TWO NEW SPECIES OF *BUNCHOSIA* (MALPIGHIACEAE) FROM WESTERN AND SOUTHERN MEXICO

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RESUMEN

Se describen dos nuevas especies de *Bunchosia* (Malpighiaceae) de la vertiente pacífica y llanura costera del oeste y sur de México. *Bunchosia luzmariae*, de Nayarit y Jalisco, se distingue por los pelos cortos, rectos y adpresos de las hojas, por el gineceo bicarpelar con ovario glabro, estilo glabro o piloso y por el fruto liso. *Bunchosia caroli*, de Guerrero y Oaxaca, es notable por las hojas tomentosas, estípulas ausentes, inflorescencia corta sobre ramas de los años anteriores y el gineceo bicarpelar y glabro.

ABSTRACT

Two new species of *Bunchosia* (Malpighiaceae) are described from the Pacific slopes and coastal plain of western and southern Mexico. *Bunchosia luzmariae*, of Nayarit and Jalisco, is distinguished by the short, straight, appressed hairs of its leaves, the bicarpellate gynoecium with the ovary glabrous and the style glabrous or pilose, and the smooth fruit. *Bunchosia caroli*, of Guerrero and Oaxaca, is notable for its tomentose leaves, lack of stipules, short inflorescence borne on wood from previous years, and glabrous bicarpellate gynoecium.

In January of 1965, as a first-year doctoral student at the University of Michigan, I made my first trip to Mexico, with Rogers McVaugh, Ruth McVaugh, and two other graduate students. Among the many interesting people whom I met on that voyage, one of the most memorable was Luz María Villarreal de Puga. In 1965, and during all my subsequent visits to Guadalajara, Mrs. Puga has always been unfailingly kind and helpful to me, my wife Christiane, and our companions. It therefore gives me special pleasure to honor Maestra Puga on the occasion of her eighty-fifth birthday. At the same time, while recognizing the accomplishments of a member of the generation that preceded mine, I want to salute Charles Davis, a young student of Malpighiaceae who represents the generation to come, to emphasize the continuity of plant taxonomy —we build on the work of our predecessors and welcome the contributions of our successors.

Bunchosia is one of the most homogeneous genera of the Malpighiaceae, and the similarity of its species has made its taxonomy difficult. At present I recognize 62 species in the genus, including the two that are described in this paper, but there are a number of additional species awaiting description, and I expect the genus eventually to comprise at least 75 species. The plants are shrubs or small trees growing in diverse vegetations from dry woodlands to wet forests. Most of the species are native to Mexico, the West Indies, Central America, and western South America; rather few

occur in central or eastern South America. The ancestral gynoecium of *Bunchosia* was surely tricarpellate, as in most Malpighiaceae, but in many species one carpel has been lost and the gynoecium is bicarpellate. That is the case for both of the species described below. Indeed, with the exception of a single collection from Guerrero, all of the specimens I have seen of *Bunchosia* from west of Oaxaca have been bicarpellate.

Bunchosia luzmariae W.R. Anderson *sp. nov. Frutex vel arbor parva 2-4 m alta; lamina sparsim sericea pilis 0.2-0.5 mm longis, rectis, sessilibus, appressis; inflorescentia 5-16 cm longa, ex 12-20 (-28) floribus constans; sepala glandulas 1.3-2 mm superantia; petala margine eglandulosa; petalum posticum spathulatum; gynoecium bicarpellatum, ovario glabro, stylo (ex 2 connatis constanti) glabro vel saepius piloso vel laxe sericeo; fructus 10-14 mm longus et 13-18 mm diametro (siccus), laevis* (figure 1, e-i).

Shrub or small tree 2-4 m tall; stems green in the first year and thinly to densely sericeous with translucent hairs or eventually glabrescent. **Lamina** of larger leaves 9-18 cm long, 4-10.5 cm wide, elliptical or ovate, cuneate at base, obtuse or short-acuminate at apex and often indented at very tip to a small gland, bearing abaxially a pair of large glands against midrib near base and a row of 1-6 smaller glands distally on each side between midrib and margin, with the 5-8 pairs of lateral veins more prominent below than above, initially thinly to moderately sericeous on both sides with short (0.2-0.5 mm), straight, sessile, appressed, translucent hairs, the adaxial hairs persistent or eventually deciduous, the abaxial hairs persistent; petiole 7-15 mm long, eglandular, sericeous or subvelutinous; stipules 0.8-1.5 mm long, borne on petiole just above base, eglandular. **Inflorescence** a pseudoraceme axillary to leaves of the current year, without vegetative leaves, 5-16 cm long, sericeous like stems, the flowers 12-20 (-28), mostly decussate at base but distally usually in no consistent order; bracts 1-2.5 mm long, triangular or ovate, abaxially sericeous, adaxially glabrous or bearing a few hairs; peduncle 1-4 mm long, sericeous; bracteoles apical, 0.8-1.3 mm long, ovate, abaxially sericeous, adaxially glabrous or bearing a few hairs, one of each pair bearing an eccentric abaxial gland 0.5-1 mm in diameter, the gland developing partly below bracteole on peduncle; pedicel 1-4.5 mm long, sericeous. **Sepals** 1.3-2 mm long beyond glands, 1.3-1.8 mm wide, rounded and sometimes slightly erose at apex, abaxially thinly sericeous proximally, ciliate with long spreading hairs all around margin, adaxially glabrous, appressed, erect, or spreading in anthesis, the glands apparently 8 (actually 10, those of the anterior sepal connate with their neighbors), 1.7-2.8 (-3.8) mm long, the anterior 2 shortest and the posterior 2 longest, obovate, compressed, glabrous, the longer glands often slightly decurrent onto the pedicel. **Petals** yellow, glabrous, all eglandular all around margin; lateral petals reflexed, with the claw 1.3-2 mm long, the limb (3-) 4-4.5 mm long, 3-6 mm wide, concave (especially the outermost) to nearly flat, dentate or erose; posterior petal spatulate, with the thick claw

erect, 2.5-3.5 mm long, widening gradually distally without an apical constriction, the limb erect to reflexed, 3-4 mm long, 3-3.5 mm wide, obovate, nearly flat, dentate or erose or shallowly lacerate. **Stamens** glabrous; filaments 2-3.5 mm long, longer opposite sepals than opposite petals, white and membranous, connate for 1/3-1/2 of their length; anthers 1-1.1 mm long, pressed against styles in anthesis or somewhat spreading, the connective yellowish or light brown, not or somewhat swollen abaxially. **Gynoecium** 2-carpellate; ovary 1.3-1.7 mm high, globose or cylindroidal, glabrous; styles 2 but completely connate or occasionally distinct distally, (1.3-) 2.2-2.5 mm long, usually pilose or loosely sericeous but occasionally glabrous, straight and erect; stigmas 2, distinct but sometimes appearing connate, each peltate with a slight ventral indentation. **Fruit** orange or orange-red at maturity, 10-14 mm long and 13-18 mm in diameter (dried), globose or depressed-globose, 2-lobed, glabrous, smooth (*i.e.*, not granulate) at all stages from early immaturity to full maturity.

TYPE: Mexico, Jalisco, steep western slopes of Sierra de San Sebastian, 15-30 km (straight line) N of Mascota on road to San Sebastian, in open places, 1 200-1 330 m, 1-3.III.1970 fl, *W.R. Anderson & C. Anderson 5985* (holotype: MICH; isotypes: DUKE, ENCB, IBUG, SD).

PARATYPES: **Jalisco**: Mpio. San Sebastián del Oeste, Km 67.5 en camino de Talpa hacia San Sebastián, 15.8 km antes de San Sebastián, bosque mesófilo con *Quercus*, *Magnolia*, 26.V.1984 fr, *Cowan 4767* (TEX); Mpio. Mascota, brecha La Estancia-Las Mulas, Km 7.5, Rancho Cieneguitas, bosque latifoliado esclerófilo caducifolio, 870 m, 9.V.1980 fr, *González et al. s.n.* (IBUG); San Sebastian, trail to Las Mesitas, Sierra Madre, dry arid rocky slope, 1 700 m, 17.III.1927 fl, *Mexia 1865* (A, CAS, DS, F, GH, MICH, MO, NY, UC, US); near Las Mesitas NW of San Sebastian, Sierra Madre Mountains, dry open spaces, 1 700 m, 17.III.1927 fr, *Mexia 1867* (A, CAS, DS, F, GH, MICH, MO, NY, UC, US); Mpio. San Sebastián, trayecto de San Sebastián a La Estancia, bosque en transición de bosque tropical a bosque de pino-encino, 900 m, 29.I.1991 fl, *Nieves et al. s.n.* (IBUG); Mpio. San Sebastián del Oeste, Milpillas, al SE de San Sebastián del Oeste, bosque de pino-encino, 1 850 m, 15.V.1986 fr, *Ramírez D. 302* (IBUG); Mpio. San Sebastián del Oeste, Milpillas, al SE de San Sebastián del Oeste, bosque de pino y encino, 1 850 m, 18.V.1986 fr, *Reyna B. 204* (CHAPA, IBUG, XAL). **Nayarit**: Mpio. San Blas, orilla de Santa Cruz, a 27 km al E de San Blas, cerca del mar, recolectado junto a una plantación de plátano, 25.IV.1981 fr, *Camarena s.n.* (IBUG); SE of San Blas, on dirt road through Matanchen, heading SE toward Rio San Cristobal, low hill above the river mangrove, with low tropical deciduous forest, 20 m, 11.IV.1979, *Davidson 7598* imm fr (RSA), *Davidson 7599* fl (ENCB); near Miramar, 15 km SE of San Blas, 1 km from the beach on road to Jalcocotan, roadsides and thickets between banana plantations, near sea level, 25.VIII.1959 fl, *Feddema 974* (MICH); Mpio. Ruiz, 6.5 km al O del Venado, selva mediana perennifolia, en cañada, 100 m,

14.IV.1990, *Flores F. 1963* fl (MEXU, MICH), *Flores F. 1966* fr (MEXU, MICH); 6-12 km NE of Miramar, road to Jalcocotan, roadsides, weedy, 250-350 m, 11.IV.1965 fl & fr, *McVaugh 23565* (ENCB, MICH); Mpio. Ruiz, 13 km al NE de El Venado, camino a San Pedro Ixcatán, encinal, 8.II.1985 fl, *Téllez V. 8289* (MEXU, MICH).

SEASON OF FLOWERING AND FRUITING: Collected with flowers from January to April and once in August, and with fruits from March to May.

HABITAT: Roadsides, open places, thickets, and woods of varying composition.

ETYMOLOGY: I name this species in honor of Maestra Luz María Villarreal de Puga (b. 1913), who, starting with nothing but joyous enthusiasm, built up systematic botany at the Universidad de Guadalajara through many years of dedicated work.

DISTRIBUTION: Pacific slopes of southern Nayarit and adjacent Jalisco, from Ruiz south to Mascota, from sea level to 1 850 m (figure 2).

DISCUSSION: *Bunchosia luzmariae* most resembles the species that passes in Mexico as *B. cornifolia* H. B. K.; I am not yet certain that the latter is true *B. cornifolia*. Both species occur in Jalisco and Nayarit, but they have not been collected in the same places. Both have the leaf hairs short, straight, sessile, and appressed, unlike most bicarpellate species in Mexico. *Bunchosia cornifolia* differs from *B. luzmariae* in that its inflorescence is only 3-6 cm long and contains only 3-10 flowers, its sepals reach only about as high as the calyx glands, and its ovary is densely sericeous.

Bunchosia caroli W.R. Anderson *sp. nov. Frutex vel arbor 2.5-6 (-10) m alta; lamina abaxialiter dense et pertinaciter tomentosa pilis 1.5-2.5 mm longis, sinuatis vel tortis, stipitatis, patentibus; petiolus 3-6 (-8) mm longus; stipulae nullae; inflorescentiae 1.5-4.5 cm longae ex 6-10 floribus constantes, nodis aphyllis vetustioribus portatae; pedunculus 0 (-1) mm longus; 1 bracteola cujusque paris 1 glandula abaxiali instructa, altera eglandulosa; glandulae calycinae non decurrentes; gynoecium bicarpellatum, glabrum, ca. 4 mm longum; fructus 11-15 mm longus et 14-20 mm diametro (siccus), granulatus per maturationem* (figure 1, a-d).

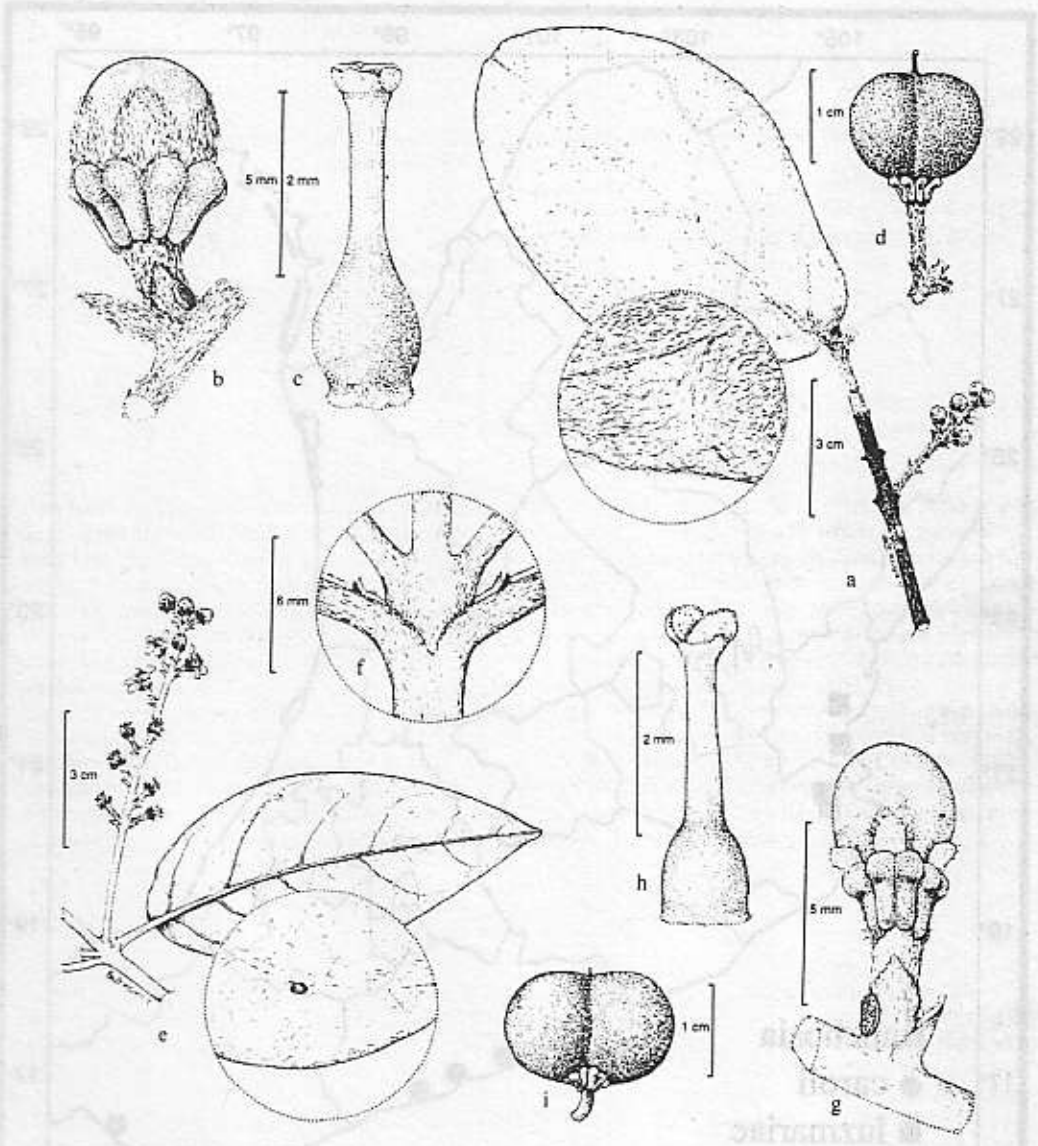

Figure 1. *Bunchosia caroli* and *Bunchosia luzmariae*. a-d, *B. caroli*: a, leaf and inflorescence, with enlargement of abaxial surface of leaf; b, flower bud; c, gynoecium; d, fruit. e-i, *B. luzmariae*: e, leaf and inflorescence, with enlargement of abaxial surface of leaf; f, node enlarged to show stipules; g, flower bud; h, gynoecium; i, fruit.

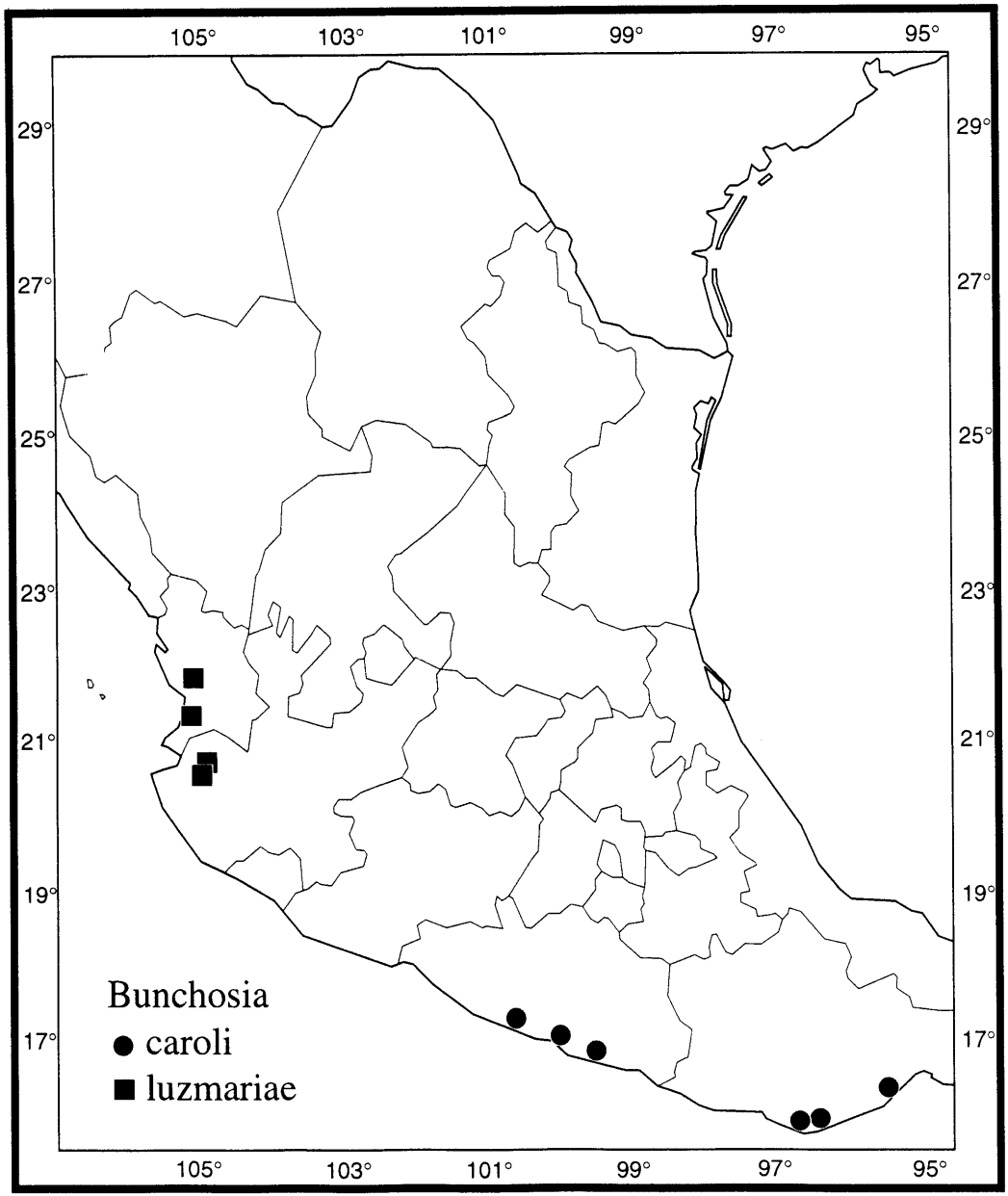

Figure 2. Distribution of *Bunchosia caroli* and *Bunchosia luzmariae*.

Shrub or small to moderate-sized tree 2.5-6 (-10) m tall; stems initially densely tomentose or loosely sericeous with the hairs eventually deciduous, either during the first year or in subsequent years. **Lamina** of larger leaves (8-) 10-16 cm long, (4-) 5-9 cm wide, elliptical or ovate, cuneate to cordate at base, rounded or obtuse or abruptly short-acuminate and usually eglandular at apex, bearing abaxially a pair of small glands near base between midrib and margin and distally eglandular or with a row of 1-16 small glands somewhat within margin, with the 6-8 pairs of lateral veins prominent below and not or hardly raised above, initially densely tomentose on both sides with long (1.5-2.5 mm), sinuous or twisted, short-stalked, spreading, whitish hairs, the adaxial hairs soon deciduous leaving the upper surface nearly glabrate at maturity, the abaxial hairs persistent; petiole 3-6 (-8) mm long, eglandular or biglandular between middle and apex, densely and persistently tomentose; stipules not found. **Inflorescence** a pseudoraceme borne on old wood axillary to scars of leaves of previous year(s), mostly without vegetative leaves but with a pair of sterile bracts at very base and occasionally with the lowest fertile bracts enlarged into small leaves, the axis 1.5-4.5 cm long, densely and persistently tomentose or loosely sericeous, the flowers 6-10, mostly decussate both proximally and distally; bracts 1.5-5 mm long (or occasionally the lowest leaflike), triangular or ovate, abaxially tomentose, adaxially glabrous or bearing a few hairs; peduncle mostly none, very rarely up to 1 mm long, tomentose; bracteoles 1-2.5 mm long, ovate, abaxially tomentose, adaxially glabrous or bearing a few hairs, one of each pair bearing an eccentric abaxial gland 0.5-1 mm in diameter, the gland developing wholly on the bracteole; pedicel 1.5-8 mm long, often flared distally, tomentose. **Sepals** 2-2.7 mm long beyond glands, 2-2.7 mm wide, broadly rounded, abaxially densely tomentose or appressed-tomentose over the whole surface and ciliate on margin, adaxially glabrous, appressed in anthesis, the glands 8 (perhaps actually 10, those of the anterior sepal connate with their neighbors), 2.1-3.5 mm long, obovate or elliptical, some compressed, glabrous, detached at apex, the posterior 2 longest but not decurrent. **Petals** yellow, glabrous; lateral petals spreading or reflexed, with the claw 2.5-3.5 mm long, the limb 4-6.5 mm long, 4-7 mm wide, concave (especially the anterior pair), erose, eglandular all around margin; posterior petal spatulate, with the somewhat thickened claw erect, 3.5-4 mm long, widening gradually distally without an apical constriction, the limb nearly erect, 3-4 mm long and wide, ovate or obovate, flat or shallowly concave, erose and eglandular or with several glands at base. **Stamens** glabrous; filaments 2.5-3.5 mm long, longer opposite sepals than opposite petals, white and membranous, connate for 1/3-1/2 of their length; anthers 0.9-1.3 mm long, erect or spreading in anthesis, the connective yellowish or slightly brownish, not swollen abaxially. **Gynoecium** 2-carpellate, glabrous; ovary 1.5 mm high, ovoid, tapering gradually distally into the style; styles 2 but completely connate, 2-2.5 mm long; stigmas 2, distinct, semicircular and inaequilaterally somewhat peltate, small. **Fruit** yellow or orange to red at maturity, 11-15 mm long and 14-20 mm in diameter (dried), globose or depressed-globose and 2-lobed, glabrous, glandular-granulate throughout development but probably becoming nearly smooth at full maturity.

TYPE: México, Oaxaca, Mpio. Salina Cruz, Rincón Bamba, al O de Salina Cruz, selva baja caducifolia, 9.VII.1986 fl, *C. Martínez R. 654* (holotype: MICH; isotypes: F, MEXU).

PARATYPES: **Guerrero**: Mpio. San Marcos, 2 km adelante de Huajintepec rumbo a Agua Zarca, bosque tropical caducifolio, 510 m, 20.VIII.1985 fl, *Fonseca J. 1226* (MEXU); Mpio. Acapulco, Cerro de la Hacienda (Laguna Tres Palos), bosque tropical caducifolio perturbado, 11.XI.1984 fr, *Gil 119* (MEXU); Atoyac, Distr. Galeana, 25-100 m, 23.VIII.1939 fr, *Hinton et al. 14555* (GH, LL, MICH, NY, UC, US); Mpio. Zihuatanejo, Carr. Ixtapa-Playa Azul, a 3 km al NNW de Ixtapa, 22.X.1977 fr, *Ladd O. 266* (MEXU); Mpio. Acapulco, in front of Hotel Mirador, Acapulco, rocky headlands, 300-400 ft, 21.VIII.1935 fr, *MacDaniels 153* (BH, F); Mpio. Acapulco, rocky headlands between Acapulco and Pie de la Cuesta, 150-220 ft, 24.VIII.1935 fr, *MacDaniels 248* (BH, F); Mpio. Acapulco, Playa Roqueta Acapulco, 30.III.1947 fr, *Miranda 4090* (MEXU); Acapulco and vicinity, X. 1894-III.1895 fr, *Palmer 545* (A, F, GH, MO, NY, UC, US); Mpio. Acapulco, Isla de la Roqueta, Acapulco, V.1952 fr, *Ramírez C. s.n.* (MEXU); Mpio. Acapulco, La Roqueta, Acapulco, XI.1952 fr, *Ramírez C. s.n.* (MEXU). **Oaxaca**: Al W de Pto. Escondido, suelo somero, arenoso, 40 m, 14.XII.1968 fr, *Blanco M. 142* (MEXU); Mpio. Huatulco, al N de Santa Cruz, selva baja caducifolia, primaria, 15°45'40"N, 96°09'50"W, 50 m, 31 X.1992 fr, *Castillo C. et al. 9200* (XAL); Mpio. Huatulco, 3 km al NW de Santa Cruz, selva baja caducifolia, primaria, 15°44'40"N, 96°08'10"W, 75 m, 4.XI.1992 fr, *Castillo C. et al. 9374* (XAL); Mpio. Santa María Huatulco, carreterra a Salina Cruz, ca. 50 km al E del entronque con carretera Pochutla-Puerto Ángel, bosque tropical caducifolio, 100 m, 14.XI.1979 fr, *Koch et al. 79546* (CAS, CHAPA, ENCB, IBUG, LL, MEXU, MICH, NY, XAL); Mpio. Tehuantepec, San Vicente Mazatán, 20 km al N del Morro entrando por el crucero de Santa Clara, selva baja caducifolia, 16°07'N, 95°25'W, 24.VII.1988 fl, *Martínez R. 1555* (F, MEXU); Mpio. Tehuantepec, de Rincón Bamba a Garrapatero (Rincón Bamba se encuentra a 44 km al W de Salina Cruz, carr. a Pochutla), selva baja caducifolia, 15°59'N, 95°27'W, 31.VIII.1988 fr, *Martínez R. 1820* (F, MEXU); 23 km al SW de el Morro Mazatlán carr. Salina Cruz-Pochutla, selva baja caducifolia, 60 m, 30.VI.1984 fl, *Torres C. 5426* (MEXU, MICH).

SEASON OF FLOWERING AND FRUITING: Collected with flowers in July and August, and with fruits in March, May, August, October, November, and December.

HABITAT: Low tropical deciduous woodland.

ETYMOLOGY: The name of this species honors my student, collaborator, and friend, Charles Cavender Davis, III (b. 1974). Chuck is just beginning his career in plant systematics, and I hope he will make as fine a contribution to our field, in his own way, as Luz María Villarreal de Puga has made in hers.

DISTRIBUTION: Coastal lowlands of Oaxaca and Guerrero, never collected far from the Pacific Ocean, and only once collected above 100 m elevation (figure 2).

DISCUSSION: *Bunchosia caroli* is readily distinguished from other species of Guerrero and Oaxaca by the following combination of characteristics: lamina densely and persistently tomentose below; petiole short; stipules lacking; inflorescence short, few-flowered, borne on wood from previous year(s) at leafless nodes; peduncle mostly none; gynoecium bicarpellate, short, glabrous. Its sister-species is probably *Bunchosia sonorensis* Rose, native to the Pacific coastal plain from Sonora to Jalisco, which also has tomentose leaves and short, few-flowered inflorescences, but differs from *B. caroli* in having stipules ca. 1 mm long, both bracteoles of each pair usually bearing 1 abaxial gland (or 2), some calyx glands usually decurrent, and the ovary always densely sericeous.

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