

# THE PODOSTEMACEAE OF THE NEW WORLD II

BY

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## INTRODUCTION

In my first paper (1951) a part of the tribe Eupodostemeae was revised, viz. the genera *Apinagia*, *Marathrum*, *Rhyncholacis*, *Lophogyne*, *Monostylis*, *Jenmaniella*, *Wettsteiniola* and *Macarenia*.

The second part deals with the subfamily Tristichoideae, which comprises the genera *Tristicha* and *Weddellina*, and the tribe Mourereae of the subfamily Podostemoideae, which consists of the genera *Mourera*, *Lonchostephus*, and *Tulasneantha*.

In this part a revision of these genera is given; a list of the collectors' numbers mentioned in the second part and a general index are included.

The third part will deal with a part of the tribe Eupodostemeae, viz. the genera *Oserya*, *Devillea*, *Ceratolacis*, *Mniopsis*, *Podostemum* and *Castelnavia*. It will also give an account of the dubious genera, and it will contain additions and corrections to part 1, latin descriptions of new taxa in part 3, a list of the collectors' numbers mentioned in that part, new references to the literature, plates with explanatory text and a general index to the third part.

The herbarium abbreviations are those proposed in the "Index Herbariorum" of Lanjouw and Stafleu (1952).

The references to the literature are given in an abbreviated form consisting of the author's name followed by the year in which the publication appeared e.g. "Pulle (1906)" means "A. Pulle: Enum. vasc. pl. Suriname, (1906)". The place of publication can be found

in the list of references which is included in the first part. Those not mentioned there are found in the third part.

The following abbreviations are used:

„**Fl**” the time of the year at which flowering specimens were collected.  
 „**Fr**” the time of the year at which fruiting specimens were collected.

When the name of a month is given without one of the prefixes fl or fr, it means that the specimen is sterile. “s.n.” means: unnumbered specimens.

### 1. **TRISTICHA** Du Petit-Thouars, nom. conserv. propos.

Moss-like coenobia, widely differing in shape and size but always strongly ramified and forming dense mats on rocks in streams. Stems thin, terete. Leaves for the greater part tristichous but the regular arrangement in the first-formed parts sometimes disturbed; the blade membranaceous, either nerveless or one-nerved, obtuse or acute, entire but in older leaves often split into 2 or 3 lobes. Flowers at the end of ordinary shoots or on brachyblasts, at first enclosed between 2 or 3 distinctly larger leaves; perianth well-developed, 3-merous, membranaceous and marcescent, petals free or united at the base; stamen 1, filament slender; anther ovate, introrse, with an elongate connective, pollen globose; ovary 3-celled, consisting of 3 equal carpels, ovoid to subglobose, rounded or attenuate at the base; placenta fleshy; fruit dehiscing with 3 equal valves each provided with 3 ribs; seeds numerous.

Type: *Tristicha trifaria* (Bory ex Willd.) Sprengel

Distribution: Tropical and subtropical America, Africa and Asia.  
 (See map)

The genus *Tristicha* was described by DU PETIT-THOUARS in 1806, but the author failed to mention a species. The first two species, which afterwards were referred to this genus, viz. *T. trifaria* and *T. alternifolia*, were described by WILLDENOW in 1810 and 1811, under the generic name *Dufourea*. This latter has been used for genera belonging to various families, viz. in 1810 by ACHARIUS for a genus of lichens, in the same year by WILLDENOW in the *Podostemaceae*, in 1815 by KUNTH in the *Convolvulaceae*, and in 1837 by GRENIER in the *Caryophyllaceae*, in the latter two families the name has since then been replaced by *Breweria* and *Arenaria* respectively.

In the case of the *Podostemaceae* and *Lichenes* the question of precedence is difficult to decide. For the Podostemaceous genus, however, an older name is available, although the latter is not fully legitimate as no species was indicated. This name, viz. *Tristicha*, has been in use since 1825, and it is therefore proposed to conserve it and to reserve *Dufourea* for the lichenous genus. The type-species of the Podostemaceous genus *Tristicha* is *T. trifaria* (Bory ex Willd.) Sprengel, described in 1810 as *Dufourea trifaria*, and transferred by SPRENGEL in 1825 to *Tristicha*.

In 1823 AUG. ST-HILAIRE described a new species of *Dufourea*, viz. *D. hypnoides*, and this was transferred to *Tristicha* by SPRENGEL in 1827. RICHARD (1824) also described a new *Dufourea*, viz. *D. boryi*, but this species is according to TULASNE conspecific with *T. trifaria*. BONGARD in 1841 founded a new genus *Philocrena* with a single species, *P. pusilla* but this plant too was recognised by TULASNE as conspecific with a *Tristicha* species, viz. with *T. hypnoides*. GARDNER (1847) added *T. bryoides* to the list, but this species was rejected by TULASNE, who recognized it as conspecific with *T. hypnoides*. LIEBMANN described a genus *Potamobryum* with three species, viz. *P. concinnum*, *P. laxum*, and *P. patulum*, but all these species were reduced by WARMING to *T. hypnoides*. *Potamobryum patulum*, however, was reinstated by JOHNSTON (1949), but it was once more reduced to *T. trifaria* by VAN ROYEN in 1950.

WEDDELL in 1873 reduced *T. dregeana* (Presl) Tulasne, to a variety of *T. hypnoides*, distinguishing at the same time the varieties *microcarpa* and *hilarii*; the latter variety had been created in 1849 by TULASNE, but in his monograph of 1852 this author did not maintain it. Two more varieties were described by WEDDELL, viz., the variety *fontinaloides* and the var. *pulchella*. In his monograph WEDDELL therefore accepts *T. hypnoides* with five varieties, viz. *hilarii*, *pulchella*, *fontinaloides*, *dregeana*, and *microcarpa*, and as distinct species *T. trifaria* and *T. alternifolia*. *T. bifaria* from the Philippines is mentioned as a dubious species.

WARMING in 1901 (p. 24—39) came to the conclusion that *Potamobryum concinnum*, *P. patulum* and *P. laxum* are conspecific with *T. hypnoides*. He united, moreover, *T. trifaria* with *T. hypnoides*, using the epithet *hypnoides* for the combined species. He left therefore but two species in *Tristicha*, viz. *T. alternifolia* and *T. hypnoides*, but as the specific epithet *trifaria* dates from 1810 and *hypnoides* from 1823 it is clear that the correct name is *T. trifaria*. This was independently recognised by TAYLOR in ANDREWS in 1950, by VAN ROYEN in 1950 and by HORN AF RANTZIEN in 1950 and 1951. The first used the name *T. trifaria* (Bory) Sprengel, the second *T. trifaria* (Willd.) Tul. and the third *T. trifaria* (Bory ex Willd.) Tul. WILLDENOW expressly states that DE BORY had asked him to use for his species, if it should prove to be a new one, the name *Dufourea trifaria*, and to credit the species to him. As part of the description of this new species was prepared by WILLDENOW, it seems justified to add the latter's name to that of DE BORY. The transfer of *Dufourea trifaria* to *Tristicha* had already been effected by SPRENGEL in 1825, whereas the work of TULASNE dates from 1849. The correct name for this species is therefore: *Tristicha trifaria* (Bory ex Willd.) Sprengel.

In the course of my study I have come to the conviction that *Tristicha alternifolia* (Willd.) Sprengel must be regarded as conspecific with *T. trifaria* as there are numerous intermediate stages between these two species. HORN AF RANTZIEN had reported already in 1948 that he could find no difference between these two species, but he did not actually carry out a fusion. As *Dufourea trifaria* was published

in 1810 and *D. alternifolia* in 1811, the specific epithet of the former has priority over that of the latter.

During the preparation of this publication I received from Prof. TOBLER in St. Gallen (Switzerland), a manuscript in which he proposed a new monotypic genus from Uruguay (*Heterotristicha*, based on *H. schroederi* Tobler, spec. nov. inedit.), differing from *Tristicha* in the shorter styles and the free tepals, the leaves, moreover, being larger although otherwise similar to those of *Tristicha*. As a result of a discussion on this question by letter Prof. TOBLER agreed to withdraw this new genus. The differences are so small that this seems to be indicated. The length of the styles is highly variable in *T. trifaria*. As regard the free tepals, I believe that we have in the perianth of this specimen merely an extreme variant of the normally trifid to tripartite condition. The same kind of variability is found in *Weddellina*, where the perianth may be 5-fid to 5-partite or split into 5 free petals. The size of the leaves is so strongly variable that it can not be used for the distinction of species.



DISTRIBUTION OF THE GENERA :

- |                 |                 |
|-----------------|-----------------|
| - - - Tristicha | — Weddellina    |
| - - - Mourera   | ■ Lonchostephus |
| ★ Tulasneantha  |                 |

**Geography** (See map)

The genus is distributed over the tropical parts of America, Africa and Asia. The area of one species, *T. trifaria*, extends from Central America and the West Indian Islands over South America to Africa and Madagascar and the islands to the east of the latter. The second species, *T. ramossissima*, is found in India and Ceylon only.

1. ***Tristicha trifaria*** (Bory ex Willd.) Sprengel (1825) 22; Steudel (1841) 715 — *Dufourea trifaria* Bory ex Willd. (1811) 63—64; Steudel (1821) 287; Steudel (1841) 533 — *Tristicha trifaria* (Willd.) Tul., v. Royen (1950) 125—126, f. 54 — *Tristicha trifaria* (Bory) Sprengel, Andrews (1950) 83 — *T. trifaria* (Bory ex Willd.) Tul., Horn af Rantzien (1951) 376—378 — *T. hypnoides* (St-Hil.) Sprengel (1827) 10; Steudel (1841) 715; Nash (1905) 3; Herter (1930) 65; Standley (1937) 472; Dugand (1944) 30; Horn af Rantzien (1948) 186—187, 1 fg. — *T. hypnoides* Sprengel (1841) 715; Weddell (1873) 44—45; Cario (1881) 25, 41, 73, t. 1—24; Warming (1881) 1; idem (EP 1891) 18; idem (1899) 107—114, f. 1—6; idem (1901) 24—30, f. 20—30; Went (1919) 67; Engler (1930) 35—36; Yuncker (1940) 292 — *T. hypnoides* Tul. (1849) 112; idem (1852) 186—189, t. 10 f. 4; Walpers (1852) 443; idem (1858) 791; Tul. (1863) 272—273; Tobler (1933) 299, f. 15 — *T. hypnoides*, Baillon (1888) 257, 267, f. 315, 316; Marie-Victorin & Leon (1944) 351 — *Dufourea hypnoides* St-Hil. (1823) 472; idem (1824) 83; Richard (1829) 636 — *Tristicha bryoides* Gardner (1847) 178; idem (1850) 39; Wight (1852) 35, t. 1920 — *T. dregeana* (Presl) Tul., (1852) 184—185 — *Podostemum dregeanum* Presl (1844) 149 — *Tristicha fontinaloides* Welw. msc. — *Philocrena pusilla* Bongard (1835) 81—82, t. 6; Steudel (1841) 320 — *Potambryum concinnum*, *P. laxum* et *P. patulum* Liebmann (1849) 513—515 — *Tristicha concinnum* (Liebmann) I. M. Johnston (1949) 130 — *T. hypnoides* (St-Hil.) Sprengel var. *hilarii* Tul., var. *microcarpa* Tul., var. *pulchella* Wedd., var. *fontinaloides* Wedd., var. *dregeana* (Presl) Tul. (1849) 112; idem (1852) 189; Weddell (1873) 45; Engler (EP 1930) 36 — *Dufourea boryi* A. Rich. (1829) 636 — *Cryptocarya tristicha* Taylor msc, in Kew Herbarium — *Tristicha alternifolia* Tul., (1849) 111; idem (1852) 182—183; Steudel (1841) 715 — *Dufourea alternifolia* Willd. (1811) 64; Weddell (1873) 45—46<sup>1</sup>).

Coenobia attached to the substrate by means of branched roots and forming dense but low mats; stems terete, 0.2—10 cm high; leaves for the greater part tristichous and the orthostichies clearly recognizable, one orthostichy on the upper side of the stem, usually consisting of ovate, about  $0.4 \times 0.5$  mm large leaves, the other two orthostichies at the flanks, at the same level, usually consisting of obliquely inserted, spatulate, about  $0.2 \times 2$  mm large leaves; on the first-formed parts the regular distribution is disturbed and then the leaves appear in irregular whorls of 3 to 6; all leaves nerveless or with a distinct nerve, entire, obtuse to acute, sessile, usually of two kinds, sometimes all similar, mature leaves split into 2—4 acute lobes. Fertile branches with a terminal flower originally enclosed within 2 or 3 membranaceous, 2—2.5 mm long leaves; perianth trifold to tripartite or with three free petals; lobes obtuse, with a distinct nerve, membranaceous, 1—2 mm long; stamen 1, from 1.5—2.5 mm long; anther sagittate or ovate, about 0.8 mm long, truncate; top sometimes darkly coloured;

<sup>1</sup> The literature dealing with *T. alternifolia* is not completely given.

base of thecae obtuse; pollen grains globose 17  $\mu$  in diam; ovary ellipsoidal, rounded or attenuate at the base, 0.5—1 mm long, about 0.8 mm in diam; styles 3, linear, about 0.5 mm long. Fruit dehiscing into 3 valves; each valve with 3 ribs; pedicel 3—20 mm long.

Type: Du Petit-Thouars s.n., P; collected in Madagascar.

Distribution: From Mexico to Madagascar.

Vernacular names: pesacarne (Panama, Costa Rica), paste de piedra rio (Guatemala).

Use: According to STANDLEY it is eaten by cattle in the dry season.

*Mexico*: Rio San Francisco, Barranca falls, Liebmann s.n., fl. fr. July (C); between Asleton and Maloapan, Liebmann s.n., May (C); Cordita, Gray s.n., fl. May (GH); Cordoba, dept. Vera Cruz, Greenman 124, fl. fr. Jan. (F, GH, MO); Rio Quiotepec, dept. Oaxaca, Conzatti 3914, March (US); prov. Orizaba, Schaffner s.n., fl. (P); idem, Weber s.n., (P); without loc., Sumichrast s.n., fl. fr. (P).

*Honduras*: Vicinity of Siguatepeque, dept. Comayagua, Standley 55915, fl. fr. Febr. (F); 56283, fl. fr. Febr. (F); 56284, fl. fr. Febr. (F, US); Mt Cangrajal, Yuncker c.s. 8853, fl. Aug. (MO); Uyuca, dept. Morazán, Rodriguez 1597, fl. fr. Nov. (F); Rio Yeguaré, dept. Morazán, Rodriguez 2552, March (F); Rio Caparrosa, Zamorano, dept. Morazán, Rodriguez 3663, fl. fr. Jan. (F); Rio Yeguaré, Standley 1123, fl. fr. Nov. (F); idem, Standley 1696, fl. fr. Jan. (F); vicinity of Comayagua, Rio Humuya, Standley & Chacon 5604, fl. fr. March (F); vicinity of Siguatepeque, dept. Comayagua, Standley & Chacón 6743, March (F); Rio Yeguaré, near El Zamorano, Standley & Molina 4660, fl. fr. Febr. (F); Rio San Alejo, dept. Atlántida, Standley 8004, April (F); vicinity of El Zamorano, Standley 3990, Febr.—March (F).

*Nicaragua*: Rio Pais, Ørsted s.n., fl. fr. Febr. (C); Salorina (?), Ørsted s.n., fl. fr. (C); Nicaragua lake, Ørsted s.n., fl. fr. (C); idem, Wright s.n., fl. fr. (GH, MO, NY, P, US); Rio d'Oro, Ørsted s.n., fr. (C); Libertad, dept. Chontales, Rio Mico, Standley 8936, fr. May—June (F); Jinotega, dept. Jinotega, Standley 9662, June—July (F).

*Guatemala*: Mazatenango, Bernouilli 39, fl. fr. Nov. (BR, NY); Retalhuleu, Kellerman 6662, fl. fr. Jan. (F); idem, Standley 88817, fl. fr. Febr. (F); between Retalhuleu and Asintal, Standley 87867, fl. fr. Febr. (F); Rio Bobos, Quebrados, Blake 7542, fl. fr. May (GH, US); Rio Lima, Muenscher 12033, May (F, GH); Rio Siguanan, Muenscher 12030, fl. May (F, GH); near Los Verdes, dept. Santa Rosa, Standley 60408, fl. fr. Dec. (F); Rio Pinule, Steyermark 32914, fl. fr. Dec. (F); between Finca Pirineos and Soledad, dept. Quezaltenango, Steyermark 33576, fl. Jan. (F); Quebrada San Geronimo, Steyermark 33363, 33368, Jan. (F); Rio Juyamá, Steyermark 39119, fl. fr. April (F); Rio Samalá, Steyermark 34548, fl. fr. Jan. (F); hills between Jutiapa and Plan de Urrutia, Standley 75497, Oct. (F); idem, Standley 88363, fl. fr. Febr. (F); near Las Delicias, Standley 88000, 88002, fl. fr. Febr. (F); Ajaxá, Standley 88248, fl. fr. Febr. (F); Rio Vil, Standley 88311, fl. fr. Febr. (F); vicinity of Chiquimulilla, Standley 79714, Nov.—Dec. (F); along Avellana-road, Standley 79471, fl. fr. Dec. (F); near Guazacapan, Standley 78604, fl. Dec. (F); Rio Sébol, Steyermark 46314, May (F); Rio Teculután, Steyermark 42113, fl. fr. Jan. (F); La Puenta, Wendland s.n., fl. Dec. (W).

*El Salvador*: vicinity of Ahuachapán, Standley & Padilla 2595, Jan. (F); idem, Standley & Padilla 2763, fl. fr. Jan. (F); idem, Standley & Padilla 2784, fl. fr. Jan. (F); vicinity of San Vicente, Standley & Padilla 3827, Febr. (F); dept. Sta. Anna, above Hacienda San José, NW of Metapán, Fassett 28763, Febr. (U, WI); dept. Sonsonate, between Nahuizalco and Juayúa, NW of Sonsonate, Fassett 28730, Jan. (U, WI); dept. San Salvador, Las Cataractas, Panchimalco, Fassett 28668, fr. Jan. (U, WI); idem, Fassett 28670, Jan. (U, WI); idem, Fassett 28667, Jan. (U, WI); idem, Fassett 28665, Jan. (U, WI).

*Costa Rica*: Aquacaliente, Pittier 892, fl. fr. Febr. (BR, P, US); Bornca, prov. San José, Pittier 3845 & 659 (BR); Rio Ceibo, Pittier 3847, (BR); Rio Torres, prov. San José, Tonduz 7126, fl. fr. Jan. (GH, MO, NY, US); idem, Tonduz 11294, July (P, US); Quebrada Azul, prov. Guanacaste, Standley & Valerio 46346, fr.

Jan. (F); vicinity of Tilarán, prov. Guanacaste, Standley & Valerio 45033, fl. fr. Jan. (F); idem 45031, Jan. (F, US); idem 44263, Jan. (F); idem 45684, fl. fr. Jan. (F, US); idem 46656, fl. fr. Jan. (US); idem 46615, fl. fr. Jan. (F); idem 46633, fl. fr. Jan. (F); Rio de Las Piedras, prov. Tilarán, Alfaro 111 & 111/2, fl. fr. March (F); idem, Alfaro 112, fl. fr. March (F); Quebrada Tronadora, prov. Tilarán, Alfaro 113, fl. fr. March; idem, Alfaro 125 & 125A, fl. fr. April (F); San Sebastian near San José, prov. San José, Standley 49291, fl. fr. Febr. (F); vicinity of El General, prov. San José, Skutch 2522, fl. fr. Jan. (NY, S, US); idem, Skutch 2473, fl. fr. Jan. (GH, NY, US); Rio Jorco, Valerio 1130, fl. (NY, US); Siguirres, Alfaro 104, fl. fr. Febr. (F); Rio Santa Rosa, Alfaro 114, fl. fr. March (F); vicinity of Pejivalle, prov. Cartago, Skutch 4603, fl. fr. Jan. (F, GH, MO, NY, US); San Antonio de Bilar, Echeverría 350, March (F); Rio Agua Caliente, prov. Cartago, Torres 3, (F); St. Anna, Wendland s.n., fl. April (W); without loc., Tonduz 9838, (G.-Boiss); idem, Pittier & Tonduz s.n. (BR).

*Panama:* Penonome, Williams 1043, fl. fr. Febr. (NY); Rio Paraiso, Standley 29878, fl. fr. Jan. (C, S, US); Rio Pedro Miguel, Standley 29933, Jan. (US); idem, Standley 29934, fl. fr. Jan. (GH, US); Quebrada Ancha, Steyermark & Allen 17130, fl. Dec. (MO); Las Cascades, Dodge & Hunter s.n., fl. Dec. (MO); Rio Boqueron, Steyermark & Allen 17257, fl. Dec. (MO, S, U); Rio Indio, Steyermark & Allen 17400, fl. Jan. (MO); Rio Anton, Muenscher 16264, March (MO, U).

*Colombia:* Jabano, André K 1595, (F, NY); Jocola, Rio Dagua, André K 2650, April (F, NY); Rio Mayo, André 2918, (F); La Union André K 1597, (F, NY); Paramo de Guapascal, André K 1596, (F, NY); Salto de Tequendama, Killip 34039, fl. Febr. (F, GH, MO, US); Rio Rancheria, Haight 4009, Febr. (US).

*Cuba:* Prov. Pinar del Rio:—Rio San Sebastian, Ekman 13797, fl. May (MO, S); idem, Ekman 18054, Nov. (F, G.-Del., GH, NY, P, S, US); Rio Guao, Britton c.s. 9638, fl. fr. Dec. (F, GH, NY, US); Rio Mestanza, Britton c.s. 10162, fl. March (NY); Rio Portales, Ekman 18700, fl. March (S); without loc., Wright 3195, fl. fr. (GH, MO, NY, P, S, W).

*Venezuela:* Near Valencia, Einar Staal s.n., (C).

*British Guiana:* Puruni river, Jenman 7607, fl. fr. Oct. (C, NY, U); without loc., Schomburgk 432, fr. (C, L, P, W); idem, Schomburgk 431, (G.-Del., L, P, W).

*Brazil:* Prov. Goyaz — Rio Tocantin, Weddell 2366, fl. fr. Febr. (P); Rio Bacalhao, Glaziou 22005, July (BR, C, G.-Boiss., G.-Del., P, S); idem, Glaziou 22002, fl. fr. July (BR, C, G.-Del., P, S); idem, Glaziou 21999, fl. July (BR, C, G.-Del., P, S); idem, Glaziou 22010, fl. July (BR); Rio Vermelho, Weddell s.n., fl. fr. Febr. (P); idem, Glaziou 22007, fl. fr. July (C, G.-Boiss., G.-Del., P, S); idem, Glaziou 22000, fl. fr. July (BR, C, G.-Del., P, S); Rio Douradinha, Glaziou 21995, fl. fr. Aug. (BR, C, G.-Del., GH, P, S); Rio Babylonia, Glaziou 21996, Aug. (BR, C, F, G.-Del., P, S); Rio Macaco, Glaziou 22004, fr. July (F, G.-Boiss., G.-Del.); Rio Trindade, Glaziou 21993, fr. Aug. (BR, C, G.-Del., P, S) — Prov. Rio de Janeiro — Rio Negro, Ronca Cao rapids, Glaziou 13140, fl. fr. June (BR, C, G.-Del., P, US); idem, Glaziou s.n., fl. July (C); idem, Glaziou s.n., fl. fr. June (C); Nova Friburgo, Schwacke 3032, fl. fr. Jan. (C); without loc., Glaziou 15442 (C, P) — Prov. Sao Paulo — Rio Piracicaba, Glaziou 19817, (C, P); idem, Glaziou 19816, (C, P); idem, Glaziou 15443, (P); idem, Glaziou 16358, (P); Rio Jaguar, Mosén 4587, Jan. (P, S) — Prov. Sta. Catharina — Blumenau, Rio Itayahy, Schwacke 5011, (C); idem, Müller 2, (C); Rio Capinzal, Dusén 17871, fl. Febr. (S); without loc., Schenck 327, Sept. (C) — Prov. Pernambuco — near Tapera, Bento Pickel 1420, fl. fr. Nov. (GH, US); Rio Pinga, v. Luetzelburg 15512 & 16032, Sept. (M) — Prov. Para — Rio Uaupès, Spruce 1084, fl. fr. Sept. (C, GH, NY, P); near Santarem, Spruce s.n., fl. fr. Sept. (C, G.-Del., P, W) — Prov. Ceara — Acude Acaraque, Drouet 2735, Sept. (F, GH, NY, S, US); Rio Salgado, Gardner 1844, fr. (BR, C, G.-Del., L, P, W) — Prov. Matto Grosso — Cusiem, near Palmeiras, Lindman A 2451, fl. Dec. (S) — Prov. Rio Grande do Sul — Silveira Martius, Arroio Grande, Lindman A 1235, fl. March — without known province — Rio Tieté, Riedel 1093 (GH); Rio Iguapé, Iporanga, Puiggari 279, fl. July (G.-Del.)

*Uruguay:* Salto Grande, Uruguay-river, Ostén 2902, fl. fr. Dec. (C); idem, Berro 5154, 5156, 5162, 5167, fl. fr. April (C); Rio Negro, Salto de Sierra, Ostén 18758, Jan. (F, S); idem, Berro, 1, 4, 5165, fr. March (C); Barra de Vera, Berro

3393, Febr. (C); idem, Berro 5155, 5163, 5164, Febr. (C); Salto Chico, Berro 5169, fr. April (C); Barra del Tala, Berro 5166, Febr. (C).

*Argentina*: According to HORN AF RANTZIEN (1951) this species is reported from the Territory of Misiones.

*Without known state*: Truando-falls, Schott 40862, 40875, 40882, fl. Jan. (F); idem, Schott 40861, fl. fr. (F, NY).

## 2. WEDDELLINA Tul.

Medium-sized to large coenobia consisting of branched sterile shoots and unbranched fertile shoots springing from the same slightly flattened and branched root. Fertile shoots small to medium-sized provided with a few squamiform leaves and ending in a single flower. Flower when young enveloped by squamiform leaves; tepals 5, distinct, membranaceous, free or slightly united at the base, provided with a single distinct nerve; stamens 5—25, in a single complete whorl; anthers dehiscing introrsely; pollen grains ellipsoidal, 3-colpate; ovary 6-ribbed, 2-celled, the cells equal; style 1, filiform, discoidally flattened at the top. Fruit opening with 2 equal valves; each valve provided with 3 indistinct ribs. Sterile shoots repeatedly forked, densely covered with 2- to 6-dentate scales and carrying small alternate leaves; the leaves repeatedly forked and covered with scales; ultimate divisions with tufts of minute filaments in the axil of 1- to 6-dentate scales.

Type: *Weddellina squamulosa* Tul.

Distribution: 1 species in British Guiana, Suriname, Colombia and Northern Brazil (See map)

1. *Weddellina squamulosa* Tul., forma **squamulosa**, Tul. (1849) 113—114; idem (1852) 195—197, t. 13 f. 5; Walpers (1852) 444; idem (1858) 792; Weddell (1873) 48; Goebel (1893) 349—350, t. 31; Warming (1894) 18, f. 13; Wächter (1897) 382—397, f. 9—21; Warming (1901) 53; Engler (1930) 31—32, f. 16 B, C, f. 23; v. Royen (1948) 382.

Small to large coenobia with the shoots arising from about 1 mm wide roots. Fertile shoots 2—12 cm long, at the base indistinctly, towards the top more distinctly winged, the wings passing into the nerves of the tepals; leaves numerous, spirally arranged, squamiform, cordate to obovate, sessile, subamplexicaul, obtuse to acute, 1—2 mm long and about 1 mm wide. Flowers pink to lilac or white; tepals spatulate, entire, obtuse or mucronate, crested at the base, free or shortly united, imbricate, 3—6 mm long; stamens 5—15, from 3.5—6.5 mm long; anthers 0.5—1 mm long, obtuse to rather deeply emarginate at the top, and with a cordate base; lobes obtuse; pollen grains 15  $\mu$  high, 10  $\mu$  diam; ovary ellipsoidal to subglobose, obtuse, attenuate at the base, 2.5—4 mm high, 1.5—2 mm diam; style 0.5—1 mm long. Sterile shoots 2.5—80 cm long, terete, slightly compressed at the base.

Type: Schomburgk 433, K, duplicates BR, C, G.-Del., K, L, P, US, W; collected in British Guiana.



**Distribution:** Colombia, British Guiana, Suriname, Northern Brazil.

*Colombia:* Rio Uaupès, Mindu rapids, Schultes s.n., fl. Jan. (GH); idem, Yurupari-falls, Cuatrecasas 6986, Sept. (US); idem, Allen 3214, fl. Nov. (MO, U).

*British Guiana:* without loc., Schomburgk 433, fl. fr. (BR, C, G.-Del., K, L, P, US, W); Essequibo-river, Head-falls, A. C. Smith 2103, fl. fr. Oct. (F, G.-Del., MO, NY, S, U, US); Mazaruni-river, Caburi-falls, Jenman 7721, fl. fr. Oct. (C, NY, U); idem, without loc., Goebel s.n. (ex mss); Potaro-river, Amatuk-falls, Jenman 7421, fr. Oct. (NY, U); idem, Jenman 7493, (S); idem, Pakatuk-falls, Jenman 7740, fl. Oct. (U); idem, near Cobanatak, Jenman 7418, fl. Oct. (F); idem, Jenman 7420, fl. Oct. (B); idem, Tumatumari-falls, Linder 14, fl. fr. Sept. (GH, NY); idem, Jenman 936, fl. fr. Sept. (F); Puruni-river, Waramboo-falls, Jenman 7604, fl. fr. Oct. (NY, U); idem, Thomas-falls, Jenman 7609, fl. fr. Oct. (U); idem, idem, Jenman 7710, fl. fr. Oct. (NY, U); Demerara, Jenman 1099, fl. fr. Jan. (P); Mazaruni-river, Jenman s.n. (NY).

*Suriname:* Saramacca-river, Gran Dam, Maguire 24925, fl. fr. Oct. (F, NY, U, US).

*Brazil:* Rio Oyapock, Grande Roche, v. Luetzelburg 21662, fl. July (M); idem, Salto Crignon, v. Luetzelburg 20246, July (NY, W); Rio Uaupès, v. Luetzelburg 23153, 23171, 23180, 23188, 23216, 23250, 23254, 23258, 23273, 23284, 23292, fl. Nov. (M); without loc., Huber 1817, (G.-Boiss., W); Rio Pauri, v. Luetzelburg 23159, 23210, fl. Nov. & Dec. (M).

Forma **uaupènsis** (Benth. & Hooker) v. Royen, nov. comb. — *Weddellina uaupènsis* Benth. & Hooker (1880) 109; Engler (1930) 32.

Flowers similar to those of forma squamulosa but provided with 20—25 stamens. Otherwise similar to forma squamulosa.

Type: Spruce 2752 in K, duplicates in BR, C, GH, K, NY, P; collected in Brazil.

**Distribution:** Brazil.

Rio Uaupès, near Panurè, Spruce 2752, fl. fr. Oct.

### 3. MOURERA Aublet

Small to very large herbs, stemless or with a short stem formed by the fusion of the leaf-bases; leaves radical, distichous, small to very large, elliptical and then with a strongly fimbriate margin, cuneate, pinnatilobed or repeatedly forked with the ultimate divisions filiform, sometimes very coarse and provided with many rigid outgrowths at the upper surface; the elliptic, cuneate and pinnatilobed leaves distinctly nerved. Flowers in 2-sided spiciform monochasia, the monochasia spring from the axils of the upper leaves and are either pedunculate or sessile, few- to many-flowered, branched or unbranched, sometimes very short or reduced to a single flower. Flowers alternating with decurrent bracts; the latter on both sides with a distinct wing, the basal margins of which cover the apical margins of the preceding bracts. Juvenile spathella clavate, obtuse or acute; mature one infundibuliform, exceeding the bracts; tepals 5—20, free, in a single complete whorl; stamens 5—35 in an incomplete or in one or two complete whorls; filaments lanceolate or linear to elliptical; anthers narrow, with deeply incised base, dehiscing introrsely or when inserted in two whorls partly extrorsely; pollen grains ellipsoidal, 3-colpate; ovary

2-celled, ellipsoidal, attenuate at the base, with two equal carpels, 6- to 14-ribbed, but 2 of the ribs sometimes indistinct; styles 2, filiform to spatulate, free or cohering at the base. Fruit with 2 equal valves, each with 3 or 5 ribs; styles, filaments and tepals marcescent.

Type: *Mourera fluviatilis* Aublet.

Distribution: 6 species distributed over Guiana, Venezuela, Colombia, Northern and Central Brazil. (See map)

*Mourera* is distinguishable from the majority of the *Podostemaceae* by the arrangement of its flowers, which are borne in 2-sided spiciform monochasia. It shares this character with *Tulasneantha*<sup>1</sup> and *Lonchostephus*, and these three genera therefore are referred by me (1951, p. 13), to a tribe of their own, the *Mourereae*. However, this character is sometimes indistinct e.g. in *Mourera alcicornis*. Originally this species was described by TULASNE as belonging to *Ligea* and WEDDELL subsequently inserted it in *Oenone*. A remark made by SPRUCE on one of his labels shows that he considered the species to belong to *Mourera*. When investigating the material of *Mourera alcicornis* I came to the conclusion that this species is provided with monochasia, although very short ones and that some specimens show a distinct peduncle. When one investigates specimens with very short peduncle, one would be inclined to refer this species in *Oenone*, but when one becomes acquainted with those provided with a distinct peduncle, one does not hesitate to insert it in *Mourera*. The rough upper surface of the leaves also points in the direction of *Mourera*. Therefore I have inserted *Oenone alcicornis* (Tul.) Wedd. in *Mourera* as *M. alcicornis* (Tul.) v. Royen.

#### Key to the species:

- |     |   |    |  |   |
|-----|---|----|--|---|
| 1a. | Small plants with few-flowered inflorescences provided with a very short peduncle. Leaves elliptical to cuneate, pinnatilobed . . . . . | 6. | <b>M. alcicornis</b> (Tul.) v. Royen.                    |   |
| b.  | Small to very large plants with distinctly stalked inflorescences. Leaves either repeatedly forked or entire to pinnatisect . . . . .   |    |  | 2 |
| 2a. | Inflorescences branched . . . . .   |    |  | 5 |
| b.  | Inflorescences unbranched . . . . .   |    |  | 3 |
| 3a. | Leaves repeatedly forked . . . . .  |    |  | 4 |
| b.  | Leaves entire to pinnatisect, margin often fimbriate. 1. <b>M. fluviatilis</b> Aublet   |    |  |   |
| 4a. | Pinnae of the leaves thick and fleshy and the filiform ultimate divisions numerous . . . . .  | 3. | <b>M. glazioviana</b> Warming                            |   |
| b.  | Pinnae membranaceous and the filiform ultimate divisions few in number . . . . .  | 4. | <b>M. weddelliana</b> Tul.                               |   |
| 5a. | Leaves large, entire or provided with a strongly lacinate margin . . . . .  |    |  | 8 |
| b.  | Leaves of medium size, i.e. up to 20 cm long, repeatedly forked . . . . .   |    |  | 6 |
| 6a. | Stamens 7—15, all free . . . . .  |    |  | 7 |
| b.  | Stamens 20—25, sometimes a few united . . . . .   | 2. | <b>M. schwackeana</b> Warming                            |   |
| 7a. | Pinnae of the leaves thick and fleshy; the filiform ultimate divisions numerous . . . . .   | 3. | <b>M. glazioviana</b> Warming                            |   |
| b.  | Pinnae membranaceous; the filiform ultimate divisions few in number . . . . .   | 4. | <b>M. weddelliana</b> Tul.                               |   |
| 8a. | Stamens in a complete whorl . . . . .   | 5. | <b>M. aspera</b> (Bong.) Tul. forma <b>aspera</b>        |   |
| b.  | Stamens in an incomplete whorl . . . . .  | 5. | <b>M. aspera</b> (Bong.) Tul. forma <b>minor</b> Warming |   |

<sup>1</sup> See for this name: v. Royen, Pod. New. World, part 1 (1951) 9

1. **Mourera fluviatilis** Aublet, 1 (1775) 582—584; idem, 4 (1775) t. 233; Lamarck, Encycl. (1796) 334; idem, Ill. Encycl. (1796) t. 480; St. Hilaire (1805) 576; Tul. (1849) 93; idem, Tul. (1852) 62—65, t. 1 f. 5; Walpers (1852) 432; Walpers (1858) 775; Weddell (1873) 49—50; Warming (EP 1891) 20; Pulle (1906) 194; Matthiesen (1908) 20—26, t. 8, f. 62—67, t. 9 f. 68—79, 87; Glaziou (1911) 574; Went (1912) 51—66, t. 1 f. 11—16, t. 14/15 f. 123—173; Engler (1930) 42; Graham (1933) 140; v. Royen (1948) 383 — *Lacis fluviatilis* Schreber (1789) 366; Willdenow (1797) no. 1225; Persoon (1807) 81; Steudel (1821) 460; Martius & Zuccarini (1824) 6; Steudel (1841) 2; Bongard (1835) 73; v. Chamisso (1835) 503 — *Stengelia* Necker (1790) 258, no. 1011.

Large herb, either stemless or provided with an unbranched, 1—5 cm long and 0.5—1.5 cm thick stem; leaves of different size and shape, 8—200 cm long, 2—30 cm wide, pinnatinerved; nerves prominent underneath; secondary nerves anastomosing, fluctuating; upper surface of the leaf rough; lower surface glabrous. Inflorescences 5—60 cm long, 3—8 m wide, unbranched, very rarely terminated by a 2 cm long leaf; bracts boat-shaped, slightly crested, rough, 5—13 mm long; pedicel of the flower 1—4 cm long, widened at the top; juvenile spathella obtuse or acute; mature one cupuliform to tubuliform, 10—15 mm long. Flowers pink to violet; tepals 16—20, squamiform and lanceolate, 0.5 mm long or less; stamens 20—35, from 6—12 mm long, in one or two whorls; anthers 3—4 mm long, with one or two acute teeth at the top; base cordate; in the inner whorl dehiscing extrorsely, in the outer whorl dehiscing introrsely, pollen grains 17  $\mu$  high, 16  $\mu$  diam; ovary 5—12 mm long, 2—3 mm diam, with 6 or 8 ribs; juvenile styles spoonshaped; mature ones filiform, 1.5—2.5 mm long. Fruit similar to the ovary; each valve with 3 or 5 ribs, 8—13 mm high; pedicel 1—4 cm long.

Type: Aublet s.n., P; duplicates BM, MO.

Distribution: Venezuela, Guiana, Northern Brazil.

Vernacular names: mourerou (French Guiana), koemaroe njam njam (Suriname), arapsoc-banja (Suriname), paco (British Guiana), avenca d'agua (Brazil).

*French Guiana*: Sinemarie-river, Aublet s.n., fl. fr. (BM, MO, P); without loc., Leprieur 1834, fr. (G.-Del.); idem, Martin 135, fl. fr. (P); idem, Martin s.n., fr. (B, C); idem, Rothery 55, fr. (K).

*Suriname*: Suriname-river, Wulschlaegel 1673, fr. (GOTT., U, W); idem, Hostmann 1248, fr. (FI, G.-Del., GH, K, U, W); Upper Nickerie-river, Tulcken 438, Sept. (L, U); Marowynne-river, Kappler & Hohenacker s.n., fl. fr. Aug. (S); idem, Armina-falls, Went 462, fr. Oct. (P, U); idem, near Poelogoedoe, Versteeg 610, July (U); idem, Gonsoetoe-falls, Florschütz 542, fr. Dec. (U); Coppename-river, Raleigh-falls, Boon 1246, fr. Oct. (U); idem, Boon 1030, fl. fr. Aug. (U); idem, Boon 1079, fl. fr. Aug. (U); idem, Boon 1141, fl. fr. Sept. (U); idem, Lanjouw 964, fl. fr. Sept. (U); Gonini-river, BoneDoro-falls, Versteeg 46, fl. fr. Aug. (U); idem, Versteeg 150, fl. fr. Aug. (U); Tapanahoni-river, Versteeg 749, Aug. (U); idem, near Drietabbetje, Florschütz 510, fl. fr. Dec. (U); idem, Zandkreek soela, Geyskes 962, fl. fr. Sept. (U); Corantyne-river, Rombouts 188, fl. fr. Sept. (U); Saramacca-river, Kwattahede to Tukoesoe, Maguire 23955, fl. fr. June (U); idem,

Maguire 24922, fl. fr. Oct. (F, K, NY, U, US); idem, near Pakka-pakka, Maguire 24949, fl. fr. Oct. (F, K, NY, U, US); idem, Saracreek near Dam, Florschütz 167, fl. fr. Nov. (U); without loc., Tresling 81, (U); Tresling 101, fl. fr. (U); Went s.n. (U).

*British Guiana*: Demerara-river, Jenman 1151, fl. fr. (K, P); idem, Parker s.n., fl. fr. (K); New River, Weber s.n., Aug. (GH); idem, King Williams falls, Anderson 748, fl. fr. (K); Puruni-river, Big Falls, Jenman 7610, fl. fr. Oct. (BM, C, F, NY, P, U); Essequibo-river, Twasinki-falls, A. C. Smith 2139, fl. fr. Sept. (F, G.-Del., K, MO, NY, S, U, US); idem, near mouth of the Onorocreek, A. C. Smith 2648, fl. fr. Dec. (F, G.-Del., K, MO, NY, S, U, US); idem, Kurupucari-falls, N. Beccari 150, fl. fr. Nov. (F1); Rupununi-river, Myers 5593, fl. fr. Nov. (K); Cuyuni-river, Akaio-falls, Sandwith 695, fl. fr. Nov. (K); idem, Tutin 27, fl. fr. May (BM); Kataboo region, Graham s.n. (U); Takutu, Appun 1637, fl. fr. (K); Cabalebo-falls, Im Thurn s.n., fl. fr. Oct. (K); without loc., Schomburgk 295, fl. fr. (BR, C, CGE, F, FI, G.-Del., GH, K, L, P, W); idem, Schomburgk 351, fl. fr. (BM, G.-Del., P, W); idem, Schomburgk 33 (P).

*Venezuela*: Alto Caura, Raudal, Bucadesode, Cardona 105, fl. fr. March (US); Rio Revaloso, Othmer s.n. (ex mss Matthiesen).

*Brazil*: Alto Cunnonny, Goeldi 1154, fr. (F, G.-Boiss); Rio Oyapock, Grande Roche, v. Luetzelburg 20258, fl. July (M, W); idem, Salto Manôa, v. Luetzelburg 20324, fl. fr. July (M); idem, idem, v. Luetzelburg 20241, fl. July (M); idem, idem, v. Luetzelburg s.n., fr. July (M); idem, Salto Caxira, v. Luetzelburg 21655, March (M); Rio Ariramba, Ducke 14891, fl. fr. Oct. (CGE); Rio Branco, Kühlmann 162, fl. fr. Febr. (CGE); idem, Ule 7966, fr. Jan. (K); Rio Trombetas, Porteira rapids, Traill 802, March (K); without loc., Gardner 1848 (W); idem, Huber 1790 (G.-Boiss., W).

2. **Mourera schwackeana** Warming (1899) 117—118, f. 10; Engler (1930) 42.

Small to medium-sized herb with an unbranched, compressed, 0.5—1.5 cm long stem. Leaves 2 or 3 times forked, 5—18 cm long; petiole cuneate, with two wings at the base, amplexicaul and decurrent, 1—5 cm long; ultimate divisions filiform, 4—7 mm long. Inflorescence branched, 1.5—5 cm long, at the ramifications with narrow, about 5 mm long leaves; common peduncle terete, densely covered with coarse papillae, slightly winged at the top, 1—2 cm long; the spiciform monochasia 0.6—3 cm long. Flowers few; pedicel 0.5—5 cm long; juvenile spathella clavate, obtuse or acuminate, stalked; mature spathella infundibuliform, 4—12 mm long; bracts boat-shaped at both sides, 1.5—8 mm long; tepals 10—15, linear, up to 0.5 mm long, sometimes a few united; stamens 20—25, in 2 whorls, 3—6.5 mm long, anthers 1—1.5 mm long, acute, cordate at the base; base of thecae acute to obtuse, those of the inner whorl dehiscent extrorsely, those of the outer one introrsely; pollen grains 19  $\mu$  high, 12  $\mu$  diam; ovary obtuse to acute, 3—7 mm high, 1.5—2 mm diam, with 6 ribs; styles spatulate or obovate, obtuse, subpapillate, about 1 mm long. Fruit similar to the ovary.

Type: Schwacke 4986, C; duplicates P, U; collected in Brazil.

Distribution: Brazil.

Prov. Piauí, Schwacke 4986, fl. fr. (C, P, U); prov. Ceara, Glaziou 15444 d, fl. fr. (C, P).

3. **Mourera glazioviana** Warming (1899) 114—117, f. 7—9.

Small to medium-sized herb; stem terete, 0.5—1 cm long. Leaves 3 to 4 times forked, 3—6 cm long, 2—6 cm wide; petiole fleshy, subcompressed, 1—4 cm long, about 1 cm in diam, the filiform ultimate divisions numerous. Inflorescences branched or unbranched, 2—14 cm long; common peduncle twisted, sometimes flexuose; the rachis 2—10 cm long, provided with linear, 1—3 cm long leaves, and compressed, widened and winged below the spiciform monochasia, densely covered with coarse papillae; bracts 0.5—7 mm long; narrowly sulcate; flowers loosely scattered; pedicel 0.3—3 cm long; juvenile spathella obtuse, stalked; mature one infundibuliform, 4—7 mm long; tepals 7 or 8, linear, acute, 0.5 mm long or less; stamens 7 or 8, from 3 to 5 mm long; anthers obtuse or acute, 1.5—2 mm long, base sagittate; pollen grains incompletely known; ovary obtuse, 2.5—5 mm long, 1—1.5 mm diam, with 6 ribs; styles spatulate, subpapillate, free, about 0.5 mm long. Fruit similar to the ovary.

Type: Glaziou 21984 a, C, duplicate P; collected in Brazil.

Distribution: Known from the type-collection only.

Rio Urucuya, Glaziou 21984 a, fl. fr. June (C, P).

4. **Mourera weddelliana** Tul., (1849) 93; idem (1852) 66—68, t. 1 f. 4; Walpers (1852) 433; idem (1858) 776; Weddell (1873) 50—51; Baillon (1888) f. 319, 320; Warming (EP 1891) 20, f. 11; Engler (1930) 42, f. 14.

Small to medium-sized herb; stem unbranched, 0.5—1 cm long. Leaves 2 to 7 times forked, antler-like, 5—15 cm long; petiole compressed, 2—7 cm long, widened at the base; the filiform ultimate divisions few in number. Inflorescences usually branched, 2.5—15 cm long; at the ramifications with 0.5—4 cm long, bract-like leaves; common peduncle terete, slightly winged, densely covered with rough papillae, 1.5—8 cm long. Flowers numerous to very few; pedicel 1—12 cm long; juvenile spathella clavate, stalked, nipple-shaped at the top; mature spathella infundibuliform, 4—15 mm long; bracts boat-shaped at both sides, acute, 3—10 mm long; margins membranaceous; the basal margin decurrent along the rachis over a long distance; tepals 9—12, linear, acute, up to 0.5 mm long; stamens 10—15, in one or two whorls, 4—7 mm long; anthers 1.5—2 mm long, acute, with one or two tips; base of the thecae acute; pollen grains 16  $\mu$  high, 14  $\mu$  diam; ovary acute to obtuse, 4—5 mm high, 1.5—2 mm diam, with 6 prominent ribs; styles filiform, subpapillate, free, 1—1.5 mm long. Fruit similar to the ovary.

Type: Weddell 2320, P, duplicates C, F, K, NY; collected in Brazil.

Distribution: Brazil.

Rio Tocantin, prov. Para, Weddell 2320, fl. fr. June (C, F, K, NY, P); without collector, Sta. Catharina, fl. fr. (P).

5. *Mourera aspera* (Bong.) Tul. forma *aspera*, Tul. (1849) 93; idem (1852) 65—66; Walpers (1852) 432; idem (1858) 776; Tul. (1863) 236; Weddell (1873) 50; Warming (1888) 493—503, t. 26 f. 1—6, t. 27 f. 1—23; Warming (EP 1891) 20, f. 12; Glaziou (1911) 574; Tobler (1933) 289—295, f. 1—10; Steude (1935) 627—650, f. 1—18; Engler (1930) 42, f. 15 — *Lacis aspera* Bongard (1835) 73—74, t. 2.

Medium-sized to large herb, stemless or with a short up to 6 cm long and 1 cm thick stem. Leaves of different shape and size 10—30 cm long, 4—14 cm wide<sup>1</sup>, entire or the margin strongly lacerate, pinnatinerved; nerves at both sides prominent; upper surface provided with folds running nearly rectangular to the primary nerves, rough, at the lower side visible as grooves; underside glabrous. Inflorescences branched or unbranched, 7—24 cm long, with bract-like 3—9 cm long, 0.5—5 cm wide leaves at the ramifications; common peduncle quadrangular, twisted, compressed, sometimes slightly winged; monochasia 0.5—5 cm long; flowers numerous; pedicels 1—3 cm long; juvenile spathe clavate, obtuse, sometimes mucronate; mature spathe infundibuliform, about 1 cm long; bracts boat-shaped, obtuse, 3—5 mm long; tepals 5—10, either subulate and acute or ovate and provided with 2 tips, 1—2 mm long; stamens 5—10, from 5 to 8 mm long; anthers obtuse or emarginate, 1.5—2.5 mm long; connective slightly protruding; pollen grains 17.5  $\mu$  high, 10.5  $\mu$  diam; ovary ovoid, 2—6 mm high, 1.5—3 mm diam, rounded to attenuate at the base, 8- to 14-ribbed; styles filiform; juvenile ones emarginate; mature ones obtuse; free or slightly cohering, 2—4.5 mm long. Fruit similar to the ovary.

Type: Riedel 413, LE—I, duplicates F, GH, L, P, S, U, W. Distribution: Southeastern Brazil.

Vernacular name: golfo de fundo (Bahia).

Use: According to CURRAN an excellent fishfood.

Prov. Minas Geraes — Rio Arassuahy, Glaziou 13136, fl. fr. June (C, G.-Del., K, P, US); without loc., Mello & Netto 14610, fr. June (US) — Prov. Goyaz — Cascade de Rasgaõ, Glaziou 21983 (BR, C, G.-Del., GH, K) — Prov. Mato Grosso — Rio Arinos, Kuhlmann 286, fr. Dec. (SP) — Prov. Sao Paulo — Cachoeira do Marimbondo, Gehrt s.n., fl. fr. July (SP); Rio Piracicaba, Piracicaba-falls, Accorsi s.n., fl. fr. (SP) — Prov. Rio de Janeiro — Rio Negro, Glaziou 13134, fl. June (C, P); idem, Ronca Caõ rapids, Glaziou 13139, fl. fr. June (BR, C, G.-Del., K, P) — Prov. Espirito Santo — Rio Guandú, near Baixo Guandú, Tobler s.n., fl. fr. Sept. (BM) — Prov. Bahia — Colonia de Gongugy, Curran 120, fl. fr. Nov. (GH, US); idem, Curran 540 A, fl. Aug. (GH) — Without known province — Rio Tieté, Riedel 413, fl. fr. Aug. (F, GH, L, LE, P, S, U, W); Rio Jequitinhua, Pohl 3270 (W); Paraiba, Schott s.n. & 5901, fl. fr. (W); Iporanga, Rio Iguapé, Puiggari (?) 3138, fl. July (G.-Del.); between Victoria and Bahia, Humboot 589 (B) — Without locality — Riedel s.n., fl. fr. (K, L, NY, W); Vauthier s.n. (W); Duparquier s.n., fl. fr. (BM).

Dubious specimens — Rio Parahyba (P), without coll.; without loc., Aug. St. Hil. 646 (P).

<sup>1</sup> TOBLER (1933) reports that the leaves reach sometimes a width of 1 m.

**Forma minor** Warming (1899) 114.

Differs from the forma aspera in the smaller, suborbicular leaves, in the shorter, up to 10 cm long inflorescences, and in the 4—5 stamens, which are inserted in an incomplete whorl, while the 6 or 7 tepals are inserted in a complete whorl.

Type: Glaziou A, in C, duplicate P; collected in Brazil.

Distribution: Prov. Minas Geraes, Brazil.

Rio Arassuahy, Glaziou A, fl. fr. (C, P); idem, Glaziou 13136, fl. June (C).

6. **Mourera alcornis** (Tul.) v. Royen, nov. comb. — *Ligea alcornis* Tul. (1852) 94—95; Walpers (1858) 780; Tul. (1863) 243, t. 73 f. 3 — *Oenone alcornis* (Tul.) Wedd. (1873) 58; Warming (EP 1891) 18; Engler (1930) 37.

Small, usually stemless species. Leaves narrowly and sometimes obliquely cuneate, pinnatilobed, 1.5—9 cm long, 3—35 mm wide, with a few irregular lobes which are divided at the top into 3—6 mm long, acute threads, rough at the upper surface, palmatinerved. Flowers in more or less indistinct spiciform pedunculate monochasia or sessile; alternating with leaf-like bracts; monochasia branched or unbranched, up to 3 cm long; mature spathella narrowly infundibuliform, up to 2.5 cm long; pedicel 1.5—3.5 cm long; tepals 8—10, linear, acute, about 0.5 mm long; stamens 8—10, from 4 to 4.5 mm long; sometimes 2 or 3 filaments united at the base and then the vascular strands in this part free or united; anthers 1—2.5 mm long, obtuse or emarginate; base of the thecae obtuse or mucronate; pollen grains 18  $\mu$  high, 11  $\mu$  diam; ovary globose, substipitate, 1—2.5 mm long, 1—1.5 mm diam, with 6 ribs; styles filiform, free or cohering at the base, 1—1.5 mm long. Fruit similar to the ovary, up to 3 mm high.

Type: Spruce 555, P, duplicates B, CGE, G.-Del., GH, K, M, NY, W; collected in Brazil.

Distribution: Northern Brazil.

Rio Aripicuru, prov. Para, Spruce 555, fl. fr. Dec. (B, CGE, G.-Del., GH, K, M, NY, P, W); idem, Cachoeira do Tronco, Ducke 14994, fl. fr. Oct. (CGE); Rio Gatapy, prov. Amazonas, Barbosa s.n., fl. fr. Sept. (CGE).

## DUBIOUS SPECIES.

1. **Mourera penicillata** Hicken (1917) 148.

Latin description of the species: "Rhizomate crasso lignoso 6 mm anguloso; foliis 10—30 cm longo, 3—10 cm lat., amplis runcinato-lobulatis, lobulis inaequalibus sinuatis in apicibus sinuum tantum longiuscule penicillatis; penicillis ad 10 cm longis. Laminae basi assymetrica; nerviis furcatis, haud anastomosantibus, extremus in penicillis desinentibus; pagina superiore papillis numerosissimis asperata. Petiolo breve 1—3 cm longo, ad basem foliae paullo expanso vel alato.

Obs. Specimina sterilia hac de causa genitalia invisae sed mihi ob habitum necnon penicilli certe novam speciem extat. Mourera aspera Bong. affinis, sed ambitu, lobulisque et conis laminae sat distincta.”

Type: Rodriguez 793, Buenos Aires, collected in Argentina.

Distribution: Known from the type-locality only.

I have not been able to study the type-specimen, and as it is sterile, it is difficult to say whether it represents a distinct species. Judging from the description reproduced above, this seems highly doubtful; as was pointed out by TOBLER (1933) for *Mourera aspera*, the margin of the leaf may in these plants be dissected in numerous lobes each ending in a few filiform segments. However, as this division is apparently due to the impact of the water, by which the leaf is partly destroyed, the remaining part reacting by the development of these segments, there is good reason to doubt the specific nature of the difference between this specimen and normal *Mourera aspera*.

#### 4. **TULASNEANTHA** v. Royen, nom. nov.

Medium-sized, stemless herbs provided with a short base. Leaves distichous, provided with a distinct, smooth petiole; lamina flabelliform, repeatedly forked. Flowers in long 2-sided spiciform monochasia, springing from the axil of the upper leaves; flowers alternating with boat-shaped bracts; spathella clavate, acuminate, slightly exceeding the bract; petiole decurrent in the rachis over a long distance; tepals 6—10, in a complete whorl, very small; stamens 6—10, in a complete whorl; filaments united halfway or slightly less; anthers sagittate, dehiscent introrsely; pollen grains globose; ovary ellipsoidal, attenuate at the base, consisting of 2 equal cells and provided with 8 ribs; styles 2, filiform, cohering at the base. Fruit slightly protruding beyond the spathella, with 2 equal persistent valves.

Type: *Tulasneantha monadelpha* (Bongard) v. Royen.

Distribution: One species collected in Western Brazil. (See map)

In 1775 AUBLET described *Mourera fluviatilis* as the first species of what later became the family Podostemaceae. For an unknown reason SCHREBER (1789) changed Aublet's generic name in *Lacis*, but no other species were referred by him to that new genus. In 1824 MARTIUS and ZUCCARINI described some other species for which they used the generic name *Lacis*, and in 1835 BONGARD too published some new *Lacis* species, i.a. *Lacis monadelpha*. In the same year VON CHAMISSO described some new *Marathrum* species, and returned *Lacis fluviatilis* to *Mourera*, where it correctly belongs. However, as *Lacis fluviatilis* is the type of *Lacis*, this genus could not be maintained. This was pointed out by LINDLEY (1836) but the latter proposed to solve the difficulty by conserving the name *Lacis* for *Lacis monadelpha*, this species being the only one that could not be included in other genera. This, however, is contrary to the international rules of nomenclature, as the type



of *Lacis* is *Mourera fluviatilis*; moreover the whole description of *Lacis* had to be changed in order to adapt it for the reception of *Lacis monadelpha*. I therefore propose to name this genus *Tulasneantha*, in honour of TULASNE, the first monographer of the *Podostemaceae*. (See also v. Royen (1951) p. 9).

1. ***Tulasneantha monadelpha*** (Bongard) v. Royen, nov. comb. — *Lacis monadelpha* Bongard (1835) 78, t. 1 f. 1—6; Lindley (1836) 442; Endlicher (1836) 270; Tul. (1849) 94; Walpers (1852) 433; idem (1858) 776; Tul. (1863) 238—239; Schnitzlein (1847—'70) t. 585 f. 6; Weddell (1873) 51—52; Baillon (1888) 260; Warming (EP 1891) 20; Engler (1930) 44, f. 33 — *Lacis bongardii* Tul. (1852) 69—70.

Base branched or unbranched, terete, 1—5 cm long, 0.5—2 cm high. Leaves 10—30 cm long; petiole membranaceous, slightly widened at the base, 5—16 cm long, 1—3 mm wide; ultimate divisions of the blade with a distinct nerve. Inflorescences unbranched, compressed, 8—30 cm long; peduncle terete, up to 20 cm long, at the base with two distinct, about 1 mm wide wings, which taper towards the top. Flowers numerous, about 0.5 cm apart; pedicel 1—3.5 cm long, slightly widened at the top; juvenile spathella clavate, acuminate; mature one infundibuliform, 0.5—1 cm long; bracts lanceolate to elliptical, acuminate, slightly folded and crested, 0.5—1 cm long; tepals 6—10, about 0.5 mm long, lanceolate, sometimes absent; stamens 6—10, from 5—12.5 mm long; anthers narrow, obtuse; base deeply incised; the thecae obtuse or emarginate; pollen grains incompletely known; ovary narrowly obovoid, acute, 3.5—8 mm high, 1.5—2 mm diam; midrib slightly winged at the top; styles with rostriform top and 3-edged base, 1.5—4 mm long, cohering. Type: Riedel 1268, herb LE—I, duplicates B, G.-Boiss., P, U; collected in Western Brazil.

Distribution: Western Brazil.

Rio Madeira, Riedel 1268, fl. fr. (B, FI, G.-Boiss., P, U); Para-district, Riedel s.n., fl. fr. (P); without loc., Riedel s.n., fl. fr. July (P); without loc., Ferreira 353, fl. fr. (K).

## 5. LONCHOSTEPHUS Tul.

Small, stemless herbs provided with a short base. Leaves radical and distichous, repeatedly forked; ultimate divisions filiform. Flowers in few-flowered, unbranched, 2-sided, spiciform monochasia springing from the axils of the leaves. Flowers alternating with boat-shaped bracts; bracts sometimes foliaceous; basal margin of the higher bracts covering the apical margin of the preceding ones; juvenile spathella clavate; mature one infundibuliform; tepals 5—8, in a complete whorl, free, filiform to subulate, very small; stamens 5—8, in a complete whorl, free; filaments widened, membranaceous, elliptic; anthers sagittate, dehiscing introrsely; pollen grains ellipsoidal, 3-

colpate, covered with many small warts; ovary ellipsoidal, attenuate at the base, with two equal carpels and provided with 8 ribs; styles cristate, free. Fruit with two equal, persisting valves; each valve with 3 ribs.

Type: *Lonchostephus elegans* Tul.

Distribution: One species in the Amazon-river, Brazil. (See map)

The single species, *Lonchostephus elegans*, was regarded by TULASNE as representing a new genus, but BAILLON referred it to *Mourera*, as according to him the widened filaments and the cristate styles are mere variations of those described e.g. in *Mourera fluviatilis*, were the styles are filiform and the filaments narrow lanceolate. However, it seems to the present author that the cristate style justifies the recognition of a separate genus.

1. *Lonchostephus elegans* Tul. (1852) 198—201; Walpers (1858) 776—777; Tul. (1863) 239—240, t. 73 f. 2; Weddell (1873) 51; Warming (1891) 20; idem (1899) 118—120, f. 11—12; Engler (1930) 42—43, f. 32 — *Mourera elegans* (Tul.) Baillon (1888) 260.

Base short, irregular, about 1 cm long and 2—5 mm wide. Leaves 1.5—8 cm long; petiole cuneate, compressed, widened at the base and provided with two wings. Inflorescences 1.5—8 cm long; peduncle 4-edged or, sometimes, slightly winged, at the top with one or a few, lanceolate to linear, pinnatipartite, 0.5—3 cm long leaves with at the top finely dissected lobes. Flowers few; pedicel 0.5—2.5 cm long; juvenile spathella obtuse or mucronate; mature one 4—10 mm long; bracts boat-shaped, about 5 mm long, sometimes developed as a small leaf and provided with an intrapetiolar sheath, in other instances cristate and ending in an acute point; basal margin or the tip of the sheath only provided with several small teeth; tepals lanceolate, acute, 0.5 mm long; stamens 4—6.5 mm long; filaments 3—5 mm long, 1—1.5 mm wide; anthers obtuse; base of the thecae obtuse to truncate, pollen grains 19  $\mu$  high, 12  $\mu$  diam; ovary borne by a short gynophore, provided with 8 ribs, 3—6 mm long, 1—2 mm wide; styles free, 1 mm long or less. Fruit similar to the ovary.

Type: Spruce 631, P, duplicates CGE, K, M, S; collected in Brazil.

Distribution: Upper Amazon, Brazil.

Amazon-river, Spruce 631, fl. Aug. (CGE, K, M, P, S); Amazon-river near Santarem, Spruce 1036, fl. fr. Aug. (B, BM, C, F, FI, GH, G.-Boiss., G.-Del., GOTT., K, P, W).

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