuse, base cordate, coarsely dentate-crenate at base, serrate above, no hairs on upper surface, numerous short hairs on margin and on veins on lower surface, smaller veins forming conspicuous reticulum, especially on lower surface; inflorescences axillary, spreading, 5-7 cm. long, pseudo-racemose, the flowers alternating in two's, many-flowered; bractlets 2 mm. long, linear; peduncles 8-17 mm. long; pedicels 3 mm. long; bractlets, peduncles, pedicels, calyx lobes and outer surface of corolla tubes densely covered with hairs, some multicellular and gland-tipped, others unicellular; calyx lobes 4-5 mm. long, lanceolate, acuminate, often with the tip recurved; corollas red, tubular, 11 mm. long, somewhat spreading at the mouth, upper lip deeply notched, lower lip 3-lobed, the lobes 2 mm. long, with flat hairs along inner surface of median lobe and shorter hairs at base near attachment of stamens; stamens didynamous, 5 and 6 mm. long, hairs at base of filaments; anthers ovoid, divaricate; staminodes 1 mm. long; pistils 6-8 mm. long; capsules glabrous; seeds small (0.3 mm. long), brown, pitted.

Type: Acapulco, Guerrero, Mexico, near sea level, October, 1894, to March, 1895, *E. Palmer 509* (F).

Mexico, Guerrero: Acapulco, *Palmer 509* (F, GH, MO, NY, UC, US); Montes de Oca, Vallecitos, *Hinton 11773* (GH, NY).

34. *Russelia rotundifolia* forma *velutina* Carlson, forma nov.

A var. *rotundifolia* differt partibus omnibus dense velutinis.

Similar to the species, but all parts much more densely velutinous.

Type: Location not given, 1791, *Haenke 1066* (F).

Mexico, ?: *Haenke 1066* (F).

35. *Russelia rugosa* Robinson, Proc. Amer. Acad. 43: 58. 1907.

Plants fruticose; stems terete or subterete with 4-6 very narrow inconspicuous ridges and fine striations between the ridges, pubescent with multicellular hairs of unequal lengths, at least on the stems of the current year's growth; branches slender; internodes 5-8 cm. long; leaves thin, opposite or ternate, generally rugose, 5-7 cm. long, 3-4.5 cm. wide, elliptic, apices acute or obtuse, bases cuneate, margins crenate-serrate except at the base, both surfaces pilose with few scattered, long, septate hairs, especially beneath on the veins, no resinous dots, veins slightly impressed on the upper surface, prominent and lighter colored on the lower; petioles 4-5 mm. long, pilose; inflorescences axillary, sessile, 2-3-flowered, much shorter than the leaves; peduncles lacking; pedicels slender, 4-6 mm. long, pilose; calyx lobes linear-lanceolate, 5-7 mm. long, pilose; corollas tubular, red, 11-15 mm. long, deeply cleft, lobes spreading-undulate, exterior with hairs, some gland-tipped, upper lobe cleft 1.5 mm. deep, lower lobes 3 mm. long, 2.5 mm. broad, hairs near

throat on inside of ventral lobe of tube and at base near attachment of stamens, the hairs much finer and more matted than in other species; stamens 3 and 6 mm. long, with fine hairs at base; staminodes 2 mm. or more, with aborted anther; anthers oval, divaricate; pistils 7 mm. long; capsules ovoid, 4 mm. long; seeds large (0.8 mm. long), with parallel ridges running lengthwise.

Type: Gualan, Zacapa, Guatemala, altitude 128 meters, January 18, 1905, *C. C. Deam 183* (GH). Known only from this locality.

Guatemala, Zacapa: Gualan, *Deam 183* (F, GH, MICH, MO, NY, PA, US), 6335 (GH, UC, US).

36. *Russelia steyermarkii* Carlson, sp. nov. Plate 4.

Planta suffruticosa, 1–2 m. alta; ramis teretibus, costatis, striatis; ramis secundariis pubescentibus; foliis oppositis vel ternatis, ellipticis, apice acutis, basi cuneatis, serratis, glanduloso-pubescentibus; petiolis 4–5 mm. longis, glanduloso-pubescentibus; inflorescentiis sessilibus, 2–3-floris; pedicellis 5–10 mm. longis, glandulosis; sepalis lanceolatis, 8–10 mm. longis, glanduloso-pubescentibus; corollis 12–15 mm. longis, extus glanduloso-pubescentibus, intus tubo supra basin et lobo ventrali prope faucem lanuloso-barbatis; filamentis 4 vel 7 mm. longis, basi lanuloso-barbatis; pistillis 10–11 mm. longis; capsulis 4 mm. longis.

Plants suffruticose, 1–2 meters tall; stems terete with narrow ridges and striate between the ridges; the slender lateral branches densely pubescent, the main stems less so; leaves of the lateral branches opposite or ternate, elliptic, apices usually acute, bases cuneate, margins sharply serrate except at the base, both surfaces densely covered with short gland-tipped hairs, upper surfaces, margins and veins of lower surfaces also with long appressed multicellular hairs; petioles 4–5 mm. long, with gland-tipped hairs; inflorescences axillary, sessile, 2–3-flowered; peduncles lacking; pedicels 5–10 mm. long, densely covered with gland-tipped hairs; calyx lobes lanceolate, 8–10 mm. long, densely covered with gland-tipped hairs and also with longer hairs on margins, midrib and tip; corollas red, 12–15 mm. long, usually with hairs, some gland-tipped on exterior of tube, lobes somewhat spreading; few fine, matted hairs on inside of ventral lobe and more at base near attachment of stamens; stamens 4 and 7 mm. long, the shorter attached at a higher level than the longer, fine hairs at base; staminodes 0.2 mm. long; pistils 10–11 mm. long; capsules 4 mm. long, longer than broad.

Type: In ravine along Río Santa Clara, valley of Vegona, between Vegas and Calera, Sierra de las Minas, Zacapa, Guatemala, altitude 1,200 meters, January 20, 1942, *J. A. Steyermark 42980* (F).

This species is similar to *R. rugosa* but differs in having smaller, non-rugose leaves with more sharply serrate leaf margins, longer calyx lobes, more elongated capsules and all parts densely covered with short gland-tipped hairs in addition to long pointed multicellular hairs. According to Steyermark, its leaves have a fetid odor.

Guatemala, Zacapa: Valley of Vegona, *Steyermark 42980* (F, PA).

37. *Russelia pubescens* Lundell, Amer. Midl. Nat. 29: 491. 1943.

Plants suffrutescent, erect, 1.5-2 meters tall; stems terete, but with 4-6 inconspicuous ridges and striations between the ridges, pilose, with long, fine, straight, multicellular hairs of irregular lengths; internodes 4-10 cm. long; leaves opposite or ternate, 4-10 cm. long, 3-6.5 cm. broad, acute or obtuse, base rounded or subcordate, crenate-dentate, velvety, pilose on upper side and principally on veins on lower side, ciliate on margins, membranaceous or thin-chartaceous, not resinous-lepidote, veins 5-7 each side of midrib; petioles 2 mm. or less, pilose; inflorescences axillary, 10-12-flowered; bractlets linear-subulate; peduncles 5 mm. long, pilose; pedicels 3.5 mm. long, pilose; calyx lobes 3-4 mm. long, ovate, abruptly long-cuspidate for one-half or three-fourths of their length, tips sometimes reflexed, sparse long hairs on margins, midrib and chiefly on cuspidate tip; corollas crimson, 9-12 mm. long, tubular, slightly constricted one-third above base, lobes undulate, dorsal lobes 3 mm. long, shallowly emarginate, ventral lobes almost as long, rounded, barbate within on median ventral lobe and at base near attachment of stamens; stamens 3 and 4 mm. long, filaments barbate at base; anthers ovoid, divaricate; staminodes 0.7 mm. long; pistils 4-5 mm. long; capsules ovoid, glabrous, 6 mm. long, with beak; seeds small, brown.

Type: From woods at Hacienda del Ototál, east of San Sebastián, Jalisco, Mexico, altitude 1500 meters, abundant, March 5, 1927, *Ynes Mexía 1815* (MICH).

Lundell says: "Distributed as *R. tepicensis* Rob., a species with subappressed sparse pubescence, resinous-punctate leaf blades, calyx lobes scarcely half as long, and corolla only 6-7 mm. long. *R. pubescens* is allied to *R. rotundifolia* Cav., but the small, crowded cymes immediately distinguish it from that species." It is also related to *R. floribunda* H.B.K., but the terete stems and the long hairs distinguish it from this species.

Mexico, Jalisco: Quimixto, trail from San Pedro el Tuito, *Mexía 1238* (UC, US); east of San Sebastián, *Mexía 1815* (F, GH, MICH, MO, NY, PA, UC, US). Colima: Manzanillo, *Ferris 6082* (US).

38. *Russelia tepicensis* Robinson, Proc. Amer. Acad. 35: 321. 1900.

Plants suffrutescent, less than 1 meter tall, branching; branches opposite or verticillate; stems terete or subterete, with 4-8 thin (narrow) ridges, striations between them, densely hirsute, sometimes with minute resinous dots; internodes 2-6 mm. long; leaves opposite, ternate, or occasionally in whorls of 4, membranaceous, broadly ovate, apices obtuse, bases truncate or subcordate, crenate-serrate, 3-4 cm. long, 2-3 cm. broad, strigose with a few long, appressed hairs along the main veins of both surfaces and numerous, minute (diam. 0.1 mm.), translucent resinous dots crowded on the lower surface, sometimes much less abundant on the upper, main veins impressed on the upper side, prominent on the lower, secondary veins reticulate on both surfaces; petioles 2-4 mm. long, ap-

pressed, pubescent; inflorescences short, cymose, 5-8-flowered, in axils of leafy bracts; bractlets linear; peduncles and pedicels 2-5 mm. long, all with hairs and minute resinous dots; calyx lobes 2-2.5 mm. long, ovate, cuspidate, the tips sometimes recurved, margins thin, few hairs along midrib, numerous minute dots; corollas red, 6-8 mm. long, tubular, spreading at the top, externally glabrous, ventral lobes 2.5-3 mm. long, 2 mm. broad, rounded, dorsal lip emarginate, bearded on inside of ventral lobe and near the insertion of the stamens; stamens 3 and 4 mm. long; anthers oval, divaricate; staminodes 0.5 mm. long; pistils 3-4 mm. long; capsules ovoid, 3-4 mm. long, equal to or slightly longer than the calyx lobes; styles persistent; seeds rough, 0.5 mm. long, 2.5 mm. wide.

Type: From Zopelote, Nayarit, Mexico, altitude 600-900 meters, in flower and fruit, February, 1895, *F. H. Lamb 578* (GH).

The distribution is shown on Map 2.

Mexico, Nayarit: Acaponeta, Tiger Mine, *Jones 23170* (MO, UC); Zopelote, *Lamb 578* (GH, MO, NY, PA, UC, US); Acaponeta, *Rose, Standley & Russell 14354* (PA, US).

39. *Russelia furfuracea* Brandege, *Zoe* 5: 219-220. 1905.

Plants suffrutescent, many stems from the base, 2-3 dm. high; stems terete, with very thin ridges and striations, densely hirsute, many minute resinous dots; internodes 2-5 cm. long, often shorter than the leaves; leaves opposite or ternate, ovate, apices acute or obtuse, bases cuneate, coarsely but not deeply crenate-serrate, slightly pubescent on upper side and on veins on lower side, both sides with numerous, crowded minute circular dots, larger leaves 3-4 cm. long, 2-2.5 cm. broad, main veins impressed on upper side, prominent on lower; petioles short (1 mm. long); inflorescences near top of numerous branches, in axils of leafy bracts, cymose, few-flowered; bractlets linear; peduncles and pedicels 3-5 mm. long, with hairs and minute resinous dots; calyx lobes 3 mm. long, ovate, long-acuminate, few hairs, numerous resinous dots; corollas scarlet, 9-11 mm. long, spreading at the top, ventral lobes 2.5-3 mm. long, 2 mm. broad, rounded, dorsal lip emarginate, the whole about the size of the ventral lobe, few flat yellow hairs inside of tube along median ventral lobe and many at base near attachment of stamens; stamens 3 and 4 mm. long; anthers divaricate; staminodes 1 mm. long; pistils 5 mm. long; capsules ovate, acuminate, about as long as the calyx lobes; seeds oval, brown, finely reticulate on surface.

Type: From cliffs in sunny exposures of Cerro Colorado, Culiacán, Sinaloa, Mexico, *T. S. Brandege s.n.* (UC).

This species is similar to *R. tepicensis*, but differs in that the leaves are cuneate at the base while those of *tepicensis* are truncate, the bracts which subtend the inflorescences are larger, and the corollas are longer. Standley (36) states that it is either synonymous with, or a form of *R. tepicensis*.

Mexico, Sinaloa: Culiacán, *Brandegee s.n.* (GH, PA, UC, US); oak forest, Cerro Colorado, *Gentry 5076* (F, GH, LUND, MO, NY,

UC); Caperadero, Sierra Tacuichamina, *Gentry 5563* (GH, LUND, MEXU, MO, NY).

40. *Russelia maculosa* Lundell, *Contr. Univ. Mich. Herb.* 6: 57. 1941.

Plants herbaceous, clambering, 2 meters long, with slender branches; stems sharply angled, usually 4- sometimes 6-angled, the angles with wing-like extensions about 1 mm. wide and pubescent ridges on the margins of the wings, flat sides striate, usually glabrous; internodes 3-6 cm. long; leaves chartaceous, opposite, 1.5-3.5 cm. long, 1-2.5 cm. wide, ovate, apices acute, bases truncate or rounded, conspicuously serrate above base, with long, scattered, multicellular hairs on upper side, these only on veins on lower side, resinous-lepidote, with numerous scales on lower side, fewer on upper side, primary veins 3-5 on each side of midrib, impressed on upper, elevated on lower side; petioles 3-5 mm. long, densely pubescent with same type of hairs as on the leaves; inflorescences axillary, solitary, 2-5-flowered; bractlets narrowly linear or subulate, up to 4 mm. long; peduncles 4-angled, 2-4 mm. long; pedicels 2-4 mm. long; bractlets with sparse long hairs especially on the margins, and peduncles and pedicels sparsely pubescent and densely resinous-lepidote; corollas variegated maroon, pink and white, 13 mm. long, distinctly bilabiate, essentially 4-lobed, the 3 lower lobes 4 mm. long, the upper shorter, slightly emarginate; corollas barbate with narrow flat hairs on inner surface of lower lobe and with shorter flat hairs and gland-tipped hairs near attachment of stamens; stamens 6 and 7 mm. long, hairs at base; anthers small, slightly oval; staminodes 1 mm. long; pistils 8 mm. long; capsules 3-5 mm. long, globose, glabrous; seeds brown, oval, 0.5 mm. long.

Type: On ledges of limestone cliff along highway above Tamazunchale, San Luis Potosí, Mexico, altitude 175 meters, in flower and fruit, July, 1937, *C. L. & A. A. Lundell 7231* (MICH). Known only from this locality.

This species is well marked by the winged stems, pubescent on the margins of the wings, the long aristate calyx lobes, covered with resinous scales, and the small, distinctly bilabiate, maculose corollas.

Mexico, San Luis Potosí: Tamazunchale, *Kenoyer A247* (F), *Lundell & Lundell 7231* (LUND, MICH, PA, SMU), *12166* (LUND, SMU), *12257* (LUND, SMU), *12491* (LUND, US), *12652* (LUND, SMU).

41. *Russelia retrorsa* E. L. Greene, *Pittonia* 1: 176. 1887-1889. *R. trachypleura* Robinson, *Proc. Amer. Acad.* 36: 474. 1901.

Plants suffrutescent, branching, 1.2-1.6 meters tall; stems 4-8-angled, angles prominent, narrow, with ridges usually roughened by swollen bases of hairs which often become callosities, the hairs 3-9-celled, 0.6-0.7 mm. long, areas between the ridges flat, with striations and usually with hairs, the hairs usually numerous but sometimes few and scattered, usually straight but sometimes retrorse; internodes 3-8 cm. long; leaves opposite or ternate, ovate or elliptic-ovate, 2-6 cm. long,

1–3.5 cm. broad, apices acute or obtuse, bases rounded or cuneate and entire, serrate or crenate above base, both surfaces densely pilose, upper and sometimes lower with large resinous scales, veins 3–4 on each side of midrib, not strikingly prominent on lower side, densely pilose; petioles 1–2 mm. long, pilose; inflorescences axillary, cymose, short, with 3–7 flowers; bracts similar to leaves but smaller; bractlets linear, pubescent; peduncles and pedicels 3–7 mm. long, pubescent; calyx lobes 2.5–3 mm. long, ovate, acuminate, margins membranaceous, few hairs along the midrib or sometimes lacking; corollas bright scarlet, tubular, 10–12 mm. long, upper lip deeply notched, lobes of lower lip rounded, 2 mm. long, barbate on inner surface of median lobe near throat and near attachment of stamens; stamens 6 and 7 mm. long, small hairs at base of filaments, anthers ovoid, 1 mm. long, divaricate; staminodes 1 mm. long; pistils 9–10 mm. long; capsules ovoid, 3–5 mm. long, about as long as the persistent calyx lobes; seeds 0.3 mm. long, ovoid, brown.

Type: Río Blanco, near Guadalajara, Jalisco, Mexico, September, 1886, *E. Palmer 540* (US).

The species grows from 1200–2400 meters altitude, and blooms throughout the year. It is found in the west-central part of Mexico (Map 3).

Mexico, Guanajuato: Near Guanajuato, *Duges s.n.* (GH), 28 (GH), 376 (GH). Mexico: Mexico, Valle de Bravo, *Carlson 3012* (F), *Lundell 12646* (LUND); Los Hornos, Temascaltepec, *Hinton 2111* (GH, LUND, NY, PA), 2112 (F, GH, PA, US); near Ozumba, *Pringle 8712* (F, GH, NY, PA, UC, US), 13152 (F, GH, US). Morelos: south of El Parque, Morelos, *Langman 2783* (PA); Sierra Chalchí, southwest of Tepoztlan, *Langman 3693* (PA); Cuautla, *Lyonnet 369* (GH, MO, NY, US); Sierra de Tepoztlan, *Pringle 8445* (F, GH, MEXU, MO, NY, PA, UC, US); Barranca of Cuernavaca, *Pringle 11069* (F, GH, MO, NY, US); Casa del Tezoztero, *Seler 43B* (F, GH). Jalisco: Etzatlan, along road to San Domingo Mine, *Barnes & Land 302* (F, PA); km. 41, Guadalajara to Autlán, *Langman 3127* (MEXU, PA); Río Blanco, near Guadalajara, *Palmer 540* (GH, NY, PA, US); near Guadalajara, *Pringle 2149* (GH), 9540 (F, GH, MEXU, MO, US); Tuxpán, *Pringle 13400* (GH, US), *Purpus 514* (UC). Michoacán: Rincón, Morelia, *Arsène s.n.* (US); Coalcomán, *Hinton 12892* (F, GH, LUND, MO, PA, US); Zitacuaro, *Hinton 13197* (GH, LUND, US); Tancitaro, Uruapán, *Hinton 15620* (GH, LUND, NY, US); between Uruapán and Jumpimito, *Langman 3298* (PA). Guerrero: environs of Taxco, *Abbott 121* (GH); Teotepec, Galeana, *Hinton 11105* (GH, US); between Ayusinapa and Petatlan, *Nelson 2143* (US); Chilpancingo, *Sharp 441460* (PA). Durango: Sianori, *Ortega 5340* (US); Sierra Madre, *Rose 3506* (US). Sinaloa: Mazatlán, *Brandege s.n.* (UC); Quebrado de Mansana, Sierra

Surotato, *Gentry 6484* (GH, LUND, MICH, MO, NY); Mazatlán, *Ortega 5658* (MEXU). Colima: Manzanillo, *West 3505* (GH, MO, US), *Orcutt 4477* (F, GH, MO). Baja California: Sierra San Lázaro, *Brandege s.n.* (GH, UC, US); Sierra de La Laguna, *Hammerly 278* (GH); Laguna Mts., *Jones 24429* (MO, NY), *24430* (F, UC), *27409* (MO). Chiapas: Comitán, *Langman 3740* (PA). Location not given: *Keating s.n.* (PA); *Pringle s.n.* (MO); *Ortega 88* (MEXU).

42. *Russelia retrorsa* f. *nudicostata* Carlson, forma nov.

A var. *retrorsa* recedit caulium costis glabris 0.5 mm. latis, laminis glabris vel minute pubescentibus.

Similar to the species except that the angles of the stems are broad (0.5 mm.) and glabrous, and the leaves are glabrous or minutely pubescent.

Type: Sierra de La Laguna, Lower California, Mexico, January 26, 1890, *T. S. Brandege 428* (US).

Mexico, Lower California: Sierra de La Laguna, *Brandege 428* (GH, PA, UC, US); Sierra San Lázaro, *Brandege s.n.* (GH); San José del Cabo, *Purpus 205* (MO, UC, US).

43. *Russelia obtusata* Blake, Proc. Biol. Soc. Wash. 33: 119. 1920.

Plants suffrutescent below, creeping base, erect stems, simple or with opposite branches, 5 meters tall, stout, 5 mm. thick at base; stems pale green, 6–8-angled, with broad flattened ridges on the angles, densely and microscopically pubescent; internodes 6–8 cm. long; leaves in three's or four's, papery or pergamentaceous, 1–3 cm. long, 1–3 cm. broad, ovate, obovate or suborbicular, apex acute or obtuse, base broadly rounded to cuneate, crenate-serrate, 4–8 pairs of teeth, acute or obtuse, upper surface deep green, glabrous or sparsely incurved tomentose, lower paler green, sparsely incurved tomentose along the costa and 3–4 pairs of prominent veins, pitted, no resinous dots either side; petioles slender, 2–8 mm. long, with densely spreading or incurved very short hairs; inflorescences axillary, 3–5-flowered; bractlets linear, tomentose; peduncles 4 mm. long to obsolete; pedicels 1.5–6 mm. long, densely and finely tomentose; calyx lobes 2.5 mm. long, ovate or oval-ovate, abruptly short-pointed or acuminate, not striate, glabrous or slightly hairy along the midrib, thick, with rosy margins; corollas red, 13–16 mm. long, glabrous outside, upper lip emarginate, lower lip with 3 equal lobes, crenulate, 3 mm. long, 2 mm. wide, pilose with one-celled hairs along inside of median lower lobe and near the attachment of stamens; stamens didynamous, 8 and 9 mm. long, pilose at base; anthers ovoid, divaricate; staminodes 1.3 mm. long; pistils 10 mm. long; capsules subglobose, 4 mm. broad, tipped with persistent style, 7 mm. long; seeds ovoid, light brown, 0.5–0.7 mm. long, surface rough.

Type: Near Tehuacán, Puebla, Mexico, altitude 1500–2000 meters, August 30–September 8, 1920, *J. N. Rose, J. H. Painter & J. S. Rose 10026* (US).

This taxon is readily recognized by the broad, somewhat flattened ridges on the angles and the dense covering of microscopic hairs on all parts except the calyx and corolla. It is related to *R. polyedra* and was so named by Karwinski (1094; see p. 283).

Mexico, Puebla: near Tehuacán, *Pringle 9621* (GH); Barranca de Thalcuilosto, *Purpus s.n.* (US); vicinity of San Luis Tultitlanapa, *Purpus 3270* (F, GH, MO, NY, UC, US); Chiltepín, near San Luis Tultitlanapa, *Purpus 3270a* (MO, US); Tlacuilotepic, *Purpus 3952* (UC); near El Riego, Tehuacán, *Rose, Painter & Rose 10026* (NY, US). Oaxaca: San Felipe, near Oaxaca, *Conzatti s.n.* (NY); Monte Albán, *Conzatti & Gonzalez 1068* (GH), *Smith 154* (MO), *400* (MO); Barranca de San Felipe, *Conzatti 5275* (MICH, PA); Natividad Road, *Kenoyer 1578* (GH); Monte Albán, *Lundell 12285* (LUND, SMU); San Miguel Alborrados, *Nelson 538* (US); Valley of Oaxaca, *Nelson 1202* (US), *1293* (US); Jazacutlon, *Rusby s.n.* (NY); Totálapan, *Seler 1747* (GH).

44. *Russelia pringlei* Robinson, Proc. Amer. Acad. 43:26. 1907.

Plants suffrutescent, 1–2 meters tall, branching; stems appearing terete but with 6–8 broad flat ridges, 8 mm. in diameter at base, gray, canescent, villous, with matted, white, unicellular hairs (0.09 mm. long); internodes 5–6 cm. long; leaves opposite, ternate or occasionally in whorls of 4, 1.5–3.5 cm. long, 1–3 cm. wide, ovate or ovate-lanceolate, apices acute, bases truncate or subcordate, upper one-fourth or one-third serrate-dentate, with 2–4 widely spaced teeth; upper leaves often entire; upper surfaces with sparse long hairs between the veins, lower surfaces with more hairs, especially on the veins, both surfaces with scattered glandular dots (0.2 mm. in diameter), more on the lower than on the upper surface; main veins impressed on upper, prominent on lower side; petioles 1–2 mm. long, villous; inflorescences axillary, spreading, cymose, 1–3 cm. long, with 4–12 flowers; bracts like the leaves except smaller and with fewer or no teeth; bractlets linear, densely hairy; peduncles slender, 4–10 mm. long, villous, without glandular dots; pedicels 4–5 mm. long, villous, without glandular dots; calyx lobes 5 mm. long, ovate-lanceolate, caudate, with a few hairs and numerous crowded glandular dots along the midrib; corollas red, 14–17 mm. long, glabrous externally, upper lip deeply notched (0.8 mm. deep), lower lobes 2 mm. long, 1 mm. wide, bearded with numerous flat hairs on median lower lobe and at base near attachment of stamens; stamens 10 and 12 mm. long, extending to throat of corolla tube; anthers oval, 0.6–0.7 mm. long, divaricate; staminodes 0.8 mm. long; pistils 12 mm. long; capsules ovoid, 4–6 mm. long; style persistent, 10 mm. long; persistent calyx extending almost to top of capsule; seeds black, 0.54 mm. long, 0.3 mm. wide, reticulate on surface.

Type: Iguala Canyon, Iguala, Guerrero, Mexico, altitude 760 meters, December 28, 1906, *C. G. Pringle 10367* (GH).

Known from only three collections on vertical limestone walls of Iguala Canyon (Canyon de la Mano), 6.5 miles north of Iguala. In flower and fruit September to January.

Mexico, Guerrero: Canyon de la Mano, *Carlson 3132* (F), *Pringle 10148* (GH, LUND, US), *10367* (F, GH, MO, NY, PA, UC, US).

45. *Russelia villosa* Lundell, Field and Lab. 13: 21. 1945.

Plants suffrutescent, 1.5–2 meters tall, branching; stems thick, bases up to 1.2 cm. in diameter, 4–8-angled, angles with prominent ridges, copiously white-villous between the ridges and somewhat on the ridges, without glandular dots; internodes 10–12 mm. long; leaves opposite or ternate, 6–10 cm. long, 4–5 cm. wide, broadly ovate, apices acute but not sharply so, or obtuse, bases cordate or truncate, often broadly cuneate, margins serrate-dentate, persistently villous on both surfaces, paler beneath, many irregular resinous dots on the lower surface, fewer on the upper; basal leaves reduced, sometimes only 1 cm. long, suborbicular; veins 5–7 on each side of the midrib, prominent and lighter colored on the lower side; petioles short (1–2 mm. long), woolly, no glandular dots; inflorescences near tops of stems, axillary, compact, with 5–10 flowers; bractlets linear, woolly; peduncles very short or lacking, woolly; pedicels 2.5–5 mm. long, woolly; calyx lobes 3 mm. long, ovate, with membranaceous margins, acuminate, keeled, short ciliate, with a few hairs on the keel, no glandular dots; corollas rose-red, 7–10 mm. long, externally glabrous, lobes slightly spreading, lower lobes up to 2 mm. long, upper emarginate, hairs at throat and along inside of lower median lobe, and near attachment of stamens; stamens 4 and 5 mm. long, hairs at base; anthers oval, divaricate; staminodes minute; pistils 7 mm. long; capsules globose, 4–5 mm. long, basal half covered by persistent calyx; seeds small, black.

Type: Mountain side near Taxco, Guerrero, Mexico, October 19, 1943, *C. L. & A. A. Lundell 12568* (SMU).

This species is very similar to *R. ternifolia* H.B.K. and may be a variety of it. The specimens from near Taxco have long, matted hairs between, but not so much on, the ridges; short peduncles, so short that the inflorescences appear umbelliferous; resinous dots on both sides of the leaves; few hairs on the calyx lobes.

Mexico, Guerrero: near Taxco, *Abbott 63* (GH), *Carlson 3111* (F), *3117* (F), *Lundell & Lundell 12568* (GH, LUND, MEXU, MICH, SMU, US); Suriana, *Mexia 8827* (F, GH, MO, NY, US). Michoacán: Apatzingan, *Leavenworth & Hoogstraal s.n.* (F); Jorullo, *Nelson 6947* (US). Mexico: Tamascaltepec, *Hinton 3191* (GH, US), *7297* (GH).

46. *Russelia ternifolia* H.B.K. Nov. Gen. et Sp. 2: 359. 1817.

Plants with stems and branches 4–6-angled, the angles slightly thickened, densely hirsute-pubescent; internodes 5–10 cm. long; leaves opposite or ternate, 5–6.2 cm. long, 3.3–5.2 cm. wide, either obovate and rounded at the tip or ovate and obtuse at the tip, bases truncate or cuneate and decurrent on the petiole, margins coarsely serrate or serrate-crenate except at the base, rigid-membranaceous, hirsute on both surfaces, especially on the veins, not resinous-lepidote, changing to purple, veins reticulate, with the midrib and primary veins prominent

on the lower side; petioles 4–5 mm. long, hirsute; inflorescences cymose, axillary, solitary, many-flowered; bractlets linear, hirsute-tomentose; peduncles 5–7 mm. long, hirsute-tomentose; pedicels 4 mm. long, filiform, tomentose; calyx lobes 2.5–3.5 mm. long, ovate, mucronate, margins incumbent, puberulous; corollas 8–10 mm. long, slightly wider at the top, externally glabrous, limb 4-lobed, the upper a little wider than the lower and slightly notched, the lobes rounded; inner surface of the lower lip barbate, stamens included, inserted at the base of the corolla, with hairs on the inner surface; filaments filiform, dilated at the base; anthers orbicular; ovaries oblong, glabrous; styles glabrous, scarcely equaling the stamens; capsules globose, 3 mm. long; seeds 0.4–0.5 mm. long, black.

Type: From declivity of Volcano Jorullo, Michoacán, Mexico, altitude 1100–1300 meters, flowering in September, *Kunth s.n.* (Herb. Mus. Paris).

Only a photograph of the type specimen was seen.

Mexico, Oaxaca: Ixtepec, *Fisher 35323* (F, MO, NY, US); Cerro de Picacho, *Purpus 7288* (GH, MO, NY, UC, US); Salina Cruz, *Deam s.n.* (GH). Chiapas: Sierra de Tonalá, *Purpus 6882* (F, GH, MO, NY, UC, US). Mexico: Ixtapan, *Hinton 1167* (F, GH, MO, PA, US).

47. *Russelia konzattii* Carlson, sp. nov. Plate 5.

Planta suffruticosa; ramis 4–6-angularibus, angulis incrassatis striatis pubescentibus; foliis oppositis vel ternatis; laminis 8 cm. longis, 5 cm. latis, ovato-lanceolatis, apice acutis, basi truncatis vel cordatis, sessilibus vel subsessilibus pubescentibus; petiolis 1 mm. longis vel nullis; inflorescentiis multifloris; bracteolis linearibus pubescentibus; pedunculis 15–20 mm. longis pubescentibus; pedicellis 8–10 mm. longis pubescentibus; sepalis 2.5–3 mm. longis ovatis acuminatis parce pubescentibus; corollis 12–14 mm. longis; staminibus 8 vel 9 mm. longis; staminodiis 0.5 mm. longis; pistillis 10 mm. longis.

Plants suffruticose; stems 4–6-angled, angles slightly thickened, flat sides striate, both angles and flat sides pubescent; leaves opposite or ternate, sessile or subsessile; blades 8 cm. long, 5 cm. wide, ovate-lanceolate, apices acute, bases truncate or cordate, pubescent, especially on the veins; petioles 1 mm. long or lacking, pubescent; inflorescences many-flowered; bractlets linear, pubescent; peduncles 15–20 mm. long, pubescent; pedicels 8–10 mm. long, pubescent; calyx lobes 2.5–3 mm. long, ovate, acuminate, slightly pubescent along costa; corollas 12–14 mm. long, ventral lobes 2 mm. long, 1.5 mm. wide, dorsal lip slightly emarginate, internally barbate along median ventral lobe and at base near insertion of stamens; stamens 8 and 9 mm. long; staminodes 0.5 mm. long; pistils 10 mm. long; no mature capsules present on specimen.

Type: Near Panixllahuaca, Dist. Tuquila, Oaxaca, Mexico, altitude 850 meters, December 25, 1921, *C. Konzatti 4525* (US).

Mexico, Oaxaca: Panixllahuaca, *Konzatti 4525* (US); Cerro de Chacalina, *Konzatti 4478* (US).

48. *Russelia grandidentata* Carlson, sp. nov. Plate 5.

Planta suffruticosa; ramis 4-6-angularibus pilosulis striatis, angulis in-crassatis 0.35 mm. latis; foliis oppositis vel ternatis; laminis inferioribus ovatis vel deltoideis, 3.5 cm. longis, 3 cm. latis, apice acutis, basi truncatis, parce breviter pubescentibus, grosse dentatis, dentibus 5-7 mm. longis; petiolis 4-5 mm. longis breviter pubescentibus; inflorescentiis 3-5-floris; pedunculis 3 mm. longis dense pilosulis; pedicellis 3-4 mm. longis, dense pilosulis; sepalis ovatis acuminatis, 3 mm. longis, costis breviter pubescentibus; corollis 15-17 mm. longis; capsulis globosis, 4 mm. longis; seminibus ovatis.

Plants suffruticose; stems 4-6-angled, ridges on the angles 0.35 mm. wide, striations between the angles, both ridges and flat sides with soft hairs of irregular lengths (0.05-0.4 mm. long, unicellular); leaves opposite or ternate; blades of lower leaves ovate or deltoid, 3.5 cm. long, 3 cm. wide, slightly short-pubescent, often caducous, lobed or large-dentate, teeth 5-7 mm. long, 3-4 on each side, upper leaves much smaller, resinous-lepidote on both sides; petioles 4-5 mm. long, short-pubescent; inflorescences 3-5-flowered; peduncles 3 mm. long, densely short-pubescent; pedicels 3-4 mm. long, densely short-pubescent; calyx lobes ovate, acuminate, 3 mm. long, pubescent along costa; corollas 15-17 mm. long, upper lip emarginate, lower lobes 2 mm. deep, 1 mm. wide, barbate within along median ventral lobe and at base near insertion of stamens; stamens 9 and 11 mm. long; anthers divaricate; staminodes 1.5-2 mm. long; pistils 10 mm. long; capsules 4 mm. long, beaked; seeds brown, oval.

Type: Vinorama, east of La Paz, Baja California, Mexico, April 1, 1949, *Annetta Carter 2621* (UC).

Mexico, Lower California: Vinorama, *Carter 2621* (PA, UC), *2687* (PA).

49. *Russelia hintoni* Lundell, Field and Lab. 13: 14. 1945.

Plants suffruticose, 2 meters tall; stems and branches 4-angled, persistently hirtellous; leaves thin, membranaceous, opposite, 2.5-6 cm. long, 2-4.5 cm. wide, ovate, ovate-elliptic or elliptic, apices acute or obtuse, bases truncate or rounded, margins coarsely serrate-dentate, basal third subentire, sparsely hairy on upper surface, more densely hairy on lower, especially on the veins, resinous-lepidote on both surfaces, sometimes sparingly so, costa and principal veins slightly impressed above, elevated beneath, 4-5 pairs on each side; petioles slender, 2-5 mm. long, hirtellous; inflorescences laxly cymose, axillary, up to 4 cm. long, few- to many-flowered; bractlets linear, hirtellous; peduncles 4-6 mm. long, densely hirtellous; pedicels slender, 4-8 mm. long, hirtellous; calyx lobes ovate at base, abruptly cuspidate or long-acuminate, tip sometimes recurved, 3 mm. long, sparsely pubescent along costa, with an occasional resinous dot; corollas tubular, slightly narrowed below, 10-12 mm. long, externally glabrous, barbate within on lower side and at base near attachment of stamens; stamens 7 and 9 mm. long, barbate at base on inner side; anthers ovoid, divaricate; staminodes 0.3 mm. long; pistils 8 mm. long; capsules 3 mm. long, globose; seeds numerous, small.

Type: Near Galeana, Guerrero, Mexico, altitude 400 meters, November 14, 1937, *G. B. Hinton 10921* (SMU).

Lundell says: "From *R. cuneata* Rob., to which it is related, *R. hintoni* differs in being densely pubescent and in having leaves obtuse or rounded at the base, not cuneate-attenuate."

Mexico, Guerrero: Atoyac, Galeana, *Hinton 10921* (GH, LUND, NY, SMU).

50. *Russelia parvifolia* Carlson, sp. nov. Plate 6.

Planta suffruticosa, 1-1.5 m. alta; ramis dense hirsutis, 4-6-angularibus, angulis incrassatis; foliis oppositis vel ternatis, petiolatis; petiolis 2-4 mm. longis, dense hirsutis; laminis 1-2 cm. longis, 0.8-1.5 cm. latis, ovatis, apice acutis vel obtusis, basi truncatis, serratis vel serrato-crenatis, utrinque dense hirsutis, minute resinoso-lepidotis; inflorescentiis cymosis, 3-8-floris; pedunculis 4-8 mm. longis, dense hirsutis; pedicellis 3-4 mm. longis, dense hirsutis; sepalis 3 mm. longis, ovatis, subulatis, pubescentibus, parce resinoso-lepidotis; corollis coccineis, 11-12 mm. longis, tubulosis; filamentis 7 vel 9 mm. longis; antheris ovalibus, divaricatis; pistillis 8 mm. longis; capsulis globosis, 3 mm. longis; seminibus numerosis, parvis.

Plants suffruticose, 1-1.5 meters tall, branching; stems 4-6-angled, ridges on angles thickened, broad and flat, densely hirsute with straight multicellular hairs of unequal lengths; internodes 3-8 cm. long; leaves opposite or ternate, 1-2 cm. long, 0.8-1.5 cm. wide, broadly ovate or elliptic, apices acute or obtuse, bases truncate or widely cuneate, margins serrate or serrate-crenate, densely hirsute on both surfaces and especially on the veins on the lower side, scattered resinous-lepidote on both sides; petioles 2-4 mm. long, hirsute; inflorescences spreading, with 3-8 flowers; peduncles 4-8 mm. long, pedicels 3-4 mm. long, both densely hirsute and glandless; calyx lobes 3 mm. long, ovate, pubescent medianly and on the subulate tip, densely or sparingly resinous-lepidote; corollas tubular, slightly spreading at the mouth, 11-12 mm. long, ventral lobes 3 mm. long, 1 mm. wide, dorsal lip shorter, emarginate; corollas glabrous externally, bearded inside along median ventral lobe and at base near attachment of stamens; stamens 7 and 9 mm. long, with hairs at base of filaments; anthers oval, divaricate; staminodes 1 mm. long; pistils 8 mm. long; capsules 3 mm. long, globose; seeds numerous, minute.

Type: Sides of ravine, near Fiscál, Guatemala, Guatemala, altitude 110 meters, May 31, 1909, *C. C. Deam 6069* (MICH).

R. parvifolia differs from *polyedra* in having shorter corollas, not funnellform, but merely wider at the top; longer stamens and pistils; and more dense pubescence on the vegetative parts. The taxon was recognized but not described by F. W. Pennell.

Guatemala, Guatemala: Fiscál, *Deam 6069* (GH, MICH, PA), *Standley 59584* (F, PA), *80371* (F, PA, US), *80390* (F), *80427* (F); Agua Caliente, *Greenman & Greenman 5899* (MO). Zacapa: Río Hondo, *Standley 73994* (PA), *Steyermark 29464* (F), *42917* (F, PA). Baja Vera Paz: Santa Rosa, *Von Tuerckheim 1198* (GH, PA, NY, US).

51. *Russelia polyedra* Zuccarini, Abh. Akad. Wiss. Muenchen 2: 328. 1831-36. *R. pennelliana* Lundell, Contr. Univ. Mich. Herb. 6: 58. 1941. *R. pennelliana* var. *pilosa* Lundell, Field and Lab. 13: 17. 1945.

Plants fruticose, 1-1.5 meters tall; stems 6-10-angled, with broad, flattened ridges on the angles, the faces between the angles flattened or concave, striate; thinly or densely velutinous, especially on the ridges, or glabrous, i.e., some branches may be very hairy while others on the same plant may be glabrous, internodes 5-7.5 cm. long; leaves opposite or verticillate, 1.2-2.5 cm. long, 1.2-2 cm. wide, suborbicular or broadly ovate, apices obtuse, bases rounded and entire, margins deeply and irregularly serrate-dentate, teeth obtuse, softly pubescent or glabrous, resinous-lepidote on both sides; petioles 6-8 mm. long, slender, widened at base, softly pubescent; inflorescences in axils of upper leaves, 2-5-flowered; bractlets linear, pubescent; peduncles and pedicels 6-8 mm. long, slender, pubescent, resinous-lepidote; calyx lobes ovate, 4 mm. long, acute, pubescent, resinous-lepidote, margins membranaceous at base; corollas red, funnellform, 15-20 mm. long, lobes decidedly spreading, somewhat undulate, ventral lobes 4.5 mm. long, 5 mm. wide, dorsal slightly shorter, emarginate, cleft 1 mm. deep; corollas externally glabrous, internally barbate with erect yellow hairs along lower lip and at base near attachment of stamens; stamens 5 and 7 mm. long; anthers oval, divaricate; staminodes 1 mm. long, filiform; pistils 7 mm. long; capsules 5 mm. long; seeds oval, 0.8 mm. long.

Type: No locality in Mexico is given for type specimen, *Karwinski 1093* (Munich).

Two specimens, *Karwinski 1093* and *1094*, were sent to me from Munich as the type of this taxon. These two are combined in a photograph (8657, F) which was distributed as the type. They represent two collections and, although similar, they are not alike. One (*1094*) is densely tomentose, with microscopic hairs which are barely visible to the naked eye, and has no resinous dots on any part. This is the readily recognized taxon which was described by Blake as *R. obtusata* and is treated as a valid species in the present work. The other specimen (*1093*) fits the description and is designated as the type of *R. polyedra*.

This species has apparently not been correctly defined in the past, as many specimens which have been identified as *R. polyedra* are definitely not *polyedra*. The type specimen has the striking, large, funnellform corollas which are characteristic of the specimens named by Lundell as *R. pennelliana* and *R. pennelliana* var. *pilosa*. Therefore, these are reduced to synonymy. The type specimen is definitely pilose, but the specimens referred to this species may have both pilose and perfectly glabrous branches on the same plant or on plants of the same collection. It seems impossible, therefore,

to separate one as a variety of the other. However, those specimens from the vicinity of Ciudad Victoria are generally pubescent, while those from farther east (Jaumave) are generally glabrous (Map 3).

As noted by Lundell, this species is worthy of cultivation. Calyces and corollas with 6 lobes and 5 or 6 stamens occur.

Mexico, Tamaulipas: Cerro de la Tamaulipeca, near San Miguel, *Bartlett 10542* (F, US); La Morita, Marmolejo, *Bartlett 10776* (F); 13 miles south of Ciudad Victoria, *Hitchcock & Stanford 6886* (GH, MO, NY, UC); Chamál, *Kenoyer & Crum 3647* (MICH); Mesa de Llera, *Lundell & Lundell 7288* (LUND, MICH); Cuesta de Llera, *Lundell & Lundell 12170, 12487, 12487A, 12489* (LUND); Río San Marcos, 5 miles west of Ciudad Victoria, *Meyer & Rogers 2490* (MO, PA); Ciudad Victoria, *Foster 900* (LUND), *Palmer 259* (US); San Vicente, Jaumave, *von Rozynski 41a* (MICH, UC); Jaumave, *von Rozynski 41* (F, GH); Nogales, Jaumave, *von Rozynski 485* (F, PA); 30 km. southwest of Victoria, 3 km. north of Huisachal, *Stanford, Lauber & Taylor 2036* (PA); 19 km. southeast of Miquihuana on road to Palmillas, *Stanford, Retherford & Northcraft 826* (GH, MO, NY, UC); Jaumave, *Viereck 482* (US); Yerba del Sueña, near San Vicente, *Wooten s.n.* (US). Guanajuato: Xichú mine, *Kenoyer 2261* (GH). Hidalgo: Jacala, *Kenoyer s.n.* (MO); west slopes of mountain near km. 278, on highway north of Jacala, *Moore 1791* (GH). No location given, *Purpus s.n.* (UC).

52. *Russelia staleyae* Carlson, sp. nov. Plate 6.

Planta suffruticosa; ramis 4–6-angularibus, angulis incrassatis striatis tomentos; foliis oppositis vel ternatis; laminis 12 mm. longis, 10 mm. latis, orbiculatis, apice obtusis, basi obtusis, crenatis, dense tomentos utrinque resinoso-lepidotis; petiolis 1 mm. longis, tomentos; inflorescentiis multifloris; pedunculis 3–5 mm. longis, tomentos; pedicellis 3–4 mm. longis, tomentos; sepalis 3 mm. longis, ovatis acuminatis parce pubescentibus; corollis 11–12 mm. longis, cornutis lobis grandibus; filamentis 3 vel 4 mm. longis, basi barbatis; staminodiis 1.5 mm. longis; pistillis 4 mm. longis; capsulis 3 mm. longis, globosis; seminibus minutis.

Plants suffruticose; stems 4–6-angled, angles thickened, striate on the flat sides, both angles and flat sides densely tomentose; leaves opposite or ternate; blades 12 mm. long, 10 mm. wide, orbicular, apices obtuse, bases obtuse, crenate, densely tomentose, both sides resinous-lepidote; petioles 1 mm. long, tomentose; inflorescences many-flowered; peduncles 3–5 mm. long, tomentose; pedicels 3–4 mm. long, tomentose; calyx lobes 3 mm. long, ovate, acuminate, sparsely pubescent; corollas 11–12 mm. long, funnelform, the lobes large (3 mm. long, 3 mm. wide) and spreading, the dorsal lip slightly emarginate, slightly barbate along the median ventral lobe, densely barbate at base; stamens 3 and 4 mm. long, with a few large hairs at the base; staminodes 1.5 mm. long; pistils 4 mm. long; capsules 3 mm. long, globose; seeds minute.

Type: Cliff near Pan-American Highway, just beyond the road to Juchitán, Oaxaca, Mexico, March 22, 1949, *M. C. Carlson 1494* (F).

This taxon is similar to *R. parvifolia*, but the flowers are smaller and more funnellform. I take pleasure in naming it for Miss Kate Staley, my companion on several collecting trips in Mexico and Central America, who discovered it.

Mexico, Oaxaca: Near Juchitán, *Carlson 1494* (F); Tehuantepec, *Orcutt 6458* (US).

Excluded Species

R. alata Cham. & Schl. *Linnaea* 3: 3. 1828=*Anetanthus* Hiern. Benth. & Hooker, *Gen. Pl.* 2: 941. 1873-1876.

R. alternifolia Pers. *Pers. Syn.* 2: 164. 1807. Not *Russelia*, as the description states, "with alternate leaves and solitary flowers."

R. americana E. A. Raeschel, *Nom. Bot. Lipsiae.* ed. III. 180. 1797=*sarmentosa* Jacq. *Kew Index* 2: 767. 1895.

R. capensis L. f. Carolus von Linné f. *Suppl. Pl.* 175. 1781=*Vahlia capensis* Thunb. *fide De Candolle Prodrum* 4: 53. 1830.

R. depressa Thunb. *Flor. Capens.* 479-480. 1823 is *Ruellia depressa* Thunb., misquoted by Lindley, *Bot. Reg.* 22 (n.s. 9): 1882. 1836.

R. flammea Raf. C. S. Rafinesque, *New Fl. N. Amer.* 2: 71. 1837=*Macranthera flammea* (Bartram) Pennell. F. W. Pennell, *Studies in the Agalinanae, a subtribe of the Rhinanthaceae II.* *Bull. Torrey Bot. Club* 40: 405. 1913.

R. peruviana Spruce, *Pl. Exs. n.* 4515=Verbenaceae. Benth. & Hooker, *Gen. Pl.* 2: 941. 1873-1876.

R. racemosa (Ruiz & Pav.) Wetts. *Engl. & Prantl, Natur. Pflanzenf.* IV. 3b: 63. 1891=*Gomara racemosa* Ruiz. & Pav. H. Ruiz & J. Pavon, *Syst. Veg.* 1: 162. 1798.

Exsiccatae

Species numbers in parentheses. Other numbers are collectors' numbers.

- Abbott, R. Q. 63 (45), 121 (41).
 Aguilar, M. 68 (25), 194 (24), 464 (4).
 Aguirre, A. & Reko, B. 312 (10).
 Allen, P. H. 92 (22), 1081 (22), 1156 (22), 1582 (23), 2770 (22), 5624 (22).
 Arsène, G. s. n. (10), (11), (12), (41).
 Auber, A. 13 (22).
 Bailey, L. H. 604 (11).
 Baker, C. F. 101 (26), 197 (26), 580 (26), 880 (26), 2168 (26), 2215 (26).
 Balls, E. R. 4272 (32).
 Barclay, G. W. s. n. (14).
 Barnes, C. R., Chamberlain, C. J., & Land, W. J. G. 47 (10).
 Barnes, C. R. & Land, W. J. G. 302 (41), 660 (10).

- Bartlett, H. H. 10542 (51), 10776 (51), 11516 (22), 11531 (22), 11716 (22), 11999 (4), 12263 (24), 12665 (24), 12852 (4).
 Bartlett, H. H. & Lasser, T. 16349 (28).
 Basil, H. B. s. n. (22).
 Bigelow, J. s. n. (26).
 Biolley, P. 71 (24), 17331 (22).
 Bonner, J. 31 (5), 37 (5).
 Botteri, M. 28 (10), 123 (32), 293 (32).
 Bourgeau, M. 1983 (10), 2163 (32).
 Brandegee, F. S. s. n. (39), (41), (42); 428 (42).
 Brenes, A. M. 168 (26), 232 (22), 532 (22), 803 (22), 12696 (24), 14408 (22), 17004 (22).
 Broadway, W. E. 8006 (10).
 Calderon, S. 184 (22), 827 (22).
 Carleton, M. A. 462 (24).
 Carlson, M. C. s. n. (5), (10); 24 (22), 170 (22), 789 (22), 1305 (10), 1494 (52), 2762 (5), 2779 (10), 2781 (5), 2782 (10), 2787 (10), 3012 (41), 3032 (43), 3049 (17), 3079 (17), 3081 (17), 3108 (16), 3111 (45), 3117 (45), 3119 (12), 3130 (10), 3132 (44).
 Carter, A. 2621 (48), 2687 (48).
 Celestino, Bro. 53 (22).
 Chanek, M. 231 (4).
 Chaves, D. 63 (26).
 Choussey, F. 13 (22).
 Chun, W. Y. 6982 (10).
 Collins, G. N. & Kempton, J. H. 21 (14).
 Conzatti, C. s. n. (43); 835 (10), 4478 (47), 4525 (47), 5275 (43).
 Conzatti, C. & Gonzalez, V. 1068 (43).
 Cook, O. F. & Doyle, C. B. 21 (22).
 Cook, O. F. & Griggs, R. F. 305 (24).
 Cooper, G. P. 39 (22).
 Cornman, L. R. 2025 (22).
 Curtiss, A. H. 753 (22).
 Davidson, M. E. 472 (23).
 Deam, C. s. n. (5), (11), (12), (27), (46); 41 (5), 183 (35), 6069 (50), 6335 (35).
 Diquet, L. s. n. (11), (12), (13), (14).
 Dodge, C. W., Alfaro, A. & Thomas, W. S. 6245 (22).
 Dodge, C. W. & Allen, P. H. 17324 (22).
 Dodge, C. W., Steyermark, J. A. & Allen, P. H. 16967 (22).
 Dodge, C. W. & Thomas, W. S. 6223 (24), 6223a (24), 6434 (22).
 Drouet, F. & Richards, D. 3943 (31).
 Duges, A. s. n. (41); 28 (41), 376 (41).
 Duss, Père 1348 (10).
 Edwards, M. T. 816 (30).
 Elmore, F. H. E11 (22).
 Emrick, G. M. 177 (15), 181 (6).
 Ervendberg, L. C. 223 (10), 263 (10).
 Ferris, R. S. 5416 (14), 5614 (21), 6082 (37).
 Fisher, G. L. 35323 (46), 45184 (30).
 Foster, M. B. 900 (51).
 Galeottii, H. 1109s (32).
 Garnier, A. s. n. (22); 58 (26), 267 (26), 4297 (26).
 Gaumer, G. F. 403 (22), 1746 (22).
 Gaumer, G. F. & sons 23660 (22).
 Gentle, P. H. 385 (4), 647 (4), 952 (22), 1140 (4), 2175 (4), 2248 (22), 2269 (4), 4060 (24).
 Gentry, H. S. 851m (31), 1128 (30), 1193 (30), 1287 (3), 2374 (30), 5076 (39), 5121 (14), 5189 (21), 5235 (21), 5563 (39), 5657 (14), 6484 (41).

- Glassman, S. F. 1559 (22).
 Goldman, E. A. 62 (10), 467 (4).
 Goll, G. P. 99 (24), 143 (24).
 Grant, V. 761 (26).
 Greenman, J. M. 73 (10), 82 (10), 185 (10).
 Greenman, J. M. & M. T. 5024 (22), 5899 (50).
 Gregg, J. 997 (14), 1185 (21).
 Haenke, T. 1066 (34).
 Hammerly, B. J. 278 (41).
 Hartweg, Th. 501 (32).
 Hayes, S. 36 (22).
 Heriberto, Bro. 130 (22).
 Hermann, J. 5067 (22).
 Herndon, W. s. n. (26).
 Hewitt, W. P. 14 (30).
 Heyde, E. T. 525 (22).
 Heyde, E. T. & Lux, E. 2943 (25).
 Hinton, G. B. 1167 (46), 2111 (41), 2112 (41), 3191 (45), 7297 (45), 9188 (15),
 10465 (12), 10921 (49), 11105 (41), 11393 (15), 11585 (15), 11773 (33),
 12892 (41), 13197 (41), 13845 (20), 15620 (41), 15841 (21), 16057 (15),
 16127 (6), 16129 (15).
 Hitchcock, A. S. s. n. (22).
 Hitchcock, C. L. & Stanford, L. R. 6886 (51).
 Howell, J. T. 10397 (21).
 Humboldt & Bonpland s. n. (16).
 Jack, J. G. 4074 (10).
 Johnson, E. P. 115 (27).
 Johnson, H. 144 (22).
 Johnston, I. M. 4062 (47).
 Johnston, J. R. 550 (22), 1561 (22), 1743 (10).
 Jones, M. E. 394 (21), 23169 (30), 23170 (38), 23217 (14), 24429 (41), 24430 (41),
 27409 (41).
 Juzepczuk, S. 1399 (42).
 Karwinski, W. F. von 1093 (51), 1094 (43).
 Keating, M. s. n. (41).
 Kellerman, W. A. 5164 (22), 7609 (22).
 Kenoyer, L. A. s. n. (51), A240 (51), A247 (39), A370 (51), 822 (10), 1578 (43),
 2261 (51).
 Kenoyer, L. A. & Crum, H. 3647 (51).
 Killip, E. P. 3192 (22), 13816 (22).
 Knoblock, J. 5623 (30).
 Kunth, C. S. s. n. (32), (46).
 Lamb, F. H. 479 (14), 578 (38).
 Langlassé, E. 723 (15).
 Langman, I. K. 2783 (41), 3127 (41), 3298 (41), 3360 (17), 3433 (10), 3693 (41),
 3740 (41), 3825 (10), 3916 (10).
 Lankester, C. H. k6 (24).
 Leavenworth, W. C. & Hoogstraal, H. 1534 (45).
 Lehmann, F. C. 1722 (24).
 León, J. 459 (22), 871 (24), 10656 (22).
 Le Roy, P. V. 153 (32).
 Le Sueur, H. 1381 (30).
 Liebmann, F. s. n. (32), 9426 (22), 9431 (10), 9434 (2).
 Lundell, C. L. 526 (22), 526B (22), 576 (4), 1112 (4), 1331 (22), 1338 (4), 1644 (4),
 2457 (25), 3507 (25), 6131 (22), 6706 (25), 6728 (22), 6868 (24), 6869 (24),
 6925 (22), 6928 (22), 7850 (4), 12285 (43).
 Lundell, C. L. & A. A. 7231 (40), 7288 (51), 7354 (22), 7849 (22), 7850 (4), 12166
 (40), 12170 (51), 12257 (40), 12285 (42), 12317 (8), 12396 (5), 12398 (5),
 12401 (10), 12402 (10), 12406 (10), 12422 (10), 12487 (51), 12487a (51),

- 12489 (51), 12490 (1), 12491 (40), 12568 (45), 12580 (17), 12581 (17), 12582 (17), 12595 (17), 12597 (16), 12646 (41), 12649 (5), 12650 (10), 12651 (10), 12652 (40).
- Lyonnnet, P. E. 369 (41), 608 (12).
- Macbride, J. F. 2771 (22).
- MacDaniels, L. H. 818 (24).
- Maltby, F. S. 2 (14), 114 (21).
- Mart, M. 1961 (11).
- Martínez-Calderon, G. 391 (10), 472 (10).
- Matuda, E. 136 (11), 1144 (32), 1643 (18), 2088 (18), 2088a (18), 2563 (18), 3524 (22), 5188 (18), 17251 (10) 17273 (10), 17336 (10).
- Maxon, W. R. 7654 (26).
- Maxon, W. R., Harvey, A. D. & Valentine, A. T. 7366 (26), 7434 (26), 7451 (26), 7665 (26).
- McVaugh, R. 10180 (14).
- Mell, C. D. s. n. (22), (27); 38 (22).
- Mexía, Y. 98 (21), 225 (21), 225½ (21), 1097a (21), 1122 (21), 1238 (37), 1815 (37), 8827 (45), 9164 (27).
- Meyer, W. C. 117 (22).
- Meyer, W. C. & Rogers, D. 2490 (51), 2664 (5).
- Miller, J. W. s. n. (22).
- Mohr, C. 307 (32).
- Molina, A. 964 (24), 3078 (24), 3350 (24).
- Moore, H. E. Jr. 1791 (51), 2531 (10).
- Morley, T. 753 (26).
- Müller, F. 1369 (10), 4098 (10).
- Nelson, E. W. 319 (10), 385 (10), 538 (43), 857 (27), 1202 (43), 1293 (43), 2143 (41), 4289 (21), 6947 (45).
- O'Neill, H. 8739 (22).
- Orcutt, C. R. 3139 (10), 3299 (5), 4477 (41), 4674 (15), 6332 (40), 6458 (52), 6556 (10).
- Orozco, J. M. 236 (22), 333 (24).
- Ortega, J. G. 88 (41), 4637 (21), 5340 (41), 5658 (41), 6062 (21), 6491 (21), 6605 (14), 6760 (21).
- Palmer, E. s. n. (14); 126 (12), 149 (12), 249 (30), 252 (17), 259 (51), 509 (33), 540 (41), 954 (21), 1448 (7).
- Palmer, W. & Riley, J. H. 854 (22).
- Paul, Bro. 149 (22).
- Peck, M. E. s. n. (22).
- Pelley, R. S. 15 (22).
- Piper, C. V. 6021 (22).
- Pittier, H. 498 (22), 2125 (22), 5384 (22), 13650 (22).
- Pringle, C. G. s. n. (11), (12), (41); 2149 (41), 2568 (12), 5086 (5), 6081 (10), 8445 (41), 8657 (12), 8712 (41), 8934 (12), 9540 (41), 9621 (43), 10148 (44), 10367 (44), 11069 (41), 13152 (41), 13400 (41).
- Purpus, C. A. s. n. (43), (51); 205 (42), 436 (10), 514 (41), 1276 (32), 2378 (5), 3270 (43), 3270a (43), 3952 (43), 5327 (5), 5749 (10), 6039 (2), 6242 (10), 6316 (10), 6882 (46), 7288 (46), 8063 (5), 8567 (10), 10833 (22).
- Record, S. J. s. n. (22).
- René, A. 12 (26), 69 (26).
- Renson, C. 172 (22).
- Robbins, J. W. s. n. (22).
- Rodriguez, J. V. 150 (22), 862 (22), 924 (22), 1698 (24), 2704 (23), 3150 (24), 3151 (24).
- Rose, J. N. 2508 (12), 3506 (41).
- Rose, J. N. & Painter, J. H. 10026 (43).
- Rose, J. N., Standley, P. C. & Russell, P. G. s. n. (31); 12712 (30), 13701 (21), 14313 (14), 14354 (38).

- Rovirosa, J. N. 151 (27), 418 (27), 893 (27).
Rowell, C. M. Jr. 3171 (10).
Rowlee, W. W. & Stork, H. E. 134 (22), 686 (22), 846 (22).
Rusby, H. H. s. n. (43); 9 (12), 12 (12).
Russell, P. G. & Souviron, M. J. 18 (12).
- Schiede, C. & Deppe, F. 1186 (5).
Schipf, W. A. S653 (4), 671 (25).
Seaton, H. E. s. n. (10).
Seler, E. 43B (41), 705 (10), 1747 (43), 4965 (10).
Shank, P. J. & Molina, A. 4583 (26).
Shannon, W. C. 271 (10).
Sharp, A. J. 441460 (41).
Shimek, B. & Smith, C. L. 20 (26).
Skutch, A. F. 951 (7), 1448 (7), 1770 (24), 2085 (7), 4134 (22), 4670 (22).
Smith, A. P. 2371 (22).
Smith, C. L. s. n. (26); 1100 (22).
Smith, H. H. 1361 (22).
Smith, J. D. 1642 (24), 2943 (22).
Smith, J. G. 303 (10), 418 (27).
Smith, L. C. 154 (43), 400 (43).
Solis, F. 82 (24), 328 (22), 366 (24).
Standley, P. C. 487 (24), 1349 (24), 1666 (22), 8184 (26), 8443 (26), 9437 (26), 9449 (26), 9486 (26), 10109 (26), 10595 (26), 19288 (22), 20037 (22), 20099 (22), 20412 (25), 20722 (24), 20883 (23), 21630 (24), 22722 (22), 23312 (22), 23565 (22), 23891 (22), 24508 (22), 26325 (22), 26478 (22), 27000 (22), 27904 (22), 29141 (22), 29313 (22), 32188 (22), 35904 (22), 36033 (22), 40070 (22), 55919 (23), 56230 (23), 58262 (22), 59584 (50), 60235 (22), 60277 (22), 60401 (22), 60668 (22), 62200 (10), 63289 (22), 63592 (10), 63944 (22), 64578 (22), 64947 (22), 67099 (7), 67165 (7), 67275 (7), 72264 (22), 72282 (22), 73994 (50), 74660 (22), 74754 (22), 75484 (22), 75705 (22), 75953 (22), 76941 (19), 77067 (19), 77093 (19), 77591 (22), 77615 (22), 77716 (22), 78254 (25), 80371 (50), 80390 (50), 80427 (50), 84737 (7), 84762 (7), 84856 (7), 86690 (7), 87111 (7), 87129 (7), 87796 (10), 88178 (10), 88923 (22), 89070 (10), 89384 (22).
Standley, P. C. & Chacon, J. 5241 (22), 6489 (23).
Standley, P. C. & Lindellie, H. O. 7416a (22).
Standley, P. C. & Padilla, E. 2478 (22), 2495 (22), 2840 (22), 3353 (24), 3454 (22).
Stanford, L. R., Lauber, & Taylor 2036 (51).
Stanford, L. R., Rutherford, K. L. & Northcraft, R. D. 826 (51).
Steere, W. C. 2287 (22), 2484 (22).
Steyermark, J. A. 29308 (23), 29464 (50), 33214 (7), 37737 (7), 37982 (9), 38497 (22), 39398 (29), 42917 (50), 42980 (36), 44056 (25), 44626 (22), 45281 (22), 49555 (24), 52174 (22).
Stork, H. E. 2788 (26), 3328 (22).
- Thieme, C. 5384 (24).
Tonduz, C. 7326 (22), 8775 (22).
- Velasco, L. V. 9007 (22).
Vioreck, H. W. 482 (51).
Von Hagen, C. & W. 1210 (24).
Von Rozynski, H. W. 41 (51), 41a (51), 485 (51), 729 (5), 759 (10).
Von Tuerckheim, H. 1198 (50), 2249 (13).
- Watson, S. 474a (22).
West, J. 3505 (41).
White, G. 77 (22), 297 (22).
Wiggins, I. L. 7511 (30).
Williams, L. 8521 (10), 9056 (27), 9251 (27), 9254 (27), 9321 (27), 9848 (27), 16039 (22).
Williams, L. & Molina, A. 10051 (24), 10118 (24), 12252 (22), 13290 (22), 14330 (24), 15843 (24).

Williams, R. S. 185 (22).

Wilson, C. L. 251 (24).

Woodson, R., Allen, P. H. & Seibert, R. 1477 (22).

Wooton, E. D. s. n. (51).

Wright, C. s. n. (22).

Wright, W. G. 1203 (21).

Yuncker, T. G., Dawson, R. F. & Youse, H. R. 5572 (23).

Yuncker, T. G., Koepper, J. M. & Wagner, K. A. 8719 (29).

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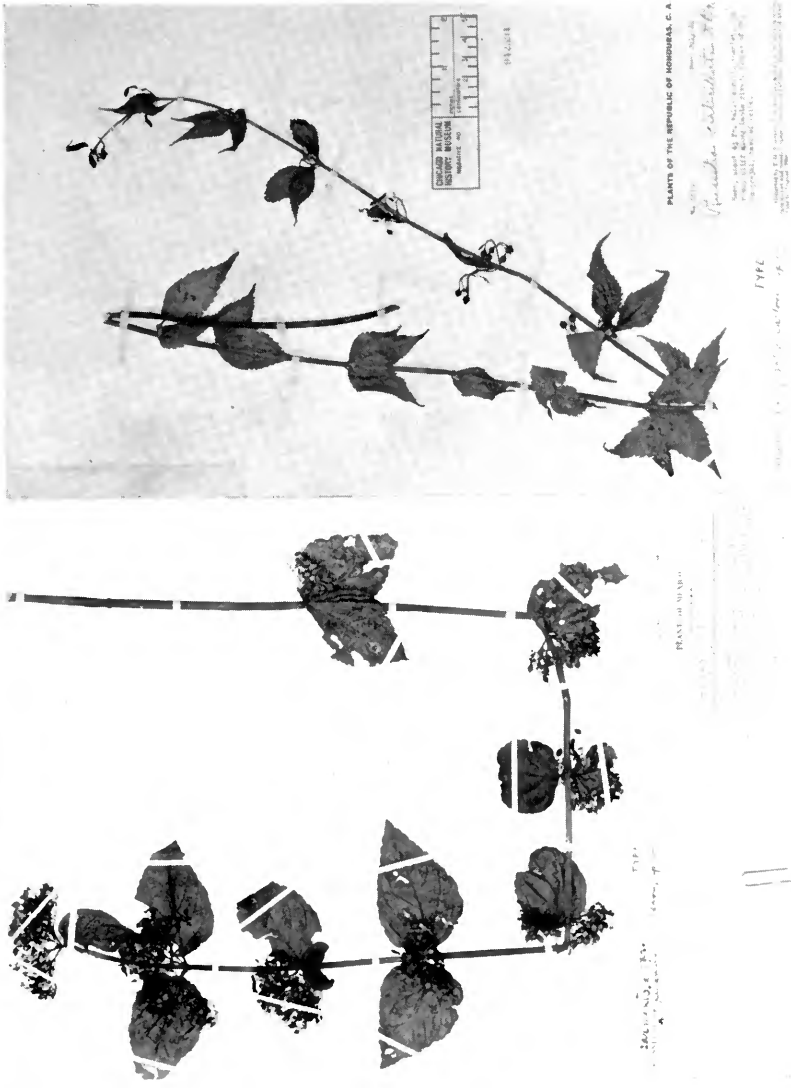


Left, *Russelia elongata* Carlson, sp. nov. Right, *R. acuminata* Carlson, sp. nov.



TYPE
RUSSELLIA standleyi Carlson
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Left, *Russelia longiseptala* Carlson, sp. nov. Right, *R. standleyi* Carlson, sp. nov.



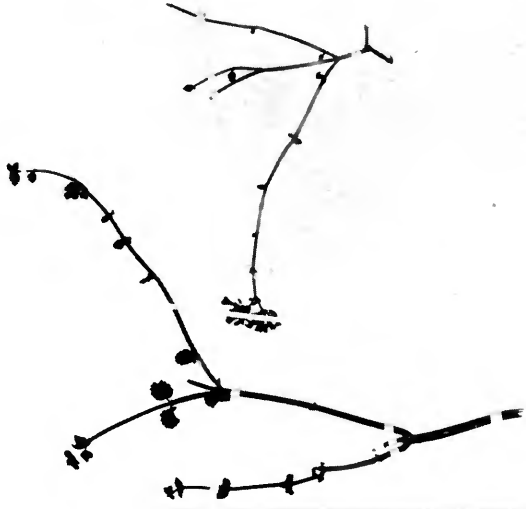
Left, *Russetia sarmentosa* var. *oaxacensis* Carlson, var. nov. Right, *R. longifolia* Carlson, sp. nov.



Left, *Russelia conzattii* Carlson, sp. nov. Right, *R. grandidentata* Carlson, sp. nov.



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PLANTS OF MEXICO

Russelia parvifolia Carlson

TYPE
 MEXICO
 PANAMA
 PANAMA
 PANAMA
 PANAMA

Left, *Russelia parvifolia* Carlson, sp. nov. Right, *R. staleyae* Carlson, sp. nov.



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