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New combinations in *Pleradenophora* (Euphorbiaceae s.s.)

ANDRÉ LAURÊNIO DE MELO[1], HANS-JOACHIM ESSER[2] & MARGARETH FERREIRA DE SALES[3]

[1]*Unidade Acadêmica de Serra Talhada, Universidade Federal Rural de Pernambuco. Fazenda Saco, s/n, Serra Talhada, Pernambuco, Brasil, CEP 56900-000; e-mail: andrelaurenio@yahoo.com.br*

[2]*Botanische Staatssammlung München, Menzinger Str. 67, D-80638 München, Germany; e-mail: esser@bsm.mwn.de*

[3]*Departamento de Biologia, Área de Botânica, Universidade Federal Rural de Pernambuco, Av. D. Manuel de Medeiros, s/n, Dois Irmãos, Recife, Pernambuco, Brasil, CEP-52171-900; e-mail: mfsales65@hotmail.com*

Abstract

A nomenclatural update is presented for the (hitherto monotypic) genus *Pleradenophora*. New combinations are presented for *Pleradenophora bilocularis*, *P. lottiae*, *P. membranifolia*, *P. tikalana* and *P. tuerckheimiana* (based on *Sebastiania bilocularis*, *S. lottiae*, *S. membranifolia*, *S. tikalana* and *Sapium tuerckheimianum*), and four new synonyms are proposed. A key to the species is provided. The genus currently comprises five species, distributed from the United States to Bolivia, with the highest diversity in Mexico and Guatemala.

Key words: Brazil, Central America, Hippomaneae, Mexico, *Sapium*, *Sebastiania*, United States

Introduction

The genus *Pleradenophora* of Euphorbiaceae, subfamily Euphorbioideae, tribe Hippomaneae was described by Esser (2001: 377), although it had been first recognized as a separate genus in the unpublished thesis of Esser (1994). In 2001 Esser published only one combination under the genus, for its type, *P. longicuspis* (Standley 1932: 134) Esser (2001: 377) from Belize. At that time it was already obvious that additional species were involved, such as the North-American plant known as *Sebastiania bilocularis* Watson (1885: 374), but the species needed a more thorough study.

During a recent revision of *Sebastiania* Sprengel (1821: 118) *sensu stricto* (sect. *Eusebastiania* Müller 1874: 582) by Melo (2006), more species from the southern US and northern Mesoamerica were studied that should be placed in *Pleradenophora*, bringing the number of species up to four. Esser (2012) indicated another, isolated species from South America, *S. membranifolia* Müller (1874: 679), that, together with several synonyms, should be transferred to *Pleradenophora*.

The species of *Pleradenophora* have previously been classified under *Sapium* Jacquin (1760: 9) and *Sebastiania* (e.g., by McVaugh 1995, Kruijt 1996, Steinmann & Felger 1997, Govaerts *et al.* 2000). These genera can be distinguished by morphological characters of leaves, staminate flowers, fruits and seeds (Table 1). *Pleradenophora* differs from *Sapium* by, e.g., the dry seeds without an aril and by staminate flowers with usually three or more stamens (versus seeds with a red aril and staminate flowers with two stamens), and from *Sebastiania* by, e.g., leaves often with petiolar glands, flowers with a distinctly fused calyx at least in staminate flowers, fruits with a thicker wall, the mericarp septa with a triangular split at the base and only one vascular strand each (versus leaves usually eglandular, staminate flowers with free to only very slightly fused sepals, fruits with a thinner wall, the mericarp septa without a basal triangular split and usually three vascular strands each) (Esser 2001, 2012).

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TABLE 1. Comparison of *Pleradenophora*, *Sapium* and *Sebastiania*.

	Pleradenophora	*Sapium*	*Sebastiania*
Petiolar glands of leaves	often present	mostly present	absent
Sepals of staminate flowers	distinctly fused at base	distinctly fused at base	± free
Number of staminate flowers per cymule	5–10	(3–)7–18	1–3(–7)
Number of stamens per flower	2–5	2	3
Pericarp of fruits	thick	thin to thick	thin
Vascular strands on septa of mericarps	0–1	0–1	usually 3
Basal triangular split of mericarp septa	present	present to indistinct	absent
Seed surface	dry	red aril	dry

Wurdack *et al.* (2005) included one species, '*Sebastiania bilocularis*', in their molecular phylogeny of uniovulate Euphorbiaceae. As would also be suggested by morphology, *Pleradenophora* is placed in their clade H2 of non-pseudanthial (hippomanoid) Euphorbioideae, together with most of the other genera characterized by, e.g., fused staminate sepals and distinctly glandular leaves, such as *Sapium*.

Taxonomy

Pleradenophora Esser (2001: 377).—Type: *P. longicuspis* (Standl.) Esser (basionym: *Sebastiania longicuspis* Standl.) [= *Pleradenophora tuerckheimiana* (Pax & K. Hoffm.) A.L.Melo & Esser]

Key to the species of *Pleradenophora*

1. Petiole with a pair of glands on the junction with the blade above 2
2. Leaves narrowly lanceolate, petiole 2–4 mm long; ovaries and fruits two-locular ..... *P. bilocularis*
2'. Leaf blades ovate to elliptical, petiole 10–18 mm long; ovaries and fruits three-locular ..... *P. tikalana*
1'. Petiole and blade eglandular above, with various marginal or laminar glands below 3
3. Leaf blades ovate, with a pair of distinct glands in basal auricles below ..... *P. membranifolia*
3'. Leaf blades more or less elliptic, without distinct glands in basal auricles below 4
4. Leaf blades (obovate-)elliptic, indistinctly serrate, marginal glands dot-shaped, numerous, spread along the whole blade margin; style 1.0–1.4 mm long ..... *P. tuerckheimiana*
4'. Leaf blades (ovate-)elliptic, distinctly serrate, marginal glands cup-shaped, only 1 or 2 near the base or absent; style 9–10 mm long ..... *P. lottiae*

1. ***Pleradenophora bilocularis*** (Watson) Esser & A.L.Melo, *comb. nov.*

Sebastiania bilocularis Watson (1885: 374).—*Sapium biloculare* (Watson) Pax (in Pax & Hoffmann 1912: 221).—Type: MEXICO. Sonora: by water courses, Northwestern mountains, 27 March 1884 (fl, fr), *C. G. Pringle, Fl. Pacific Slope s.n.* (lectotype GH!, isolectotypes A!, CAS!, K!, MPU!, NY!, PH!, WIS!, WU!), proposed by Steinmann & Felger (1997: 63). Remaining syntype: MEXICO. Sonora: 1853, *G. Thurber s.n.* (US?).

Sapium salicifolium auct.: Torr. in Emory (1858: 201), *nom. nud.*, based on *Thurber s.n.*

Sapium biloculare var. *amplum* Johnston (1924: 1077).—*Sebastiania ampla* (I.M.Johnst.) Jablonski (1968: 423).—Type: MEXICO. Baja California: Loreto, 19 May 1921 (fl), *I. M. Johnston 3772* (holotype CAS, isotypes MO!, US!).

Distribution:—United States (Arizona) and adjacent Mexico.

Note:—Steinmann & Felger (1997) already discussed the variability and delimitation of this species. It is the only distinctly sclerophyllous species of the genus.

2. ***Pleradenophora lottiae*** (McVaugh) A.L.Melo & Esser, *comb. nov.*

Sebastiania lottiae McVaugh (1995: 208).—Type: MEXICO. Jalisco: Mpio. La Huerta, Estación Biológica CHAMELA (UNAM), Arroyo Colorado, 9 July 1985 (fem fl), *F. Ayala & E. J. Lott 37* (holotype MICH!, isotypes F!, MEXU).

Distribution:—Central and South-Western Mexico.

Note:—*Pleradenophora lottiae* is easily identified by its long styles, acuminate fruits, and by the presence of 1 or 2, cup-shaped glands on the leaf margins.

3. ***Pleradenophora membranifolia*** (Müll.Arg.) Esser & A.L.Melo, *comb. nov.*

Sebastiania membranifolia Müller (1874: 579).—Type: BRAZIL. Minas Gerais: Serra da Chapada, without date (fr), *L. Riedel 1179* (LE?, isotypes G!, P!).

Sapium rhombifolium Rusby (1901: 307), *syn. nov.—Sebastiania rhombifolia* (Rusby) Jablonski (1967: 452, pl. 4), *nom. illeg.* (non Müller 1874: 590).—Type: BOLIVIA. Pando: Madeira, October 1886 (fl), *H.H. Rusby 1824* (holotype NY!, isotypes BM!, GH-2 sheets!, K!, NY-2 sheets!, PH!).

Sebastiania huallagensis Croizat (1943: 177), *syn. nov.*—Type: PERU. San Martín: Río Huallaga, Juan Jui, 400–800 m, February 1936 (fl), *G. Klug 4243* (holotype A!; isotypes MO!, NY!, U!).

Distribution:—Amazonian lowlands and mesophilous forests of Peru and Bolivia, extending into Brazil (Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, São Paulo).

Notes:—This species was well illustrated by Jablonski (1967). It was discussed also by Esser (2012, as *Sebastiania*). It is the only South-American species of the genus. Morphologically, in particular the peculiar leaf glands [which are shared with completely different genera, such as *Dendrothrix* Esser (1993: 245)] are unique in the genus, but in so many other characters the species agrees with *Pleradenophora* that this combination seems justified. The species is certainly isolated in South-American Hippomaneae.

4. ***Pleradenophora tikalana*** (Lundell) A.L.Melo & Esser, *comb. nov.*

Sebastiania tikalana Lundell (1960: 54).—Type: GUATEMALA. Petén: Tikál, in low forest on top of Temple III, 27 October 1959 (fr), *E. Contreras 322* (holotype LL!, isotypes DAV!, F!, K!, MO!, PH!, S!).

Sebastiania cornuta McVaugh (1995: 205, 206 fig. 4), *syn. nov.*—Type: MEXICO. Durango: Mpio. Otaez, Otaez, frente al Rancho La Lechuguilla, ladera con bosque caducifolio en la parte baja y matorral subtropical en la superior, 1270–1700 m, 5 July 1990 (fl), *E. Guizar 2347* (holotype MEXU, isotype CIIDIR!).

Distribution:—South-Eastern Mexico and Guatemala.

Note:—This species was well illustrated by McVaugh (1995) under *Sebastiania cornuta*. Although the author did not mention the similarities between his new species and *Sebastiania tikalana*, the type collection *Guizar 2347* clearly belongs to *Pleradenophora tikalana*, and for this reason it is presented as a synonym.

5. ***Pleradenophora tuerckheimiana*** (Pax & K.Hoffm.) A.L.Melo & Esser, *comb. nov.*

Sapium tuerckheimianum Pax & Hoffmann (1919: 61).—*Sebastiania tuerckheimiana* (Pax & K. Hoffm.) Lundell (1975: 80).—Type: GUATEMALA. Alta Verapaz: Cubilquitz, 350 m, date unknown (male fl), *H. von Türckheim II 941 (= J. Donnell Smith, Pl. Guatem. 8658)* (holotype B?, probably destroyed; lectotype US!, proposed here, isolectotype F!).

Sebastiania longicuspis Standley (1932: 134), *nom. illeg.—Pleradenophora longicuspis* (Standl.) Esser (2001: 377).—Type: BELIZE. Toledo Distr.: Punta Gorda, "Eldorado", 17 September 1932 (fr), *W. A. Schipp 1018* (holotype F!, isotypes G!, GH!, MICH!, MO!, S!, Z!).

Sebastiania standleyana Lundell (1939: 97), *nom. illeg.*—Type: BELIZE. Cayo District: hillside opposite Vaca, 1 May 1938 (fl, fr), *P. H. Gentle 2544* (holotype MICH!, isotypes A!, F!, G!, GH!, NY!).

Sebastiania confusa Lundell (1939: 99), *syn. nov.*—Type: BELIZE. Belize District: near Big Falls, Belize River, 14 June 1933 (fr), *C. L. Lundell 4119* (holotype MICH!, isotypes F!, G!, S!).

Distribution:—South-Eastern Mexico, Guatemala, Belize and Honduras.

Note:—*Türckheim II 941*, the type for *Sapium tuerckheimianum*, was cited by Standley (1932) as paratype in the protologue of his *Sebastiania longicuspis*, as *Türckheim 8658*, which however refers to the same collection (II 941 is Türckheim's own collection number, 8658 is the number in Donnell Smith's distribution series). The name of *S. longicuspis* is therefore illegitimate (Art. 52.1 ICBN; McNeill *et al.* 2006). The holotype of *Sebastiania longicuspis* is the collection *Schipp 1018;* it is composed of a branch and fruits that clearly belong to different species. The fruits are drupe-like and are not euphorbiaceous, but the caudate leaves are quite characteristic. Therefore, Lundell (1939) considered *S. longicuspis* an incorrect designation (a nomen confusum), and proposed a new name for the species (*Sebastiania standleyana*), based on the specimen *Gentle 2544*; Türckheim 8658 (the type of *S. tuerckheimianum*) was again included as paratype. The synonymy of these three species has already been mentioned by Balick *et al.* (2000).

Lundell (1939) also proposed the species *Sebastiania confusa*, distinguishing it from *S. standleyana* based on its short-acuminate to obtuse foliar apex (as opposed to long cuspidate in *S. standleyana*), staminate cymules 3-flowered (vs. 6–9-flowered), stamens 2–3 (vs. 2–6), and capsules 6 × 10 mm (vs. 8–11 × 10–13 mm). After analyzing both type collections, as well as other specimens, it was concluded that the characteristics Lundell considered diagnostic for *S. confusa* fall within the range of variability of *Pleradenophora tuerckheimiana.*

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