THE MEXICAN AND CENTRAL AMERICAN SPECIES OF VIBURNUM

By C. V. Morton

INTRODUCTION

The genus *Viburnum* is the commonest representative of the family Caprifoliaceae in the American Tropics, but has been generally neglected, nevertheless, probably because of the slight economic importance of the plants and the remoteness of the type specimens of the early species. Despite an abundance of recently collected material only five new species from Mexico and Central America have been described since Oersted's revision in 1861. The recent work of Killip and Smith on the South American species of *Viburnum* [1] has stimulated the author to attempt a similar revision for the northern region.

In addition to specimens in the United States National Herbarium there has been available also the tropical North American material in the following institutions: University of California (C),[2] Botanisk Museum, Copenhagen (Co), Field Museum of Natural History (F), Gray Herbarium of Harvard University (G), Royal Botanic Gardens, Kew (K), Missouri Botanical Garden (M), and the New York Botanical Garden (Y). The loan of this material, much of it indispensable to a satisfactory understanding of the group, is gratefully acknowledged. Thanks are due also to Dr. Fr. Markgraf, of the Botanisches Museum, Berlin-Dahlem, who very kindly provided notes on the type collections of *Viburnum stellato-tomentosum* Oerst. and *V. stellato-pilosum* Polak.

HISTORY OF THE GENUS

The genus *Viburnum* was established by Linnaeus,[3] to whom, however, none of the Mexican or Central American species were known. Many North American collections have been named errone-

[1] "The genus Viburnum in northwestern South America", Bull. Torrey Club **56**: 265–274. 1929, and "The South American species of Viburnum", Bull. Torrey Club **57**: 245–58. 1931.

[2] The letters in parentheses are abbreviations employed in citing specimens. The United States National Herbarium is indicated by "N".

[3] Sp. Pl. 267. 1753.

ously *V. glabratum* H. B. K., a South American species described in 1818, but a photograph (procured by E. P. Killip) of the type in the Paris Herbarium shows that this species is not very closely related to any of those known from the area under consideration. The first Mexican species to be described was *Viburnum microcarpum* Schlecht. & Cham.[4] In 1840 and 1841 five species from this area were published by Bentham,[5] namely: *V. elatum*, *V. densum*, *V. acutifolium*, *V. discolor*, and *V. hartwegi*.

In 1861 Oersted [6] revised the genus *Viburnum*, dividing it into five genera: *Oreinotinus*, *Solenotinus*, *Microtinus*, *Viburnum*, and *Tinus*. All the tropical American species, with the exception of *V. elatum* and *V. densum*, were referred to the genus *Oreinotinus*, said by Oersted to be distinguished from *Viburnum* by its "spuriously trilocular ovary." The "spurious" cells are formed by a more or less prominent intrusion of the horny endocarp. This character is important as a sectional distinction, but it can hardly be regarded as of generic value. The 11 new species of *Oreinotinus* described from Mexico and Central America by Oersted were transferred to *Viburnum* by Hemsley,[7] who listed some 20 species in all. In recent years additional species have been proposed by Gandoger, Graebner, Bartlett, and Greenman.

CLASSIFICATION OF THE SPECIES

The first important classification of the species of *Viburnum* was that made by Oersted. His various segregate genera all probably constitute good sections or subgenera. *Oreinotinus*, with which we are chiefly concerned, was subdivided as follows:

Sect. 1. Tiliaefolii.—Folia ovata v. cordata, calloso-dentata, plerumque stellato-tomentosa. Costulae subtus prominentes, rectae, parallelae marginem attingentes, indivisae v. deorsum tantum ramos paucos emittentes; ramulae tenuissimae, parallelae costulas jungentes. [*Oreinotinus microcarpus*, *O. tiliaefolius*, *O. rhombifolius*, *O. stellato-tomentosus*, *O. wendlandi*, *O. membranaceus*, and *O. stenocalyx*.]

Sect. 2. Sloaneaefolii.—Folia oblonga v. ovata, plerumque integra v. levius dentata, saepe glabra. Costulae subtus prominentes, curvatae, intra marginem anastomosantes; ramulae parallelae v. subparallelae costulas jungentes.

a. Foliis tomento v. pube stellata tectis. [*O. ferrugineus*.]

b. Foliis supra glabris v. fere glabris subtus tomentosis v. dense pubescentibus. [*O. discolor* and *O. sulcatus*.]

c. Foliis glabris v. parce pubescentibus saepe ternatim verticillatis. [*O. hartwegi*, *O. fuscus*, *O. costaricanus*, *O. stellatus*, *O. acutifolius*, and *O. microphyllus*.]

This classification has much to commend it, but unfortunately it is not strictly accurate. Whether the principal lateral veins reach the

[4] Linnaea **5**: 170. 1830.
[5] Pl. Hartw. 59, 83, 84. 1840–41.
[6] Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 267–303. 1861.
[7] Biol. Centr. Amer. Bot. **2**: 2–3. 1881.

margin is apparently determined solely by the extent of the toothing of the leaves, which varies greatly in several species. The same specimen or even the same leaf may have both veins anastomosing and veins reaching the margin.

Study of the large series of specimens brought together has shown that these same sections may be quickly and accurately distinguished by the presence or absence of pubescence on the style. This unexpected correlation has not previously been pointed out; in fact, so far as the writer has been able to ascertain, the pubescence of the style has not even been mentioned in any of the specific descriptions. When present, it is conspicuous, even in the fruiting condition. All the species of Oersted's section Tiliaefolii have pubescent styles with the exception of *V. stellato-tomentosum* (including *V. wendlandi*), which the writer considers to be more closely related to *V. discolor* Benth.

The type and distribution of pubescence afford good specific characters, as do to a lesser degree the size and form of the leaves.

GEOGRAPHIC DISTRIBUTION

Most of the Middle American species of *Viburnum* are of limited distribution. None range outside of the area under consideration, with the exception of *V. pubescens* (Ait.) Pursh, a common species of the Eastern United States, which has been collected twice in Central Mexico. It is conceivable that this species has been introduced there, but further information will be necessary in order to reach a definite conclusion.

In Mexico seven species are confined to the central xerophytic plateau or its borders, namely: *V. australe*, *V. stenocalyx*, *V. dispar*, *V. loeseneri*, *V. elatum*, *V. ciliatum*, and *V. caudatum*. Of these, two show marked affinity to United States species, *V. elatum* being a Mexican analogue of *V. prunifolium* and *V. australe* a close relative of *V. affine*. The neotropical Mexican species are much rarer in herbaria, perhaps because of the few collections made in Oaxaca, Veracruz, and Chiapas. They are 13 in number, namely: *V. guatemalense*, *V. lautum*, *V. blandum*, *V. fuscum*, *V. microphyllum*, *V. acutifolium*, *V. jucundum*, *V. sulcatum*, *V. membranaceum*, *V. hirsutum*, *V. microcarpum*, *V. tiliaefolium*, and *V. rhombifolium*. These species are all endemic to Oaxaca, Veracruz, and Chiapas, except *V. guatemalense*, which occurs also in Guatemala and El Salvador.

In Guatemala are found five species: *V. guatemalense*, *V. hartwegi*, *V. disjunctum*, *V. discolor*, and *V. optatum*. No species are known from Honduras or Nicaragua, but the genus reappears again in Costa Rica and adjacent Panama, being represented by four endemic species: *V. stellato-tomentosum*, *V. costaricanum*, *V. conspectum*, and *V. venustum*.

From this enumeration it may be seen that the localization of the various species is pronounced. Less is known concerning the altitudinal distribution. All are, however, plants of altitudes of 1,000 meters or more. The highest elevation recorded is 3,300 meters, on Mount Zempoaltepec in Oaxaca.

SYSTEMATIC TREATMENT

VIBURNUM L.

Erect trees or shrubs; leaves opposite or rarely ternate, petiolate, usually evergreen, the blades pinnately or rarely palmately veined, entire, serrate or dentate (the teeth often glandular), glabrate or variously pubescent; stipules usually none, if present borne on the petiole; flowers small, hermaphrodite, borne in compound bracteate cymes; calyx tube frequently glandular or pubescent; calyx lobes 5, usually free to base, often ciliate, usually persistent on the fruit; corolla campanulate or rotate, the lobes 5, imbricate in bud, glandular-margined; stamens 5, inserted at base of the corolla tube, the filaments narrow, attenuate at apex, the anthers versatile, longitudinally dehiscent; ovary inferior, adnate to the calyx tube, 1-celled, the ovule solitary, anatropous, pendulous from the apex; style very short and thick, glabrous or pubescent, the stigmas 3, capitate, free or connate; drupe red or black, often sulcate, the horny endocarp often inflexed and forming a prominent central intrusion.

KEY TO THE SECTIONS AND SPECIES

Fruit distinctly flattened, without a central intrusion of the endocarp. Style glabrous.
- Leaves stipulate, conspicuously dentate; fruit slightly sulcate both dorsally and ventrally; cyme peduncled ..... I. STIPULATA.
- Leaves not stipulate, entire or slightly serrate; fruit not sulcate on either face; cyme sessile ..... II. SESSILIA.

Fruit not much flattened, invariably with a central intrusion of the endocarp.
- Style glabrous.
  - Bracts at base of inflorescence leaflike. Hairs solitary or fasciculate, antrorse ..... III. BRACTEATA.
  - Bracts at base of inflorescence not leaflike.
    - Leaves glabrous on the mesophyll beneath.
      - Cymes large, several times compound ..... IV. COSTARICANA.
      - Cymes small, twice compound (thrice compound in *V. microphyllum*). V. MEXICANA.
    - Leaves densely stellate-pubescent on the mesophyll beneath. VI. DISJUNCTA.
- Style pubescent.
  - Mature leaves glabrous on the mesophyll beneath (sometimes bearded in the vein axils).
    - Leaves ciliate.
      - Leaves entire or rarely with one or two serrations near apex, glabrous on the mesophyll above; rays of the cyme eglandular ... VII. OPTATA.
      - Leaves conspicuously dentate, strigose on the mesophyll above; rays of the cyme glandular ..... VIII. CILIATA.
    - Leaves not ciliate ..... IX. CAUDATA.
  - Mature leaves stellate-pubescent on the mesophyll beneath .. X. SERRATA.

I. Stipulata

A single species (Nuevo Leon, Coahuila)..... **1. V. australe.**

II. Sessilia

Leaves acute, entire or minutely serrulate (central and southern Mexico).
2. V. elatum.
Leaves obtuse, serrate at apex (Nuevo Leon, Tamaulipas).
2a. V. elatum var. cuneifolium.

III. Bracteata

Corolla and calyx tube pubescent (Guatemala)..... **3. V. hartwegi.**
Corolla and calyx tube glabrous (Chiapas, Guatemala, and El Salvador).
4. V. guatemalense.

IV. Costaricana

Leaves opposite or in 3's, cuneate at base, entire; calyx lobes ciliate, sometimes sparingly so (Costa Rica and Panama)..... **5. V. costaricanum.**
Leaves all opposite, rounded or subcordate at base, entire or toothed; calyx lobes not ciliate.
Leaves obovate, rounded and conspicuously toothed at apex, mucronate; twigs gray, stellate-pilose (Panama)..... **6. V. conspectum.**
Leaves ovate, acute, entire or rarely with one or two teeth near apex; twigs reddish, glabrous (Costa Rica)..... **7. V. venustum.**

V. Mexicana

Stems hirsute. Calyx lobes ciliate; calyx tube eglandular; leaves ciliate (Chiapas)..... **8. V. lautum.**
Stems not hirsute.
Calyx lobes not ciliate; whole plant glabrous, except for a few long, simple hairs in the inflorescence; calyx tube eglandular (Chiapas).. **9. V. blandum.**
Calyx lobes ciliate; pubescence variously evident; calyx tube glandular.
Leaves fuscous beneath, the midrib bearing a few scattered, long, simple hairs, the vein axils bearded; branchlets and peduncle glabrous (Oaxaca)..... **10. V. fuscum.**
Leaves pale beneath, not fuscous, the midrib (when pubescent) with some stellate hairs; branchlets and peduncles with stellate pubescence (sometimes very sparse in age).
Leaves ciliate, the midrib pubescent beneath; branchlets and petioles conspicuously stellate-pubescent.
Calyx lobes stellate-pubescent and ciliate; bractlets at base of flowers stellate-pubescent and ciliate, much shorter than the calyx tube (Oaxaca)..... **11. V. microphyllum.**
Calyx lobes merely ciliate; bractlets at base of flowers merely ciliate, longer than the calyx tube (Jalisco)..... **12. V. dispar.**
Leaves not ciliate (exceptionally with a few cilia), glabrous throughout; branchlets and petioles practically glabrous (Oaxaca).
13. V. acutifolium.

VI. Disjuncta

Ovary densely stellate-pubescent; corolla pubescent; hairs on under surface of leaves sessile or in one species short-stipitate.

Leaves softly stellate-tomentose beneath (the hairs short-stipitate), stellate-pilose above (the hairs with erect branches about 1 mm long or more); calyx lobes and bractlets very densely stellate-tomentose (Chiapas).
14. V. jucundum.

Leaves stellate-puberulent beneath (the hairs sessile or rarely a few short-stipitate), sparsely stellate-pubescent above (the hairs with spreading branches less than 0.5 mm long); calyx lobes and bractlets sparingly pubescent.

Corolla bearing a few simple hairs; hairs of lower leaf surface moderately large (Guatemala)---------- **15. V. disjunctum.**

Corolla conspicuously stellate-pubescent; hairs of lower leaf surface minute (Guatemala)---------- **16. V. discolor.**

Ovary very sparingly pubescent, red-glandular; corolla glabrous; hairs on under surface of leaves long-stipitate (Costa Rica).
17. V. stellato-tomentosum.

Insufficiently known species, probably of this section (Oaxaca).
18. V. sulcatum.

VII. Optata

Veins of the leaves hirsute beneath; leaves conspicuously ciliate to base (Guatemala)---------- **19. V. optatum.**

Veins of the leaves glabrous beneath; leaves inconspicuously ciliate toward apex (Guatemala)---------- **19a. V. optatum var. vagum.**

VIII. Ciliata

Calyx lobes evidently ciliate; branchlets and petioles densely stellate-tomentose; rays of the cyme tomentose (Oaxaca)---------- **20. V. membranaceum.**

Calyx lobes not ciliate; branchlets and petioles hirsutulous, the hairs simple; rays of the cyme glabrate (Hidalgo)---------- **21. V. ciliatum.**

IX. Caudata

A single species (Hidalgo, Veracruz)---------- **22. V. caudatum.**

X. Serrata

Leaves small (5 cm long or usually less), subentire or shallowly dentate; calyx lobes densely stellate-pubescent when young; corolla sparsely stellate-pubescent; cyme not over 3 cm wide (Mexico)---------- **23. V. loeseneri.**

Leaves large (very much more than 5 cm long, except sometimes in *V. stenocalyx*), conspicuously serrate, dentate, or sinuate-dentate; calyx lobes glabrous on the back (except in *V. hirsutum* and *V. tiliaefolium*); corolla glabrous (except sometimes in *V. stenocalyx*); cymes at least 5 cm wide, usually more.

Petioles, branchlets, peduncles, rays of the cyme, and calyx tube all densely hirsute; leaves strigose above (Oaxaca)---------- **24. V. hirsutum.**

Petioles, branchlets, peduncles, rays of the cyme, and calyx tube stellate-tomentose; leaves stellate-pubescent (except sometimes in *V. stenocalyx*) or glabrous above.

Intrusion of the fruit very prominent, long-stalked, the seed conspicuously curved; leaves substrigose above, the hairs mostly simple, or furcate at base, rarely with 3 to 5 antrorse branches; hairs beneath comparatively few, sessile, few-branched (central Mexico).
25. V. stenocalyx.

Intrusion of the fruit obviously flattened and scarcely stalked, the seed lightly curved; leaves glabrous above or stellate-pubescent (the branches erect, not antrorse), stellate-tomentose beneath, the hairs many-branched.

Leaves glabrous above, rhombic or obovate, sharply serrate (especially toward the apex), cano-tomentose beneath (Veracruz, Puebla). **26. V. microcarpum.**

Leaves stellate-pubescent above, sinuate-dentate or sinuate-denticulate, more loosely tomentose beneath.

Leaves ovate or suborbicular, irregularly sinuate or sinuate-denticulate, subcordate or cordate at base; rays of the cyme densely tomentose; calyx tube glandular, often conspicuously so; calyx lobes usually pubescent on the back (Veracruz)__**27. V. tiliaefolium.**

Leaves rhombic, regularly sinuate-dentate, rounded but not at all cordate at base; rays of the cyme thinly tomentose; calyx tube eglandular or practically so; calyx lobes glabrous on the back (Veracruz)_____ **28. V. rhombifolium.**

Species excluded from foregoing groups (central Mexico). **29. V. pubescens.** **30. V. stellatum.**

1. Viburnum australe Morton, sp. nov.

Sect. *Stipulata.* Ramuli angulati, sparse glandulosi, demum omnino glabri; petioli glandulosi, hispiduli, stipulas persistentes lineares glandulosas hispidulas gerentes; laminae foliorum late ovatae vel suborbiculares, apice breviter acuminatae, basi cordatae vel subcordatae, evidenter dentatae, ciliatae, supra juventute sparse strigosae demum glabratae, subtus glandulosae, venis hirsutulis, axillis barbatis; pedunculi glandulosi, pilos stellatos multiradiatos paucos gerentes; bracteae conspicuae, basi angustatae, glanduolsae, sparse pubescentes, pilis simplicibus et stellatis; cymae radii dense glandulosi; bracteolae lineares, glandulosae, ciliatae; calycis tubus cylindricus, dense glandulosus; calycis lobi acuti, eglandulosi, extus glabri, ciliati; corolla glabra; stylus glaber; fructus compressus, carnosus, dorso 3-sulcatus, ventre 2-sulcatus, endocarpio haud inflexo.

Branches angled, dull, glabrous, pale; branchlets similar, sparsely glandular; leaves opposite, petiolate, the petiole up to 1 cm long, glandular, hispidulous, stipulate, the stipules persistent, borne on the petiole about 1.5 to 2 mm above its base, linear, up to 5 mm long, glandular and hispidulous; blades broadly ovate to suborbicular, the larger 6 cm long by 4.5 cm wide, cordate or subcordate at base, abruptly short-acuminate at apex, conspicuously dentate (the teeth broad, extending to the middle of the blade or below), ciliate, above sparsely but uniformly strigose (the hairs all simple), glabrate with age, beneath glandular, hispidulous on the veins and veinlets, densely bearded in the vein axils; lateral veins 2 to 5, straight, reaching the margin; peduncle up to 3.5 cm long, conspicuously glandular, bearing a few stellate hairs, these with numerous spreading branches; bracts at base of inflorescence conspicuous, up to 1.5 cm long, 2 mm broad at middle, narrowed at base, glandular and sparsely pubescent, the hairs both simple and stellate; cyme up to 5.7 cm wide and 3 cm long, twice compound, the primary rays 6 to 8, very densely glandular; bractlets of cyme linear, glandular, sparingly ciliate; calyx tube 2 to 2.5 mm long, cylindric, densely glandular; calyx lobes about 1 mm long, acute, ciliate with long simple hairs, glabrous on the back, eglandular; corolla 3.5 to 4 mm long, glabrous; stamens slightly exserted, the filaments about 4 mm long; style glabrous; fruit much flattened, about 1 cm long, 8 mm wide, and 3 mm thick, fleshy, the endocarp 3-sulcate on one face (the central groove very slight, the lateral pronounced) and lightly 2-sulcate on the other, with no ventral intrusion.

Type in the U.S. National Herbarium, no. 462237, collected in the Sierra Madre above Monterrey, Nuevo León, Mexico, alt. about 900 meters, April 25, 1906, by C. G. Pringle (no. 10193). Duplicates in all the herbaria consulted.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: General Cepida, Coahuila, Apr. 20, 1902, *Nelson* 6725 (G, N). Caracol Mountain, 21 miles southeast of Monclova, Coahuila, February–October 1880, *E. Palmer* 388 (G, K, N).

This is a truly remarkable new species, which has previously been identified as *Viburnum membranaceum* (Oerst.) Hemsl. Examination of the type specimen of the latter species shows, however, that it is utterly different and can not even be referred to the same section. *V. australe* is, in fact, by the structure of the fruit, by the stipules, and by general habit closely related to a United States species, *V. affine* Bush (excluding the var. *hypomalacum*, which is to be considered a distinct species). It differs, however, from *V. affine* as follows:

Lobes of the calyx distinct almost to base, about 1 mm long; primary leaf veins, as also the minute intermediate veinlets, hirsutulous beneath; glands of the calyx tube large, conspicuously stipitate ..... **V. australe.**

Lobes of the calyx united for half their length into a rotate disk, about 0.5 mm long; principal leaf veins hirsutulous beneath, the veinlets glabrous; glands of the calyx tube very minute, scarcely if at all stipitate ..... **V. affine.**

2. Viburnum elatum Benth. Pl. Hartw. 59. 1840.

Viburnum densum Benth. Pl. Hartw. 59. 1840.

Branches stout, pale brown, terete, smooth, not shining, glabrous; branchlets similar, very slender, slightly angular, black-punctate; buds glabrous; leaves opposite, petiolate, the petiole 1 cm long or less, deeply channelled above, winged to base, glabrous, black-punctate; blades ovate to lanceolate, small (the larger 6 cm long, 3 cm wide), acute or bluntly acuminate at apex, cuneate at base, entire or minutely serrulate, almost concolorous, glabrous, conspicuously black-punctate beneath; principal veins 5 to 7, inconspicuous, scarcely if at all elevated beneath, arcuate and anastomosing; peduncle none; cyme thrice compound, up to 3 cm long and 6.5 cm wide, the primary rays 4 or 5, about 1.5 cm long, glabrous, black-punctate; bractlets of inflorescence minute, 1 mm long or less, glabrous, those subtending the flowers about one-fourth as long as the calyx tube; calyx tube cylindric, about 2 mm long, glabrous; calyx lobes rounded, minute (about 0.5 mm long), glabrous; corolla white, rotate-campanulate, about 3 mm long, glabrous; style glabrous; fruit much flattened, black, about 10 mm long, 8 mm wide, and 3 mm thick, fleshy, not sulcate on either face, the intrusion absent.

Type in the Kew Herbarium, collected at Tlalpuxahua, Mexico, May 1830, by Graham. Duplicate in the Gray Herbarium.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Real del Monte, May 1830, *Graham* (K; type of *V. densum*); Mar. 22, 1849, *Gregg* 619 (G, M). Chiapas, *Linden* 567 (K). Tlopisca, Chiapas, May 14, 1904, *Goldman* 973 (N); May 7, 1904, *Goldman* 936 (N). Zimapan, Hidalgo, *Coulter* 216 (G), 903 (G). Vicinity of Morelia, Michoacán, alt. 1,950 meters, April 1911, *Arsène* 5256 (G, M, N). Sierra Madre, Michoacán or Guerrero, alt. 1,600 meters, May 2, 1899, *Langlassé* 1017 (N). Alvarez, San Luis Potosí, Sept. 5–10, 1902, *Palmer* 120 (G, M, N, Y); July 13–23, 1904, *Palmer* 196 (F, K, M, N, Y). Near Toluca, Mexico, April 1834, *Andrieux* 339 (K), 340 (K). Thickets near Eslaba, Federal District, alt. 2,400 meters, Nov. 17, 1903, *Pringle* 11466 (Co, F, G, N); alt. 2,240 meters, May 27, 1904, *Pringle* 13012 (Co, F, G, N); alt. 2,240 meters, Apr. 13, 1904, *Pringle* 13011 (Co, F, G, N). By streams, base of Sierra de Ajusco, Federal District, alt. 2,250 meters,

Aug. 16, 1897, *Pringle* 6666 (C, F, M, N, Y); Nov. 2, 1896, *Pringle* 6226 (C, F, G, M, N, Y). Valley of Mexico, Oct. 10, 1896, *Pringle* (N). Ahuasco, March 1848, *Halstead* (G). Without specific locality, *Uhde* 710 (C, N); *Ehrenberg* 578 (C, N); *Coulter* 630 (G).

This, the most widespread species in Mexico, is somewhat variable and may be divisible into recognizable varieties. The types of *V. densum* and *V. elatum* are almost identical. *V. elatum* is most closely related to the United States species, *V. prunifolium* L.

2a. Viburnum elatum Benth. var. **cuneifolium** (Bartlett) Morton.

Viburnum cuneifolium Bartlett, Proc. Amer. Acad. 44: 635. 1909.

Differs from the typical form of the species only in its smaller, obtuse leaves, serrate at apex.

Type in the Gray Herbarium, collected in the Sierra Madre above Monterrey, Nuevo León, Mexico, alt. 750 meters, Mar. 27, 1906, by C. G. Pringle (no. 10234). Duplicates are in all the herbaria consulted.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Santa Rita Ranch, South Victoria, Tamaulipas, alt. 1,500 meters, Apr. 7, 1926, *Runyon* 986 (N), 1048 (N).

This variety is the most northerly representative of the genus in Mexico.

3. Viburnum hartwegi Benth. Pl. Hartw. 84. 1841.

Branchlets stout, about 3.5 mm thick, angled, densely pubescent when young with antrorse, fasciculate, yellowish hairs; bud scales densely pubescent; leaves opposite, petiolate, the petiole up to 15 mm long, canaliculate, pubescent like the branchlets; blades elliptic or elliptic-lanceolate, the larger about 9.5 cm long and 4.5 cm wide, cuneate and somewhat oblique at base, obtusely acuminate at apex, entire, shining, almost glabrous above (the hairs very few, minute, solitary or fasciculate), paler beneath and not shining, the pubescence similar to that of the upper surface, more dense on the veins, the vein axils conspicuously barbate; primary veins about 4, arcuate-ascending, anastomosing before reaching the margin, slightly elevated on both surfaces; peduncle about 2 cm long, stout, about 2 mm thick, densely pubescent like the branchlets; bracts at base of inflorescence deciduous; cyme very large, up to 11 cm wide and 6.5 cm long, 3 to 4 times compound, the primary rays about 8, up to 3 cm long, the secondary shorter, all densely yellowish pubescent like the branchlets; terminal flowers sessile, the lateral short-pedicellate; calyx tube subcylindric, not red-glandular, minutely strigose, the hairs antrorse, solitary or fasciculate; calyx lobes low, about 0.75 mm long, rounded, strigose, long-ciliate; corolla campanulate, about 3 mm long, strigose; anthers scarcely exserted, orbicular, about 0.75 mm long; style glabrous.

Type in the Kew Herbarium, collected in the Santa María Mountains near Guatemala City, Guatemala, 1840, by Hartweg (no. 580). Duplicate at the New York Botanical Garden.

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Santiago, Dept. Zacatepequez, alt. about 1,950 meters, in 1891, *Gomez* (J. D. Smith, no. 859; G, K, N).

4. Viburnum guatemalense Gandog. Bull. Soc. Bot. France 65: 33. 1918.

Shrub or tree, 2 to 7.5 meters high; branches terete, glabrous; branchlets slightly angled, strigose, the hairs fasciculate, usually in pairs; leaves opposite, petiolate, the petiole up to 12 mm long, sparsely pubescent like the branchlets; blades elliptic or lanceolate-elliptic, the larger about 13.5 cm long by 5.3 cm wide, sharply or obtusely acuminate at apex, cuneate and complicate at base, entire, glabrate

above at maturity (the hairs very few and inconspicuous, fasciculate, antrorse), beneath paler, pubescent like the upper surface, and more or less densely bearded in the vein axils; primary veins about 5, arcuate-ascending, anastomosing toward the margin; peduncle long (up to 12 cm), very stout, pubescent like the branchlets, glabrescent; bracts at base of inflorescence leaflike, up to 5 cm long, numerous, petiolate, pubescent like the leaves; cyme very large, up to 13 cm wide and 8.5 cm long, 4 to 5 times compound, the primary rays 7 to 9, up to 6 cm long, the secondary shorter, all pubescent like the branchlets; terminal flowers sessile, the lateral pedicellate; bractlets at base of flowers linear, ciliate, longer than the calyx tube; calyx tube cylindric-obconic, 1.5 mm long or less, glabrous or sparsely glandular; calyx lobes deltoid, about 0.75 mm long, rounded at apex, glabrous on the back, ciliate; corolla white, campanulate, about 3 mm long, glabrous; stamens slightly exserted; style glabrous; fruit black, ellipsoidal, scarcely flattened, about 8 mm long, 6 mm wide, 4 mm thick, scarcely fleshy, glabrous, deeply sulcate on the ventral face, the intrusion prominent, bilobed.

The very brief original description is based upon material collected in Alta Verapaz by von Tuerckheim. The collector's number is not cited.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Chiapas, 1864–70, *Ghiesbreght* 809 (G, K). Finca Covadonga, Chiapas, June 1913, *Purpus* 7833 (C, G, M, N).

GUATEMALA: San Lucas, alt. 1,500 meters, Jan. 23, 1907, *Kellerman* 6628 (F). Near Antigua, Dept. Sacatepequez, alt. 1,800 meters, Feb. 3, 1908, *Kellerman* 7575 (F). Volcán de Agua, Dept. Sacatepequez, alt. 2,850 meters, Feb. 5, 1908, *Kellerman* 7453 (F, Y). Near Chimaltenango, alt. about 1,800 meters, Feb. 4, 1931, *Bequaert* 2 (F). Near San Rafael, near Guatemala City, alt. 1,465 meters, Feb. 3, 1907, *Kellerman* 6452 (F). Laguna de Ayarza, Dept. Jalapa, alt. about 2,400 meters, September 1892, *Heyde & Lux* (J. D. Smith, no. 3972; G, N). Near San Lucas, Dept. Antigua, Oct. 30, 1896, *Seler* 2413 (G, K, N, Y). Cobán, Dept. Alta Verapaz, alt. 1,300 meters, August 1885, *von Tuerckheim* 41 (F, G, K, N); January 1903, *von Tuerckheim* 8489 (F, G, N); April 1889, *J. D. Smith* 1730 (N, Y); September 1907, *von Tuerckheim* II, 679 (Co, F, G, M, N, Y); Nov. 9, 1919, *Johnson* 37 (N). Santa Rosa, Dept. Santa Rosa, alt. 900 meters, August 1892, *Heyde & Lux* (J. D. Smith, no. 3971; G, N). Without specific locality, *Heyde* 230 (N), 437 (N); *Salas* 654 (N).

EL SALVADOR: San Juan de Diós, alt. 1,470 meters, Feb. 27, 1907, *Pittier* 1992 (N). Comasagua, December 1922, *Calderón* 1368 (N, Y). Volcán de San Vicente, Dept. San Vicente, alt. 1,200 to 1,500 meters, Mar. 7–8, 1922, *Standley* 21591 (G, N, Y). Volcán de San Salvador, alt. 1,000–1,800 meters, Apr. 7, 1922, *Standley* 22869 (G, M, N, Y); *Calderón* 460 (N).

5. Viburnum costaricanum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 2. 1881.

Oreinotinus costaricanus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 290. 1861.

Tree up to 9 meters high; branches more or less angled, about 3 mm thick, glabrous; branchlets angled or subterete, at first stellate-pubescent (the hairs sessile, with several short branches), glabrescent; leaves opposite or in 3's, petiolate, the petiole sulcate, up to 1.3 cm long, pubescent like the branchlets, at length glabrate; blades elliptic, or oblanceolate to obovate, the larger 12 cm long by 4.5 cm wide, cuneate at base, abruptly short-acuminate or merely acute at apex, entire, pale beneath, when young sparsely pubescent above with few-branched, sessile, stellate hairs, at length glabrous except along the midribs.

beneath sparsely stellate-pubescent at first, the hairs chiefly confined to the midvein and primary veins, glabrate at maturity; peduncle up to 6 cm long, glabrate; bracts at base of inflorescence not seen; cyme 3 to 5 times compound, up to 16 cm wide and 8 cm long, the primary rays 5 to 8, up to 3 cm long, sparsely stellate-pubescent, slightly or not at all glandular; bractlets of inflorescence ciliate, those subtending the flowers equal to or shorter than the calyx tube; calyx tube short, 1 mm long or less, glabrous, sparingly red-glandular; calyx lobes broadly deltoid, about 0.5 mm long, glabrous, ciliate; corolla creamy white, rotate-campanulate, 2 to 3 mm long, glabrous, the lobes broadly rounded; stamens obviously exserted, the filaments 3 to 4 mm long, the anthers elliptic, 1 mm long; style glabrous, conspicuous; fruit green or black, ellipsoidal, 4 to 8 mm long, 3 to 6 mm wide, 2 to 5 mm thick, scarcely fleshy, shallowly sulcate ventrally, the intrusion very narrow and flat.

Type in the Copenhagen Herbarium, collected on Volcán Irazú, Costa Rica, alt. about 2,700 meters, January 1847, by Oersted (no. 7808).

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Hills of Santiago, near San Ramón, alt. 1,300 meters, May 3, 1901, *Brenes* (Herb. Nat. Cost. 14316; K, N). Forests of Achiote, Volcán Poás, alt. 2,200 meters, November 1896, *Tonduz* (Herb. Nat. Cost. 10806; N). Banks of Río Segunda, January 1890, *Tonduz* (Herb. Nat. Cost. 1716; N). Volcán Irazú, alt. 2,700 meters, June 24, 1874, *Kuntze* 2275 (K, Y). Alto de la Estrella, Prov. Cartago, Mar. 26–27, 1924, *Standley* 39277 (N). Zurquí, Prov. San José, alt. 2,000–2,500 meters, Feb. 13, 1926, *Standley & Valerio* 48126 (N). Vicinity of Fraijanes, Prov. Alajuela, alt. 1,500–1,700 meters, Feb. 12–13, 1926, *Standley & Torres* 47659 (N). San Cristóbal Road, alt. 2,400 meters, May 27, 1928, *Stork* 2223 (F). Cerro de las Vueltas, alt. 2,700–3,000 meters, Dec. 29, 1925–Jan. 1, 1926, *Standley & Valerio* 43515 (N). Santa María de Dota, Prov. San José, alt. 1,500–1,800 meters, *Standley* 42519 (F, N); *Standley & Valerio* 43466 (N). Near Finca La Cima, above Los Lotes, north of El Copey, Prov. San José, alt. 2,100–2,400 meters, Dec. 21–22, 1925, *Standley* 42583 (N). Oak forest near Quebradillas, about 7 km north of Santa María de Dota, Prov. San José, alt. 1,800 meters, Dec. 24, 1925, *Standley* 43045 (N). Cervantes, near Cartago, alt. 1,300 meters, December 1896, *Tonduz* (Herb. Nat. Cost. 10422; N). Cañas Gordas, alt. 1,100 meters, February 1897, *Pittier* (Herb. Nat. Cost. 11188; Co, N). Estrella, May 30, 1928, *Stork* 2832 (F). Two miles southwest of Agua Caliente, Apr. 1, 1928, *Stork* 1318 (F). El Copey, alt. 1,800 meters. March 1898, *Tonduz* 7354 (Herb. Nat. Cost. 11923; F, G, N, Y).

PANAMA: Vicinity of El Boquete, Chiriquí, alt. 1,000–1,300 meters, Mar. 16, 1911, *Maxon* 5379 (F, N).

The present species is undoubtedly an aggregate. The Kuntze specimen cited (from the type locality) is a good match for the type in the Copenhagen Herbarium. Many of the other specimens show marked variations. Although some of these are undoubtedly of taxonomic importance, I have been unable to provide a satisfactory classification.

6. Viburnum conspectum Morton, sp. nov.

Sect. *Costaricana.* Ramuli juventute stellato-pilosi, pilis sessilibus pauciradiatis, demum glabrati; petioli stellato-pubescentes; laminae foliorum suborbiculares vel late obovatae, apice rotundatae, mucronatae, serratae, basi rotundatae vel subcordatae, integrae, supra juventute parce stellato-pubescentes, demum glabrae, subtus venis substrigosae, alioqui glabrae; bracteae parvae, lineares, acuminatae, utrinque glabrae, ciliatae; cymae radii stellato-puberulenti, sparse

nigroglandulosi; calycis tubus cylindrico-obconicus, parce strigosus; calycis lobi deltoidei, fere glabri, eciliati; corolla rotato-campanulata, glabra; stylus glaber.

Shrub 0.4 to 1 meter high; branches thick, about 8 mm in diameter, glabrous, shining, with large lenticels; branchlets similar, about 2.5 mm in diameter, stellate-pilose when young, the hairs sessile, with few long, spreading branches; buds densely pubescent; leaves opposite, petiolate, the petiole short, about 5 mm long, deeply channelled above, conspicuously stellate-pubescent; blades suborbicular or broadly obovate, the larger 7.5 cm long and 5 cm wide, rounded and short-mucronate at apex, rounded or subcordate at base, serrate at apex (the teeth glandular), entire below the apex, deep green above, pale beneath, glabrous above at maturity, sparingly stellate-pubescent when young (the hairs sessile, few-branched), beneath conspicuouly substrigose on the veins, otherwise glabrous; principal lateral veins about 3, reaching the margin; peduncle short, up to 3 cm long, 1.5 mm thick, pubescent like the branchlets; bracts at base of inflorescence small, linear, up to 8 mm long and 1 mm wide at base, acuminate at apex, glabrous on the surfaces, ciliate; cyme twice compound, up to 3.5 cm high and 7 cm broad, the primary rays about 7, up to 2.5 cm long, the secondary very short, all stellate-puberulent, sparingly black-glandular; bractlets of inflorescence numerous, linear, persistent; calyx tube cylindric-obconic, about 1.5 mm long, sparsely strigose; calyx lobes deltoid, about 1 mm long, concave, almost glabrous, near the base beset with a few, straight, simple hairs, not ciliate; corolla about 3 mm long, rotate-campanulate, glabrous; stamens not exserted; style glabrous.

Type in the U.S. National Herbarium, no. 677659, collected between the Río Ladrillo and Los Siguas Camp, southern slopes of Cerro de la Horqueta, Chiriquí, Panama, alt. 1,200 to 1,700 meters, Mar. 17–19, 1911, by H. Pittier (no. 3268). Duplicates at the Field Museum.

This striking species is known only from the original collection.

7. Viburnum venustum Morton, sp. nov.

Sect. *Costaricana.* Ramuli teretes, nitentes, rubescentes, glabri; petioli glabri vel pilis paucis simplicibus instructi; laminae foliorum ovatae, apice longe acuminatae, basi rotundatae vel truncatae, integrae vel raro sursum dentibus paucis acutis glandulosis instructae, supra nitentes nervo medio stellato-pubescentes, alioqui glabrae, subtus glabrae (venarum axillis exceptis), eciliatae; pedunculi glabrati; bracteae lineari-lanceolatae, glanduloso-ciliatae; cymae radii pilosuli, rubroglandulosi; bracteolae extus substrigosae, eciliatae vel vix ciliatae; calycis tubus obconicus, glaber, saepe eglandulosus; calycis lobi deltoidei, glabri; corolla rotato-campanulata, glabra; stylus glaber; fructus ovoideus, niger, ventre sulcatus, endocarpio evidenter inflexo.

Branchlets terete, 3 to 3.5 mm thick, shining, reddish, glabrous; leaves opposite, petiolate, the petiole up to 2 cm long, scarcely channelled above, glabrous or with a few scattered simple hairs; blade ovate, the larger 12 cm long and 7 cm wide, sharply long-acuminate at apex, rounded or truncate at base, entire or rarely with a pair of sharp glandular teeth near the apex, very lustrous above, pale beneath, not ciliate, above sparsely stellate-pubescent on the depressed midvein, otherwise glabrous, beneath bearded in the vein axils, otherwise glabrous; lateral veins about 4, arcuate and anastomosing, prominent beneath, secondary veins conspicuous, reticulate; peduncle variable in length, glabrate, the hairs few, scattered; bracts at base of inflorescence linear-lanceolate, not leaflike, about 11 mm long, 1.5 mm wide at base, glandular-ciliate; cyme variable in size, 3 to 4 times compound, up to 6 cm high and 10 cm wide, the primary rays about 7, up to 3 cm long, the secondary rays much shorter, all conspicuously pilosulous, red-glandular; bractlets of inflorescence numerous, persistent, linear-lanceolate, substrigose on the back, not or very sparingly ciliate; calyx tube obconic, 1 to 1.5 mm long, glabrous, usually eglandular; calyx lobes deltoid, up to 1

mm long, acute, entirely glabrous; corolla white, rotate-campanulate, 2.5 to 3 mm long, glabrous; stamens not exserted, the filaments short, glabrous, the anthers elliptic, 1 mm long; style conspicuous, glabrous; fruit ovoid, black, flattened, about 6 mm long, 5 mm wide, 2.5 mm thick, slightly fleshy, deeply sulcate ventrally, the intrusion prominent, bilobed, the persistent calyx lobes erect, conspicuous.

Type in the U.S. National Herbarium, no. 1,306,420, collected on Cerros de Zurquí, northeast of San Isidro, Prov. Heredia, Costa Rica, alt. 2,000 to 2,400 meters, March 3, 1926, by Paul C. Standley and J. Valerio (no. 50545).

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Volcán de Poás, alt. 2,600 meters, Mar. 31, 1907, *Pittier* 2053 (N). Forests of Rancho Flores, alt. 2,043 meters, Feb. 22, 1890, *Tonduz* (Herb. Nat. Cost. 2108; F, N). Vicinity of La Palma, on the road to La Hondura, alt. 1,500–1,700 meters, July 17–18, 1923, *Maxon & Harvey* 7987 (N). Las Nubes, Prov. San José, alt. 1,500–1,900 meters, Mar. 20–22, 1924, *Standley* 38747 (N). Cerros de Zurquí, Prov. Heredia, alt. 2,000–2,400 meters, Mar. 3, 1926, *Standley & Valerio* 50479 (N).

All these specimens have been referred previously to *V. stellatum* (Oerst.) Hemsl., but examination of the type material of that species shows that *V. venustum* is not at all closely related, its alliance being with *V. costaricanum*.

8. Viburnum lautum Morton, sp. nov.

Sect. *Mexicana*. Ramuli graciles, hirsuti; petioli glabrati; laminae foliorum ovales vel ellipticae, apice acutae, basi cuneatae vel rotundatae, integrae vel dentibus glandulosis paucis basi instructae, subtus juventute nervis mediis hirsutae, venis lateralibus hirsutulae, aetate glabrescentes; pedunculi hirsuti; bracteae lineari-oblanceolatae, apice acutae, basi attenuatae, parce ciliatae; cymae radii hirsuti, eglandulosi; bracteolae lineares, ciliatae; calycis tubus obconicus, glaber, eglandulosus; calycis lobi deltoidei, ciliati; corolla glabra; stylus glaber.

Small tree, 1.5 to 1.8 meters high; branchlets slender, about 1.5 mm thick, conspicuously but not densely hirsute, the hairs widely spreading, usually simple, rarely 2- or 3-branched at base; buds glabrate; leaves opposite, petiolate, the petiole slender, 5 to 8 mm long, deeply channelled and slightly 2-winged above, glabrate, bearing a few simple hairs; blades oval or elliptic, the largest 4.5 cm long by 2.5 cm wide, acute or rarely subacuminate at apex, rounded or cuneate at base, entire or sometimes with 1 or 2 pairs of inconspicuous glandular teeth near the base, conspicuously ciliate, green above, very pale beneath, glabrous on the leaf tissue of both surfaces, beneath hirsute along the midrib when young, hirsutulous along the principal lateral veins, glabrescent with age, the hairs all simple; principal lateral veins about 4, arcuate and anastomosing; peduncle 3 to 5 cm long, about 1.4 mm thick, pubescent like the branchlets; bracts at base of inflorescence deciduous, linear-oblanceolate, acute at apex, narrowed at base, about 1 cm long, 1.4 mm wide at widest place, sparingly ciliate, otherwise glabrous; cyme twice compound, about 2 cm high and 4 cm wide, the primary rays 6 or 7, up to 1.4 cm long, the secondary very short, all conspicuously pubescent like the branchlets, eglandular; bractlets of the inflorescence numerous, linear, subpersistent, ciliate, otherwise glabrous; calyx tube obconic, about 2 mm long, glabrous, eglandular, calyx lobes deltoid, about 1 mm long, obtusish, conspicuously ciliate, otherwise glabrous; corolla white, open-campanulate, about 3 mm long, glabrous, the lobes rounded; stamens slightly exserted; style glabrous.

Type in the Gray Herbarium, collected in Chiapas, Mexico, 1864–70, by A. Ghiesbreght (no. 517). Duplicates at Kew and the Missouri Botanical Garden.

Viburnum lautum is apparently not closely related to any of the other species of the section *Mexicana*. The pubescence is characteristic.

9. Viburnum blandum Morton, sp. nov.

Sect. *Mexicana*. Ramuli teretes, rubescentes, nitentes, glabri; petioli glabri, canaliculati; laminae foliorum ovales, apice longe acuminatae, basi cuneatae, integrae, glabrae; pedunculi graciles, glabri; cymae radii glabri; bracteolae lineares, glabrae; calycis tubus cylindrico-obconicus, glaber, eglandulosus; calycis lobi deltoidei, glabri, ciliati; corolla campanulato-rotata, glabra, lobis saepe reflexis; stylus glaber.

Branchlets terete or slightly angular, about 2 mm thick, reddish, shining, glabrous, the epidermis thin, hyaline, exfoliating; buds glabrous or with a few long hairs at the tip; leaves opposite, petiolate, the petiole 6 to 8 mm long, glabrous, channelled above; blades oval, the largest 8 cm long and 3 cm wide, sharply long-acuminate at apex, cuneate at base, dark green above, pale yellowish green beneath, entire except for a pair of marginal glands near the base, completely glabrous; principal veins about 6 pairs, the intermediate veins very numerous and obviously reticulate; peduncle 2.5 to 4 cm long, slender (about 0.8 mm wide), glabrous; bracts at base of inflorescence deciduous; cyme twice compound, up to 2.5 cm long and 4 cm wide, the primary rays up to 14 mm long, the secondary much shorter, all glabrous; terminal flowers sessile in clusters of 2 or 3, lateral flowers short-pedicellate, the pedicels up to 3 mm long, glabrous; bractlets subtending the flowers linear, slightly longer than the calyx tube, glabrous, deciduous; calyx tube cylindric-obconic, about 2 mm long, glabrous, eglandular; calyx lobes deltoid, about 0.7 mm long, glabrous, not ciliate; corolla campanulate-rotate, about 3.5 mm long, glabrous, the lobes rounded, about 1.5 mm long, more or less reflexed; filaments slightly exserted; style glabrous.

Type in the U.S. National Herbarium, no. 256530, collected at Pinabete, Chiapas, Mexico, alt. 2,200 to 2,700 meters, Feb. 8, 1896, by E. W. Nelson (no. 3782). A duplicate is in the Gray Herbarium.

This species is easily distinguished by its nonciliate calyx lobes and bracts and the almost complete absence of pubescence. Neither the calyx tube nor the rays of the cyme are glandular.

10. Viburnum fuscum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 2. 1881.

Oreinotinus fuscus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 289. 1861.

Branches terete, about 3 mm thick, smooth, glabrous and shining, marked by conspicuous lenticels, brownish; branchlets slender, about 1.5 mm thick, shining, red, glabrous except for a few long simple antrorse hairs; bud scales pubescent at apex; leaves opposite, petiolate, the petiole canaliculate above, 5 to 7 mm long, when young pubescent like the branchlets, glabrous at maturity; leaf blades elliptic or elliptic-oblanceolate, the larger 10 to 10.5 cm long and 4.5 to 5 cm wide, cuneate at base, long-acuminate, entire, green above, pale and reddish beneath, glabrous except for a few scattered simple hairs on the veins beneath; primary veins 4 or 5, arcuate-ascending, anastomosing, not reaching the margin; peduncle long (4 to 6 cm), glabrous, reddish; bracts at base of inflorescence oblong or oblanceolate, acute, ciliate; cyme 3 to 5 cm wide, almost glabrous, twice compound, the primary rays 6 or 7, 1.2 to 1.7 cm long, the secondary much shorter; terminal flower sessile, lateral pedicellate, the pedicels slender, 1.5 to 2 mm long; bractlets present at the base of each flower, linear or linear-oblong, longer than the calyx tube, ciliate; calyx tube cylindric-obconic, 1.5 mm long or less, glabrous, sparingly red-glandular; calyx lobes deltoid, acute or rounded, about 0.5 mm long, glabrous, conspicuously ciliate; corolla rather fleshy, open-campanulate, about 5 mm wide, 2.5 mm long, glabrous, the lobes rounded, glandular-margined; style glabrous.

Types in the Copenhagen Herbarium, collected by Liebmann, in Oaxaca, Mexico, at Totontepec (no. 7809), at Tonaguia (no. 7810), and at San Jago Amatlan (no. 7811).

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Near Totontepec, Oaxaca, alt. 1,250–1,800 meters, July 15–28, 1894, *Nelson* 828 (N).

Viburnum fuscum Oerst. was reduced to the synonymy of *V. acutifolium* Benth. by Standley,[8] but incorrectly so. The only specimen of this species seen in American herbaria is the Nelson collection (from the type locality) cited above, which had been identified as *V. glabratum* H. B. K. Examination of the type specimens of both *V. fuscum* and *V. acutifolium* shows the two species to be very distinct, not only in the characters pointed out in the key but also in leaf shape and general habit.

11. Viburnum microphyllum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.

Oreinotinus microphyllus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 293. 1861.

Branches terete, about 2 mm thick, glabrous, rough and conspicuously fissured, lenticels numerous, black; branchlets slightly ribbed, pubescent, the hairs stellate, sessile (the branches few and short); bud scales pubescent with simple hairs; leaves opposite, petiolate, the petiole 5 to 8 mm long, sulcate, pubescent, the hairs stellate, few-branched; blades oblong to lanceolate, small, the larger 5.3 cm long and 2.3 cm wide, cuneate at base, sharply acuminate at apex, entire, scarcely paler beneath, glabrous above except for stellate hairs on the midvein, pubescent beneath on the midvein and near the base of the leaf with long, white, stellate hairs, densely bearded in the vein axils; primary veins 4 to 6, obscure above, slightly elevated beneath, arcuate-ascending, anastomosing, not reaching the margin; peduncle 1.5 to 2.2 cm long, pubescent like the branchlets; bracts at base of inflorescence deciduous; cyme about 6 cm broad in fruit, thrice compound, the rays pubescent like the branchlets; primary rays 4 to 6, stout (0.75 to 1 mm thick), very variable in length in the same inflorescence, 3.5 to 20 mm long, secondary rays variable in length; terminal flowers sessile, lateral pedicellate, the pedicels stout; bracts at base of flowers linear or linear-oblong, pubescent, ciliate, shorter than the calyx tube; calyx tube subcylindric, densely red-glandular, with a few white simple hairs intermixed; calyx lobes deltoid, rounded or acutish at apex, sparingly pubescent, ciliate; corolla campanulate, about 2.5 mm long, glabrous or with a few scattered simple hairs, the lobes rounded; anthers elliptic, about 1 mm long; style glabrous; stigmas 3, capitate; fruit immature.

Type in the Copenhagen Herbarium, collected at Cuesta de San Pedro Alto, Oaxaca, Mexico, alt. 2,600 meters, by Liebmann (no. 7816).

This species is known only from the original collection.

12. Viburnum dispar Morton, sp. nov.

Sect. *Mexicana*. Ramuli teretes, stellato-puberulenti, pilis minutis sessilibus multiradiatis, glabrescentes; petioli sparse stellato-pubescentes vel pilis simplicibus instructi; laminae foliorum ovatae vel ellipticae, apice acuminatae, basi late cuneatae, integrae, nervis mediis pubescentes (pilis stellatis et simplicibus intermixtis), ciliatae; pedunculi minute stellato-puberulenti; cymae radii dense stellato-puberulenti, sparse rubroglandulosi; calycis tubus cylindrico-obconicus, pilis simplicibus et stellatis sparse instructus; calycis lobi deltoidei, acuti, ciliati; corolla glabra; stylus glaber.

Shrub 5 to 6.5 meters high; branchlets terete, stellate-puberulent (the hairs sessile, minute, many-branched), glabrescent; buds pubescent; leaves opposite, petiolate, the petiole about 1 cm long and 1 mm in diameter, deeply channelled above, sparsely stellate-pubescent, or some of the hairs simple; blades ovate to elliptic, the larger about 7 cm long and 4 cm wide, sharply acuminate at apex, broadly cuneate at base, entire, green above, paler beneath, conspicuously ciliate,

[8] Contr. U.S. Nat. Herb. **23**: 1397. 1926.

the midrib above and beneath beset with both stellate and simple hairs, the leaf tissue glabrous; principal veins about 4 pairs, arcuate-ascending, anastomosing; peduncle up to 4.5 cm long, about 1.25 mm thick, minutely stellate-puberulent; bracts at base of inflorescence deciduous, not seen; cyme twice compound, up to 3.5 cm high and 4.5 cm broad, the primary rays about 5, up to 1.5 cm long, the secondary shorter, all densely stellate-puberulent, very sparingly red-glandular; bractlets of inflorescence small, deciduous, those subtending the flowers longer than the calyx tube, ciliolate; calyx tube cylindric-obconic, about 1.5 mm long, densely red-glandular, sparingly beset with both simple and stellate hairs; calyx lobes deltoid, about 0.75 mm long, acute, ciliate, otherwise glabrous; corolla about 4 mm long, open-campanulate, glabrous, the lobes rounded; stamens exserted, the filaments about 4 mm long, glabrous, the anthers oval, about 1 mm long; style glabrous.

Type in the U.S. National Herbarium, no. 1,493,953, collected in canyons at the base of the Nevada de Colima, Jalisco, Mexico, May 23, 1893, by C. G. Pringle (no. 4384). Duplicates are at the University of California, the Field Museum, the Gray Herbarium, the Missouri Botanical Garden, and the New York Botanical Garden.

Known only from the original material, distributed as *Viburnum microphyllum* Hemsl.?, to which species it is probably most closely related. Examination of the type of *V. microphyllum*, however, shows that the two plants are specifically distant. *V. dispar* differs not only in the characters enumerated in the key, but also is strikingly unlike in its leaves and in general habit.

13. Viburnum acutifolium Benth. Pl. Hartw. 59. 1840.

Branchlets terete or slightly angular, 3 to 4 mm in diameter, glabrate, slightly stellate-pubescent at nodes; buds sparingly pubescent; leaves opposite, petiolate, the petiole short (5 to 10 mm long) deeply channelled above, glabrous; blades ovate or ovate-lanceolate, small, the larger ones about 6 cm long and 3 cm wide, acute at apex, rounded at base, entire, or occasionally with a few marginal glands, green above, paler beneath, glabrous above except for a few minute hairs on the depressed midvein, wholly glabrous beneath, ciliate or nonciliate; principal veins about 5, inconspicuous, arcuate and anastomosing; peduncle up to 4 cm long, slender, bearing a few scattered stellate hairs; bracts at base of inflorescence deciduous, linear-oblanceolate, about 9 mm long, narrowed at base; cyme twice compound, up to 3 cm long and 5 cm wide, the primary rays 5 to 7, up to 18 mm long, the secondary short, all very sparsely stellate-pubescent, slightly red-glandular; bractlets of inflorescence linear-oblanceolate, glabrous on the back, ciliate, those subtending the flowers obviously longer than the calyx tube; calyx tube cylindric-obconic, about 1.5 mm long, glabrous, sparingly red-glandular; calyx lobes broadly deltoid, about 0.75 mm long, glabrous on the back, ciliate; corolla white, fragrant, 2 to 3 mm long, open-campanulate, glabrous, the lobes rounded; stamens slightly exserted; style glabrous.

Type in the Kew Herbarium, collected at Cerro Pelado, Oaxaca, Mexico, by Hartweg (no. 449).

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Pine woods, mountains of Oaxaca, 2,300–3,000 meters, June 1840, *Galeotti* 3095 (K). Cerro de Zempoaltepec, Oaxaca, June 1842, *Liebmann* 7807 (Co, K). Northwest slope of Zempoaltepec, Oaxaca, alt. 2,600–3,300 meters, July 10, 1894, *Nelson* 676 (N). Cerro de Yalina, Dist. Villa Alta, Oaxaca, alt. 1,500 meters, June 1899, *Conzatti* 954 (G). Sierra de Reyes, Oaxaca, alt. 3,150 meters, Nov. 9, 1894, *Pringle* 5631 (G).

The Pringle specimen is the only one bearing mature fruit, and is not certainly conspecific with the flowering specimens. The fruit is much flattened (about 9 mm long, 6 mm wide, and 2.5 mm thick), and is tipped with the persistent, erect

calyx lobes. It is deeply sulcate on one face and the two internal "spurious" cells are conspicuous.

Another specimen doubtfully referred to this species was collected east of Cerro Santa María Papalo, Distr. Cuicatlan, Oaxaca, alt. 2,500 meters, June 16–22, 1898, by Conzatti and Gonzalez (no. 766; G). It may represent a distinct species.

14. Viburnum jucundum Morton, sp. nov.

Sect. *Disjuncta.* Ramuli robusti, crassi, dense tomentosi, pilis stellatis flavescentibus; petioli robusti, dense stellato-tomentosi; laminae foliorum ovatae, apice acuminatae, basi rotundatae vel cuneatae, glanuloso-serratae, supra stellato-pilosae, pilis sessilibus, 5–7–radiatis, subtus dense stellato-tomentosae, pilis breviter stipitatis multiradiatis; pedunculi breves, robusti, dense tomentosi; cymae radii dense stellato-tomentosi; calycis tubus obconicus stellato-tomentosus; calycis lobi breves, obtusiusculi, extus dense stellato-tomentosi; corolla dense stellato-pubescens; stamina exserta; stylus glaber.

Small tree, 3 to 5 meters high, branchlets terete, robust, 4 to 5 mm thick, densely matted-tomentose, the hairs yellowish, stellate; buds densely pubescent; leaves opposite, petiolate, the petiole of the larger leaves very robust, about 3 mm thick, up to 16 mm long, densely stellate-tomentose; blades ovate, the larger about 13 cm long and 9 cm wide, sharply short-acuminate at apex, rounded to broadly cuneate at base, conspicuously glandular-serrate to the base, densely stellate-pilose above (the hairs sessile, 5- to 7-branched), paler beneath, densely stellate-tomentose, the hairs short-stipitate, with many (more than 15) radiately spreading branches; principal lateral veins 3 to 5, arcuate, reaching the margin, slightly impressed above, elevated beneath; peduncle short, stout, about 18 mm long and 3 mm thick, densely tomentose like the branchlets; bracts at base of inflorescence deciduous; cyme 4 times compound, about 4.5 cm high, 10 cm wide, the primary rays 6, up to 3 cm long, secondary rays up to 1.7 cm long, all densely stellate-tomentose; bractlets of inflorescence deciduous; calyx tube obconic, about 1.5 mm long, completely covered with a dense stellate yellowish tomentum; calyx lobes short, about 0.6 mm long, obtusish, densely stellate-tomentose without, glabrous within; corolla white, open-campanulate, 3.5 mm long, conspicuously stellate pubescent externally, the hairs small, sessile, many-branched; stamens long-exserted, the filaments linear-subulate, about 4.5 mm long, the anthers elliptic, about 1 mm long; style glabrous.

Type in the Gray Herbarium, collected in Chiapas, Mexico, 1864–70, by A. Ghiesbreght (no. 729).

This species is notable for its large, remarkably tomentose leaves, robust branchlets, and densely pubescent corolla. It is probably most nearly related to *Viburnum discolor* Benth.

15. Viburnum disjunctum Morton, sp. nov.

Viburnum ferrugineum Donn. Smith, Enum. Pl. Guat. **1**: 16. 1889. Not *Oreinotinus ferrugineus* Oerst. 1861.

Sect. *Disjuncta.* Ramuli brunneo-tomentosi, pilis numerosis, stellatis, sessilibus, multiradiatis; petioli dense stellato-pubescentes; laminae foliorum lanceolato-ovatae vel ovatae, magnae, apice acuminatae, basi rotundatae et complicatae, integrae vel remote denticulatae, supra stellato-pubescentes, pilis sessilibus, subtus stellato-tomentosae, pilis sessilibus vel substipitatis multiradiatis; bracteae lineares, utrinque stellato-pubescentes; cymae radii dense stellato-pubescentes; bracteolae oblanceolatae, basi angustatae, dense stellato-pubescentes; calycis tubus brevis, dense albo-tomentosus; calycis lobi breves, stellato-pubescentes, ciliati; corolla campanulata, extus pilis simplicibus parce instructa; stylus glaber.

Branches thick, terete, glabrescent; branchlets densely brown-tomentose, the hairs stellate, close, sessile, with many spreading branches; bud scales densely pubescent; leaves opposite, petiolate, the petiole up to 2 cm long, very densely stellate-pubescent; blades ovate-lanceolate to lanceolate, the larger up to 18 cm long and 8 cm wide, rounded and complicate at base, acuminate at apex, entire or remotely glandular-denticulate, stellate-pubescent above (the hairs subdistant, sessile, many-branched), paler beneath, stellate-tomentose, the hairs substipitate or sessile, many-branched: primary veins 6 or 7, arcuate-ascending, anastomosing toward the margin; peduncle variable in length, 1.8 to 15 cm long, densely pubescent like the branchlets; bracts at base of inflorescence linear, about 9 mm long, densely stellate-pubescent on both sides; cyme large, up to 11 cm wide and 5 cm long, 3 to 4 times compound, the primary rays about 7, up to 6 cm long, densely pubescent like the branchlets; bractlets at base of flowers oblanceolate, narrowed at base, densely pubescent; calyx tube short, about 1 mm long, densely white-tomentose; calyx lobes short, rounded-deltoid, about 0.5 mm long, stellate-pubescent, ciliate; corolla white, campanulate, about 2.5 mm long, bearing externally a few scattered straight simple hairs; stamens slightly exserted; style glabrous.

Type in the U.S. National Herbarium, no. 1,394,718, collected at Cobán, Dept. Alta Verapaz, Guatemala, alt. about 1,300 meters, June 1886, by H. von Tuerckheim (no. 977). Duplicates at the Gray Herbarium and the New York Botanical Garden.

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Cobán, alt. 1,350 meters, July 1912, *von Tuerckheim* 2438 (F, N).

This striking species has been confused with *Oreinotinus ferrugineus* Oerst. (= *Viburnum ferrugineum* Donn. Smith [not Raf.] = *V. anabaptista* Graebn.), a South American species of which I have seen the type from the Copenhagen Herbarium. The latter species is obviously different in the dense woolly tomentum of the under surface of the leaves (in which the individual hairs can scarcely be distinguished) and the much smaller and more compact cymes.

16. Viburnum discolor Benth. Pl. Hartw. 83. 1840.

Shrub or small tree, up to 7 meters high; branches glabrous, shining, slightly ribbed; branchlets somewhat angular, about 2.5 mm in diameter, stellate-pubescent, the hairs short-stipitate, many- (at least 10-) branched; bud scales densely stellate-tomentose outside, glabrous within; leaves opposite, petiolate, the petioles 10 to 14 mm long, broadened at base, sulcate above, densely stellate-tomentose like the branchlets; blades ovate to slightly obovate, the largest 7.5 cm long and about 4.7 cm wide, cuneate or rounded at base, abruptly short-acuminate at apex or merely acute, margin revolute, sparsely and irregularly toothed (the teeth glandular), above deep green, densely pubescent on the impressed midvein, sparsely stellate-pubescent on the leaf surface (hairs sessile, the branches 4 to 10, spreading), pale beneath, densely white-stellate-puberulent (hairs sessile or short-stipitate, the branches spreading, very numerous, over 10); principal veins 4 or 5 to a side, elevated beneath, impressed above, arcuate-ascending, anastomosing toward the margin; peduncle 5 to 6 cm long, about 1.5 mm wide, the pubescence dense, similar to that of the branchlets; bracts at base of inflorescence deciduous, not seen; cyme convex, thrice compound, about 3.5 cm long and 5 cm broad, the primary rays 5 or 6, 6 to 14 mm long at anthesis, 11 to 25 mm long in fruit, the secondary rays several, shorter, up to 8 mm long, the tertiary rays similar, all densely pubescent like the branchlets; flowers sessile at the end of the tertiary rays, mostly in pairs, subtended by linear-subulate pubescent bractlets, slightly longer than the calyx tube; calyx tube obconic, about 1.5 mm long, completely

covered with a dense tomentum of white stellate hairs; calyx lobes ovate, acute, about 0.75 mm long, sparsely white-hirtellous, ciliate; corolla white, campanulate, 3 to 3.5 mm long, 2 mm wide at base, the limb about 5 mm across, the lobes about equal to the tube, obtuse, glandular-margined, the tube beset with stiff whitish hairs, those toward the base sessile and stellate (with 3 to 5 branches), the upper ones simple; filaments subulate, about equal to the corolla; anthers oval, 1 to 1.25 mm long, sagittate; style glabrous; ovary 1-celled, the ovule solitary, pendulous from the apex of the cell; fruit (immature) ellipsoidal, with persistent style and calyx lobes, stellate-pubescent.

Type in the Kew Herbarium, collected at Totonicapán, Guatemala, by Hartweg (no. 579).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: *Bernouilli & Cario* 1942 (K). Oak forest at Chichavac, Dept. Chimaltenango, alt. 2,600–3,000 meters, November–December 1930, *Skutch* 58 (B, Co, N).

A most distinct species, without near relatives.

17. Viburnum stellato-tomentosum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.

Oreinotinus stellato-tomentosus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 283. 1861.

Oreinotinus wendlandi Oerst. loc. cit.

Viburnum wendlandi Hemsl. loc. cit.

Viburnum stellato-pilosum Polak. Linnaea **41**: 564. 1877.

Tree or shrub 2 to 8 meters high; branchlets stout, terete, glabrous in age, densely stellate-tomentose when young; leaves opposite, petiolate, the petiole 6 to 10 mm long, 1.5 to 2 mm thick, scarcely channelled above, densely stellate-tomentose; blades very variable in shape, ovate, elliptic, or oblong-obovate, the larger 12 cm long and 7 cm wide, acute at apex, cuneate and complicate at base, conspicuously toothed or rarely subentire, with conspicuous marginal glands near the base, pubescent on the upper leaf surface with scattered stellate hairs (these sessile, many-branched), densely stellate-tomentose beneath, the hairs long-stipitate, many-branched; principal veins about 5, anastomosing or reaching the margin; peduncle variable in length, up to 8 cm long and 2.5 mm thick, terete, densely stellate-tomentose; bracts at base of inflorescence deciduous; cyme 3 to 4 times compound, up to 4.5 cm long and 10 cm wide, the primary rays about 7, up to 3 cm long, densely stellate-tomentose, sparsely red-glandular; bractlets of inflorescence very minute, sparingly stellate-pubescent, those subtending the flowers not so scarcely exceeding the calyx tube; calyx tube small, 1 to 1.5 mm long, conspicuously red-glandular, not or only very sparsely pubescent, the hairs stellate or simple; calyx lobes broadly deltoid, about 1 mm long, rounded at apex, glabrous on the back, ciliate; corolla white rotate-campanulate, about 3 mm long, glabrous, the lobes rounded, spreading; stamens exserted, the filaments flattened, glabrous, the anthers subrotund, about 0.75 mm long; style glabrous; fruit black, ellipsoidal or subsphaeroidal, 5 to 6 mm long, about 5 mm wide and thick, glabrous, grooved on one surface, the intrusion conspicuous.

Type in the Copenhagen Herbarium, collected on Volcán Irazú, Costa Rica, alt. about 3,000 meters, January 1847, by Oersted (no. 7818). Duplicate at Kew.

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Volcán Irazú, alt. 2,600 meters, Apr. 16, 1857, *Wendland* 657 (Co; type collection of *Oreinotinus wendlandi* Oerst.). Above San Rafaël de Cartago, alt. 1,700 meters, Oct. 18, 1894, *Pittier* (Herb. Nat. Cost. 9031; N). Forests at La Verbena, near Alajuelita, alt. about 1,000 meters, August 1894, *Tonduz* (Herb. Nat. Cost. 8881; N). Río

Reventado, Prov. Cartago, alt. 2,000 meters, April 1894, *J. D. Smith* 4830 (G, N). Gorges of the Río Virilla, near San Juan, Prov. San José, Dec. 14, 1913, *Tonduz* (Herb. Nat. Cost. 17923; N). Río Tibas, San Juan, January 1913, alt. 1,200 meters, *Jiménez* 824 (N); Nov. 10, 1913, alt. 1,200–1,300 meters, *Jiménez* 917 (N). Banks of Río Virilla, Prov. San José, alt. 1,100 meters, December 1895, *Tonduz* 7230 (Herb. Nat. Cost. 9812; F, G, N). Las Cóncavas, August 1919, *Lankester* K 281 (F, K). Cartago, alt. 1,600 meters, Aug. 24, 1924, *Rojas* 63 (N). Cerro de Piedra Blanca, above Escasu, Prov. San José, Jan. 31, 1924, *Standley* 32442 (N). Between Aserrí and Tarbaca, Prov. San José, alt. 1,600–1,900 meters, Feb. 12, 1924, *Standley* 34038 (N). Cerro de la Carpintera, Prov. Cartago, alt. 1,500–1,850 meters, February 1924, *Standley* 34507 (N), 34510 (N), 35474 (N). Vicinity of San José, alt. about 1,150 meters, February 1924, *Standley* 34821a (N). Vicinity of Santa María de Dota, Prov. San José, alt. 1,500–1,800 meters, Dec. 14–26, 1925, *Standley* 42456 (N). Volcán Irazú, alt. 2,100 meters, Jan. 21, 1916, *Holway* 451 (N).

This, the commonest species of Costa Rica, is a round-topped tree with black edible fruit. It is known by the name "tirrá" or "currá" or "surá," names also applied to other species of *Viburnum* in Costa Rica.

18. Viburnum sulcatum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.

Oreinotinus sulcatus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 287. 1861.

Branches angled, sulcate, 2.5 to 3 mm thick, inconspicuously stellate-pubescent, the hairs small, sessile, many-branched; branchlets obviously stellate-pubescent, the hairs larger and more numerous; bud scales pubescent; leaves opposite, petiolate, the petiole 7 to 9 mm long, sulcate, densely stellate-pubescent; blades ovate, the larger 7 to 8 cm long, 4 to 4.5 cm broad, rounded or subcordate at base, sharply acuminate at apex, entire, green above, much paler beneath, glabrous above except for a few scattered stellate hairs on the mesophyll, these more numerous on the midrib, beneath everywhere densely stellate-puberulent, the hairs yellowish, rather small, sessile, many branched; primary veins 6 or 7, arcuate-ascending, anastomosing toward the margin, deeply impressed above, elevated beneath; peduncle 2.5 to 3.2 cm long, similar to the branchlets; bracts at base of inflorescence deciduous, linear, about 3.5 mm long, pubescent on the back; cyme small, 2 to 2.5 cm wide, 4 times compound; primary rays 7 to 8 mm long, all the rays densely stellate-pubescent like the branchlets; pedicels 1 to 1.5 mm long; bractlets of inflorescence concave, stellate-pubescent externally; calyx tube subcylindric, bearing numerous red glands and a few short simple hairs; calyx lobes deltoid, acute, sparingly pubescent, ciliate; style glabrous; stigmas 3, capitate.

Type in the Copenhagen Herbarium, collected by Liebmann on Cerro de Zempoaltepec, Oaxaca, Mexico, June 1842. Duplicate at Kew.

The description of the calyx tube, calyx lobes, and style is drawn from material in the pocket, not certainly of the same species as the mounted specimen, which is in young bud. Proper description of this species must await further collections from Mount Zempoaltepec.

19. Viburnum optatum Morton, sp. nov.

Sect. *Optata*. Rami angulati, glabri; ramuli nitidi, glabrati; petioli glabrati; laminae ovatae vel oblongo-ovatae, apice longe acuminatae, basi cuneatae, integrae, ciliatae, supra glabrae (venis exceptis), subtus venis hirsutae, alioqui glabrae; pedunculus glaber; cymae radii glabri; bracteae inflorescentiae lineares vel oblongo-lineares, glabrae, non ciliatae; calycis tubus glaber, eglandulosus; calycis lobi glabri, non vel vix ciliati; corolla campanulato-rotata, glabra; stylus albovillosus.

Branches stout, angular, dull, glabrous, with numerous lenticels; branchlets slender, shining, glabrate, bearing a few spreading hairs; leaves opposite, petiolate, the petiole up to 1 cm long, deeply channelled above, glabrate, bearing a few simple hairs toward the apex; blades ovate to oblong-ovate, the larger 8.5 cm long by 3.5 cm wide, sharply long-acuminate at apex, cuneate and slightly complicate at base, entire, glabrous above except on the principal veins, beneath paler, glabrous on the surface, and conspicuously hirsute on the midvein and lateral veins, conspicuously ciliate, bearded in the vein axils, the hairs once-furcate at base; lateral veins about 5, arcuate-ascending, anastomosing toward the margin; peduncle 2.6 to 3.3 cm long, glabrous; bracts at base of inflorescence deciduous; cyme up to 5.5 cm wide and 2.8 cm long, the primary rays 6 or 7, up to 13 mm long, glabrous; bracts of inflorescence linear to linear-oblong, not narrowed at base, glabrous, not ciliate; terminal flowers sessile, lateral pedicellate, the pedicels short; calyx tube about 1.5 mm long, glabrous, eglandular; calyx lobes deltoid, about 0.75 mm long, acute or rounded, glabrous, not or scarcely ciliate; corolla campanulate-rotate, about 3 mm long, glabrous; stamens slightly exserted, the filaments about 3 mm long, inserted at base of corolla, the anthers explanate, about 1 mm long; style densely white-villous; stigmas inconspicuous.

Type in the Gray Herbarium, collected at Jacaltenango, Dept. Huehuetenango, Guatemala, Apr. 9, 1896, by C. & E. Seler (no. 2639). Duplicate at the New York Botanical Garden.

A peculiar species, evidently forming a distinct section of the genus.

19a. Viburnum optatum var. **vagum** Morton, var. nov.

Ramuli glabri; petioli glabri; laminae foliorum ovatae ad ovales (raro obovatae), apice longe acuminatae, basi cuneatae vel truncatae, integrae vel parce serratae, utrinque omnino glabrae (venis axillis exceptis), parce ciliatae; pedunculus glaber; cymae radii glabri (nodis exceptis); bracteae inflorescentiae lanceolatae, parce ciliatae; calycis tubus cylindrico-obconicus, glaber; calycis lobi deltoidei, parce ciliati; corolla campanulato-rotata, glabra; stylus albo-pubescens.

Branchlets terete, about 2.5 mm thick, glabrous, shining; buds glabrous or with a few long hairs at apex; leaves opposite, petiolate, the petiole 9 to 10 mm long, about 1 mm thick, glabrous; blades ovate to oval (rarely obovate), the largest 9.5 cm long and 4.2 cm wide, sharply long-acuminate, broadly cuneate or truncate at base, entire except for 1 or 2 pairs of glandular teeth near the base (or some of the leaves conspicuously and sharply serrate, the teeth glandular, few), green above, pale beneath, glabrous on both surfaces (the principal veins not pubescent either above or beneath), barbate in the vein axils beneath, ciliate near apex, sometimes sparingly so; principal veins about 4, arcuate, anastomosing in entire-margined leaves, running to the teeth in serrate leaves; peduncle 4 to 5 cm long, about 2 mm thick, glabrous; bracts at base of inflorescence deciduous; cyme 3 to 4 times compound, up to 7 cm high and 11 cm wide, the primary rays 5 to 7, up to 4 cm long, glabrous, the secondary rays much shorter and slenderer, short-pubescent at the nodes; flowers mostly pedicellate, the pedicels short, glabrous; bractlets of inflorescence small, lanceolate, sparsely ciliate, deciduous; calyx tube cylindric-obconic, about 1.5 mm long, glabrous; calyx lobes deltoid, about 0.7 mm long, sparsely ciliate; corolla campanulate-rotate, about 3 mm long, glabrous, the lobes rounded; stamens exserted; style white-pubescent at base.

Type in the U.S. National Herbarium, no. 1,390,003, collected at San Miguel Uspantán, Dept. Quiché, Guatemala, alt. about 2,100 meters, April 1892, by Heyde and Lux (J. D. Smith, no. 3042). Duplicates in the New York Botanical Garden and Gray Herbarium.

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Las Bordes, Dept. Santa Rosa, alt. about 1,050 meters, May 1892, *Heyde & Lux* (J. D. Smith, no. 3162; G, N).

The cilia of the leaf margins are very inconspicuous in this variety and are somewhat deciduous. The absence of pubescence on the veins is characteristic.

20. Viburnum membranaceum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 2. 1881.

Oreinotinus membranaceus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 284. 1861.

Branches dark, slender, glabrous, with short internodes, lenticels few; branchlets at first densely stellate-tomentose with matted, sessile, long, many-branched hairs, becoming glabrate; leaves opposite, petiolate, the petiole short, up to 6 mm long, densely stellate-tomentose, the blades ovate, the larger about 5 cm long by 3.5 cm wide, slightly cordate at base, sharply short-acuminate, conspicuously serrate from near middle to apex (the teeth about 7 to a side), almost glabrous above (the hairs few, scattered, stellate, sessile, 2- to 4-branched, more numerous on the midrib), sparsely substrigose on the veins beneath (the hairs partly simple, partly stellate), conspicuously ciliate; primary veins about 5, impressed above, elevated beneath, almost straight; peduncle 15 to 22 mm long, equaling or shorter than the cyme, glabrescent, glandular; bracts at base of inflorescence deciduous, linear, about 6 mm long, 0.5 mm wide, pubescent externally; cyme 3 to 4 cm wide, twice compound, the primary rays about 7, up to 14 mm long, stellate-tomentose, densely glandular (the glands red, stipitate), the secondary rays shorter; pedicels very short; bractlets subtending the flowers linear, acuminate, ciliate, longer than the calyx tube; calyx tube subcylindric, almost glabrous, very sparingly glandular; calyx lobes deltoid, about 0.75 mm long, acutish, glabrous on the back, conspicuously ciliate; corolla campanulate, about 3 mm long, glabrous; stamens slightly exserted; style densely short-pubescent.

Type in the Copenhagen Herbarium, collected at Cuesta de San Juan del Estado, Oaxaca, Mexico, alt. 2,300 meters, by Liebmann (no. 7813). Duplicate at Kew.

Known only from the original collection.

21. Viburnum ciliatum Greenm. Proc. Amer. Acad. **41**: 251. 1905.

Branches angulate, about 2 mm thick, glabrous, lenticels few; branchlets similar, sparsely glandular, when young laxly hirsutulous; bud scales glabrous, ciliate; leaves opposite, short-petiolate, the petiole canaliculate, 3 to 4 mm long, sparsely pubescent; blades broadly ovate, the larger about 6.5 cm long and 4.7 cm wide, cordate at base, sharply short-acuminate at apex, conspicuously serrate almost to base (the teeth numerous), when young sparsely strigose above (the hairs mostly simple, rarely furcate at base), glabrate at maturity, beneath glandular, hirsutulous along the midrib and veins, glabrate at maturity, conspicuously ciliate; primary veins 6 or 7, running straight to the margin; peduncle variable in length, 5 to 19 mm long, bearing scattered simple hairs, obviously glandular; bracts at base of inflorescence linear-lanceolate, not leaflike, up to 7 mm long, ciliate; cyme loose, up to 5.5 cm wide and 3 cm long, twice compound; primary rays about 5, up to 15 mm long, glabrous, glandular, secondary rays shorter; bractlets at base of flowers linear, about 3.5 mm long, ciliate; calyx tube subcylindric, glabrous; calyx lobes deltoid, about 1 mm long, acute, glabrous, not or sparingly ciliate; corolla rotate, about 7 mm wide, 4 mm long, glabrous; anthers exserted, oval, 1 mm long; style white-villous; stigmas three.

Type collected in wet woodlands near Trinidad Iron Works, Hidalgo, Mexico, alt. 1,780 meters, Apr. 30, 1904, by C. G. Pringle (no. 8881; C, F, G, M, N, Y).

Known only from the type collection.

22. Viburnum caudatum Greenm. Proc. Amer. Acad. **41**: 250. 1905.

Branches terete, glabrous; branchlets similar, sparingly stipitate-glandular; bud scales glutinous, sparingly stipitate-glandular; leaves opposite, petiolate, the petiole canaliculate, up to 1.5 cm long, conspicuously stipitate-glandular; blades rhombic-ovate, the larger 12.5 cm long and 8.5 cm wide, cordate or rounded at base, abruptly and acutely short-acuminate at apex, entire or undulate below, sometimes with a few teeth, bearing 3 or 4 conspicuous marginal glands toward the base, deep green above, glabrate at maturity, beneath paler, glabrate, glandular, bearded in the vein axils with long white stellate hairs; primary veins 4 to 6, straight, anastomosing near the margin; peduncle 3 to 4.5 cm long, conspicuously stipitate-glandular; bracts at base of inflorescence long, linear, glandular; cyme up to 8 cm broad and 4.5 cm long, twice or thrice compound, the primary rays 6 or 7, up to 2 cm long, the secondary much shorter, all densely stipitate-glandular; bractlets subtending the flowers linear, glandular, longer than the calyx tube; calyx tube cylindric, about 13 mm long, densely stipitate-glandular; calyx lobes about 0.75 mm long, obtuse, ciliate, not or scarcely glandular; corolla rotate, about 6.5 mm wide, 4 mm long, glabrous, the lobes rounded, spreading; filaments long-exserted, about 8 mm long; anthers oval, about 1 mm long; style densely villous; stigmas 3; fruit ellipsoidal, about 6 mm long, 4 mm wide, and 3 mm thick, scarcely fleshy, deeply sulcate ventrally, the intrusion conspicuous, bilobed, shallowly sulcate dorsally.

Type collected in the barranca below Trinidad Iron Works, Hidalgo, Mexico, alt. 1,500 meters, May 24, 1904, by C. G. Pringle (no. 8826; C, Co, F, G, M, N, Y). Fruiting material was collected at the same locality on Aug. 21, 1905, *Pringle* 10037 (C, Co, F, G, M, N, Y).

An additional specimen referred to this species was collected at Misantla, Sierra Madre, Veracruz, August 1912, *Purpus* 6024 (C, M, Y). It differs from the type in several particulars and may represent a recognizable variety.

23. Viburnum loeseneri Graebn. Repert. Sp. Nov. Fedde **12**: 244. 1913.

Branchlets slightly angular, dark gray, not at all shining, densely stellate-tomentose when young, glabrate with age, very irregular, with numerous lenticels and longitudinal ridges; buds densely tomentose; leaves opposite, petiolate, the petiole short (up to 5 mm long), densely stellate-tomentose; blades ovate, very small (the larger 5 cm long and 2.5 cm wide), acute at apex, rounded at base, entire or remotely denticulate, substrigose above (the hairs mostly simple except on the principal veins), much paler beneath, sparsely glandular, stellate-pilose, the hairs sessile, several- to many-branched; primary veins about 3, arcuate-ascending, anastomosing; peduncle 1.5 to 2.5 cm long, about 1.5 mm in diameter. densely stellate-tomentose; bracts at base of inflorescence linear, about 5 mm long, 0.75 mm wide, densely stellate-tomentose externally; cyme twice compound, very small (the largest 2.2 cm long and 3 cm wide), the primary rays about 6, up to 6 mm long, the secondary very short, all densely stellate-tomentose; bractlets of inflorescence linear or linear-lanceolate, stellate-pubescent externally, those subtending the flowers about equaling the calyx tube; calyx tube cylindric-obconic, about 1.5 mm long, somewhat stellate-pubescent, sparingly glandular; calyx lobes deltoid, about 0.75 mm long, stellate-pilose toward the tip, the hairs deciduous with age; corolla campanulate, about 3.5 mm long, sparingly stellate-pubescent externally; stamens included; style short-pubescent.

Type (not seen) in the Berlin Herbarium, collected in Mexico by Ehrenberg. There is, however, an Ehrenberg specimen in the U. S. National Herbarium which agrees in all details with the original description and is almost certainly a specimen of the type collection.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Tapalpa, Jalisco, June 10, 1892, *M. E. Jones* 121 (M, N).

The small leaves, the distribution of pubescence, the comparatively small cymes, and the large flowers all distinguish this species satisfactorily.

24. Viburnum hirsutum Morton, sp. nov.

Sect. *Serrata.* Ramuli teretes, juventute hirsuti, pilis simplicibus vel stellatis sessilibus 2- to 4-radiatis glandulis rubris intermixtis, demum glabrati; petioli dense hirsuti; laminæ foliorum rhombeae, magnae, apice breviter acuminatae, basi subcordata integrae sursum paullulum serratae (dentibus brevibus vix glandulosis), supra dense strigosae, subtus sparse glandulosae, stellato-pubescentes, pilis sessilibus, paucis, pauciradiatis; pedunculi dense hirsuti et glandulosi; bracteae lineares, apice acutae, extus substrigosae; cymae radii dense hirsuti, rubroglandulosi; bracteolae lineares, pilosae et glandulosae; calycis tubus dense viscoso-glandulosus, hirsutus; calycis lobi deltoidei, acuti, dense strigosi; corolla rotata, glabra; stamina exserta; stylus pubescens.

Branchlets terete, up to 2.5 cm thick, glabrous, the young twigs of the season densely hirsute (hairs simple or stellate, 2- to 4-branched, sessile, mixed with red glands), the internodes very short, up to 2 cm long; buds glabrate, shining; leaves near the ends of the branchlets only, opposite, petiolate, the petiole short (about 1 cm long), very densely hirsute like the branchlets; blades rhombic, large, up to 12.5 cm long and 9 cm wide, sharply short-acuminate at apex, subcordate at base, entire below, slightly serrate toward the apex (the teeth low, scarcely glandular), densely strigose above, beneath paler, sparsely glandular and stellate-pubescent, the hairs sessile, with few long, spreading branches; principal veins about 7, once or twice furcate; peduncle 3 to 3.5 mm long, very densely hirsute and glandular; bracts at base of inflorescence subpersistent, linear, about 10 mm long, 1 mm wide, acute at apex, substrigose externally; cyme twice compound, up to 3 cm high and 6 cm wide, the primary rays 7, about 1.5 cm long, the secondary very short, all densely hirsute, red-glandular; bractlets of inflorescence subpersistent, linear, pilose and glandular; calyx tube 1.5 to 2 mm long, densely viscid-glandular and hirsute; calyx lobes deltoid, about 1 mm long, acute, densely strigose; corolla rotate, 3 mm long, glabrous, the lobes broadly rounded; stamens exserted, the filaments about 5.5 mm long, glabrous; style short-pubescent.

Type in the U.S. National Herbarium, no. 1,012,274, collected at Cerro La Raya, Dist. Cuicatlan, Oaxaca, Mexico, alt. 2,500 meters, Apr. 15, 1919, by Conzatti and Gomez (no. 3476).

This remarkable species, which has no near relative, is known from the single collection cited.

25. Viburnum stenocalyx (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.
Oreinotinus stenocalyx Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 285. 1861.

Branchlets densely tomentose, the hairs matted, stellate, sessile, with many long, spreading branches; leaves opposite, petiolate, the petiole canaliculate, up to 1 cm long, densely stellate-tomentose; blades ovate-lanceolate or rarely obovate, the larger about 9 cm long by 4 cm wide, rounded at base, acute at apex, conspicuously dentate, the teeth very numerous, extending almost to the base of the blade, paler beneath, thinly substrigose above (the hairs usually simple, sometimes furcate at the base, rarely stellate, with 3 to 5 antrorse branches), stellate-pubescent beneath (the hairs sessile, with long silky branches, chiefly on the veins and veinlets), conspicuously ciliate; primary veins about 6, arcuate-ascending, slightly impressed above and elevated beneath, reaching the margin; peduncle about 2 cm long, densely tomentose like the branchlets; bracts at base of inflorescence leaflike, persistent, linear-oblanceolate or oblanceolate, about 17 mm long, about 2.5 mm wide above the middle, narrowed at base, pilose, entire; cyme up to 13 cm wide, 5 cm long, 3 to 4 times compound, the primary rays 6 or 7, up to 2.7 cm long, the secondary much shorter, all densely tomentose like the

branchlets, glandular; terminal flowers sessile, lateral pedicellate, the pedicels very short; bractlets subtending the flowers linear, pilose, ciliate, longer than the calyx tube; calyx tube 1 to 1.25 mm long, glabrous or with a few hairs toward the apex, glandular; calyx lobes oblong, 1 to 1.75 mm long, obtuse at apex, glabrous or with a few scattered hairs, ciliate; corolla campanulate, 2.5 to 3 mm long, glabrous or with a few scattered hairs, the lobes rounded; style white-villous at base; stigmas 3, capitate; fruit black, ellipsoidal, somewhat fleshy, about 7 mm long, 5 mm wide, and 4 mm thick, slightly sulcate ventrally, the intrusion very conspicuous, long-stalked.

Type in the Copenhagen Herbarium, collected in Mexico by Ehrenberg. An Ehrenberg collection in the herbarium of the University of California is probably part of the type material.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Canada, above Contreras Station, Federal District, alt. 2,400 meters, Sept. 17, 1906, *Pringle* 10310 (C, Co, F, G, M, N, Y). By streams, base of Sierra de Ajusco, Federal District, alt. 2,250 meters, September–October 1896, *Pringle* 6569 (C, F, G, M, N, Y). Thickets near Eslaba, Federal District, alt. 2,400 meters, Nov. 13. 1903, *Pringle* 11466½ (Co, F, G, N). Cerro de las Nalgos, Morelia, alt. 2,300 meters, January 1910, *Nicolas* (N). Woods, Eslaba, Valley of Mexico, Federal District, alt. 2,400 meters, May 18, 1901, *Pringle* 9373 (G, N, Y). Ixtaccihuatl, March–July 1903, *Purpus* 163 (C, G, M, N).

This distinctive species has previously been misidentified as *Viburnum stellatum* (Oerst.) Hemsl., to which it is scarcely related. The original material of *V. stenocalyx* has unusually long calyx lobes but is not otherwise distinguishable from the other specimens here cited.

26. Viburnum microcarpum Schlecht. & Cham. Linnaea **5**: 170. 1830.

Viburnum microcarpum var. *evanescens* Greenm. Proc. Amer. Acad. **35**: 313. 1900.

Tree 4.5 to 6 meters high; branches glabrous, shining, 3 to 3.5 mm thick, with long internodes; branchlets white-tomentose when young, the hairs stellate, matted; leaves opposite, borne chiefly on short lateral branchlets, petiolate, the petiole up to 1 cm long, very densely stellate-tomentose, the hairs white, sessile, many-branched; blades rhombic, obovate, or broadly ovate, the larger up to 9 cm long and 7.7 cm wide, subcordate or rounded at base, merely acute at apex, conspicuously serrate (the teeth numerous, up to 15 on each side), entire toward the base, here with a few marginal glands, deep green above, glabrous (even when young) except on the sunken midvein, reticulate-veined, cano-tomentose beneath, the hairs stellate, sessile, many-branched; primary veins 6 or 7, impressed above, elevated beneath, straight, running to the marginal teeth; peduncle variable in length, very short or up to 3.4 cm long, pubescent like the branchlets; bracts at base of inflorescence not seen; cyme large, up to 10.5 cm wide and 5 cm long, thrice compound, the primary rays about 7, up to 3 cm long, the secondary much shorter, all rather sparsely stellate-pubescent, glandular; terminal flowers sessile, the lateral short-pedicellate; bractlets subtending the flowers linear, shorter than the calyx tube; calyx tube cylindric, about 3 mm long, glabrous or minutely glandular; calyx lobes short, about 0.5 mm long, obtuse or acute, sparsely ciliate; corolla white, subrotate, about 5 mm wide, 3 mm long, glabrous; filaments exserted, about 3 mm long, glabrous; anthers oval, about 1 mm long; style villous; fruit black, very small (3.5 to 4 mm long, 3.5 mm wide, and 3 mm thick), slightly fleshy (the juice red), deeply sulcate ventrally, the intrusion large, conspicuously bilobed.

Type collected between Jalapa and San Miguel del Soldado, Veracruz, by Schiede.

ADDITIONAL SPECIMENS EXAMINED.

MEXICO: Type collection (M, Y). San Miguel del Soldado, Veracruz, alt. 1,800 meters, Apr. 20, 1899, *Pringle* 8172 (type coll. of var. *evanescens* Greenm.; C, Co, F, G, M, N, Y). Jalapa, Veracruz, April 1838, *Linden* 529 (K). Chinantla, Puebla, alt. 2,100 meters, May 1841, *Liebmann* (Co, K).

The original material of *V. microcarpum* is a mixture of two species, one (in the flowering stage) with orbicular, subcordate, sinuate-denticulate leaves, stellate pubescent above, the other (in fruiting condition) with rhombic or obovate, serrate leaves, glabrous above. Although the original description contains almost equally characters derived from both elements, the species should be typified on the fruiting material, as indicated by the author's choice of the peculiarly appropriate specific name, *microcarpum*, the fruits being in fact the smallest known for any tropical member of the genus. In this fruiting material, the glabrous condition of the upper surface of the leaves is not a matter of age, as shown by Liebmann's specimens, in which even the youngest are without a trace of pubescence above. Moreover, the pubescence of the under leaf surface is not quite the same. The differences in leaf shape and dentition are also conspicuous.

The other component of the original species has been described as *V. tiliaefolium* (Oerst.) Hemsl. on specimens collected by Sartorius.

27. Viburnum tiliaefolium (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.

Oreinotinus tiliaefolius Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 282. 1861.

Viburnum microcarpum Schlecht. & Cham. Linnaea **5**: 170. 1830, in part.

Branches sulcate, about 5 mm thick, glabrous; branchlets densely stellate-tomentose when young, the hairs sessile, mostly with numerous short spreading branches; bud scales densely pubescent; leaves opposite, petiolate, the petiole up to 1.6 cm long, densely stellate-tomentose; blades broadly ovate or suborbicular, the larger up to 16 cm long and 11.5 cm wide, subcordate at base, acute at apex, sinuate-denticulate (the teeth numerous, very short, passing into marginal glands toward the base), densely stellate-pubescent above (the hairs sessile, few to many-branched), pale beneath with a very dense pubescence of stellate, sessile or stipitate many-branched hairs; primary veins 6 or 7, conspicuously elevated beneath, running to the marginal teeth; peduncle variable in length (0.7 cm to 4.2 cm long), densely pubescent like the branches; bracts at base of inflorescence not seen; cyme large, 3 to 4 times compound, spreading, up to 11 cm broad and 5 cm long, the primary rays 5 to 7, up to 3 cm long, the secondary much shorter, all rather densely stellate-pubescent, sparingly red-glandular: terminal flowers sessile, the lateral pedicellate; bractlets subtending the flowers linear, very small, shorter than the calyx tube; calyx tube subcylindric, about 2 mm long, red-glandular, bearing a few small hairs toward apex; calyx lobes short (0.75 to 1 mm long), obtusish, sparsely pubescent on the back, ciliate; corolla about 5 mm wide, 2 to 3 mm long, glabrous; stamens slightly exserted, glabrous; style villous; stigmas 3, conspicuous; fruit black, ellipsoidal, 5 to 6 mm long, 3.5 mm wide, and 3 mm thick, the intrusion prominent, bilobed.

Type in the Copenhagen Herbarium, collected between Mirador and Jalapa, Veracruz, July 1842, by Sartorius.

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Jalapa, Veracruz, *Schiede* (G, M, Y). Orizaba, July 1857, *Mohr* (N); June 1855, *Botteri* 983 (K).

This species is discussed under *V. microcarpum*. The Liebmann specimen referred to this species by Oersted is a quite different and probably undescribed species.

A specimen collected at Honey Station, Puebla, by Pringle (no. 10807; G) probably represents a new species of this relationship also.

28. Viburnum rhombifolium (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.

Oreinotinus rhombifolius Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 282. 1861.

Branchlets slender, about 3 mm in diameter, glabrous and shining in age, pubescent when young, the hairs stellate, sessile, with numerous spreading branches; buds sparingly stellate-pubescent; leaves opposite, petiolate, the petiole up to 12 mm long, channelled above, densely stellate-pubescent, sparingly red-glandular; blades large, rhombic-ovate, the larger about 14 cm long and 9 cm wide, slightly attenuate toward apex, rounded at base, conspicuously and regularly sinuate-dentate from base to apex (the teeth glandular), stellate-pubescent above (the hairs sessile, with 2 or 3, rarely 5, long, spreading branches), more densely pubescent beneath, the hairs stellate, sessile, many-branched, the branches more than 10, spreading; primary veins about 6, straight, reaching the margin; peduncle terete, 3.5 to 4 cm long, pubescent like the young branchlets; bractlets at base of inflorescence linear, not leaflike, subpersistent, about 5 mm long, densely stellate-pubescent externally, glabrous on the inner surface; cyme thrice compound, about 4 cm long and 7 cm wide, the primary rays 5 or 6, up to 2.2 cm long, the secondary short, stellate-pubescent like the branchlets, conspicuously red-glandular; bractlets of inflorescence linear; calyx tube cylindric, 2 mm long, glabrous, sparingly glandular; calyx lobes elongate-triangular, 1.5 mm long, acute, erect, glabrous except for a few cilia; corolla rotate-campanulate, about 3 mm long, glabrous; stamens exserted, the filaments about 3 mm long, glabrous; style densely short-pubescent.

Founded on two specimens in the Kew Herbarium, collected on Mount Orizaba, Veracruz, Mexico, by Linden (no. 531), August 1838, and by Galeotti (no. 2667), June–October 1840, mounted on the same sheet, which are very similar. The one collected by Galeotti may be designated as the type.

This species is known only from these two collections.

29. Viburnum pubescens (Ait.) Pursh, Fl. Amer. Sept. **1**: 202. 1814.

Viburnum dentatum var. *pubescens* Ait. Hort. Kew. **1**: 372. 1789.

Two specimens from central Mexico are tentatively referred to this common species of the eastern United States: Near Toluca, April 1834, *Andrieux* 341 (K) and San Bartolo, Federal District, May 1928, *Lyonnet* 331 (N). The determination of their actual relationship to the various forms of *Viburnum pubescens* must await further study.

30. Viburnum stellatum (Oerst.) Hemsl. Biol. Centr. Amer. Bot. **2**: 3. 1881.

Oreinotinus stellatus Oerst. Naturhist. For. Kjöbenhavn Vid. Medd. **1860**: 292. 1861.

Branches terete, 2.5 mm thick, glabrous, shining, with conspicuous lenticels; branchlets slender, terete, closely stellate-tomentose, the hairs stellate, sessile, with numerous long, spreading branches; bud scales almost glabrous; leaves opposite, petiolate, the petioles canaliculate, up to 1 cm long, densely tomentose like the branchlets; blades oval, the larger about 9.5 cm long by 4.7 to 5 cm wide, cuneate at base, sharply long-acuminate at apex, minutely denticulate, green above, paler beneath, above with scattered stellate hairs, these few- or many- (up to 8-) branched, beneath with scattered stellate hairs, these chiefly on the veins and veinlets; primary veins 5 or 6, impressed above, elevated beneath,

arcuate-ascending, anastomosing toward the margin; peduncle 4 to 5 cm long, 1.5 mm thick, tomentose like the branchlets; bracts at base of inflorescence leaflike, petiolate (the petioles about 5 mm long), the blade about 1.5 cm long, pubescent like the leaves; cyme twice or thrice compound, about 5 cm across, the primary rays 6 or 7, up to 2 cm long, densely tomentose, the secondary rays shorter; terminal flowers sessile, the lateral short-pedicellate; bractlets subtending the flowers small, linear, shorter than or equaling the calyx tube, sparsely hairy; calyx tube obconic, glabrous or with a few short simple hairs, sparsely glandular; calyx lobes deltoid, concave, about 0.75 mm long, acutish, glabrous on the back, ciliate; corolla about 5.5 mm wide, 3 mm long, glabrous or with a few scattered hairs, the lobes rounded; filaments glabrous, about 2.5 mm long; anthers exserted, oval, about 1 mm long; style glabrous.

Type in the Copenhagen Herbarium, collected on Mount Orizaba, Mexico, alt. 2,600 meters, September 1841, by Liebmann (no. 7806).

The second specimen cited by Oersted (Volcán Irazú, Costa Rica, alt. 2,700 meters, January 1847, *Oersted* 7819; Co) is not identical with the type from Orizaba and may represent a distinct species or variety. Further material is necessary to make a proper decision.

Viburnum stellatum is not closely related to any other Mexican or Central American species, and when better known will probably be found to represent a distinct section or subsection of the genus.

DOUBTFUL SPECIES

VIBURNUM PARVIFLORUM Mart. & Gal. Bull. Acad. Brux. **11**[1]: 243. 1844.

Founded on *Galeotti* 7138, collected at Zacatepec, Oaxaca, Mexico. No specimens have been examined.