

Three new species of *Calyptranthera* (Apocynaceae, Secamonoideae) from Madagascar

Jens KLACKENBERG

Naturhistoriska riksmuseet, Sektionen för fanerogambotani,
Box 50007, SE-104 05 Stockholm (Sweden)
klack@nrm.se

Klackenberg J. 2007. — Three new species of *Calyptranthera* (Apocynaceae, Secamonoideae) from Madagascar. *Adansonia*, sér. 3, 29 (1): 113-121.

ABSTRACT

Three new species of *Calyptranthera* (Apocynaceae, Secamonoideae), *C. villosa* Klack., *C. sulphurea* Klack., and *C. filifera* Klack., are described, illustrated and compared to related species. *Calyptranthera villosa* and *C. sulphurea* are described from material collected at Daraina in northern Madagascar. *Calyptranthera villosa* differs from other species of the genus by its densely hairy corolla lobes in combination with long corona lobes, *C. sulphurea* by its yellow flowers. The type of *C. filifera* was found near Farafangana at the southeastern coast of Madagascar and is characterized by its exceedingly delicate connectival appendages with triangularly broadened bases. A key to the 10 known species of *Calyptranthera* is also presented.

KEY WORDS

Apocynaceae,
Secamonoideae,
Calyptranthera,
Madagascar,
Daraina,
new species.

RÉSUMÉ

Trois nouvelles espèces de Calyptranthera (Apocynaceae, Secamonoideae) de Madagascar.

Trois nouvelles espèces de *Calyptranthera* (Apocynaceae, Secamonoideae), *C. villosa* Klack., *C. sulphurea* Klack., et *C. filifera* Klack., sont décrites, illustrées et comparées aux espèces affines. *Calyptranthera villosa* et *C. sulphurea* sont décrites à partir de matériel récolté à Daraina, au nord de Madagascar. *Calyptranthera villosa* diffère des autres espèces du genre par les lobes de la corolle densément pubescents associés à de longs lobes de la couronne, *C. sulphurea* par ses fleurs jaunes. Le type de *C. filifera* a été trouvé à proximité de Farafangana sur la côte sud-est de Madagascar et est caractérisé par ses appendices connectifs très délicats à bases élargies de façon triangulaire. Une clé des 10 espèces connues de *Calyptranthera* est présentée.

MOTS CLÉS

Apocynaceae,
Secamonoideae,
Calyptranthera,
Madagascar,
Daraina,
espèces nouvelles.

INTRODUCTION

In the course of analysing Apocynaceae material for a contribution to *Flore de Madagascar et des Comores*, I have come across two specimens from the Daraina region near Vohémar in NE Madagascar, collected during a floristic inventory project by the Conservatoire et Jardin botaniques de la ville de Genève, and one specimen from SE Madagascar near Fianarantsoa, collected by collaborators at the Missouri Botanical Gardens, that belong to the genus *Calyptranthera* Klack. (Apocynaceae, Secamonoideae). They have proved to represent three new species, and are here described, illustrated and compared to related species. A key to the 10 accepted species of *Calyptranthera* is also given.

The genus *Calyptranthera* was described by Klackenberg (1996) based on a species previously known as *Toxocarpus caudiclava* Choux. Beside the single specimen of the type, however, several unidentified specimens of Apocynaceae in the Muséum national d'Histoire naturelle in Paris turned out to belong to this new genus, and a revision with a morphologic and phylogenetic discussion of five species was presented one year later (Klackenberg 1997). In the following years two additional taxa were described (Klackenberg 1998, 2000).

Below three new species are presented. For a generic description of *Calyptranthera* see Klackenberg (1997). Fruit material (follicles) of this genus have been studied in only one of the 10 known species, viz. in *C. gautieri*. For a description, see Klackenberg (1998).

SYSTEMATICS

Calyptranthera villosa Klack., sp. nov.

(Fig. 1)

Species haec Calyptrantherae gautieri et C. pubipetalae similis lobis corollae distincte pubescentibus autem differt lobis corollae filiformibus et adscendentibus; ab illa etiam differt antherae connectivo dorso longe piloso, a hac connectivi lobo valde filiforme prolongato.

TYPUS. — **Madagascar.** Province de Diego-Suarez/Ant-siranana, sous-préfecture de Vohémar, commune rurale de Daraina, forêt de Binara, 13°15'S, 49°37'E, 910 m

alt., 2005, *P. Ranirison & L. Nusbaumer PR 995* (holo-, S!; iso-, G, TAN).

DESCRIPTION

Suffrutescent twiner *c.* 1.5 m long with younger branches densely covered by more or less straight to bent often retrorse rather stiff reddish hairs, glabrescent. Leaves somewhat coriaceous, shining green above, paler below; blade 10-13 × 3-4.5 cm, narrowly obovate to elliptic, cuneate at base, acuminate at apex, with reddish bent hairs beneath, glabrescent above or with a few remaining hairs especially along the midrib towards base, without colleters at the very base above; margin entire; venation pinnate and looped, reticulate; midrib when dry distinctly impressed above and raised beneath; secondary veins divaricate to right-angled and tertiary veins grossly reticulate, slightly raised on both sides when dry; epidermis ± smooth on both sides; petiole distinct, 1-2 cm long, with dense reddish mostly appressed hairs, glabrescent. Inflorescences extra-axillary, shorter than the adjacent leaves; cyme appearing umbel-like but actually with flowers in pairs with reduced internodes at a *c.* 1 cm long stalk, with 7-11 flowers, hairy; pedicels 3-4 cm long; bracts and bracteols narrow, 1.5-2 mm long. Calyx lobes united only at the very base, 2-2.5 × 0.7-0.9 mm, much longer than the corolla tube, triangular, acute, with reddish hairs outside, glabrous inside, with a small colleter at each lobe sinus. Corolla ellipsoidal in bud, contorted with the left lobe margin overlying, not or only slightly twisted, with the lobes fused at the base only into a short tube, greenish white in bud turning brownish pink when mature; tube *c.* 0.7 mm long, glabrous; lobes *c.* 8 × 3.4 mm, elliptic, acute at apex, ascending to rotate, glabrous outside, villous inside but glabrous along the right margin. Staminal column *c.* 4.5 mm high (*c.* 1.5 mm with projecting connectives excluded); filaments broad with short sclerified margins (anther wings) and with five cup-like projections below (pollinium entrances), united into a short cylinder at base; anthers with connectives much prolonged into filiform appendages grouped together basally in a column but diverging above, at lower half covered with dense short and sparser much longer hairs, upper half glabrous; filiform appendages

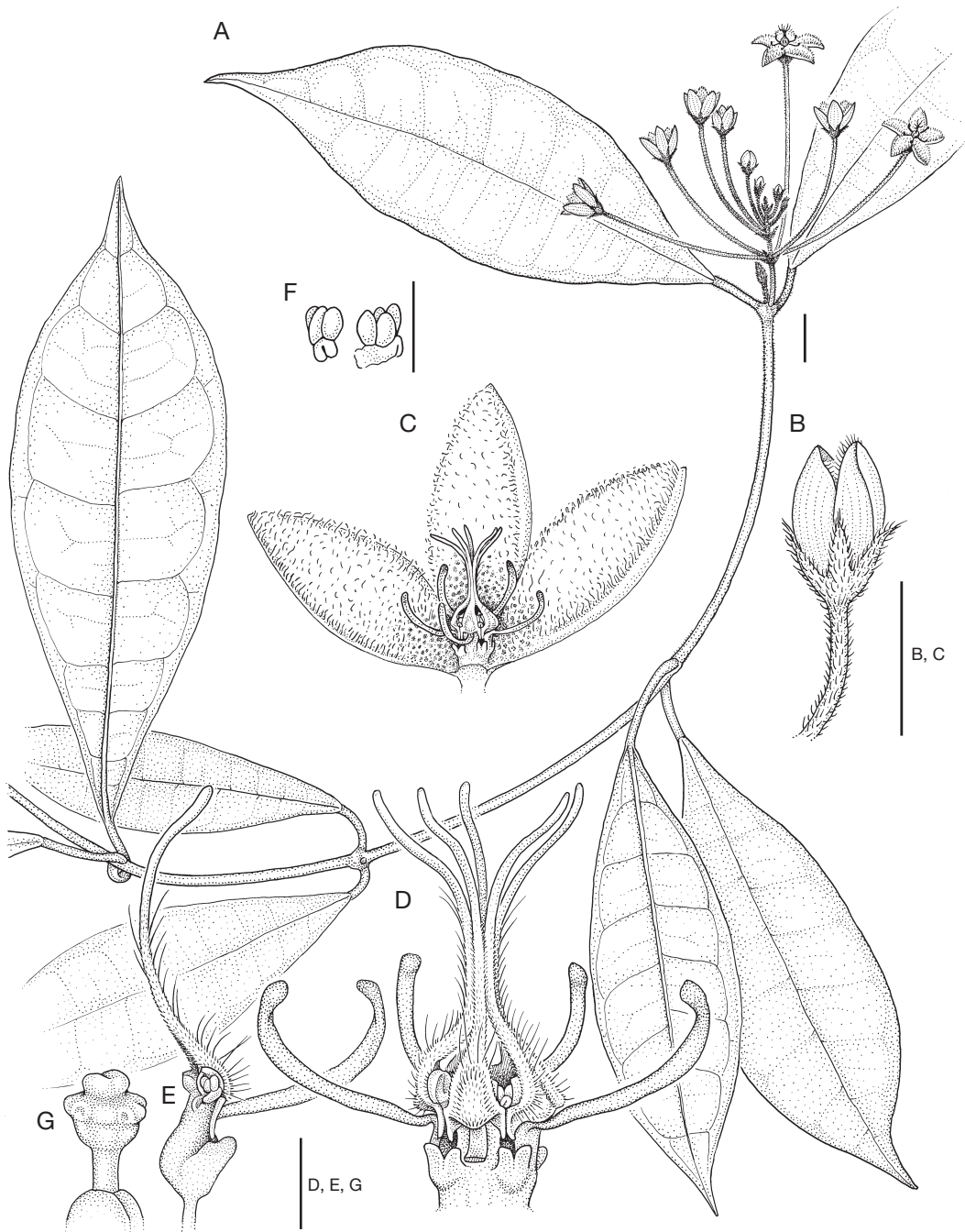


FIG. 1. — *Calyptranthera villosa* Klack.: **A**, habit; **B**, flower in bud; **C**, flower with calyx and two petals removed; **D**, gynostegium with one corona lobe missing; **E**, anther, lateral view; **F**, pollinaria; **G**, style-head and part of ovary. *P. Ranirison & L. Nusbaumer PR 995*. Drawing by Andrea Klintbjer, Stockholm. Scale bars: A, 1 cm; B, C, 5 mm; D, E, G, 1 mm; F, 0.5 mm.

c. 3 mm long; thecae yellow. Corona lobes filiform, *c.* 2.5 mm long, bent outwards-upwards, shorter than the prolonged connectives, glabrous. Pollinia ellipsoidal, *c.* 0.15 mm long, attached to minute soft corpuscula. Style narrow and cylindric at lower half but conical below the style-head, *c.* 0.6 mm high; style-head *c.* 0.5 mm high, with a discoid lower part that abruptly narrows into the style, and with a narrower and short shallowly bilobed upper part. Fruits unknown.

HABITAT AND DISTRIBUTION

Calyptranthera villosa is known only from the type locality at Daraina in the northeastern part of Madagascar, found in dense humid forest at 910 m altitude. It was collected in flower in November.

REMARKS

Calyptranthera villosa has ascending, filiform corona lobes that are distinctly longer than the thecae. This structure is also characteristic for the large-flowered *C. baronii* Klack. and *C. grandiflora* Klack. In contrast, *C. brevicaudata* Klack., *C. caudiclava* (Choux) Klack., *C. gautieri* Klack. and *C. pubipetala* Klack. have short, spatulate and horizontal corona lobes. The remaining of the hitherto described species of this genus, *C. schatziana* Klack. from the Masoala peninsula, differs by having erect but only *c.* 1 mm long corona lobes, i.e. about as long as the thecae only. Although furnished with the ascending and filiform corona lobes, *C. villosa* is probably not closely related to *C. baronii* or *C. grandiflora*, but is with its hairy corolla lobes most similar to *C. gautieri* from the Manongarivo mountains *c.* 150 km SW of Daraina and to *C. pubipetala* from the Masoala peninsula *c.* 150 km S of Daraina, i.e. at relatively short distances from each other but phytogeographically separate. *Calyptranthera pubipetala* differs from *C. villosa* by lacking the much prolonged connectives. From *C. gautieri* it differs by having the corolla lobes densely and almost entirely pubescent inside with only the left margin glabrous, not half of the petal without indumentum as in *C. gautieri*. Furthermore *C. villosa* has distinctly hairy connectives, both with dense short hairs and with sparse but much longer straight hairs. See also *C. sulphurea*.

The epithet of this species alludes to the thick indumentum of the petal lobes.

Calyptranthera sulphurea Klack., sp. nov. (Fig. 2)

Species haec Calyptrantherae gautieri et C. pubipetalae similis lobis corollae distincte pubescentibus autem differt corolla sulphurea.

TYPUS. — Madagascar. Province de Diego-Suarez/Antsiranana, sous-préfecture de Vohémar, commune rurale de Daraina, forêt de Binara, 13°15'S, 49°37'E, 802 m alt., 2005, L. Nusbaumer & P. Ranirison LN 1728 (holo-, G!).

DESCRIPTION

Suffrutescent twiner *c.* 1 m long with younger branches densely covered by more or less straight to bent often retrorse rather stiff reddish hairs, glabrescent. Leaves somewhat coriaceous, shining green above, paler below; blade 7-10 × 2.5-3.5 cm, elliptic, cuneate at base, acuminate at apex, with reddish bent hairs beneath, glabrous above, without colleters at the very base above; margin entire; venation pinnate and looped, reticulate; midrib when dry distinctly impressed above and raised beneath; secondary veins divaricate to right-angled and tertiary veins grossly reticulate, slightly raised on both sides when dry; epidermis ± smooth on both sides; petiole distinct, 0.5-1 cm long, with dense reddish mostly appressed hairs, glabrescent. Inflorescences extra-axillary, shorter than the adjacent leaves; cyme appearing umbel-like but actually with flowers in pairs with reduced internodes at a *c.* 1 cm long stalk, 3-5 flowered, hairy; pedicels *c.* 1 cm long; bracts and bracteoles narrow, 1.5-3 mm long. Calyx lobes united only at the very base, *c.* 2.3 × 0.9 mm, much longer than the corolla tube, triangular, acute, with long reddish hairs outside, glabrous inside, with a small colleter at each lobe sinus. Corolla ellipsoidal in bud, contorted with the left lobe margin overlying, not or only slightly twisted, with the lobes fused at the base only into a short tube, greenish yellow with small purple dots at base; tube *c.* 0.3 mm long, glabrous; lobes *c.* 6.5 × 3 mm, elliptic, rounded to bluntly acute at apex, rotate, glabrous outside, with rather long and erect but sparse hairs along

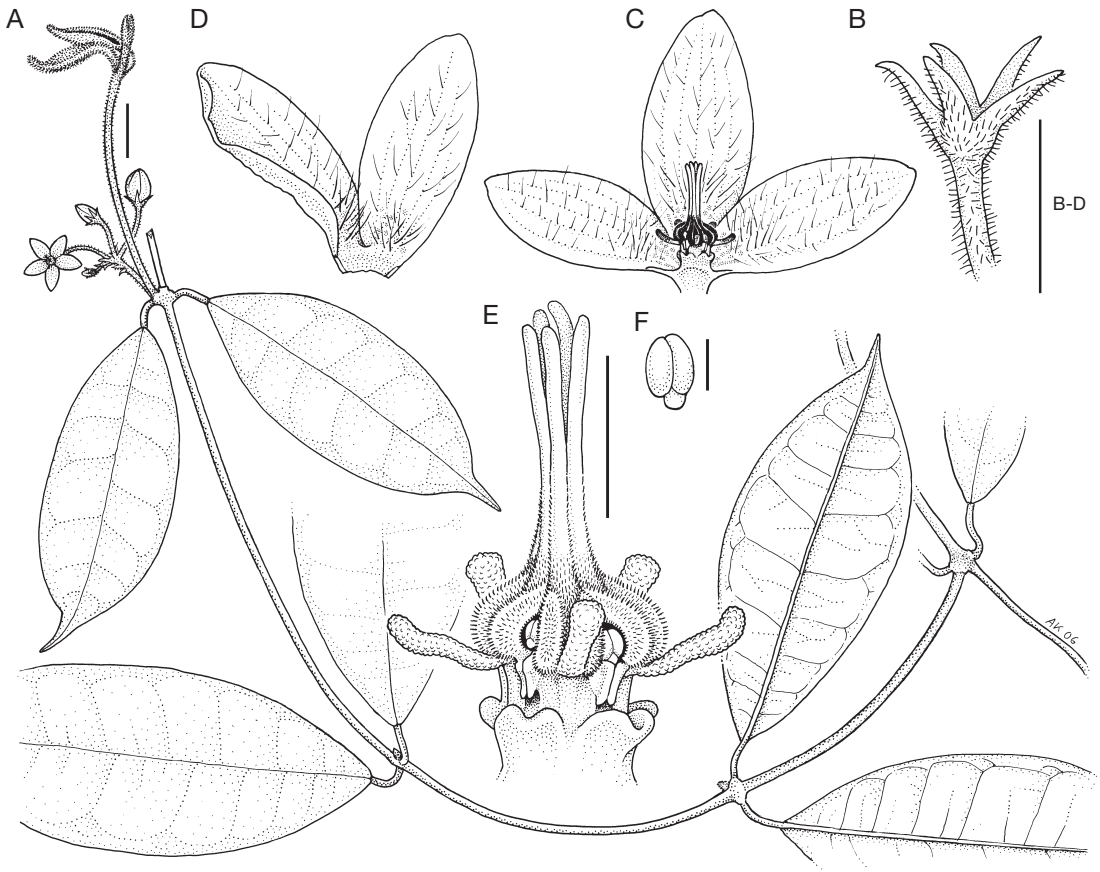


FIG. 2. — *Calyptranthera sulphurea* Klack.: **A**, habit; **B**, calyx; **C**, flower with calyx and two petals removed; **D**, portion of corolla from within; **E**, gynostegium; **F**, pollinarium. L. Nusbaumer & P. Ranirison LN 1728. Drawing by Andrea Klintbjer, Stockholm. Scale bars: A, 1 cm; B-D, 5 mm; E, 1 mm; F, 0.15 mm.

left margin (seen from above) and on the inside of lobe becoming denser towards base. Staminal column *c.* 2.8 mm high (*c.* 1 mm with projecting connectives excluded); filaments broad with short sclerified margins (anther wings) and with five cup-like projections below (pollinium entrances), united into a short cylinder at base; anthers with connectives much prolonged into yellow filiform appendages grouped together basally in a column but diverging above, papillate; filiform appendages *c.* 1.8 mm long; thecae distinctly papillate, reddish brown. Corona lobes filiform, *c.* 0.8 mm long, \pm horizontal, much shorter than the prolonged connectives, papillate. Pollinia ellipsoidal,

c. 0.2 mm long, attached to minute soft corpuscula. Gynoecium not studied. Fruits unknown.

HABITAT AND DISTRIBUTION

Calyptranthera sulphurea is known only from the type locality at Daraina in the northeastern part of Madagascar, found in dense humid forest at 800 m altitude. It was collected in flower in December.

REMARKS

Calyptranthera sulphurea has yellow flowers. In contrast, all other species of *Calyptranthera* are basically reddish, from pale rose or almost white to lavender and purple or dull brown. In addition to

the yellow flowers this species differs from the sympatric *C. villosa* by its smaller staminal column, the shorter and more or less horizontal corona lobes, by its connectives lacking long hairs on dorsal side and by the much less hairy corolla lobes. Furthermore, the thecae are reddish brown in *C. sulphurea*, yellow in *C. villosa*. The pubescence of the corolla lobes is not seen without magnification, whereas in *C. villosa* the white (when dry) indumentum completely covers the adaxial side of the lobes.

The epithet of this species alludes to the yellow flowers.

Calyptranthera filifera Klack., sp. nov.
(Fig. 3)

Species haec Calyptrantherae caudiclavae similis lobis coronae spathulatis et connectivi lobis filiforme prolongatis, autem differt pedicellis longioribus, connectivi lobis valde prolongatis, floribus majoribus, et lobis corollae parum pubescentibus.

TYPUS. — Madagascar. Province de Fianarantsoa, S of Farafangana near Manombo Reserve, 23°03'20"S, 47°40'24"E, 70 m alt., 2001, *McPherson & Rabenantoandro 18448* (holo-, S!; iso-, MO!, TEF).

DESCRIPTION

Suffrutescent twiner with younger branches densely covered by erect reddish hairs, glabrescent. Leaves somewhat coriaceous, shining green above, paler below; blade 6-9 × 3-4 cm, elliptic to obovate, cuneate at the base, acuminate to apiculate at apex, pubescent with reddish hairs beneath, when young sparsely so also above but here soon becoming glabrous, without colleters at the very base above; margin entire; venation pinnate and looped, reticulate; midrib when dry distinctly impressed above and raised beneath; primary veins divaricate to right-angled and secondary veins grossly reticulate, slightly raised on both sides when dry; epidermis ± smooth on both sides; petiole distinct, 0.5-1 cm long, with dense reddish mostly appressed hairs. Inflorescences extra-axillary, about as long as the adjacent leaves or shorter; cyme with few flowers in pairs near the apex with short internodes and with distinct scars of earlier flower-pairs below, hairy; pedicels 3-4 cm long; bracts and bracteols

narrow, 1.5-2 mm long. Calyx lobes united only at the very base, *c.* 3 × 1.2 mm, much longer than the corolla tube, triangular to slightly ovate, acute, with reddish hairs outside, glabrous inside, without colleters at the lobe sinuses. Corolla ellipsoidal in bud, contorted with the left lobe margin overlying, not or only slightly twisted, with the lobes fused at the base only into a short tube, dull pale brown with dull red patches surrounding white centre; tube *c.* 0.5 mm long, glabrous; lobes *c.* 15 × 7 mm, elliptic, bluntly acute at apex, probably rotate, glabrous outside, finely hairy at basal half inside particularly along the veins and with a patch of straight erect longer white hairs near the base fenced by a submarginal *c.* 1 mm long row of long distinct somewhat bulbous hairs at each side, with 3-5 parallel veins. Staminal column *c.* 15 mm high (*c.* 2.5 mm with projecting connectives excluded); filaments broad with short sclerified margins (anther wings) and with five cup-like projections below (pollinium entrance), united into a distinct cylinder at base; thecae finely papillate; connectives much prolonged, at base dorsi-ventrally flattened and narrowly triangular standing together in form of a cone, apically narrowing into 5 free very thin *c.* 13 mm long filiform club-shaped appendages. Corona lobes club-shaped, *c.* 0.6 mm long, horizontal, much shorter than the connectives, glabrous but with warty surface. Pollinia ellipsoidal, *c.* 0.2 mm long, attached to minute soft corpuscula. Style narrow and cylindrical at lower half but conical below the style-head, *c.* 1.5 mm high; style-head *c.* 0.5 mm high, with a discoid lower part with 5 pads supporting the pollinia in between and with a narrower and short upper rounded part. Fruits unknown.

HABITAT AND DISTRIBUTION

Calyptranthera filifera is known only from the type locality south of Farafangana in the southern part of the Malagasy east coast. It was found in disturbed forest at 70 m altitude in flower in November.

REMARKS

Calyptranthera filifera shares several characters with *C. caudiclava* and is thought to be closely related to this taxon. Both species have spathulate and horizontal corona lobes, prolonged connectives that

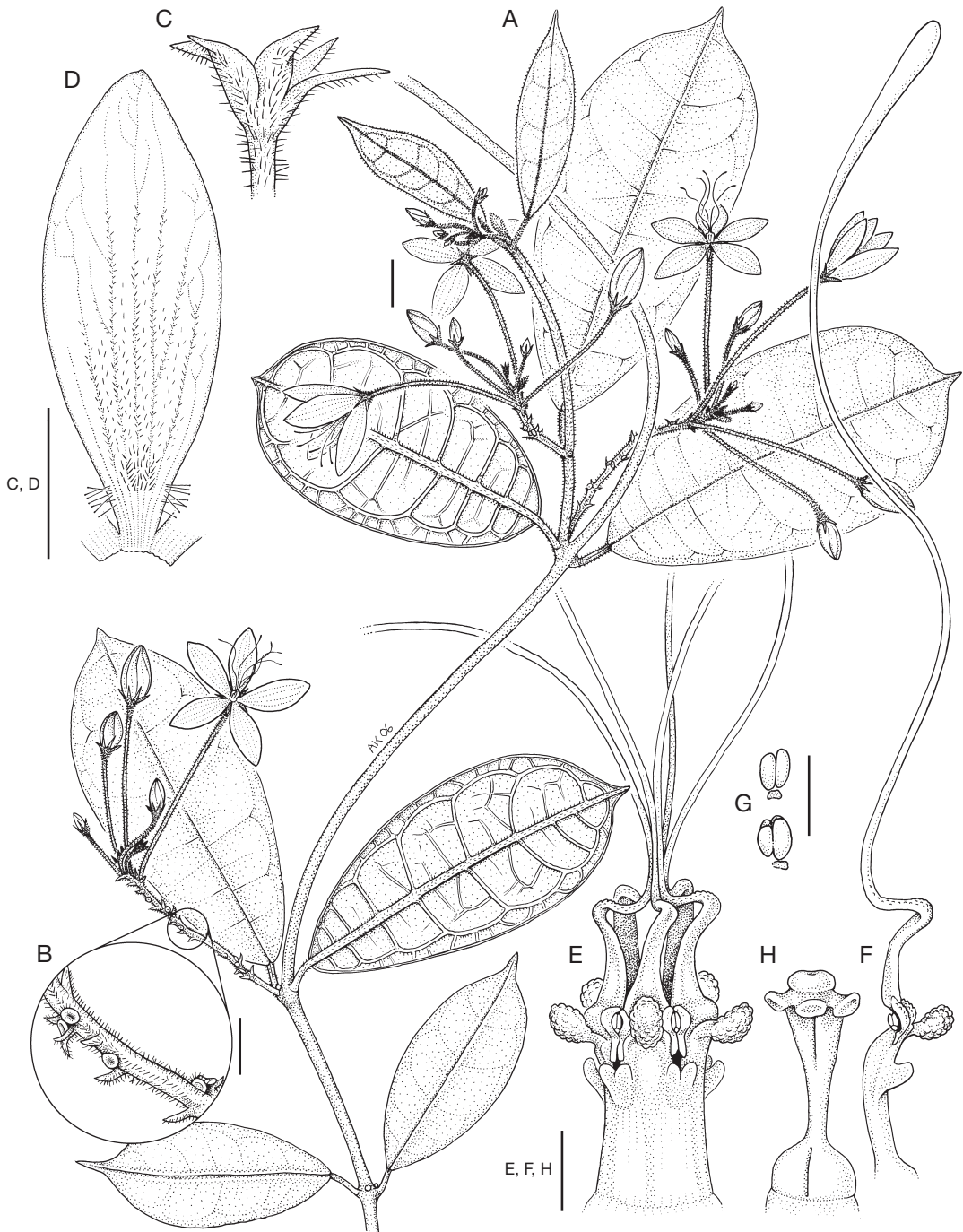


FIG. 3. — *Calyptranthera filifera* Klack.: **A**, habit; **B**, magnification of inflorescence showing paired scars of fallen flowers; **C**, calyx; **D**, portion of corolla from within; **E**, gynostegium; **F**, anther seen in lateral view; **G**, pollinaria; **H**, style-head and part of ovary. *McPherson & Rabenantoandro 18448*. Drawing by Andrea Klintbjer, Stockholm. Scale bars: A, 1 cm; B, 3 mm; C, D, 5 mm; E, F, H, 1 mm; G, 0.5 mm.

basally are dorsi-ventrally flattened and form a cone (calyptra) above the thecae, but apically transform to long and filiform and somewhat club-shaped appendages. They also share the character of having two submarginal straight lines of bulbous hairs near the base of the corolla lobes (Fig. 3D), as well as having the basal part of the filaments, i.e. the part below the cup-shaped entrances for the pollinia, united into a distinct tube (Fig. 3E). *Calyptranthera filifera* differs, however, by having larger flowers, twice as long pedicels, shorter connectival cone (calyptra) formed by triangular parts, and exceedingly delicate connectival appendages. Furthermore, *C. filifera* is finely pubescent over a large part of the petals, *C. caudiclava* having completely glabrous petals except for the patch of longer hairs at the base of

the lobes which is characteristic for both species. *Calyptranthera schatziana* Klack. from the Masoala peninsula further north along the east coast, is similar to *C. filifera* by having rather large flowers on long pedicels. *Calyptranthera schatziana*, however, differs by having erect and narrow, although short, corona lobes (vs. horizontal and club-shaped corona lobes in *C. filifera*). *Calyptranthera filifera* differs also by its very long and filiform connectival appendages, that furthermore are dorsi-ventrally flattened and triangularly broadened at base, forming a short calyptra immediately above the thecae. In *C. schatziana* these appendages are filiform all along to the base.

The epithet of this species alludes to the very long and delicate connectival appendages.

KEY TO THE SPECIES OF *CALYPTRANTHERA* KLACK.

Morphologic explanations and illustrations showing the structure of the *Calyptranthera* flowers are given in Klackenberg (1997).

1. Corolla \geq 6 cm in diameter; corolla lobes glabrous except for a small patch of hairs at the very base; coronal lobes \pm filiform, ascending and distinctly longer than the thecae 2
 - Corolla < 6 cm in diameter; corolla lobes variously hairy, from a small patch of hairs at the very base to covered by an indumentum over most of its adaxial surface; coronal lobes usually spatulate and \pm horizontal, and/or short (long and ascending in *C. villosa*) ... 3
2. Corona lobes longer than the connectival appendages; corolla 6-7 times longer than the calyx *C. grandiflora*
 - Corona lobes shorter than the connectival appendages; corolla 4-5 times longer than the calyx *C. baronii*
3. Connectives prolonged into filiform appendages; appendages much longer than the thecae, often club-shaped 4
 - Anthers with only shortly projecting connectival appendages; appendages \pm of the same length or shorter than thecae, not club-shaped 9
4. Connectival appendages at base dorsi-ventrally flattened forming a conical or cylindrical cap above the thecae but apically with 5 free, long and filiform, \pm club-shaped tails; basal part of the staminal column between the cup-shaped pollinium entrances and the corolla tube being cylindrically prolonged 5
 - Connectival appendages clustered above the thecae but filiform all along to thecae, slightly club-shaped or not at the tips; cup-shaped pollinium entrances not or only slightly elevated above the corolla tube 6
5. Pedicels 3-4 cm long; connectival appendages forming a short cone above the thecae by their triangular bases; filiform part of appendages very delicate, at least 4 times longer than the rest of the staminal column *C. filifera*
 - Pedicels 1-2 cm long; connectival appendages forming a longer cylinder above the thecae; filiform part of appendages at most 4 times longer than the rest of the staminal column *C. caudiclava*

6. Corolla > 3 cm in diameter *C. schatziana*
 — Corolla < 3 cm in diameter 7
7. Corolla yellowish *C. sulphurea*
 — Corolla rose to brownish red 8
8. Corolla densely villous on inner surface; indumentum when dry seen with the naked eye *C. villosa*
 — Corolla only finely pubescent on left half (seen from above) of the corolla lobe, not seen with the naked eye *C. gautieri*
9. Corolla lobes shaggy inside in addition to a patch of straight ± erect hairs near the base; corolla 1-1.5 cm in diameter *C. pubipetala*
 — Corolla lobes glabrous except for a patch of straight ± erect hairs near the base; corolla c. 2 cm in diameter *C. brevicaudata*

REFERENCES

- KLACKENBERG J. 1996. — The new genus *Calyptranthera* (Asclepiadaceae) from Madagascar. *Novon* 6 (1): 25-27.
- KLACKENBERG J. 1997. — Revision of the Malagasy genus *Calyptranthera* (Asclepiadaceae). *Adansonia*, sér. 3, 19 (1): 21-37.
- KLACKENBERG J. 1998. — *Calyptranthera gautieri* Klack. (Apocynaceae s.l., Secamoneae), a new species from Madagascar. *Candollea* 53: 395-398.
- KLACKENBERG J. 2000. — *Calyptranthera schatziana* (Apocynaceae s.l., Secamoneae), a new species from Madagascar. *Adansonia*, sér. 3, 22 (1): 33-37.

*Submitted on 8 January 2007;
 accepted on 30 March 2007.*