

# NOTES ON AMERICAN LOGANIACEAE I REVISION OF PLOCOSPERMA BENTH.

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## INTRODUCTION

The delimitation of the *Loganiaceae* has been discussed very often since the family was first described, several genera having been added or removed at various times. The African representatives of the *Loganiaceae* are being revised by the present author. The study of extra-African genera appeared to be necessary for a better understanding of the relationships of the African taxa, in order to arrive at a decision about their taxonomic position.

## REVISION OF PLOCOSPERMA BENTH.

### HISTORY OF THE GENUS

*Plocosperma* was described by BENTHAM (1876) and placed in the tribe *Gelsemieae* of the *Loganiaceae* because of its floral characters. After a study of the fruits SOLEREDER (1892) excluded *Plocosperma* from the *Gelsemieae*, preferring to maintain it as a genus with a doubtful taxonomic position in the *Loganiaceae*.

### RELATIONSHIP TO OTHER GENERA

*Plocosperma* resembles both genera of the *Gelsemieae*, *Gelsemium* Juss. and *Mostuea* Didr., in possessing an infundibuliform corolla, small calyx, and a twice dichotomously branched stigma. It differs from them mainly by its ovary, which is not two-locular, but has one single loculus, a linear-fusiform fruit, and a long seed which carries a terminal pappus-like brush, resembling the fruit of some *Compositae*. Seeds with a brush in linear fruits occur in a related family, the *Apocynaceae*. The insertion of the hairs on the seed of *Plocosperma* is like that in the *Apocynaceae* genera *Echites* L. and *Macrosiphonia* Muell.-Arg. These genera, however, always have apocarpous fruits and partly sterile anthers. Other *Apocynaceae* genera, such as *Allamanda* L. and *Landolphia* P. Beauv., show some resemblance to *Plocosperma* by their syncarpy, but the fruits of the former are nearly globose and contain sub-globose, not linear, seeds without hairs. Moreover, the fruits of *Landolphia* are fleshy and indehiscent. The twice dichotomously branched stigma, typical of *Plocosperma* and the *Gelsemieae*, occurs in none of the above mentioned *Apocynaceae*. Furthermore the latex-cells which are characteristic of the *Apocynaceae* do not occur in *Plocosperma*.

Although *Plocosperma* is the only *Loganiaceae* genus with a brush on the seeds, the present author prefers to leave it in this family on account of the

shape of the stigma and of the anthers, and because of the absence of the latex-cells. Within the family the presence of glandular hairs and the absence of intraxylar phloem might indicate relationship with the *Buddlejeae* and *Retzieae*. In habit and flowers *Plocosperma* resembles *Gomphostigma* Turcz., a South-African genus of the *Buddlejeae*, and *Logania* R. Br., the type genus of the family, indigenous in Australia.

To summarize, on the basis of its affinities, discussed above, the present author proposes making *Plocosperma* the basis of a new tribe in the *Loganiaceae*, to be placed near the *Gelsemieae*.

#### **Plocospermeae** Leeuwenberg, tribus nova

Frutices vel arbores parvi. Folia breviter petiolata laminis integris penninerviis apice saepissime emarginatis. Inflorescentia axillaris pauciflora. Flores pentameri subactinomorphi corolla late infundibuliformi limbo patente lobis rotundatis. Stamina filamentis corollae tubo affixis antheris oblongis introrsis loculis duobus separatis parallelibus. Pistillum ovario uniloculari ovulis quattuor basi pariei insertis stylo deciduo stigmatibus bis bifido. Fructus capsularis lineari-fusiformis seminibus linearibus coma flava coronatis embryone recto maximo albumine tenui circumdato.

*Plocosperma* Benth. in Bentham & J. D. Hooker, Gen. Pl. 2: 789. 1876 and in W. J. Hooker, Icon. 12: 82, t. 1195. 1876; Baillon, Bull. Mens. Soc. Linn. Paris 780. 1889; Solereder in Engler & Prantl, Natürl. Pflanzenf. 4 (2): 49. 1892; Blake, Contrib. U. S. Nat. Herb. 24: 17. 1922.

Type species: *P. buxifolium* Benth.

Shrubs or treelets. *Branches* pale grey-brown, with thin often finely fissured bark, not lenticellate; branchlets like the branches at the base, smooth at the apex, green, shortly pubescent with often ranked hairs. *Stipules* none. *Leaves* opposite or sometimes subopposite, shortly petiolate; petiole shortly pubescent; blade shining above, matt and paler beneath, coriaceous, ovate, elliptic, or oblong, variable in shape and size in a single branchlet, 1.3–3 × as long as wide, mostly emarginate at the apex, but often obtuse, entire, with a slightly revolute margin, more or less scabrous above, pubescent to nearly glabrous beneath, with some minute glandular hairs on both sides, not or hardly ciliate; costa impressed above, prominent beneath; veins prominent on both sides, but beneath often obscurely so, reticulate in adult dry leaves. *Inflorescence* axillary, racemose, 1–7-flowered. Peduncle and inflorescence-axis very short, sparsely pubescent like the pedicels which are elongate in fruit. *Flowers* 5-merous. Sepals connate at the base, subequal, narrowly triangular, 3–4 × as long as wide, acuminate at the apex, sparsely pubescent or glabrous outside, ciliate, glabrous inside, without colleters. Corolla widely infundibuliform, much longer than the calyx; tube with 5 lines of hairs outside below the lobes or sometimes glabrous, glabrous inside; lobes spreading, subequal, imbricate in the bud, orbicular or nearly so, obscurely sinuate, sparsely pubescent out-

side, glabrous inside, slightly ciliate. Stamens equal, somewhat exerted; filaments glabrous, much longer than the anthers, inserted on the corolla tube; anthers oblong, about  $1.5 \times$  as long as wide, rounded at the apex, deeply cordate at the base, basifix, versatile, glabrous; cells 2, parallel, discrete, dehiscent throughout by a longitudinal lateral split. Pistil glabrous, slightly exerted or not; ovary narrowly ovoid or oblong, 1-celled; style deciduous; stigma twice dichotomously branched, above minutely pubescent with glandular hairs. The ovary with 4 erect ovules at the base of the wall. *Fruit* capsular, linear-fusiform, glabrous, longitudinally ribbed, bivalved, 1–4-seeded. *Seeds* linear, glabrous, smooth, inserted above each other on thin long funiculi on the rib of the fruit-valves, the lower and the upper seed of one valve above the corresponding seed of the other valve, topped by an ochraceous pappus-like brush of unbranched hairs. Embryo straight, cylindrical or nearly so, filling the seed (18–19 mm long in seeds of 19–20 mm); rootlet  $8 \times 1.5$  mm, acute at the base, turned to the hilum; cotyledons narrowly oblong,  $9\text{--}11 \times 2$  mm, rounded at the apex; endosperm very thin, fleshy, surrounding the embryo.

Distribution: One species, in southern Mexico and in Guatemala.

*P. buxifolium* Benth. in W. J. Hooker, *Icon.* 12: 82, t. 1195.1876; Baillon, l.c.; Solereder, l.c. p. 50; Blake, l.c.

#### Figs. 1 and 2

Type: Guatemala: sin. loc., Skinner anno 1857 (K, holotype).

Heterotypic synonyms: *P. microphyllum* Baill. ex Solered., l.c. p. 50; Baill. ex Durand & Jackson, *Ind. Kew. Suppl.* 1: 336. 1906 (as *macrophyllum*); Blake, l.c. Type: Mexico: sin. loc., Galeotti s.n. (P, holotype).

*P. anomalum* Blake, l.c. Type: Guatemala: Gualán, Department of Zacapa, Blake 7693 (US, holotype).

Plant 2–5 m high. Leaves: petiole 0.5–2 mm long; blade  $4\text{--}50 \times 2\text{--}26$  mm, cuneate, rounded, or subcordate at the base; secondary veins 1–3 pairs, anastomosing, more or less curved along the margin. Sepals  $1\text{--}3.2 \times 0.5\text{--}1$  mm. Corolla blue-violet or light purple; tube 5–9 mm long; limb about 13–23 mm in diam.; lobes about 3–7 mm in diam. Stamens: filaments inserted at 3.5–5 mm from the base of the corolla, 2–5 mm long; anthers  $1\text{--}1.2 \times 0.6\text{--}0.8$  mm. Pistil 5–9 mm long; ovary  $1\text{--}3 \times 0.5\text{--}1$  mm. Capsule  $40\text{--}95 \times 3\text{--}4$  mm. Seed  $12\text{--}23 \times 1\text{--}1.5$  mm; brush 7–15 mm long.

Ecology: Bushy hillsides. Alt. 200–700 m.

MEXICO: sin. loc. (fl.) Galeotti s.n. (P, holotype of *P. microphyllum*).

MICHOACÁN: Tepalcatepec, Apatzingan District (Feb.) Geo Hinton 12103 (K).

OAXACA: Quiotepec, Cuicatlán District (fr. Nov.) Conzatti 3882 (US); Cuicatlán Hills (fr. March) Conzatti & Sánchez 3431 (US); *ibid.* (fl., fr. June) Lucius C. Smith 405 (GH); near Trapiche de Aragón, near Cuicatlán (veg.) Liebmann 4703 (C, F); Tomellín Cañon (veg.) J. N. Rose & J. S. Rose 11358 (NY, US).

GUATEMALA: sin. loc. (fl., fr.) Skinner anno 1857 (K, holotype); near Zacapa, Zacapa Department (veg.) Standley 74246 (F, US); Gualán, Zacapa Department (fl., imm. fr. May) Blake 7693 (US, holotype of *P. anomalum*); *ibid.*, N. of the Motagua R. (fl., imm. fr. June) Deam 6270

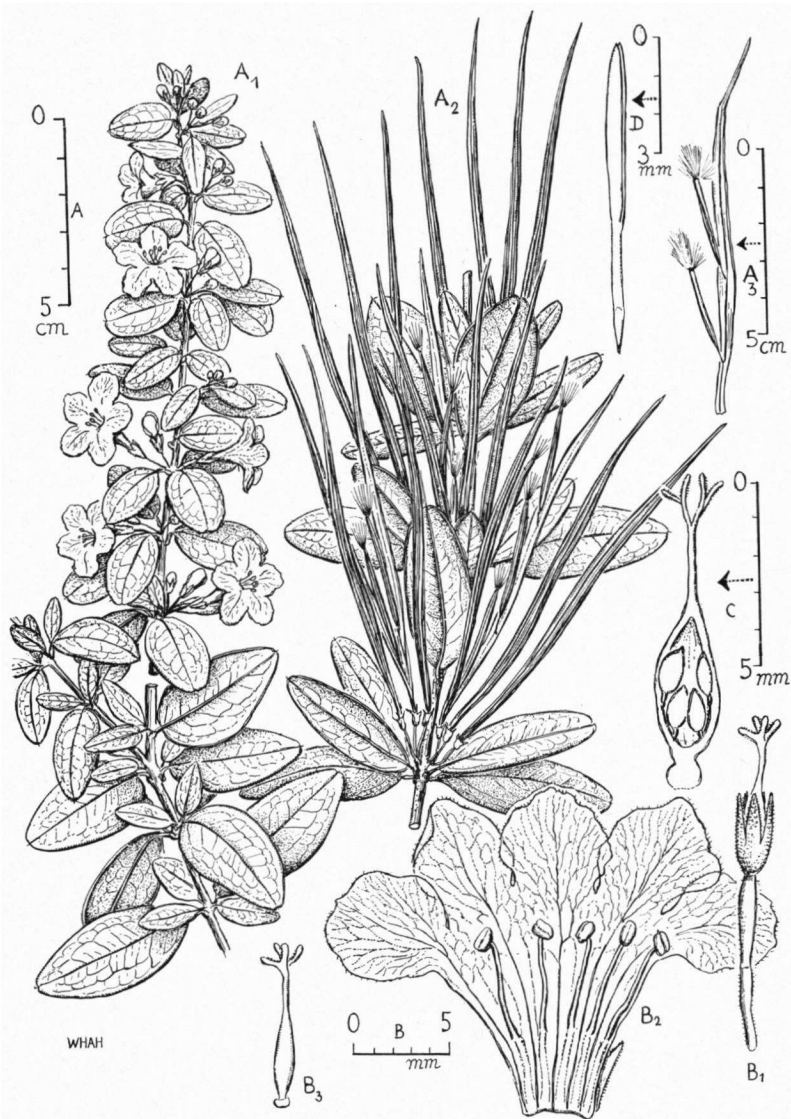


Fig. 1. *Plocosperma buxifolium* Benth. (large leaves). A<sub>1</sub>, flowering branch; A<sub>2</sub>, fruiting branch; A<sub>3</sub>, fruit valve with 2 seeds; B<sub>1</sub>, calyx with pistil; B<sub>2</sub>, opened corolla; B<sub>3</sub>, pistil; C, pistil with opened ovary; D, embryo. (A<sub>1</sub>, B, C: Deam 6270; A<sub>2</sub>, A<sub>3</sub>: Kellerman 7739; D: Kellerman 7005).

(E, F, GH, K, NY, US, paratype of *P. anomalum*); valley of Río Motagua, near Santa Marta, Zacapa Department (fr. Oct.) Steyermark 29230 (F); near Barranquillo, Department El Progreso (veg.) Popenoe 972 (US); *ibid.* (fr. May) Steyermark 46432 (A, F, US); El Rancho, Jalapa (fr. Dec.) Kellerman 7005 (F, WAG); Aguacaliente, Department Santa Rosa (fr. Jan.) Kellerman 7739 (F).

CULT.: Cuba: Soledad, Cienfuegos, Santa Clara Province (veg.) J. G. Jack 8327 (NY, US).

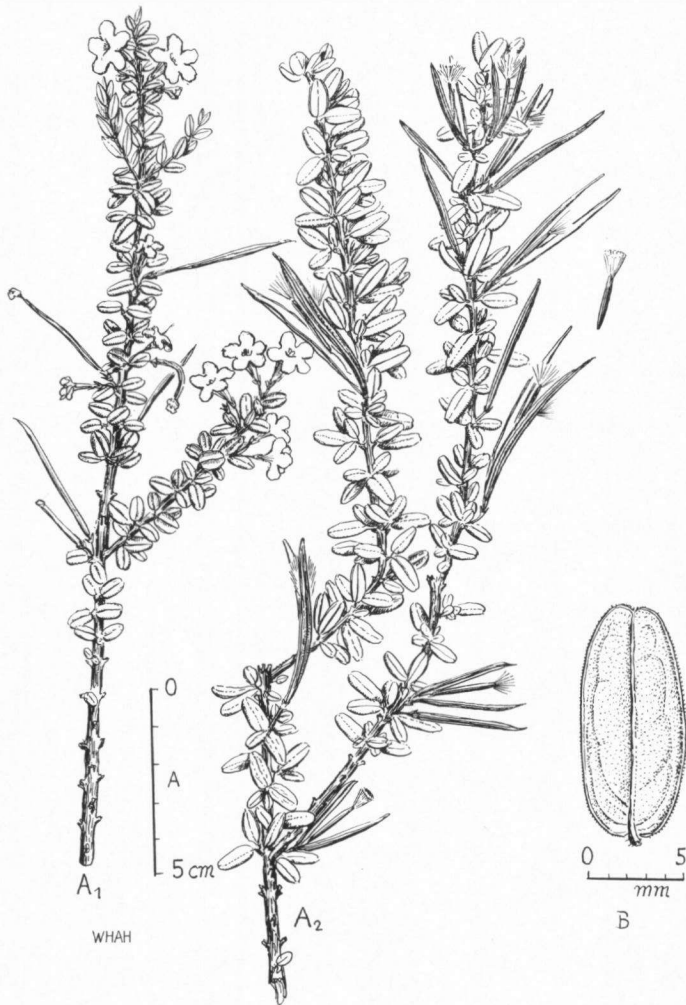


Fig. 2. *Plocosperma buxifolium* Benth. (small leaves). A<sub>1</sub>, branch with flowers and immature fruits; A<sub>2</sub>, fruiting branch; B, leaf. (A<sub>1</sub>: Lucius C. Smith 405; A<sub>2</sub>, B: Conzatti 3882).

#### NOTES

Up to the present only a few collections of *Plocosperma* are available in the herbaria. This curious genus is easily recognized. Three species were described, but they cannot be clearly separated. In addition to slight differences of indumentum, especially on the leaves, the variation within the genus only concerns size (leaves, flowers, and fruits). Most Guatemalan specimens have rather large leaves and most Mexican mainly small leaves. The size of the flowers and of the fruits is more or less correlated with the size of the leaves. The largest leaves are seen in the best specimen so far collected: Deam 6270: E sheet

(15 × 7–50 × 26 mm) and US sheet (10 × 5–35 × 16 mm). The smallest leaves occur on the type of *P. microphyllum*, and in Rose & Rose 11358 (5 × 3–8 × 6 mm). So far small flowers are known only in Lucius C. Smith 405 and Galeotti s.n. (corolla-tube 5–6 mm long, limb about 13 mm in diam.). Smith 405 has leaves between 5 × 2 and 12 × 5 mm. The flowers of Deam 6270 (corolla-tube 7–9 mm long and limb about 15–18 mm in diam.) are of about the same size as those of the type of *P. buxifolium*, which has leaves 13 × 7–22 × 12 mm and those of the type of *P. anomalum* (25 × 10–40 × 20 mm). The largest flowers occur in Hinton 12103, the northernmost collection (corolla-tube 8–9 mm long and limb up to 23 mm in diam.) which had, however, rather small leaves (7 × 4–17 × 9 mm).

Specimens collected in the same or nearly the same locality hardly vary, but the plants on hill slopes with different exposures are much influenced. The on this way induced variability is clearly shown in the rich collections of the allied montane shrub, *Desfontainia spinosa* Ruiz et Pav., which occurs from Costa Rica to the Straits of Magellan.

According to BLAKE (l.c. 1922), the paratype of *P. anomalum*, Deam 6270, was compared with the type of *P. buxifolium* by Stapf. BLAKE stated, that Deam 6270 represented a different species because the leaves of the type of *P. buxifolium* were hairier and not reticulate, the flowers larger, and there were two pendent ovules at the apex of the wall of the ovary and two erect basal ovules. In *P. buxifolium* all the ovules are basal and erect. It appears, however, that the hairiness of the leaves of Deam 6270 varies and some of the less hairy leaves are exactly like those of the type of *P. buxifolium*. The difference in the reticulation of the leaves in Deam 6270 depends on the age and exposure of the various branchlets. Skinner's collection has only thick well-exposed leaves. The flowers vary more in size than was supposed by BLAKE. BENTHAM studying the very small ovary of the only specimen at hand in that time, arrived at erroneous conclusions through want of material.

BAILLON gave an elaborate description of *P. microphyllum* (l.c. 1889). He cited the type specimen, but wrote the name only on the herbarium sheet, and *P. microphyllum* was validly published afterwards by SOLEREDER (l.c. 1892), accompanied by a short note on its characteristics.

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