Five new species of Marantaceae endemic to Gabon

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ABSTRACT
Five new species of African Marantaceae are described and illustrated from two locations in Gabon, *Marantochloa alba* A. C. Ley, sp. nov., *M. grandiflora* A. C. Ley, sp. nov., *M. montsdecristalii* A. C. Ley, sp. nov. and *Thaumatococcus flavus* A. C. Ley, sp. nov. from the mountainous area of Monts de Cristal, north east of the capital Libreville, as well as *Hypselodelphys lopei* A. C. Ley, sp. nov. from the central part of Gabon in secondary forest near La Lope and Mikongo. New keys to the genera *Marantochloa* Brongn. & Gris., *Thaumatococcus* Benth. and *Hypselodelphys* (K. Schum.) Milne.-Redh. are provided.

KEY WORDS
Africa,
Monts de Cristal,
Marantaceae,
Hypselodelphys,
Marantochloa,
Thaumatococcus,
new species.

RÉSUMÉ
Cinq espèces nouvelles de Marantaceae endémiques du Gabon.
Cinq espèces nouvelles de Marantacées d'Afrique sont décrites et illustrées de deux sites du Gabon, *Marantochloa alba* A. C. Ley, sp. nov., *M. grandiflora* A. C. Ley, sp. nov., *M. montsdecristalii* A. C. Ley, sp. nov. et *Thaumatococcus flavus* A. C. Ley, sp. nov. de la région montagneuse de Monts de Cristal, au nord-est de la capital Libreville, ainsi que *Hypselodelphys lopei* A. C. Ley, sp. nov., de la forêt secondaire près de La Lope et Mikongo, au centre du Gabon. De nouvelles clefs des genres *Marantochloa* Brongn. & Gris., *Thaumatococcus* Benth. et *Hypselodelphys* (K. Schum.) Milne.-Redh. sont fournies.

MOTS CLÉS
Afrique,
Monts de Cristal,
Marantaceae,
Hypselodelphys,
Marantochloa,
Thaumatococcus,
espèces nouvelles.

INTRODUCTION

The Marantaceae are a pantropically distributed family of herbaceous and lianescent plants in the tropical forest understory and at forest edges from sea level to about 1300 m. The African Marantaceae became first apparent with five genera in the "Genera plantarum" by Bentham & Hooker (1883) (but see also Gris 1860). Since then, many new genera and species have been described (e.g., Schumann 1902; Gagnepain 1908; Leonard 1949; Milne-Redhead 1950, 1952, 1954; Dhetchuvi 1996a, b; Jongkind 2008). In the beginning, African species were placed in the same genera as American and Asian species but today all species except two (*Halopegia azurea* K. Schum. and *Thalia geniculata* L.) belong to genera endemic to Africa (Andersson 1998).

The last revision of the African Marantaceae species has been undertaken by Dhetchuvi (1996a). He described one new species, *Marantochloa incertifolia* Dhetchuvi, and a new combination, *Marantochloa microphylla* (Koechlin) Dhetchuvi. Further two new species of *Hypselodelphys* (K. Schum.) Milne.-Redh. have recently been described for West Africa (Jongkind 2008). At present, 10 genera (see Ley & Claßen-Bockhoff 2011) and 37 species are recognized for Africa (see Lebrun 1991-1997 but also Dhetchuvi 1996a, b; Jongkind 2008; Ley & Claßen-Bockhoff 2011).

The species to be newly described here are from the genera *Marantochloa* Brongn. & Gris., *Thaumatococcus* Benth. and *Hypselodelphys*. *Marantochloa* is the most species rich genus in Africa with so far 18 known species (Perrier de la Bâthie 1946; Schnell 1957; Koechlin 1964, 1965; Dhetchuvi 1996b; Jongkind 2008) distributed from Sierra Leone to DRCongo and one species in Madagascar. The diversity center is in Gabon. Most species have large distribution ranges in Lower Guinea and Congolia and extend to Upper Guinea. One species is restricted to Upper Guinea, i.e. West of the Dahomey gap, one to Cameroun and three to Gabon. *Thaumatococcus* has so far been a monotypic genus distributed from Sierra Leone to DRCongo (Dhetchuvi 1996a). The fruits of *Thaumatococcus daniellii* (Benn.) Benth. are known to contain thaumatin, a substance used as nutrition sweetener (Most *et al.* 1978; Bartoszewski *et al.* 2003). *Hypselodelphys* is a genus of lianas with so far seven known species (Koechlin 1965; Jongkind 2008). Three of these are restricted to Lower Guinea and Congolia, two to Upper Guinea and two expand over all three areas.

The new species have been found during intensive field studies on floral ecology and phylogeny in Gabon. Voucher specimen have hereafter been thoroughly compared with specimens from the most important herbaria harboring collections from Central Africa (C, BR, BRLU, HBG, K, LBV, P, WAG, YA). That these species have not been extensively sampled before might be due to their very small distribution ranges in areas where access is difficult and on the general negligence of collectors towards herbal species. Drawings are made from herbarium specimen, alcohol collections and photos.

SYSTEMATICS

FAMILY MARANTACEAE R. Brown
Genus Marantochloa Brongn. & Gris.

Marantochloa alba A. C. Ley, sp. nov.
(Figs 1; 2)

Marantochloa purpurea (Ridley) Milne-Redh. *similis sed foliis homotropis, laminis inferioribus non albis, rhachidi inflorescentiae viridi et floribus albis praecipue differt, atque in silva haud in palude habitat.*

TYPUS. — **Gabon**. Monts de Cristal, Tchimbele, in primary forest north of storage lake, 0°37'30.8"N, 10°24'16.7"E, 15.XII.2005, *A. C. Ley 242* (holo- WAG!; iso- LBV!).

PARATYPI. — **Gabon**. Monts de Cristal, in the closed forest around the hydroelectrical station in Tchimbele, 0°37'11.0"N, 10°24'24.1"E, 18.XII.2005, *A. C. Ley 250* (LBV, WAG), 28.XI.2006, *A. C. Ley* 268 (LVB, WAG). — near Tchimbele, 0°36'S, 10°23'E, 1994, *Breteler 13036* (LBV, WAG). — SEEF Logging Concession, 590 m, 0°27.597'N, 10°30.359'E, 21.X.2010, *T. Stevart* 3504 (BRLU). — 580 m, 0°27.914'N, 10°30.229'E, 23.X.2010, *T. Stevart* 3548 (BRLU).

HABITAT AND DISTRIBUTION. — Primary forest at around 500 m altitude in Monts de Cristal, Gabon (Fig. 3).

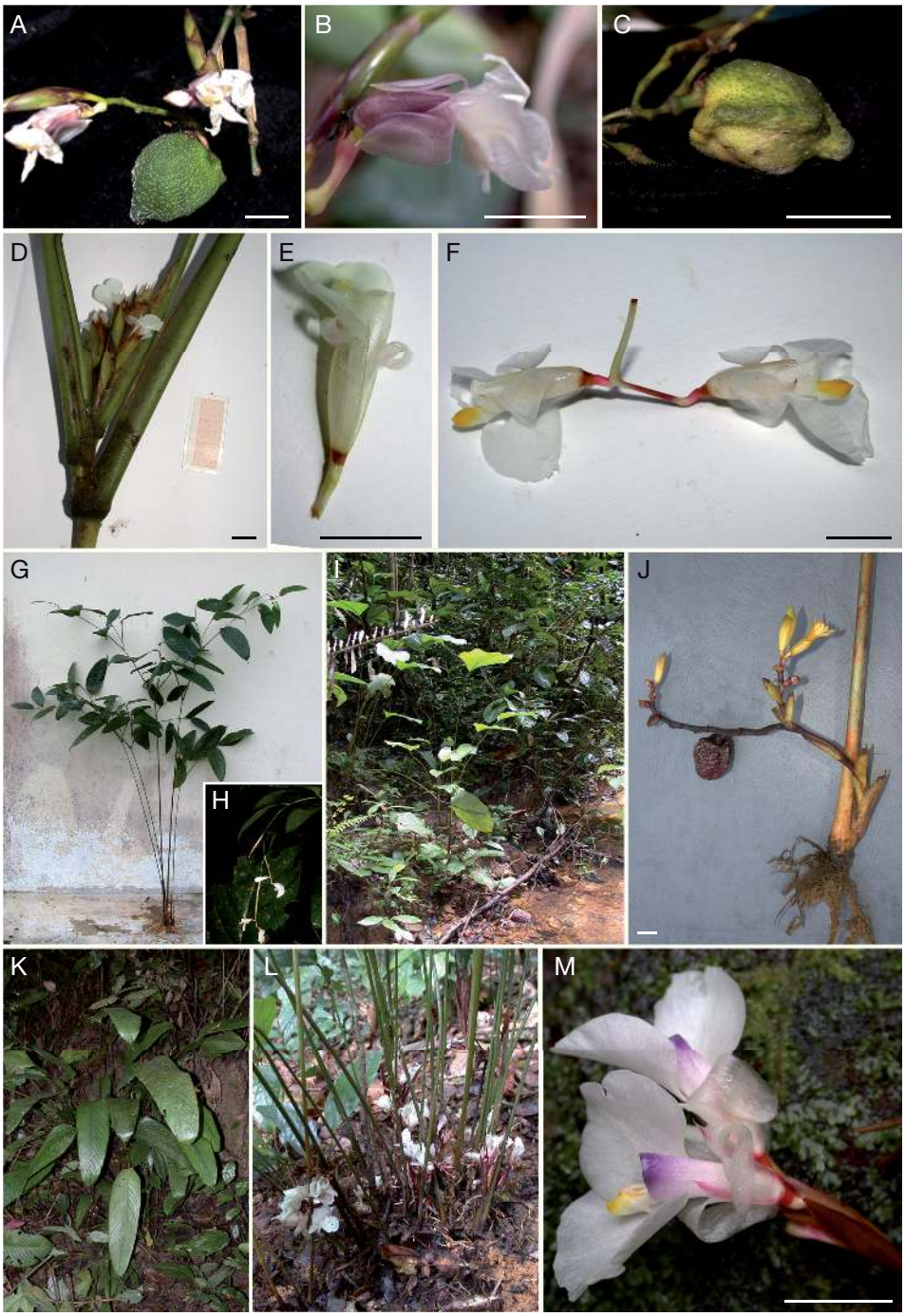

Fig. 1. — **A**-**C**, *Hypselodelphys lopei* A. C. Ley, sp. nov., inflorescence (**A**), flower (**B**) and fruit (**C**); **D**, **E**, *Marantochloa montsdecristalii* A. C. Ley, sp. nov., inflorescence (**D**) and flower (**E**); **F**-**H**, *Marantochloa alba* A. C. Ley, sp. nov., flower pair (**F**), habitus (**G**), inflorescence (**H**); **I**, **J**, *Thaumatococcus flavus* A. C. Ley, sp. nov., habitus (**I**), inflorescence (**J**); **K**-**M**, *Marantochloa grandiflora* A. C. Ley, sp. nov., habitus (**K**), inflorescence (**L**) and flower pair (**M**). Scale bars: 1 cm.

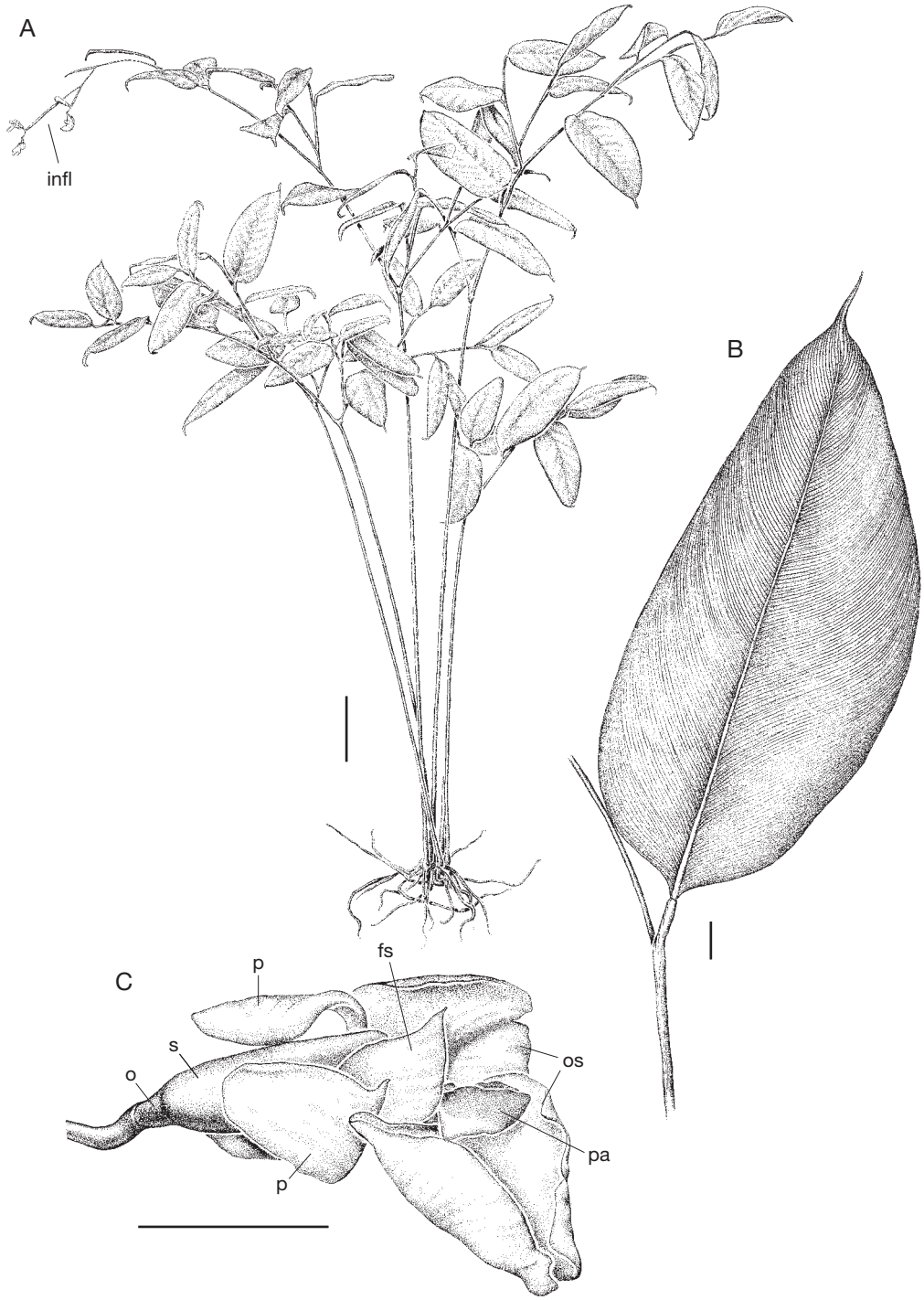

Fig. 2. — *Marantochloa alba* A. C. Ley, sp. nov.: **A**, habitus with hanging, lax inflorescence (**infl**); **B**, leaf, oblong-elliptic; **C**, flower. **A**-**C**, *A. C. Ley 242.* Abbreviations: **fs**, fleshy staminode; **o**, ovary; **os**, outer staminode; **p**, petal; **pa**, petaloid appendage of fertile theca; **s**, sepal. Scale bars: A, 10 cm; B, C, 1 cm.

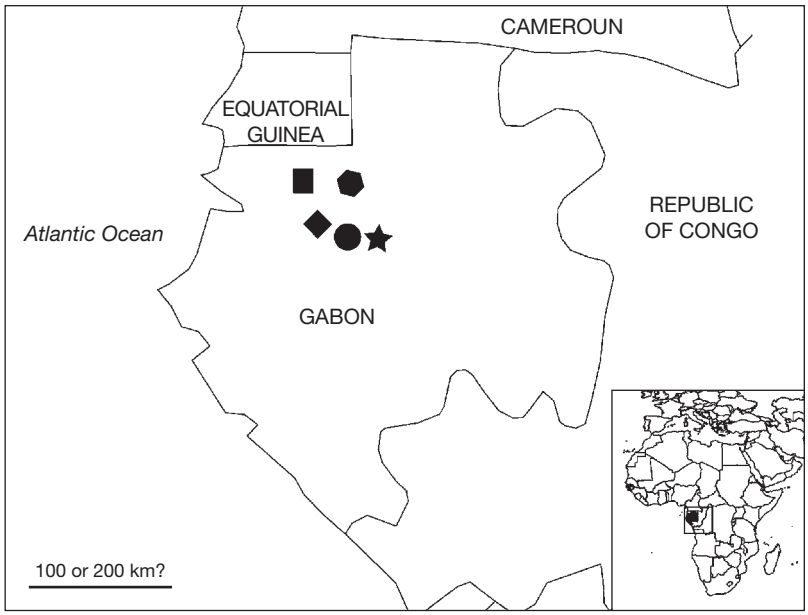

Fig. 3. — Collection sites of the five new species from Gabon. Site names: ■, Monts de Cristal/Kingele/Lonmin; ⬢, Mikongo, Monts de Cristal; ◆, Ndjole; ●, La Lope, research station; ★, Mikongo, Lopé National Park.

Description

Rhizomatous herb, up to 2.5 m tall, forming clusters; above ground shoots ramified (branched) with five sheaths at the base. Leaves homotropic; leaf sheath up to 15 cm long, oblong-elliptic, pubescent on exterior side; petiole absent; pulvinus 5-10 cm, pubescent; lamina up to 27 × 12 cm, glabrous except at the base around the midrib, leaf ending in a tip 1.7 cm long. Inflorescence lax, hanging, rarely branching, up to 25 cm long; peduncle 6.5 cm long, green, pubescent; internodes of the inflorescence axis up to five, 2.0-5.5 cm long, green, glabrous except of the base; fertile bracts distichous, 4-5 bracts per partial inflorescence (partial inflorescence) all of similar length (3.6 cm), green, glabrous except of the ciliate margin; flower pairs 1-2 (3) per bract; axis of flower pair 32 mm long, white, glabrous; pedicelles 3 and 13 mm long, rose, glabrous; bracteoles absent. Flowers white; sepals 15 × 5 mm; petals 22 × 6 mm, folded backwards; outer staminodes 25 mm long; cucullate staminodes about 20 mm long with yellow trigger appendage; callose staminode about 15 mm long, with characteristic upward bending near the base of the corolla tube (as found in *M. purpurea* (Ridley) Milne-Redh. and *M. mannii* (Benth.) Milne-Redh.); stamen 3 mm; petaloid appendage yellow, up to 20 mm long enfolding the cucullate staminode; style about 23 mm; ovary 2 × 1.5 mm, white pubescent. Fruit and seeds not seen.

Remarks

Marantochloa alba A. C. Ley, sp. nov. differs from the similar *Marantochloa purpurea* in homotropic leaves, the colour of inflorescence and flower and the colour of the lower leaf side. In contrast to *Marantochloa purpurea,* which is restricted to swampy habitats *Marantochloa alba* A. C. Ley, sp. nov. has been found on dry ground in the primary forest.

Marantochloa grandiflora A. C. Ley, sp. nov.
(Figs 1; 4)

Ab omnibus aliis speciebus generis Marantochloae foliis *lamina grande, oblonga angustaque, inflorescentia prope solum, ad primum nodum prolatum, bracteis roseis, floribus grandibus, albis praecipue differt.*

Typus. — **Gabon**. Monts de Cristal, Tchimbele, in swampy area of creek north of storage lake, 0°37'30.8"N, 10°24'16.7"E, 10.XII.2005, *A. C. Ley 204* (holo- WAG!; iso- LBV!).

Paratypi. — **Gabon**. Monts de Cristal, Tchimbele, in the closed forest below the hydroelectrical station near the esplanade, 0°36.855'N, 10°24.159'E, 10.XII.2005, *A. C. Ley 190*, *194, 195, 205* (LBV, WAG). — Tchimbele, forest below airstrip towards the river, 0°37'30.6"N, 10°23'51.8"E, 11.XII.2006, A. C. *Ley 207, 212* (LBV, WAG). — Tchimbele, in primary forest north of storage lake, 0°37'30.8"N, 10°24'16.7"E, 15.XII.2005, *A. C. Ley 235* (LBV, WAG). — NNW of Ndjolé, 150 m, 0°04'S, 10°47'E, 1994, *Breteler 12914* (LBV, WAG). — Kingele, near upper barrage, 0°27.457'N, 10°17.394'E, 18.XII.2008, *A. C. Ley 580,* (WAG, LBV). — Lonmin, 0°27.097'N, 10°10.768'E, 17.XII.2008, *A. C. Ley 569* (BRLU, LBV).

Habitat and distribution. — Primary forest in relatively shaded locations, additionally along streams and in swamps at an altitude of about 500 m in Monts de Cristal in Gabon (Fig. 3).

Description

Rhizomatous herb, up to 1.50 m tall, forming clusters of up to 20 aerial shoots; one leaf per shoot; shoot base with up to five sheaths of up to 20 cm in length, pubescent, slightly rose when young. Leaf lamina lanceolate asymmetric 25-80 × 5-10 cm, upper side green with midrib either light green in younger leaves or dark green in older leaves, glabrous on both sides; lamina on the lower side slightly pale green with a broad (2 cm) reddish border along the side of the curved leaf margin, lamina base hardly pointed, apically ending in a long tip, 10-20 mm. Inflorescence erect, 6 cm long arising only a few centimetres above ground from a sheath 2.5 cm long; sheath heavily pubescent; peduncle 8 cm long, brown, pubescent; nodes of inflorescence axis red, pubescent; internodes green or rose *c.* 1 cm long, pubescent; fertile bracts 3-5 distichous, all bracts ± similar, 15-20 × 3-4 mm, lanceolate, rose at the base with a few white hairs towards the tip; 1-2 flower pairs per bract; axis of flower pair 17 mm long, white-rose, glabrous; pedicels 3 and 11 mm long, longer one glabrous and red, shorter one pubescent and white. Flowers white, 20 mm long; sepals 16 × 5 mm semi-transparent, sometimes with a broad rose midrib or completely rose/red; petals 28 × 10 mm, folded backwards; outer staminodes about 30 mm long with petaloid lobe up to 25 × 20 mm; cucullate staminode about 18 mm long with yellow margin at the tip; callose staminode up to 20 mm long with violet front margin; stamen 3 mm with a petaloid appendage of about 24 mm in length with a yellow tip, enfolding the cucullate staminode; style about 23 mm long; ovary 2.0 × 1.5 mm, red/brownish, pubescent. Fruit round, red, pubescent, 8 × 8 mm. Seeds white, 5 mm long.

Remarks

Marantochloa grandiflora A. C. Ley, sp. nov. differs from all other species in the genus in the form and size of the leaves, the position and size of the inflorescence, the colour of the bracts and the size of the flower which is one of the largest in the genus. This is also the only species in the genus with inflorescences near to the ground.

Marantochloa montsdecristalii A. C. Ley, sp. nov. (Figs 1; 5)

Marantochloa cordifolia *(K.Schum.) Koechl. similis sed inflorescentia brevi, floribus totum albis et minoribus praecipue differt.*

Typus. — **Gabon**. Monts de Cristal, Tchimbele, in primary forest entered from road leading to Esplanade, 0°36.855'N, 10°24.159'E, 29.XII.2005, *A. C. Ley 254* (holo- WAG!; iso- LBV!).

Habitat and distribution . — In swampy areas along little creeks in primary forest at around 500 m in Monts de Cristal in Gabon (Fig. 3).

Description

Rhizomatous herb, up to 2.0 m tall, forming clusters, above ground shoots are ramified (branched); sheaths up to 17 cm, pubescent. Leaves homotropic; petioles up to 12 cm long, glabrous; pulvinus 1-2 cm, pubescent; leaf lamina asymmetric up to 30 × 15 cm, glabrous, dark green above, matt green beneath with red rim; midrib slightly pubescent on top towards the tip, entirely pubescent beneath, leaf ending in tip up to 1.7 cm long. Inflorescence condensed, erect, simple or branched, up to 6 cm long; peduncle 1 cm long, green, glabrous; internodes of the inflorescence axis 3 mm long, green, glabrous; fertile bracts distichous, all bracts similar, about 2-2.5 × 1 cm, green, glabrous

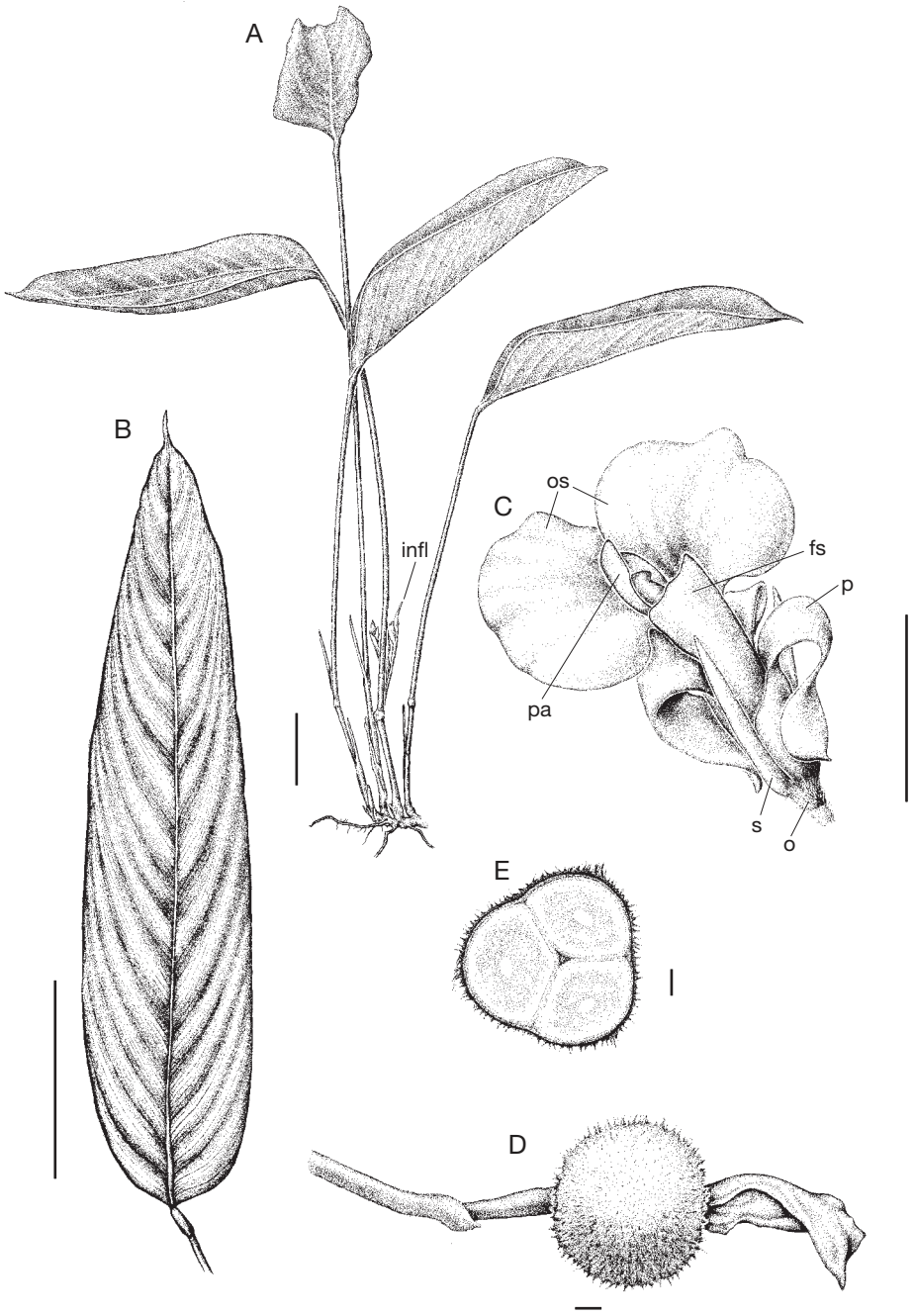

Fig. 4. — *Marantochloa grandiflora* A. C. Ley, sp. nov.: **A**, habitus with erect inflorescence at about 10 cm above the ground; **B**, leaf; **C**, flower; **D**, fruit; **E**, open fruit with three seeds. **A**-**E**, *A. C. Ley 204*. Abbreviations: **fs**, fleshy staminode; **o**, ovary; **os**, outer staminode; **p**, petal; **pa**, petaloid appendage of fertile theca; **s**, sepal. Scale bars: A, B, 10 cm; C, 1 cm; D, E, 0.1 cm.

except at the midrib and towards the tip; flower pairs 1-2 per special bract; axis of flower pair 3 mm long, white, glabrous; pedicels 1 and 3 mm long, white, glabrous; bracteoles absent. Flower white; sepals 14 × 3 mm; petals 22 × 6 mm, folded backwards; outer staminodes about 21 mm long; cucullate staminodes about 19 mm long, callose staminode about 19 mm long with characteristic sidewise bending of the corolla tube (as found in *M. cordifolia* (K.Schum.) Koechl. and *M. mildbraedii* Koechl.); stamen about 3 mm with a petaloid appendage reaching about 20 mm enfolding the cucullate staminode; style about 20 mm; ovary 1.5 × 1.5 mm, brown pubescent. Fruit red, pubescent, 5 mm long. Seeds white.

Remarks

Marantochloa montsdecristalii A. C. Ley, sp. nov. differs from the most similar species *Marantochloa cordifolia* (K.Schum.) Koechl. in the colour and size of inflorescence and flower and the colour and pubescence pattern of the lower leaf side.

Thaumatococcus flavus A. C. Ley, sp. nov.
(Figs 1; 6)

Thaumatocco daniellii *similis sed inflorescentiae rhachidi fusca, bracteis floribusque, flavis bracteis pubescentibus, fructu juveni fusco cum verrucis, maturo rubro praecipue differt.*

Typus. — **Gabon**. Monts de Cristal, Tchimbele, in primary forest below the hydroelectrical station near the esplanade, 0°36.855'N, 10°24.159'E, 14.XI.2004, *A. C. Ley 56* (holo- WAG!; iso- LBV!).

Paratypi. — **Gabon**. Monts de Cristal, Tchimbele, in the closed forest below the hydroelectrical station near the esplanade, 0°36.855'N, 10°24.159'E, 10.XII.2005, *A. C. Ley 201, 202* (LBV, WAG). — Forest below airstrip towards the river, 0°37'30.6"N, 10°23'51.8"E, 13.XII.2006, *A. C. Ley 218* (LBV, WAG). — Mikongo, 0°35.815'N, 11°12.413'E, 19.XI.2008, *A. C. Ley 457* (BRLU, LBV).

Habitat and distribution. — Primary forest along streams at around 500 m in Monts de Cristal in Gabon (Fig. 3).

Description

Rhizomatous herb, up to 2.5 m tall, forming clusters. Leaves arising solitary from rhizome; shoot base with sheaths of up to 20 cm in length, glabrous; petiole up to 2.5 m long, green, glabrous; pulvinus 10 cm long, glabrous; leaf lamina almost round, only slightly asymmetric, up to 40 × 30 cm, with a short broad tip, almost equally light green on both sides, pronounced parallel veins. Inflorescence arising from rhizome, up to 20 cm long, 2-3 partial inflorescences; peduncle 10 cm long with 2-4 sterile yellow bracts at the base of each branch; inflorescence axis brown, pubescent; internodes 3 cm at the base, 0.8 cm at the tip, long hairs around nodes; fertile bracts up to about 14 per partial inflorescence, yellow, about 22 mm long, pubescent; only one flower pair per bract; prophyll missing; axis of flower pair 1 mm, glabrous; pedicelles 0.5 and 1 mm long, glabrous, bearing one bracteole each, 1.5 × 0.9 mm, brown. Flower yellow, 2.5 cm long; sepals 12 × 3 mm; petals 28 × 7 mm folded backwards; corolla tube about 15 mm; outer staminodes mostly absent, about 23 cm long; cucullate staminode about 25 mm long; callose staminode 24 mm; stamen 3 mm; petaloid appendage about 25 mm long; style about 30 mm long; ovary 3 × 2.5 mm, yellow/brown, pubescent. Fruit first brown then red at maturity, triangular, fleshy, surface verrucous, about 3.5 × 4 cm. Seeds white, 1.5 cm long.

Remarks

Thaumatococcus flavus A. C. Ley, sp. nov. differs from the only other species in the genus, *Thaumatococcus daniellii* Benth., in the colour of the inflorescence, bracts and flowers, the surface structure of the fruit and its restricted distribution range in the mountainous area of Monts de Cristal.

Hypselodelphys lopei A. C. Ley, sp. nov.
(Figs 1; 7)

Ab omnibus aliis speciebus generis Hypselodelphys *similis, sed fructuum forma cum lineis rotundis verrucisque praecipue differt.*

Typus. — **Gabon**. La Lope, Research station, 0°12.308'N, 11°36.304'E, 16.XII.2004, *A. C. Ley 141* (holo- WAG!; iso- LBV!).

Paratypus. — **Gabon**. Mikongo, 0°17.104'N, 11°42.517'E, 13.XII.2004, *A. C. Ley 125* (LBV, WAG).

Habitat and distribution. — Secondary forest at La Lope and Mikongo in Gabon (Fig. 3).

Fig. 5. — *Marantochloa montsdecristalii* A. C. Ley, sp. nov.: **A**, habitus with erect, condensed inflorescence; **B**, leaf, oblong-elliptic; **C**, flower; **D,** fruit, pubescent. **A**-**D**, *A. C. Ley 254*. Abbreviations: **fs**, fleshy staminode; **o**, ovary; **os**, outer staminode; **p**, petal; **pa**, petaloid appendage of fertile theca; **s**, sepal. Scale bars: A, 10 cm; B, C, 1 cm; C, 0.1 cm.

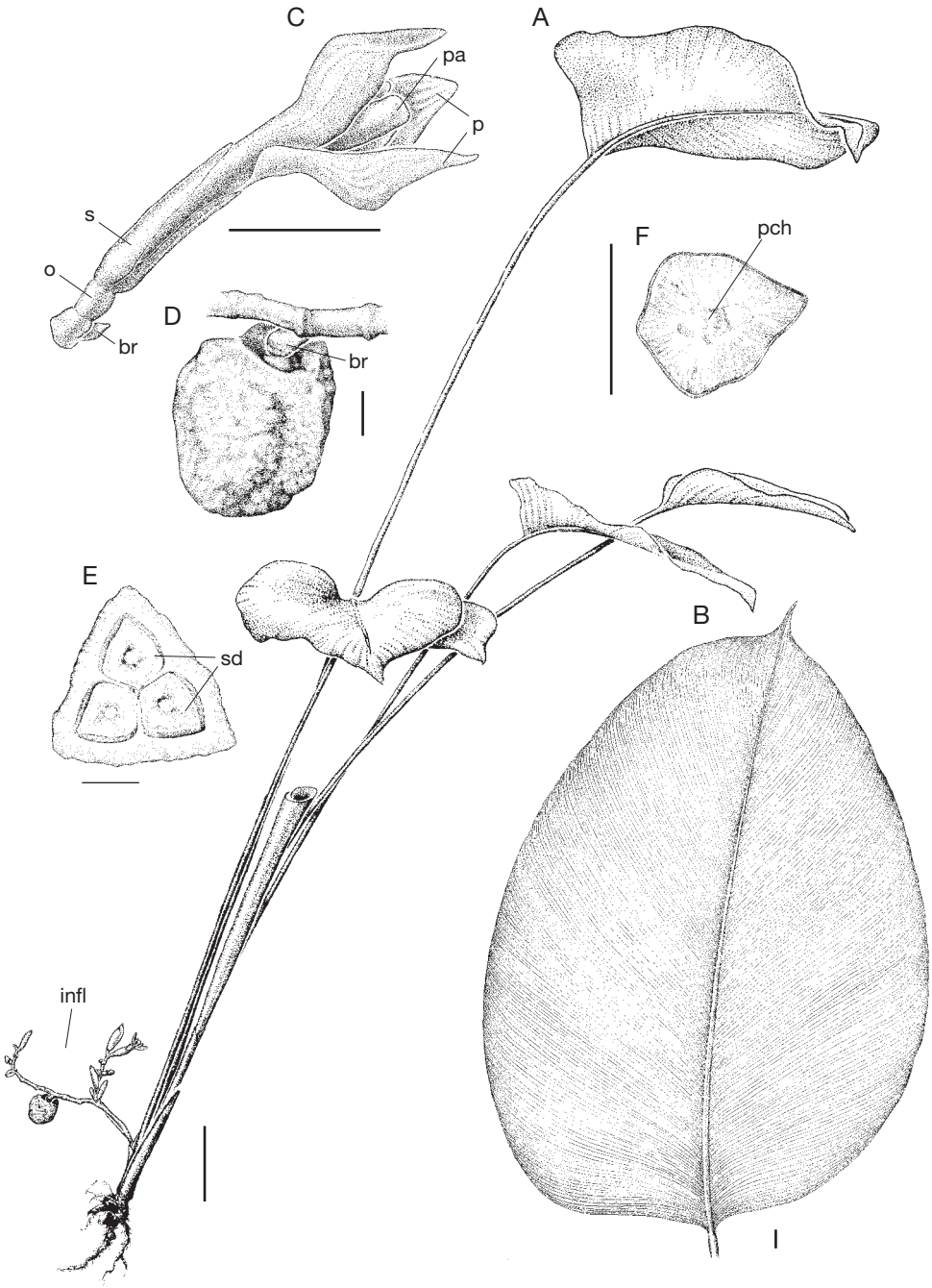

Fig. 6. — *Thaumatococcus flavus* A. C. Ley, sp. nov.: **A**, habitus with inflorescence arising from the rhizome bearing flowers and fruit; **B**, leaf; **C**, flower (note the long and narrow floral tube); **D**, fruit; **E**, open fruit with three seeds; **F**, seed cut in half. **A**-**F**, *A. C. Ley 56*. Abbreviations: **br**, bracteole; **infl.**, inflorescence; **o**, ovary; **p**, petal; **pa**, petaloid appendage of fertile theca; **pch**, perispermatic channel; **s**, sepal; **sd**, seed. Scale bars: A, 10 cm; B-F, 1 cm.

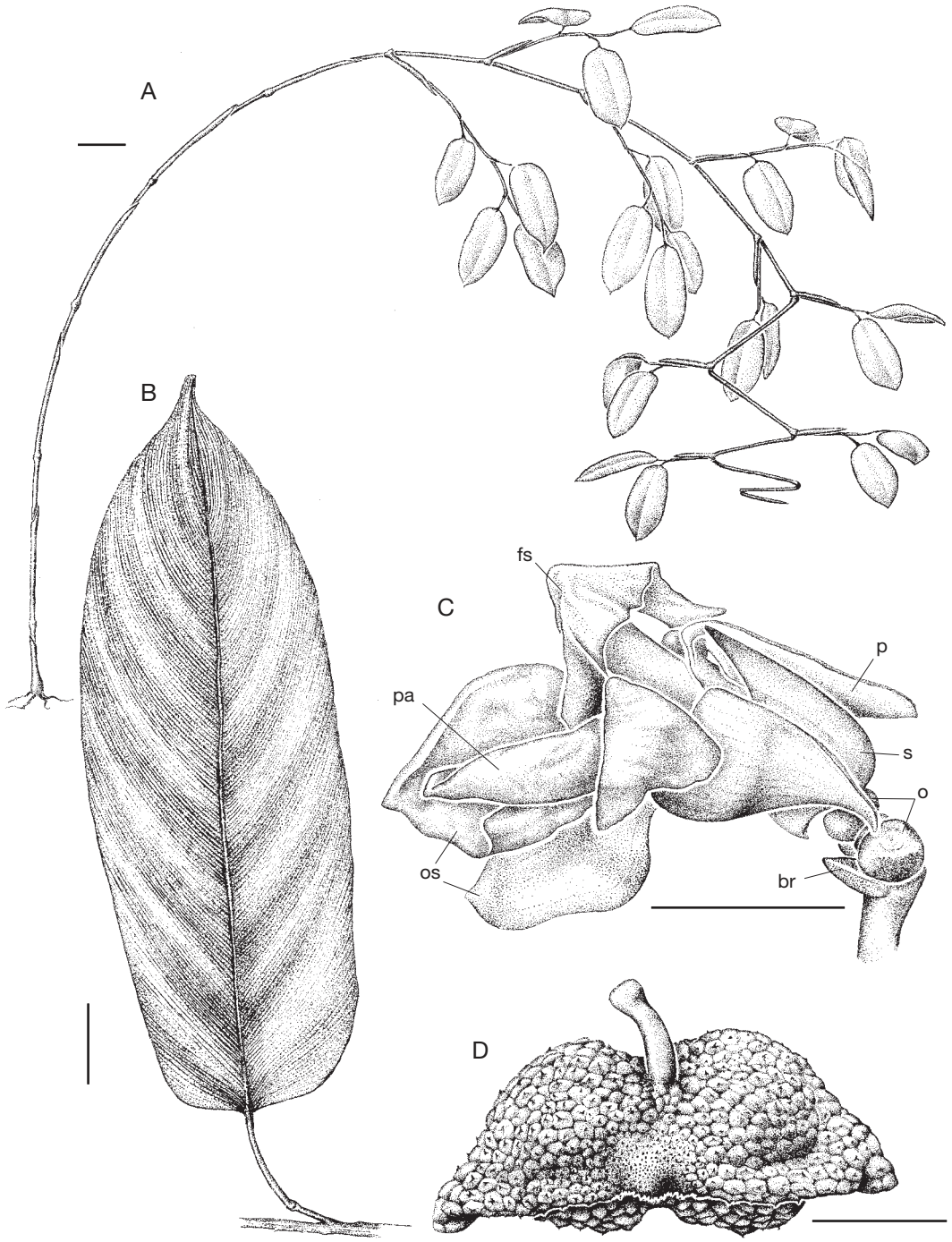

Fig. 7. — *Hypselodelphys lopei* A. C. Ley, sp. nov.: **A**, habitus (liana); **B**, leaf; **C**, flower; **D**, fruit (note the verrucous surface with short spiny tips). **A**-**D**, *A. C. Ley 141*. Abbreviations: **br**, bracteole; **fs**, fleshy staminode; **o**, ovary; **os**, outer staminode; **p**, petal; **pa**, petaloid appendage of fertile theca; **s**, sepal. Scale bars: A, 10 cm; B-D, 1 cm.

Description

Liana. Shoots erect when young and supported by other plants later on. Leaves 4 per short shoot; sheath up to 17 × 6 cm; midrib glabrous; lamina ending in a tip of 0.5-0.7 cm length. Inflorescence with several partial inflorescences, each having up to 12 internodes, glabrous, 5 mm long; only one flower pair per bract; axis 5 mm long, glabrous; 2 bracteoles, 3 mm each; fertile bracts 1.8-2 cm long. Flower white and violet, sepals white; petals violet; outer staminodes and stamen (including petaloid appendage) white. Fruit green, large (2-4 cm in diameter), rounded with 1-3 oval lobes, with ledges running around the oval lobes; surface verrucous with short spiny tips. Seeds not investigated.

Remarks

The species *Hypselodelphys lopei* A. C. Ley, sp. nov. is most easily differentiated from the other species of the genus by its distinct fruit morphology, notably its different shape and surface structure (see Fig. 1).

NEW KEYS TO THE GENERA

For geographic circumscription of phytochoria see White (1979).

Marantochloa Brongn. & Gris.

This genus is widely distributed from Senegal to Madagascar and includes currently 17 species on the African mainland and one further species (*M. comorensis* Brongn. ex Gris) described from Madagascar which is similar to *M. filipes* but with white-yellow flowers (Perrier de la Bâthie 1946, but see also Catalogue of the Vascular Plants of Madagascar: http://www.tropicos.org/project/mada). All species of *Marantochloa* are perennial herbs from 0.5 to 4 m in height. They are recognized by their characteristic leaf shape which is straight on one side and rounded on the other side with a slight displacement of the leaf tip versus the central vein (Fig. 2). On the leaf underside along the rounded side there is often a differently coloured band. This particular shape allows the distinction between an anti- and a homotrop leaf positioning along the shoot. The reddish colouration on the underside of the leaf in some species is a highly variable character not useful for identification.

The star (*) between two species means that the first author does not agree with the distinction between these two taxa as proposed by Dhetchuvi (1996a, b). Characters described to distinguish the two species are highly variable and overlap between species and herbarium specimens (including types) did not show distinct sets of characters.

1. Plants with strictly one leaf per shoot 2
— Plants with several leaves per shoot 3

2. Inflorescence green, arising from upper part of the shoot near the leaf; flowers small (*c.* 1 cm), white; ovary and fruit yellow; restricted to Lower Guinea and Congolia ..... *M. monophylla*
— Inflorescence reddish, arising from the shoot a few centimetres above the ground; flowers large (20 mm long), white, in the centre violet and yellow; leaves long, lanceolate; ovary and fruit red/brownish; species so far only known from the Monts de Cristal ..... *M. grandiflora*

3. Leaves antitrop 4
— Leaves homotrop 7

4. Plant with 2 to 4 leaves per shoot 5
— Plant multi-branched with numerous leaves per shoot 6

5. Plants with 2 to 4 leaves; leaf lamina at base cordate; restricted to Lower Guinea .... *M. incertifolia**
— Plant with 3 leaves; leaf lamina less cordate; restricted to Gabon ..... *M. sulphurea**

6. Leaves small, 3.5-8.5 cm long, 1-4.5 cm wide; endemic to Mont de Chaillu in Gabon .. .. *M. microphylla*

— Leaves larger, 8-20 cm long, 3-10 cm wide; conspicuously hairy above callous; widespread ..... *M. congensis*

7. Inflorescence lax, ± hanging; internodes 15-30 mm 8
— Inflorescence dense, erect; internodes < 15 mm 12

8. Inflorescence ramified with 1 to 2 internodes per partial inflorescence; internodes longer than bracts; flowers purple; leaves 7-15 cm long, papery with extremely elongated leaf tip, sometimes white at undersurface; capsules yellow and red with black seed and red aril; widespread ..... *M. filipes*
— Inflorescence ramified or not with more than 2 internodes per partial inflorescence; internodes slightly shorter than bracts; flowers purple or white; leaves larger and stronger than in *M. filipes* 9

9. Inflorescence rhachis and bracts green 10
— Inflorescence rhachis and bracts purple; bracts persistent; flowers large (*c.* 1.8 cm), purple (tone can vary considerably between individuals from dark violet to light purple); leaves large, 20-50 cm long, 9-19 cm wide, often white below; generally in swampy areas; widespread ..... *M. purpurea*

10. Bracts deciduous; flowers small (*c.* 1cm), whitish; leaves max. 25 cm long and 13 cm wide, strong; fruits yellow and red; widespread ..... *M. leucantha*
— Bracts persistent; flowers large (2 cm) 11

11. Inflorescence erect to hanging on long petiole (8-11 cm), branched at base, up to seven bracts per partial inflorescence (>10 cm long); bracts broad (*c.* 1 cm), overlapping over half of their length; flowers yellow; plant with 2 leaves only; leaf lamina up to about 45 × 20 cm; species restricted to Upper Guinea ..... *M. cuspidata*
— Inflorescence hanging, slender, mostly simple, with up to 4 bracts per partial inflorescence; bracts narrow (*c.* 6 mm wide), non-overlapping; flowers white with yellow centre; leaf lamina up to 27 × 12 cm; so far only known for the Monts de Cristal area in Gabon ..... *M. alba*

12. Inflorescence bracts green or red; inflorescence internodes up to 3 mm long 13
— Inflorescence bracts green; inflorescence internodes ≥ 5 mm long 15

13. Inflorescence bracts green; peduncle *c.* 1 cm long; flowers about 2 cm long, entirely white; so far only known for the Monts de Cristal area in Gabon ..... *M. montsdecristalii*
— Inflorescence bracts red; peduncle either absent or 1-3.5 cm long 14

14. Inflorescence on peduncle (1-3.5 cm); bracts narrow (< 1 cm); flower sepals and petals purple; outer staminodes white; floral center yellow; floral tube with characteristic narrowing; widespread ..... *M. mannii*
— Inflorescence sessile; bracts broad (> 1 cm); flowers white with violet center; floral tube straight; widespread ..... *M. conferta*

15. Inflorescence on long peduncle (5-20 cm), branching at base; partial inflorescence long (*c.* 10 cm) with up to 8 bracts; flower white; fruit yellow; restricted to Cameroun ..... *M. ramosissima*
— Inflorescence on short peduncle (< 5 cm), branching at base; partial inflorescence short (< 10 cm) with up to 4 bracts 15

16. Inflorescence peduncle 2 cm; margin of bracts glabrous; flowers large (*c.* 2.5 cm long) with long floral tube; sepals and petals slightly purple; floral tube white; flower with yellow center; restricted to Lower Guinea ..... *M. cordifolia*
— Inflorescence peduncle 2.5-5 cm; margin of bracts and peduncle of individual flower pubescent; restricted to Lower Guinea ..... *M. mildbraedii*

Thaumatococcus Benth.

The two species of this genus are herbaceous, up to 3 m high with a single large leaf (> 30 cm wide) per shoot. They are confined to the boarders of small water courses. Inflorescences emerge from the base of the stem, fruits are up to 4 cm in diameter and bright red at maturity.

1. Inflorescence rhachis; bracts and bracteoles brown; flower entirely yellow; the surface of the fruit verrucous; restricted distribution range in the mountainous area of Monts de Cristal ..... *Thaumatococcus flavus*
— Inflorescence rhachis and bracts violet; flower entirely white except sepals violet; fruit surface smooth; widely distributed from Sierra Leon to DRCongo .... *Thaumatococcus daniellii*

Hypselodelphys (K. Schum.) Milne.-Redh.

All 8 species of this genus are lianescent. The architecture of the vegetative shoot is the same in all species as depicted for *H. lopei* A. C. Ley, sp. nov. in Figure 7. All species of the genus have a characteristic interruption before the petiole goes into the midrib and are best distinguished by the morphology of their fruits (Fig. 8). Leaf morphology, leaf pubescence and flower colour have been experienced to be very variable within species and thus do not serve as unique characters for an unequivocal determination at species level (see also Koechlin 1964; Dhetchuvi 1996a; Jongkind 2008).

1. Inflorescence internodes long (7-15 mm) and glabrous 2
— Inflorescence internodes short (*c.* 5 mm), glabrous or velutinous 3

2. Inflorescence multi-branched with numerous partial inflorescences arising from the base and many sterile, persistent bracts; fertile bracts closely overlapping, acutely acuminate, about 3 cm long; only known from Cameroun ..... *H. zenkeriana*
— Inflorescence rarely branched and only few sterile bracts 3

3. Fruit acutely triangular, each side about 4 cm long with median and lateral ledges, muricate-very short spines; widespread ..... *H. violacea*
— Fruit with three round lobes without ledges, muricate – long spines; leaves large, wide along its whole length, up to 35 cm long and 17 cm wide; restricted to Lower Guinea and Congolia ..... *H. scandens*

4. Fruit with oval lobes slightly flattened with lateral ledges running around; surface verrucous; so far only known from Central Gabon ..... *H. lopei*
— Fruit lobes round with or without longitudinal ledges, muricate 4

5. Fruit round without ledges 5
— Fruit round with longitudinal ledges 6

6. Fruit muricate – short spines; inflorescence glabrous; leaves generally small, up to 25 cm long and 9 cm wide; widespread ..... *H. poggeana*
— Fruit muricate – long spines; inflorescence internodes and bracts are densely velutinous; distribution restricted to Upper Guinea ..... *H. velutina*

7. Fruit with round lobes; leaves triangular pointed, up to 25 cm long and 10 cm wide; often whole plant very hairy; distribution restricted to Lower Guinea ..... *H. hirsuta*
— Fruit lobes strongly acute, flattened; distribution restricted to Upper Guinea .... *H. triangularis*

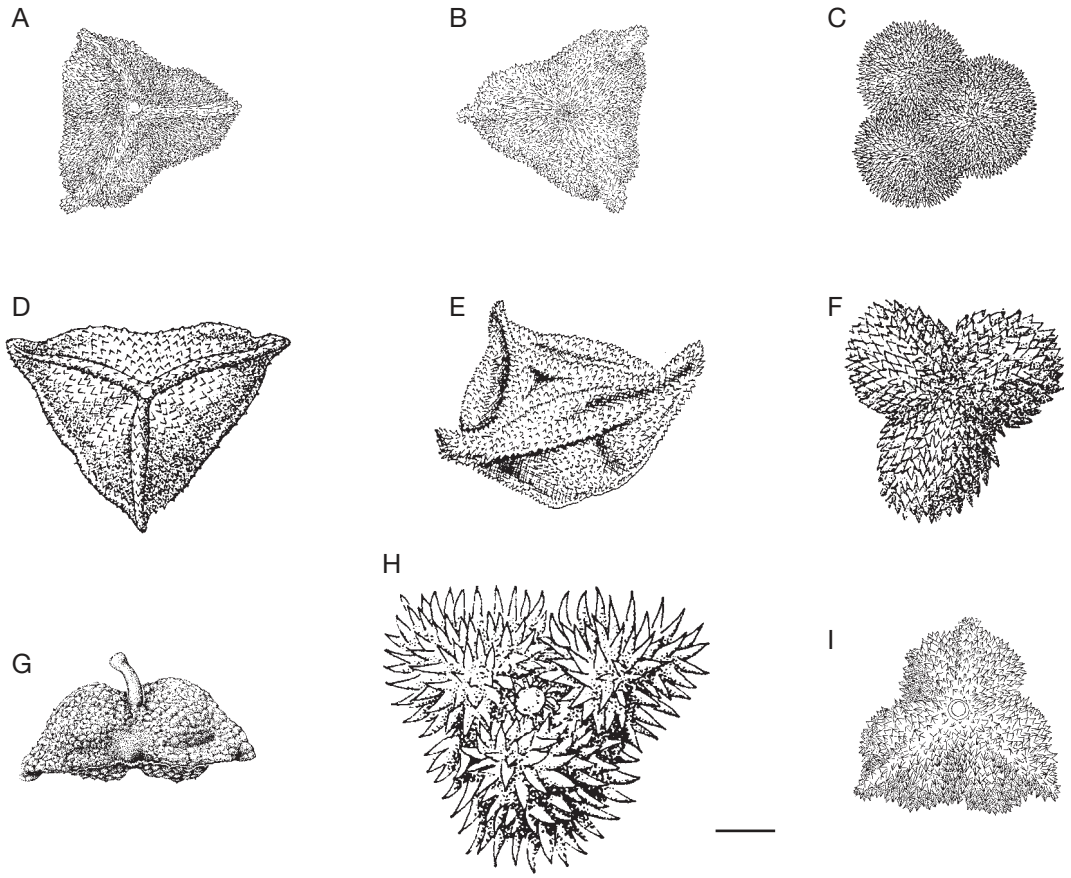

Fig. 8. — Fruits of *Hypselodelphys* (K. Schum.) Milne.-Redh. species: **A**, **B**, *H. triangularis* Jongkind (from Jongkind 2008); **C**, *H. velutina* Jongkind (from Jongkind 2008); **D**, *H. violacea* (Ridley) Milne-Redh. (from Koechlin 1964); **E**, *H. violacea* (from Hepper 1968); **F**, *H. poggeana* (K.Schum.) Milne-Redh. (from Koechlin 1964); **G**, *H. lopei* A. C. Ley, sp. nov.(drawing from this paper); **H**, *H. scandens* Louis & Mullenders (from Koechlin 1964); **I**, *H. hirsuta* (Loes.) J.Koechlin (drawing by A. C. Ley). Scale bar: 1 cm.

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