

TWO NEW SPECIES OF *ARCHIBACCHARIS* (ASTERACEAE: ASTEREEAE)
FROM MÉXICO WITH A REEVALUATION OF SECTIONAL GROUPINGS IN
THE GENUS

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ABSTRACT

Six sections are recognized within the genus *Archibaccharis*, compared to the two previously recognized by Jackson. The four newly described sections, which are primarily segregated from sect. *Archibaccharis* sensu Jackson, are sect. *Tomentosa*, sect. *Stricta*, sect. *Glandulicarpa*, and sect. *Stylosa*. In this modified view, the difference between "erect" and "scandent" habit is not as absolute as conceived by Jackson, since five of the six sections include species with scandent tendencies. The sectional placement of all 32 species of the genus is proposed, including two species that are described as new. *Archibaccharis tuxtlenensis* sp. nov. (sect. *Glandulicarpa*) is described from the peak of Volcán San Martín Tuxtla in Veracruz, México. *Archibaccharis vesticaulis* sp. nov. (sect. *Stylosa*) from southern Chiapas is apparently most closely related to *A. salmeoides* (S.F. Blake) S.F. Blake.

KEY WORDS: *Archibaccharis*, Asteraceae, Astereae, México, taxonomy

I. Sectional classification of *Archibaccharis*

The taxonomic revision of the genus *Archibaccharis* Heering by J. D. Jackson (1974, 1975) provided a detailed and coherent taxonomic interpretation of the genus, but since his study there have been changes in the nomenclature and delimitation of numerous taxa (Nesom 1988a), and a number of additional species have been described (Turner 1984; Sundberg 1984; Nesom 1988b, 1989, 1990). Jackson divided the genus into two sections, based on the habit of the plants (erect - sect. *Archibaccharis* vs. scandent - sect. *Hirtella* J.D. Jackson). In a reevaluation of the relationships of all the species, the present study divides sect. *Archibaccharis* sensu Jackson into four separate sections, three of

them previously undescribed, and two species of sect. *Hirtella* are transferred to a fourth new section, where they join a third species described in the present paper.

Archibaccharis Heering, Jahr. Hamb. Wissensch. Anst. 21, Beiheft 3:40. 1904.

Type species: *A. hieraciifolia* Heering (= *A. auriculata* [Hemsl.] Nesom)

1. Sect. *Archibaccharis* Type species: *A. auriculata* (Hemsl.) Nesom, *Phytologia* 65:123. 1988.

Plants erect to subscandent, 0.5-2.0(-3.0) m tall, stems greenish, herbaceous, straight to weakly zig-zag, stems and leaves stipitate glandular, eglandular in some, leaves slightly thickened but not coriaceous, capitulescences corymboid and terminal (rounded paniculate and axillary in *Archibaccharis blakeana* Standl. & Steyerl. and *A. pringlei* [Greenm.] S.F. Blake), pistillate heads 6-10(-15) mm high (4-6 mm in *A. pringlei* and *A. blakeana*), on relatively long pedicels, staminate flower styles with linear collecting appendages (0.6-)0.8-1.2 mm long, achenes strigose to glabrous, eglandular.

Species included: *Archibaccharis auriculata*, *A. campii* S.F. Blake, *A. hieracioides* (S.F. Blake) S.F. Blake, *A. macdonaldii* Nesom, *A. simplex* (S.F. Blake) S.F. Blake, *A. blakeana*, and *A. pringlei*.

Only the first two species listed have all of the features noted above, but the section appears to be monophyletic. The first four species produce a stipitate glandular vestiture, and the first five have larger heads than any others in the genus. *Archibaccharis simplex* is distinct in its glabrate, nonglandular vestiture but has an erect habit, sessile to slightly clasping leaves, and produces a corymboid capitulescence of large heads on long pedicels. *Archibaccharis hieracioides* and *A. macdonaldii* have petiolate leaves, but the petioles are broad, and in the latter, they have a flaring, foliar base. Jackson (1975) placed *A. blakeana* and *A. campii* in sect. *Hirtella* because of their subscandent tendencies (he characterized them as "weak-stemmed scramblers"), fractiflex stems, but in their auriculate leaves and linear collecting appendages, they appear to belong in sect. *Archibaccharis*.

2. Sect. *Glandulicarpa* Nesom, sect. nov. Type species: *Archibaccharis standleyi* S.F. Blake, J. Washington Acad. Sci. 19:271. 1929.

Herbae erectae vel subscandentes, folia plerumque coriacea, appendices styli lineares 0.8-1.0 mm long, achenia glandulosa.

Plants 0.4-3.0 m tall, erect but usually with marked subscandent tendencies (sprawling, leaning, or climbing), stems greenish, herbaceous, straight to weakly zig-zag, glabrous or glabrate (except for *Archibaccharis corymbosa*), leaves thick, lanceolate to ovate, glabrous to glabrate with a shiny upper surface, capitulescence corymboid to rounded or convex paniculate, terminal or

terminal and axillary, pistillate heads 4-7(-8) mm high, on relatively short pedicels, staminate flower styles with linear to linear-lanceolate collecting appendages 0.8-1.0 mm long, achenes glandular and usually strigose as well.

Species included: *Archibaccharis standleyi* (including *A. aequivenia* [S.F. Blake] D. Nash), *A. nicaraguensis* Nesom, *A. venturana* Nesom, *A. tuxtlenensis* Nesom, *A. veracruzana* Nesom, *A. subsessilis* S.F. Blake, *A. linearilobis* J.D. Jackson, and *A. corymbosa* (J.D. Smith) S.F. Blake.

Archibaccharis subsessilis, *A. linearilobis*, and *A. corymbosa* produce ovate leaves with truncate to cordate bases and relatively long ligules on the pistillate flowers and appear to form a closely related group; the leaves of the first two are epetiolate or nearly so. *Archibaccharis veracruzana*, *A. venturana*, and *A. tuxtlenensis* have ovate leaves with tapering bases, while the rest have lanceolate leaves.

3. Sect. **Stricta** Nesom, *sect. nov.* Type species: *Archibaccharis caloneura* S.F. Blake, Proc. Biol. Soc. Washington 55:117. 1942.

Caules stricti lignescentes porphyreisque et appendices styli lineares 0.8-1.0 mm longi.

Plants 0.6-3.0(-6.5) m tall, strictly erect, stems usually reddish brown, lignescent, straight, glabrous or glabrate, leaves thickened to coriaceous, lanceolate (or ovate to ovate-lanceolate in *Archibaccharis asperifolia*), capitulescence corymboid or broadly paniculate, terminal, rarely also from the upper axils, pistillate heads (3.5-)4.0-7.5(-9.0) mm high, on relatively short pedicels, staminate flower style appendages linear to linear-lanceolate, 0.8-1.0 mm long, achenes sparsely strigose, eglandular.

Species included: *Archibaccharis caloneura*, *A. androgyna* (Brandeg.) S.F. Blake, *A. panamensis* S.F. Blake, *A. irazuensis* (S.F. Blake) S.F. Blake, *A. jacksonii* Sundberg, and *A. asperifolia* (Benth.) S.F. Blake (including *A. sescenticeps* [S.F. Blake] S.F. Blake).

Archibaccharis caloneura and *A. androgyna* have coriaceous leaves and appear to be closely related. *Archibaccharis irazuensis*, *A. panamensis*, and *A. jacksonii* have thinner leaves, and as pointed out by Sundberg (1984), the last two have more achenial nerves than any other species of the genus. *Archibaccharis asperifolia* is unusual in its broader leaves and the strongly developed indument on its leaves, but in diagnostic features it belongs with sect. *Stricta*.

4. Sect. **Tomentosa** Nesom, *sect. nov.* Type species: *Archibaccharis serratifolia* (Kunth) S.F. Blake, Contr. U. S. Natl. Herb. 26:236. 1930.

Herbae erectae vel subscaedentes, caules ac folia tomentosa vel villosa, appendices styli deltati vel triangulares 0.2-0.5 mm longi.

Plants 0.5-3.0 m tall, erect to leaning or sprawling, stems greenish, herbaceous, straight to weakly zig-zag, stems and leaves sparsely to densely tomentose or villous, the leaves thickened, lanceolate-ovate, capitulescence corymboid or rounded paniculate, terminal, sometimes with axillary branches, pistillate heads most 2.0-5.0 mm high, on relatively short pedicels, staminate flower styles with deltate to triangular appendages 0.2-0.5 mm long, achenes sparsely strigose, eglandular.

Species included: *Archibaccharis serratifolia*, *A. nephocephala* Nesom, and *A. peninsularis* S.F. Blake.

These three species are similar in their primarily erect habit, vestiture, and style branch morphology. *Archibaccharis corymbosa* of sect. *Glandulicarpa* also produces tomentose vestiture, but the similarity clearly is parallel. The only other species in which the style collecting appendage are so short are those of sect. *Hirtella*, and the two groups may ultimately prove to be closely related, despite their disparity in habit.

5. Sect. *Stylosa* Nesom, sect. nov. Type species: *Archibaccharis lucentifolia* L.O. Wms., Fieldiana, Bot. 29:388. 1962.

Herbae scandentes vel subscandentes, appendices styli ovati-deltati 0.7-0.8 mm long.

Plants subscandent herbs (up to 5 m tall) or true vines, stems greenish, herbaceous, straight to weakly zig-zag, stems and leaves glabrous to glabrate, the leaves coriaceous to slightly thickened, ovate, capitulescence rounded paniculate, terminal and axillary, pistillate heads 3.0-8.0 mm high, on relatively short pedicels, staminate flower styles with ovate-deltate appendages 0.7-0.8 mm long, achenes sparsely strigose, eglandular.

Species included: *Archibaccharis lucentifolia*, *A. salmeoides* (S.F. Blake) S.F. Blake, and *A. vesticaulis* Nesom.

These species are separated primarily on the basis of their very thick staminate style branch appendages with thick, spreading, sweeping hairs. No other species of the genus are similar. The first two species are strongly scandent, while *Archibaccharis vesticaulis* is more shrublike. All have thick leaves, and their relationship may prove to be with sect. *Glandulicarpa*, where their position would be analogous to the two of sect. *Archibaccharis* that are hypothesized to have evolved a scandent habit from primarily erect ancestors.

6. Sect. *Hirtella* J.D. Jackson, Phytologia 32:158. 1975. Type species: *Archibaccharis hirtella* (DC.) Heering, Jahr. Hamb. Wissensch. Anst. 21, Beiheft 3:41. 1904.

Scandent herbs, sometimes leaning, stems greenish, sharply zig-zag to sinuous, stems and leaves hirsute to sparsely hirsutulous, the leaves thin and not

shiny, ovate, capitulescence mostly rounded to convex panicles, terminal and axillary, heads 3.5-5.5(-7.0) mm high, on relatively short pedicels, of the staminate flower styles with minute, ovate-deltate collecting appendages 0.2-0.5 mm long, achenes strigose, eglandular.

Species included: *Archibaccharis hirtella**, *A. intermedia** (S.F. Blake) B. Turner, *A. albescens** (J.D. Jackson) Nesom, *A. taeniotricha** (S.F. Blake) Nesom, *A. flexilis* (S.F. Blake) S.F. Blake, and *A. schiedeana* (Benth.) J.D. Jackson.

From sect. *Hirtella* as delimited by Jackson (1975), *Archibaccharis salmeoides* and *A. lucentifolia* have been transferred to sect. *Stylosa*, and *A. pringlei* and *A. blakeana* have been transferred to sect. *Archibaccharis* sensu stricto.

Jackson (1975) pointed out the similarity in collecting appendages among the taxa he regarded as four varieties of *Archibaccharis hirtella* (marked with asterisk above). These are the core of sect. *Hirtella* and are here considered four separate species. *Archibaccharis flexilis* shares with *A. taeniotricha* and *A. albescens* a truly scandent habit and densely hispid stems with coarse, erect, long, sharp pointed trichomes. The collecting appendages of both *A. flexilis* and *A. schiedeana*, however, are much more linear than the core species, and the evolutionary affinities of both of these may ultimately prove to belong elsewhere.

As noted by Jackson (1975), the plants of *Archibaccharis schiedeana* are initially decumbent or procumbent to sprawling or arching herbs, but at maturity the stems elongate greatly and they become true vines. Plants of *A. hirtella* and its three closest relatives, however, as well as *A. flexilis*, have been collected only as vines. The stems of most of the scandent plants are zig-zag ("fractiflex" in the terminology of Jackson 1975) and produce a terminal capitulescence as well as similar sized axillary ones at least on the upper portions, while those of erect plants are usually relatively straight and produce only a single, terminal capitulescence. The stems of many of the erect species in other sections with scandent tendencies, however, tend to be slightly zig-zag, and the capitulescences are often axillary as well as terminal. Further, the stems even of the scandent species are variable in orientation. For example, the stems of *A. schiedeana* are usually nearly straight, and *A. flexilis* has sinuous rather than zig-zag stems. In any case, the definite and consistent tendency for plants of almost all species of *Archibaccharis* to become at least somewhat vinelike argues for the monophyletic status of the genus. It is assumed, however, that primarily erect stems, rather than true vines, are the primitive condition for the genus.

II. Two new species

Continued study of *Archibaccharis* has revealed the existence of two previously undescribed species. The first apparently is restricted to Veracruz,

México, where it is known only from Volcán San Martín Tuxtla.

Archibaccharis tuxtliensis Nesom, *sp. nov.* TYPE: MÉXICO. Veracruz: Mpio. San Andres Tuxtla, near summit (upper 300 ft) of Volcán San Martín, ca. 6000 ft, 28 Dec 1964, *A.C. Faberge s.n.* (HOLOTYPE: TEX!).

Differt a *A. venturana* Nesom phyllariis interioribus longioribus, corollis staminalibus longioribus, et acheniis glandes non nisi ferentibus.

Subscandent shrubs ca. 0.5 m tall, stems noticeably but not strongly zigzag, eglandular, sparsely to moderately invested with thick, vitreous hairs with conspicuous brownish crosswalls. Leaves thick, the upper surface shiny, with a raised reticulum of veins, mostly glabrous except along the midvein, lower surface with a duller texture, blades ovate with acuminate apices and rounded to obtuse bases, 5-10 cm long, 2-4 cm wide, on petioles 5-8 mm long, the margins minutely and widely mucronulate with 2-9 pairs of mucros. Capitulescences axillary and terminal on the upper portion of the stems, in rounded, ebracteate panicles. Staminate heads not seen. Pistillate heads with 7-12 outer, pistillate flowers and 1 central, staminate flower; phyllaries lanceolate, greenish, with fringed-ciliate distal margins, otherwise glabrous, in 3-4 graduated series, the inner 4.5-5.5 mm long, the outer 1/5 as long. Pistillate flowers fertile, the corollas eligulate or with an extension 0.2 mm long, the tube 2.5-3.5 mm long, with thick, viscid trichomes, the style 2.5-3.5 mm long, with branches 1 mm long; achenes 1.2-1.5 mm long, gland dotted and viscid, without other hairs; pappus of numerous bristles. Staminate flowers with sterile ovaries, the corollas 3.5-4.0 mm long, the lobes purplish, lanceolate, 1.5 mm long, cut 2/3 to the tube, tube densely hairy with viscid trichomes.

Additional collection examined: MÉXICO. Veracruz: Mpio. San Andres Tuxtla, top of Volcán San Martín Tuxtla, ca. 1730 m, 14 Feb 1972, *Beaman & Castillo 5686* (TEX).

Archibaccharis tuxtliensis is most similar in habit, leaf morphology, and fruit morphology to *A. venturana* and *A. subsessilis* of sect. *Glandulicarpa*. The new species is distinguished from its closest relatives by the following contrasts.

1. Leaves gland dotted above and beneath, not distinctly thick or shiny, basally rounded to slightly cordate, sessile or on petioles 1 mm long; heads mostly in loose, broad, terminal corymbs; pistillate corollas ligulate; Guatemala, Chiapas, and Oaxaca. *A. subsessilis*
1. Leaves eglandular, thick, the upper surface shiny, basally obtuse to acute, on petioles 5-8 mm long; heads in relatively dense, terminal and axillary, corymboid panicles; pistillate corollas eligulate or essentially so; Veracruz. (2)

2. Inner phyllaries 2.0-3.0 mm long; pistillate heads with 2 staminate flowers, the corollas 2.0-2.8 mm long; achenes both sparsely strigose and glandular; vicinity of Xalapa to Perote. *A. venturana*
2. Inner phyllaries 4.5-5.5 mm long; pistillate heads with 1 staminate flower, the corolla 3.5-4.0 mm long; achenes glandular, without other vestiture; Volcán San Martín Tuxtla. *A. tuztlensis*

Archibaccharis vesticaulis Nesom, *sp. nov.* TYPE: MÉXICO. Chiapas: Mpio. Las Margaritas, E of Comitán Dominguez, 2.5 mi E of Ejido Tziscaco turnoff, along a short spur road toward lake, disturbed ground, 7 Jan 1984, S. Sundberg 2423 (HOLOTYPE: TEX!).

Differt a *A. salmeoide* (S.F. Blake) S.F. Blake habitu subscandenti, foliis glandulosis, caulibus dense pubescentibus, capitulis brevioribus, et corollis staminalibus brevioribus.

Subscandent shrubs 5 m tall, stems slightly zig-zag, invested with thick, reddish brown trichomes completely obscuring the stem surface, eglandular. Leaves coriaceous, dark green, the upper surface shiny, with a slightly raised reticulum of veins, sparsely and minutely puberulous along the veins, eglandular, lower surface minutely but definitely gland-dotted, the blades elliptic-obovate with short attenuate apices and acute bases, 3-9 cm long, 2-4 cm wide, on petioles 5-15 mm long minutely but densely viscid puberulous, the margins entire or usually mucronulate with 2-7 pairs of mucros. Capitulescence of rounded, ebracteate panicles, terminal and on short axillary branches. Staminate heads not seen. Pistillate heads with 11-12 outer, pistillate flowers and 1 central, staminate flower; phyllaries narrowly oblong-lanceolate, greenish, with fringed ciliate distal margins, otherwise glabrous, in 3-4 graduated series, the inner 3.0-4.0 mm long, the outer 1/5 as long. Pistillate flowers fertile, the corollas tubular-filiform, 2.0-2.4 mm long, with a purple apex, eligulate; achenes 1.2-1.4 mm long, flattened, with 3-4 thick nerves, sparsely strigose, eglandular; pappus of numerous bristles. Staminate flowers with sterile ovaries, the corollas 3.0-3.2 mm long, the tube 1.8-2.0 mm long, densely hairy with viscid trichomes, the lobes purple, lanceolate, 1.2 mm long, cut nearly to the tube, style branches 0.8 mm long, with broad, elliptic-ovate appendages 0.5 mm long.

Additional collection examined: MÉXICO. Chiapas: Mt. Pasitar, Jan 1937, *Matuda 1544* (MEXU).

Jackson (1975) cited a MICH duplicate of *Matuda 1544* as a specimen of *Archibaccharis schiedeana*, but the MEXU specimen is clearly the same as the type. *Archibaccharis schiedeana* has neither coriaceous leaves nor densely invested stems, and its style branch morphology is very different from that of *A. vesticaulis*. The new species appears to be most closely related to *A.*

salmeoides and *A. lucentifolia* and is placed with them in sect. *Stylosa*. It is distinguished from *A. salmeoides* by the following contrasts.

1. Stems densely invested with reddish brown trichomes, obscuring the surface; lower surface of leaves sessile-glandular; pistillate heads 3.0-4.0 mm high; staminate corollas 3.0-3.2 mm long. *A. vesticaulis*
1. Stems sparsely puberulous with relatively thin trichomes; leaves eglandular; pistillate heads 4.0-6.4 mm high; staminate corollas 3.9-4.4 mm long. *A. salmeoides*

ACKNOWLEDGMENTS

I thank Dr. B.L. Turner and Dr. A. McDonald for their review and comments.

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