

CONCISE REVISION OF THE SARCOSPERMATACEAE

by

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After the senior writer, together with W. W. Varossieau, had published a revision of this monogeneric family (Blumea III, 1938—'39 and IV, 1941), some more material has been examined by us and, moreover, some new species have been described. Thanks to the courtesy of Prof. F. Gagnepain of Paris, and the Director of the Musée d'Histoire Naturelle, Phanérogamie, we had the opportunity to examine the type specimens of Gagnepain's new species from Indo-China. All with all we felt that a new key and a brief enumeration of the species with the main literature, their synonyms and distribution, might be useful.

SARCOSPERMATACEAE H. J. Lam, Bull. Jard. Bot. Buitenz., sér. III, 7, 1925, 248; Blumea III, 1, 1938, 184.

Sarcosperma Hook. f. in Bentham and Hooker f., Gen. Pl. II, 2, 1876, 655; H. J. Lam & Varossieau, Blumea III, 1, 1938, 185 — 8 species from India and China through the Malay Archipelago to New Guinea.

Remarks: The flowers in the whole genus are remarkably constant and provide few or no differential characters of use in a key. Yet, most of the species seem to be sufficiently distinct on account of vegetative characters.

In a study of the wood-anatomy of *Sarcosperma arboreum* and *S. tonkinense* (= *Kurrimia robusta* Kurz = *K. pulcherrima* Waller, *Celastraceae*), Chesnais (Bull. Mus. Nat. Hist., sér. 2, 16, 6, 1944, 514) points out that on account of the structure of the vascular bundle in the petiole, *Sarcosperma* has to be regarded as representing a separate family. It must, however, be pointed out that *S. tonkinense* is not sarcospermaceous at all, so the results of Chesnais have to be regarded with care.

Key to the species.

- 1.a. Auricles at the top of the petiole extant (rarely wanting in *S. kachinense*) 2
- b. No auricles at the top of the petiole 3
- 2.a. Young branchlets, inflorescences and lower side of the leaves conspicuously pubescent, more or less glabrescent; leaves light brown when dry; glandular pits in the axils of the secondary nerves rare; petioles densely tomentose, short, usually less than 1 cm long; calyx puberulous; staminodes subulate to narrowly deltoid (*Burma, Siam, Tonkin, SW China, Hainan*)
5. *S. kachinense* (King & Prain) Exell, var. *kachinense*

Var. *simondii* (Gagnep.) H. J. Lam, from Tonkin differs in the glandular pits being less rare, the pubescence of the inflorescences being less dense, the somewhat smaller flowers and the subulate, incurved or lanceolate-linear, keeled staminodes.

- b. Branches, inflorescences and leaves entirely glabrous or the inflorescences slightly pubescent; leaves dark brown when dry, pits in or near the axils of the nerves and often also scattered on the lower leaf surface; calyx glabrous; petioles 1—2.5 cm long (*British Malaya through the Malay Archipelago to New Guinea*)
- 3.a. Leaves glabrous, mostly with glandular pits 4
- b. Leaves more or less pubescent underneath and without glandular pits 5
- 4.a. Leaves almost all strictly opposite 6
- b. Leaves alternate, only the uppermost sometimes opposite; petioles 1—2.5 cm long; glandular pits in the axils of the uppermost nerves only 7
- 5.a. Leaves oblong to ovate, 10—25 cm long, 4.5—9.5 cm broad, thin, chartaceous; secondary nerves 8—16; pubescence minute; inflorescences lax; pedicel 0.2—0.4 cm long; ovary 1-celled (*Sumatra*) 8. *S. uitlenii* H. J. Lam
- 5.b. Leaves lanceolate, 12—16 cm long, 3—4 cm broad, rigid, secondary nerves 10—12, pubescence woolly; inflorescences dense, pedicels shorter than 0.1 cm; ovary 2-celled (*Tonkin*) 2. *S. angustifolium* Gagn.
- 6.a. Glandular pits always extant in the axils of the secondary nerves, mostly close to the axis; leaves variable, mostly relatively large, 11—35 cm long and not rarely broad, up to 13 cm; petioles 1.2—3 cm long, secondary nerves 7—13, inflorescences moderately pubescent, up to 18.5 cm long, lateral branches up to 10.5 cm long; calyx tomentose (*India, Burma, Siam, SW. China*) 3. *S. arboreum* Hook. f.
- b. Glandular pits, if any, very rare; leaves generally smaller, 5.5—20 cm long, 1.5—5.5 cm wide, relatively narrow; petioles 0.4—1.3 cm long; secondary nerves 6—9; inflorescences glabrous, 3.2—6.8 cm long, branches 1—4.5 cm long; calyx glabrous (*India, SW. China*) 4. *S. griffithii* Hook. f.
- 7.a. Leaves mostly obovate, with blunt apex to more or less acutely acuminate, rarely lanceolate; calyx slightly puberulous or glabrous; pedicels 0.1—0.2 cm long; ovary 1-celled (*S. and E. China, Honkong, Hainan*) 6. *S. laurinum* Hook. f.
- b. Leaves lanceolate with acutely acuminate apex; calyx glabrous; ovary 2- or 3-celled (*Annam*) 1. *S. affine* Gagn.

1. *S. affine* (*affinis*) Gagn. in Bull. Mus. Nat. Hist. 2, sér. XX, 1948, 293 — Indo-China.

INDO-CHINA — Annam, near Moi Go-oi, Quang-Nam prov., 500 m: *E. Poilane 31452*, type specimen (P), tree, 6—7 m high, 0.40 m diam., flow. buds on 21. 2. 1941, latex white, very sticky.

Remarks: To Gagnepain's description the following may be added: staminodes either subulate or deltoid and keeled and mostly longer than the anthers; stigma 4-lobed; calyx up to 2.5 mm long.

This species seems to be intermediate between *S. laurinum* (leaves not strictly opposite, tertiary nervation inconspicuous, glandular pits in the axils of upper nerves; different by the acutely acuminate top of the leaf, the lanceolate leaves and the longer pedicels), and *S. griffithii* (leafshape and tip; different by its mostly alternate leaves, opposite only near the tips of the branchlets, glandular pits extant and larger pedicels). The species might well represent a hybrid between the two species just mentioned.

In the flowers examined by us the ovary is found to be 2-celled. Gagnepain states that they are either 2- or 3-celled. At any rate, 3-celled ovaries are very rare in this genus (cf. sub *S. griffithii* underneath).

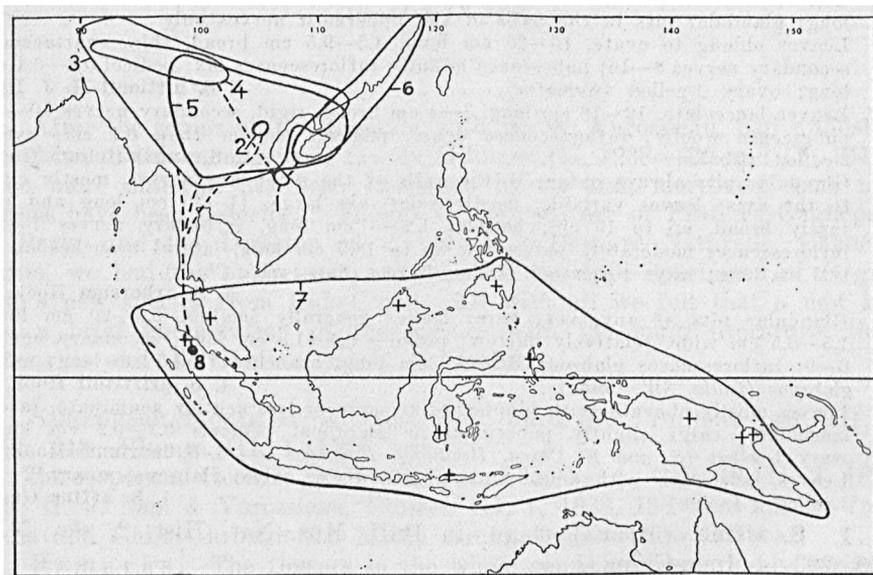
2. *S. angustifolium* Gagn. in Bull. Mus. Nat. Hist. 2, sér. XX, 1948 294 — Indo-China.

INDO-CHINA — Tonkin-Massif de Mui-bien, near Chobo, 800—900 m: *E. Poilane 13172*, type specimen (P), flow. on 6. 9. 1926.

Remarks: In addition to Gagnepain's description it may be pointed out that the staminodes are sometimes subulate and that the stigma is 4-lobed. The calyx is up to 4 mm long.

Apparently related to *S. wittienii* from Sumatra but quite distinct by its stiff, narrow leaves with fewer nerves (8—12, *S. wittienii* 8—16), the more woolly pubescence of its dense inflorescences, the 2-celled ovary (*S. wittienii* 1-celled) and the ribbon-shaped to subulate staminodes.

3. *S. arboreum* Hook. f. — Lam & Varossieau, *Blumea* III, 1, 1938, 192; Fletcher, *Fl. Siam. Enum.* 2, 4, 1938, 363; Lam & Varossieau, *Blumea*



Distribution of *Sarcosperma* — 1. *affine*; 2. *angustifolium*; 3. *arboreum*; 4. *griffithii*; 5. *kachinense*; 6. *laurinum*; 7. *paniculatum* (add + in Celebes, on equator, and in Ceram); 8. *wittienii*. Interrupted lines indicate supposed relations.

III, 2, 1939, 262; Merrill, *Brittonia* 4, 1, 1941, 163; Chesnais, *Bull. Mus. Hist. Nat.*, sér. 2, 16, 6, 1944, 514, 1 f. — India, Burma, Siam, China.

New records:

CHINA — prov. Yunnan: Lau Tsang Hsien, ravine: C. W. Wang 76417 (A), tree 6 m high, 20 cm diam., fr. green, May 1936; Shunning Hila: T. T. Yü 16539 (A), 1900 m, in ravine, forest, tree 13 m high, fr. oblong ovoid, green, June 1938.

UPPER BURMA — Keng Tung Territory, Meh Len Valley, alt. 660—930 m: Rock 2178 (NY), 29. I. 1922 (*specimen not seen*, cf. Merrill).

Remarks: In the description given by Lam (1938), the staminodes are characterized as being subulate; however, deltoid and lanceolate, either of which with or without keel, are found too. The stigmas are sometimes 4-lobed.

4. *S. griffithii* Hook. f. — Lam and Varossieau in *Blumea* III, 1, 1938, 197—198; Lam and Varossieau, *ibid.* III, 2, 1939, 262 — *S. chelense* Hu (ined.) — India, W. China:

New record:

CHINA — Yunnan province, Meng Soong, Dah-meng lung, Che-li Hsien, 1900 m, mixed woods: *C. W. Wang 78276*, type specimen of *S. cheliense* (A), tree, 9 m, diam. 0.3 m, flow. buds greenish, in Sept. 1933.

Remarks: In Lam's description the ovary is given as being 2-celled but 1- or 3-celled ovaries have been found by us. The staminodes are subulate or lanceolate-linear. The calyx may be slightly puberulous.

According to Hu's manuscript description of *S. cheliense* this specimen (*Wang 78276*) should deserve specific rank. However, in our opinion it is so close to *S. griffithii* as to make a separation from that species very difficult. We therefore prefer to insert it in the last-named species. We cannot find any close relation with *S. laurinum* or *S. arboreum*, as is claimed by Hu.

As to the glandular pits which are mostly absent in *S. griffithii*, *Wang 78276* shows no pits of the usual type, though in some leaves rather large depressions close to the lateral nerves are found. They are about 1 mm across and remotely suggest the nature of glandular pits in other species. The pubescence of the inflorescences seems too slight to form a specific barrier against *S. griffithii* which is mostly almost entirely glabrous in this respect. *Wang 78348* mentioned in Hu's manuscript description was not available to us.

5. *S. kachinense* (King and Prain) Exell, var. *kachinense* in Journ. of Bot. 69, Apr. 1931, 100; Lam and Varossieau in Blumea III, 1, 1938, 188—190; idem in III, 2, 1939, 261; Merrill and Chun in Sunyatsenia 5, 1—3, 1940, 161, f. 20; Merrill in Brittonia 4, 1, 1941, 164, *erroneously quoted as S. kachinense* (*King and Prantl*) Exell; Chatterji and Raizada, Indian Forester 74, 1948, 390—391, tab. 2 — *Combretum kachinense* King and Prain, Journ. As. Soc. Beng. 69, 2, 1900, 169 — *Sarcosperma kachinense* Cowan, Notes Roy. Bot. Gard. Edinburgh 16, 79, Oct. 1931, 222 — *S. pedunculatum* sensu Merr., Lingnan Sc. Journ. 13, 1934, 66, not of Hemsl. — *S. siamense* Fletcher, Kew Bull. 1937, 380; Fletcher, Fl. Siam. Enum., 2, 4, 1938, 363 — *S. caudatum* Merr., ined. — *S. tomentosum* H. H. Hu (ex comm. E. D. Merrill) — Burma, Siam, China.

New records:

UPPER BURMA — Hkamti plain, alt. 400 m, *Ward 9054* (NY), a small tree in the jungle, 20.12.1930 (*specimen not seen by us*, cf. Merrill in Brittonia); ibidem, Lakhimpur district, Deliungmukh, *Bor 18047*, a small to medium-sized tree with milky juice, in true ever-green forest, flowers yellowish, Febr. 1944 (*specimen not seen by us*, cf. Chatterji and Raizada).

Remarks: The staminodes are described by Gagnepain as subulate, but sometimes they are lanceolate-linear or deltoid with a subulate apical part; the stigma is either 4-lobed or capitate.

Var. *simondii* (Gagn.) H. J. Lam, nov. comb. — *S. simondii* Gagn. in Bull. Mus. Nat. Hist. 2, sér. 20, 1948, 294 — Indo-China.

INDO-CHINA — Tonkin, near Long-tcheou: *Simond s.n.* (P¹), type specimen of *S. simondii*, flowers and fruits.

Remarks: The staminodes are described as subulate by Gagnepain, but sometimes they are lanceolate-linear and keeled. Moreover, some dimensions were found different from those given by him: the styles and calyx are up to 0.3 mm and 0.4 cm long respectively, the staminodes up to

0.15 cm and the anthers up to 0.1 cm. For the differences from the specific type cf. the key.

6. *S. laurinum* (Benth.) Hook. f. — Lam and Varossieau in *Blumea* III, 1, 1938, 195—197; idem III, 2, 1939, 262 — *Reptonia laurina* Benth., Fl. Hongkong, 1861, 208. — China, Hainan, Hongkong.

Remarks: The staminodes are either subulate or deltoid with a subulate apical part, or triangular to linear.

New record:

HONGKONG — *Weiss 3841*, 15.1.1870 (BO, L).

7. *S. paniculatum* (King) Stapf and King, l.c. Pl. 7, 1901, 2690; Lam & Varossieau, *Blumea* III, 1, 1938, 190—192 and III, 2, 1939, 262 and IV, 2, 1941, 322 — *Bracea paniculata* King, Journ. As. Soc. Bengal 2, 1896, 54 — *Discocalyx macrocarpa* Elmer, Leaflet Ph. Bot. 8, 1915, 2781 — *Apoia macrocarpa* (Elm.) Merr., Phil. Journ. Sc. 17, 1920, 605 — *Sacrosperma breviracemosum* H. J. Lam, Bull. Jard. bot. Buitenz., sér. III, 8, 1926, 21, f. 2 — Malay Peninsula and Sumatra to New Guinea and the Philippine Islands.

New records:

BORNEO — Mt Kinabalu, Kappok, long hill, forest, margin of grass land, alt. c. 500 m: *Clemens 51286* (BM), fr. green Dec.

CELEBES — Manado, Palu, Tomado, alt. 760 m, *Neth. Ind. Forest Service bb 28216* (BO, L); 5.7.1939.

CERAM — Wae Bekai, Seakasóle, *P. J. Eyma 2520*, fl. 7.1.1938 (BO, L), buds yellow, ovary red.

NEW GUINEA — Idenburg-river, Bernhard-camp, *Brass and Versteegh 13184* (L), fruit red, April 1939; Kani-mountains, in forest: *Schlechter 17245* (B), flowers Jan. 1908.

Remarks: Lam describes the staminodes as acute, but in some cases they are squamiform, obtuse.

8. *S. uittienii* H. J. Lam — Lam and Varossieau in *Blumea* III, 1, 1938, 194—195 — Sumatra.

Excluded species.

S. pedunculatum (-a) Hemsley — Lam and Varossieau in *Blumea* III, 1, 1938, 198 = *Planchonella pedunculata* (Hemsl.) H. J. Lam and D. A. Kerpel in *Blumea* III, 2, 1939, 258, f. 3.

S. tonkinense (-sis) H. Lecomte — Lam l.c. 198; Chesnais, l.c. 514 (cf. p. 148 above).

According to Merrill (communication by letter) this species has proved to be *Kurrimia robusta* Kurz (= *K. pulcherrima* Waller) (*Celastraceae*).

S. ovatifolium Gagnepain l.c. 294.

This is certainly not sarcospermaceous: the leaves are exstipulate, without auricles or pits and different venation and mostly alternate, the inflorescences are terminal; the corolla is sericeous pubescent and there are no staminodes; the ovary is 2-celled, each cell being bi-ovulate. It looks like a *Convolvulacea*, but Dr van Ooststroom tells us that he cannot confirm this suggestion.

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(Numbers indicate the number of the species; synonyms in italics)

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 <i>Combretum kachinense</i> King & Prain = 5
 <i>Disococalyx macrocarpa</i> Elm. = 7
 <i>Reptonia laurina</i> Benth. = 6
 <i>Sarcosperma</i> affine Gagn. = 1
 <i>angustifolium</i> Gagn. = 2
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Collectors' numbers.

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