

**Zeitschrift:** Candollea : journal international de botanique systématique = international journal of systematic botany  
**Herausgeber:** Conservatoire et Jardin botaniques de la Ville de Genève  
**Band:** 55 (2000)  
**Heft:** 1

**Artikel:** Novelties in Secamone (Apocynaceae s.l., Secamonoideae) from western Madagascar  
**Autor:** Klackenberg, Jens  
**DOI:** <https://doi.org/10.5169/seals-879508>

### **Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

### **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

### **Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 12.01.2026

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**

# Novelties in *Secamone* (Apocynaceae s.l., Secamonoideae) from western Madagascar

JENS KLACKENBERG

## ABSTRACT

KLACKENBERG, J. (2000). Novelties in *Secamone* (Apocynaceae s.l., Secamonoideae) from western Madagascar. *Candollea* 55: 75-85. In English, English and French abstracts.

Three new species, *Secamone bemarahensis* Klack., *S. jongkindii* Klack., and *S. tsingycola* Klack. (Apocynaceae s.l., Secamonoideae), from Madagascar are described, illustrated and compared to related taxa. *Secamone stylosa* is given a new rank and the new combination *S. sulfurea* subsp. *stylosa* (Klack.) Klack. is made.

## RÉSUMÉ

KLACKENBERG, J. (2000). Nouveautés dans le genre *Secamone* (Apocynaceae s.l., Secamonoideae) de l'ouest de Madagascar. *Candollea* 55: 75-85. En anglais, résumés anglais et français.

Trois nouvelles espèces, *Secamone bemarahensis* Klack., *S. jongkindii* Klack., and *S. tsingycola* Klack. (Apocynaceae s.l., Secamonoideae), de Madagascar sont décrites, illustrées et discutées. Le statut de *S. stylosa* Klack. est revu et la combinaison nouvelle *S. sulfurea* subsp. *stylosa* (Klack.) Klack. est validée.

**KEY-WORDS:** APOCYNACEAE – SECAMONOIDEAE – *Secamone* – Madagascar – Taxonomy.

## Introduction

*Secamone* R. Br. is a paleotropical genus of suffrutescent twiners or small scrambling herbs, rarely erect shrubs, with usually small white to yellow flowers. In a revision of the *Secamone* species from the Madagascar region (KLACKENBERG, 1992), 56 species were recognized from Madagascar, and recently (KLACKENBERG, 1997, 1998, 2000a, 2000b) six more species were added. In the course of preparing the subfamily *Secamonoideae* for the "Flore de Madagascar et des Comores", I have worked with a recent collection from the Tsingy de Bemaraha area just north of the Manambolo River made by a Dutch-Malagasy team headed by C. C. H. Jongkind from Wageningen. In this collection I have come across three new species of *Secamone*, all of which are probably endemic to this particular area.

Tsingy de Bemaraha is a large limestone plateau in western Madagascar, now to a large part included in a nature reserve of 152 000 ha. The eroded limestone is furnished with caves and ravines of vertical cliffs, but with flat rock areas inbetween with conspicuously rugged surface of small and large vertical often very sharp lamellae (denoted tsingy in Malagasy), an extreme habitat with high insulation and water stress.

1. *Secamone bemarahensis* Klack., spec. nova (Fig. 1, 5 (map)).

**Typus:** MADAGASCAR, Mahajanga, Tsingy de Bemaraha north of the Manambolo river, 50 m alt., 17.12.1996, Jongkind, Andriantiana & Razanatsoa 3583 (holo-, WAG; iso-, WAG).

*Species haec Secamonae sulfureae affinis sed differt corollae tubo brevior (lobi solum 1/6-1/5 longitudinum suarum coalescentes) et minus pubescenti vel lobis corollae solum basaliter latis sed apice distincte contractis.*

Suffrutescent twiner with young branches covered by short reddish hairs. Leaves opposite, somewhat coriaceous, entire, glabrous; blade ca. 5-7 × 2.5-3.5 cm, elliptic, attenuate at the base, acute but sometimes obtuse at the very apex; venation pinnate, looped, faintly visible; midrib impressed above, raised below; epidermis smooth on both sides; petiole distinct, ca. 1 cm long.

Inflorescences extra-axillary, much shorter than the adjacent leaves; cymes dense, irregularly umbel-like on 1-3 mm long stalks, many-flowered, hairy; pedicels 1-2 mm long; bracts minute. Flowers pentamerous, actinomorphic. Calyx lobes ca. 2.2 × 0.7 mm, narrowly triangular, acute at the apex, with few scattered hairs, with collectors in the sinuses. Corolla narrowly ovoid in bud and gradually narrowing towards apex, fused for 1/5-1/6 of its length into a tube, contorted with the right lobe margins overlying, twisted to the left, greenish; tube ca. 2 mm long, puberulous inside; lobes probably slightly twisted, ca. 9 × 1.3 mm, narrowly oblong, acute at the apex, glabrous. Staminal column 1.0 mm high; connective produced into a lacinate membranous tip; filaments with sclerified margins (pollinium collectors) to the base. Coronal lobes 2; outer one ca. 0.5 mm long (free part), trigonous mostly with flat back, straight, ± equalling the staminal column, narrow but rather abruptly broadened at base; inner one small, placed inside above the outer one. Pollinia 4 in each pollinarium, glued together on a horse-shoe shaped corpuscle, ca. 0.1 mm long. Styles 2, short but distinct, ca. 0.2-0.3 mm long. Style head projecting ca. twice as long as the staminal column; upper narrower part three to four times as long as the lower broader part, ca. 1.8 mm long, cylindric and entire.

Fruits not seen.

*Distribution and habitat.* – *Secamone bemarahensis* is known only from the type that was collected in flower in December in the southernmost part of Tsingy de Bemaraha.

*Discussion.* – In a treatment of the Malagasy *Secamone*, four taxa, i.e. *S. toxocarpoides* Choux, *S. stylosa* Klack., *S. valvata* Klack. and *S. sulfurea* (Jum. & H. Perrier) Klack. (as *S. longipetala* Klack., see KLACKENBERG, 1996: 183), were thought to form a group of closely related species (*S. toxocarpoides* group, KLACKENBERG, 1992: 27). They are characterized by dense and short inflorescences, long and narrow corolla lobes, linear and thin-walled follicles, and by having a long protruding style head as well as glossy dark to olive green upper surface of the leaves when dry. *S. bemarahensis* shows these characters (follicles not seen) and relates to the *S. toxocarpoides* group. The specimen of *S. bemarahensis*, together with recently accumulated material from NW Madagascar of the other taxa, however, have called for a smaller revision of this group. Although the available material is still rather limited, new material of all taxa except of *S. valvata* has been gathered during the last 10 years. In this paper four species are recognized, one from the northernmost tip of Madagascar (*S. toxocarpoides*), a second more variable species along the northwestern coast (*S. sulfurea*), here divided into two subspecies from the Mahajanga area (subsp. *sulfurea*) and from Sambirano (subsp. *stylosa*), respectively, a third species from South Central Madagascar (*S. valvata*), and the here described new species from the large limestone plateau of Tsingy de Bemaraha (*S. bemarahensis*) (Fig. 5).

*Secamone bemarahensis* is characterized by the corolla lobes being fused for 1/5-1/6 of their length only as opposed to the longer tubes of *S. sulfurea* that usually constitute about 1/3 of the total corolla length (Figs. 1E, 2B, 2D). The tube is only slightly puberulous inside and about as long as the calyx lobes in *S. bemarahensis*, as opposed to a usually villous as well as distinctly longer tube than calyx in *S. sulfurea* (Figs. 1E, 2B, 2D). It furthermore differs by its corona lobes being narrowly trigonous and ± acute at apex and rather abruptly broadened only at the very base

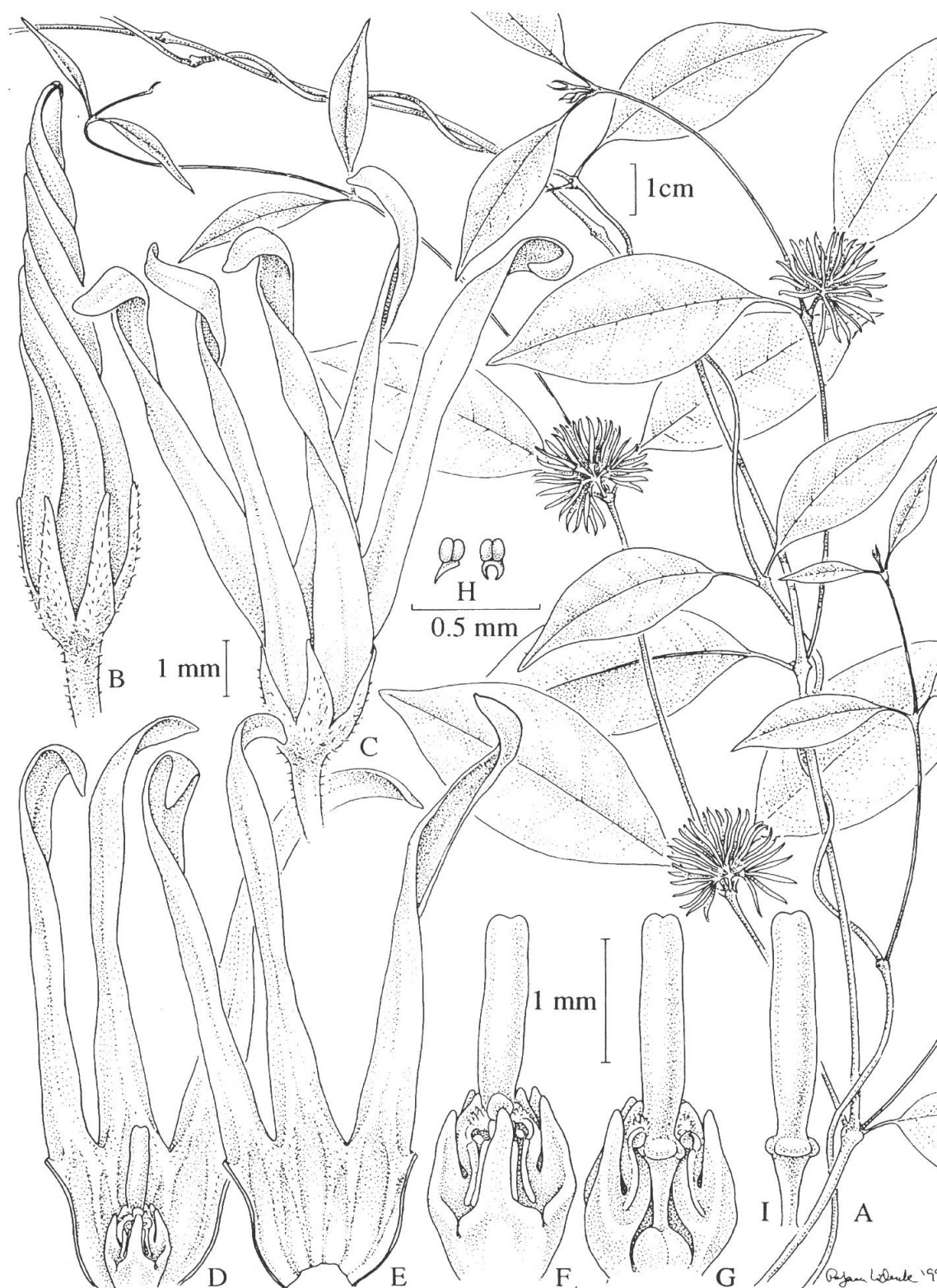


Fig. 1. – *Secamone bemarkensis* Klack. – A, Habit; B, Flower in bud; C, Flower; D, Gynostegium and portion of corolla; E, Portion of corolla from within; F, Gynostegium; G, Gynostegium with one anther removed; H, Pollinarium; I, Style head. [A-I, Jongkind & al. 3583 – Drawn by Pollyanna Lidmark, Stockholm].

(Fig. 1F). *Secamone sulfurea* has flat and broad corona lobes with a rounded apex (Fig. 2C). The style head protrudes slightly from the corolla tube.

*Secamone toxocarpoides* has a short and open tube with five distinct pouches at the corolla tube that protrude between the calyx lobes (Fig. 2F-H). The bud is obpyriform, almost spherical at base and with a much narrower cylindric apical part of contorted corolla lobes (Fig. 2F). The buds of *S. bemarahrensis*, *S. sulfurea* and *S. valvata* are all narrowly ovate, gradually narrowing from a broader base (Figs. 1B, 2A), and the corolla tube does at most only slightly protrude between the calyx lobes (Fig. 1C, 2B, 2D-E). Overlooked (*Perrier de la Bathie 11770*, P) and recently collected material (*Gautier & al. 3058, 3216*, G) show that *S. toxocarpoides* is distributed also in Nosy Be and in lowland Manongarivo, i.e. in Sambirano phytogeographical Domain further south than was known earlier (phytogeographical delimitations after HUMBERT, 1955). It is here sympatric to *S. sulfurea* subsp. *stylosa* (formerly *S. stylosa*, see below) (*Gautier & Totozafy Be 2961*, G) and a supposed distribution of four isolated and vicariant populations (KLACKENBERG, 1992) does not hold true. However, no intermediate specimens have been observed between the two taxa, and *Secamone toxocarpoides* is to be recognized as a distinct species.

*Secamone sulfurea*. New and better preserved material particularly from the Sambirano area, has made me reconsider the status of *S. stylosa*. This taxon was described on two 19-century collections from the island of Nosy Be in Sambirano Domain (KLACKENBERG, 1992: 27). It was distinguished by a long corolla tube, long and protruding style head, broad and flat corona lobes and by having a true style. As mentioned above, new material confirms the distinctness of this taxon in relation to *S. toxocarpoides*, but the morphological gap to the taxon that is distributed south of Sambirano in the Mahajanga area, *S. sulfurea*, is narrowed.

The structure of the staminal column is similar in the two populations, and the differences stated between *Secamone stylosa* and *S. sulfurea* in the form of the pollinaria entrances at the bases of the anther column and the form of the coronal lobes (KLACKENBERG, 1992: 27, 29) cannot be observed on new and better preserved material. The corona lobes are dorsio-ventrally flattened and broad with rounded tips in both taxa (Fig. 2C). In a commentary to the protologue (KLACKENBERG, 1992: 29), *S. stylosa* was said to be furnished with a true style. A short style, however, is not unique to this taxon, but is characteristic for all taxa in the *S. toxocarpoides* group. Generally styles are absent in *Secamone*, and the style head is placed directly on the ovary. Furthermore, the style heads are very long at specimens from Nosy Be and distinctly protrude from the corolla tube, but in new material from lowland Manongarivo on the Malagasy mainland the style heads hardly protrude (Fig. 2B). In this way some of the distinguishing features have proved to be artefacts, and the character of having the style head included in (*S. sulfurea*) or protruding from (*S. stylosa*) the corolla tube is less distinct than earlier thought. Consequently, the taxa are best separated at the subspecific level.

***Secamone sulfurea* subsp. *stylosa* (Klack.) Klack. stat. nov.** (Fig. 2A-C, 5 (map)).

≡ *Secamone stylosa* Klack. in Opera Bot. 112: 27. 1992.

*Secamone sulfurea* is characterised by a long corolla tube that is distinctly longer than the calyx and usually covered by long hairs inside. *Secamone sulfurea* subsp. *stylosa* is distributed in the Sambirano Domain and differs by its cylindric corolla tubes and very long upper part of the style head, which reaches the mouth of the corolla tube or protruds from it (Fig. 2B). The corolla is larger in subspecies *stylosa*, particularly the lobes that are both longer and broader. *Secamone sulfurea* subsp. *sulfurea* is hitherto known only from the Mahajanga area, but might have a wider distribution. It has a long and somewhat barrel-shaped corolla tube and the gynostegium is completely included in the corolla tube (Fig. 2D).

*Secamone valvata* from Central phytogeographical Domain distinctly differs from *S. toxocarpoides*, *S. sulfurea* and *S. bemarahrensis* from Western and Sambirano Domains, by its valvate



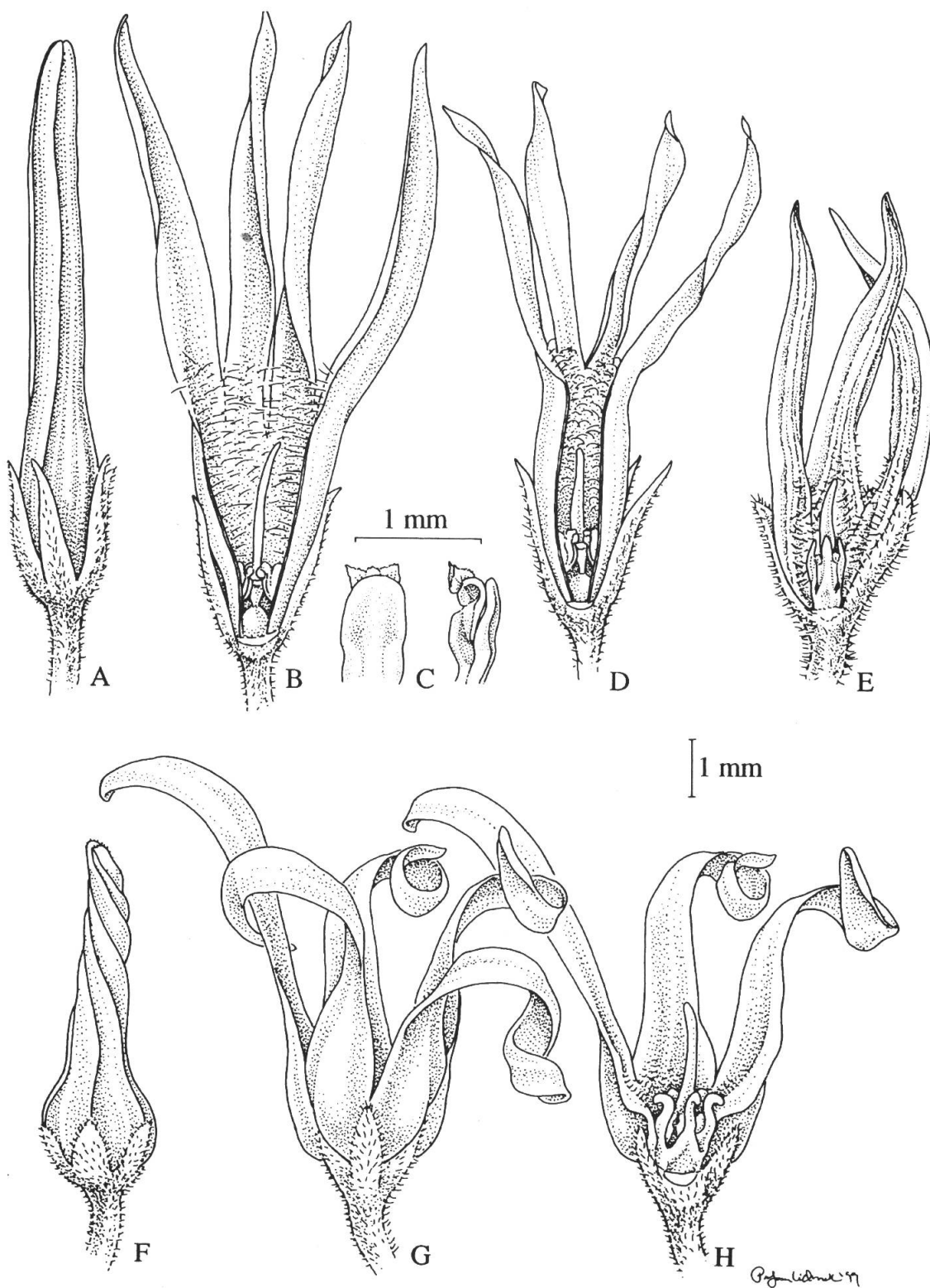


Fig. 2. – *Secamone sulfurea* subsp. *stylosa* (Klack.) Klack. – A, Flower in bud; B, Flower with one corolla lobe and one anther removed; C, Corona lobe, dorsal (left) and lateral view. *Secamone sulfurea* (Jum. & H. Perrier) Klack. subsp. *sulfurea*. – D, Flower with one corolla lobe and one anther removed. *Secamone valvata* Klack. – E, Flower with one corolla lobe and one anther removed. *Secamone toxocarpoides* Choux. – F, Flower in bud; G, Flower; H, Flower with two corolla lobes removed. – [A-C, Gautier & Be 2961; D, Dorr & al. 3750; E, Descoings 3582; F-H, Gautier & al. 3216 – Drawn by Pollyanna Lidmark, Stockholm].

and centrally thickened corolla lobes (Fig. 2E). The latter three taxa have contorted corollas with the right lobe margins overlying (Figs. 1B, 2A, 2F). Furthermore the lobes are evenly thick over their surfaces.

The diagnostic characters of the taxa in the *Secamone toxocarpoides* group discussed in text can be summarized in a key as follows:

1. Corolla lobes valvate in bud, each with distinctly thickened central part by longitudinal ridges, not twisted ..... *S. valvata*
- 1a. Corolla lobes with their right margins overlying in bud,  $\pm$  equally thin all over, not or distinctly twisted ..... 2
2. Corolla tube short, usually shorter than 1.5 mm long (2.1 mm) and broadly open, with 5 pouches distinctly protruding between the calyx lobes; corolla buds obpyriform, almost spherical at base and with a much narrower cylindric upper part; calyx lobes densely hairy ..... *S. toxocarpoides*
- 2a. Corolla tube long, about 2.0 mm long or longer and cylindric, without or with only smaller pouches indistinctly protruding between the calyx lobes; corolla buds narrowly ovate, gradually narrowing from a broader base; calyx lobes densely to usually sparsely hairy ... 3
3. Corolla lobes fused along 1/5-1/6 only of their length into a tube; tube about as long as the calyx, puberulous inside; corona lobes narrow and trigonous,  $\pm$  acute at apex, broadened only at the very base; style head projecting ca. twice as long as the staminal column ..... *S. bemarahensis*
- 3a. Corolla lobes fused along at least 1/4 of their length into a tube; tube much longer than the calyx, usually villous inside; corona lobes broad and dorsi-ventrally flattened, rounded at apex; style head projecting 2 to 4 times as long as the staminal column ..... 4
4. Corolla lobes  $< 6$  mm long; tube often somewhat barrel-shaped; style head included in the corolla tube ..... *S. sulfurea* subsp. *sulfurea*
- 4a. Corolla lobes  $> 7$  mm long; tube cylindric; style head about as long as to usually slightly longer than the corolla tube ..... *S. sulfurea* subsp. *stylosa*

## 2. *Secamone jongkindii* Klack., spec. nova (Fig. 3, 5 (map)).

**Typus:** MADAGASCAR, Mahajanga, Tsingy de Bemaraha north of the Manambolo river, 50 m alt., 27.11.1996, Jongkind, Andriantiana & Razanatsoa 3241 (holo-, WAG; iso-, WAG).

*Species haec Secamonae buxifoliae et S. dequairei similis sed differt ab illa foliis subtus reticulatis et epidermide tuberculata/papillata vel lobis corollae longioribus et obovatis, a hac lobis corollae longioribus subtus rugosisque et tubo intus minus piloso.*

Suffrutescent twiner; branches  $\pm$  divaricate, glabrous but younger ones sparsely covered with whitish hairs. Leaves herbaceous, entire; blade ca.  $2-3 \times 1-1.5$  cm, elliptic to somewhat obovate, cuneate at the base, rounded or acute to often apiculate at the apex, glabrous on both sides but often with hairs along the midrib above; venation pinnate, arched, distinctly reticulate below when dry, less distinctly so above; midrib  $\pm$  even with leaf surface above, slightly raised below; epidermis smooth above, tuberculate-papillate below; petiole 1-2 mm long, usually sparsely hairy.

Inflorescences extra-axillary, shorter than the adjacent leaves; cymes few-flowered, di- to mostly monochasial, glabrous or with a few hairs; axes usually 0.5-2 mm long; pedicels 2.5-4 mm long; bracts 1-2 mm long, rather narrow. Flowers pentamerous, actinomorphic. Calyx lobes ca.  $1.8 \times 1$  mm, ovate, rounded at the apex, glabrous on both sides, with colleters in the sinuses. Corolla ellipsoid in bud and rounded at the apex, fused for 1/4-1/3 of its length into a tube, contorted with the right lobe margins overlying but not or only slightly twisted, pale yellow; tube



Fig. 3. – *Secamone jongkindii* Klack. – A, Habit; B, Lower leaf surface showing tuberculate-papillate epidermis; C, Flower; D, Gynostegium and portion of corolla; E, Portion of corolla from within; F, Gynostegium; G, Gynostegium with one anther removed; H, Anther, lateral view; I, Pollinarium; J, Style head. – [A–J, Jongkind & al. 3241 – Drawn by Pollyanna Lidmark, Stockholm].



ca. 1.7 mm long, with 5 small patches of short retrorse hairs in the middle; lobes curved outwards, ca.  $4.0 \times 1.4$  mm, obovate to narrowly obovate, acute at the apex, with rather roughly wrinkled surface on abaxial side when dry. Staminal column with corona lobes excluded ca. 1.5 mm high; connective produced into a lacinate membranous tip; filaments with sclerified margins (pollinium collectors) almost to the base. Coronal lobes ca. 0.8 mm long (free part), dorsiventrally compressed, arched over the staminal column; basal part with rounded back,  $\pm$  as broad as the lobe, attached along ca.  $2/3$  of the stamen. Pollinia 4 in each pollinarium, attached on a rim of a membrane projecting from the corpuscle, ca. 0.15–0.2 mm long. Ovary of two separate carpels, subinferior, with numerous ovules. Style absent. Style head  $\pm$  equalling the staminal column but shorter than the corona lobes; upper narrower part ca.  $1/2$  as long as the lower broader part, ca. 0.5 mm long, cylindric and not broadened at the apex, entire.

Only immature follicles seen.

*Distribution and habitat.* – *Secamone jongkindii* is known only from the type that was collected in flower in November in the southernmost part of Tsingy de Bemaraha.

*Discussion.* – *Secamone jongkindii* is characterized by its long corolla tube and long and obovate corolla lobes with grossly wrinkled surface underneath when dry, and furthermore by the distinctly reticulate leaves below when dry as well as the finely tuberculate-papillate lower leaf epidermis.

The closest relatives of *Secamone jongkindii* are a group of three species, *S. buxifolia* Decne., *S. ligustrifolia* Decne. and *S. perrieri* Choux, which are distributed in the Central plateau and characterized by style heads with relatively large lower but small and short upper part, fleshy coronal lobes with rounded back and only small patches of short hairs in the middle of the corolla tube (KLACKENBERG, 1992: 101). Furthermore, *S. jongkindii* shares with *S. perrieri* distinctly tuberculate lower leaf epidermis, but have much thinner and smaller leaves and lacks the characteristic erect reddish leaf hairs of *S. perrieri*. The rare feature of having wrinkled surface on abaxial side of the corolla lobes when dry is sometimes also seen in *S. buxifolia*. However, the long and narrowly obovate corolla lobes, the finely reticulate leaves below when dry, as well as the distinctly tuberculate-papillate lower leaf epidermis, distinguish *S. jongkindii* from *S. buxifolia*.

*Secamone jongkindii* has also an overall resemblance to *S. dequairei* Klack., a species known from a couple of collections from near Morondava just south of Bemaraha. They both have elliptic leaves with tuberculate-papillate lower epidermis, and short inflorescences. *S. jongkindii* differs, however, by its long and obovate or narrowly obovate corolla lobes, which furthermore have a wrinkled abaxial surface, by its contorted aestivation (valvate in *S. dequairei*), as well as by having only small patches of hairs in the corolla tube. With its relatively long and narrow corolla lobes, as well as by the leaf morphology, *S. jongkindii* is similar also to several species in the *S. bicolor* Decne. group (see KLACKENBERG, 1992: 37). No closer affinity can be proposed, however, as *S. jongkindii* is furnished with a long corolla tube with acute lobes as well as dorsiventrally flattened corona lobes that arch over the gynostegium, all characters unknown of among the eight species of the *S. bicolor* group.

### 3. *Secamone tsingycola* Klack., spec. nova (Fig. 4, 5 (map)).

**Typus:** MADAGASCAR, Mahajanga, Tsingy de Bemaraha north of the Manambolo river, 50 m alt., 6.12.1996, Jongkind, Andriantiana & Razanatsoa 3420 (holo-, WAG).

*Species haec Secamonae pachystigmae affinis sed differt corolla aurantiaca et majore, foliis basi truncatis vel cordatis et subter pilis erectis omnina tectis.*

Suffrutescent twiner with terete stem and younger branches densely covered by somewhat reddish hairs. Leaves opposite, herbaceous, entire, flat but sometimes with slightly wavy margins; blade ca.  $6.0\text{--}8.0 \times 2.5\text{--}3.5$  cm, elliptic to narrowly obovate, truncate to slightly cordate at the base, acute to acuminate at the apex, covered with straight to slightly curved erect hairs on

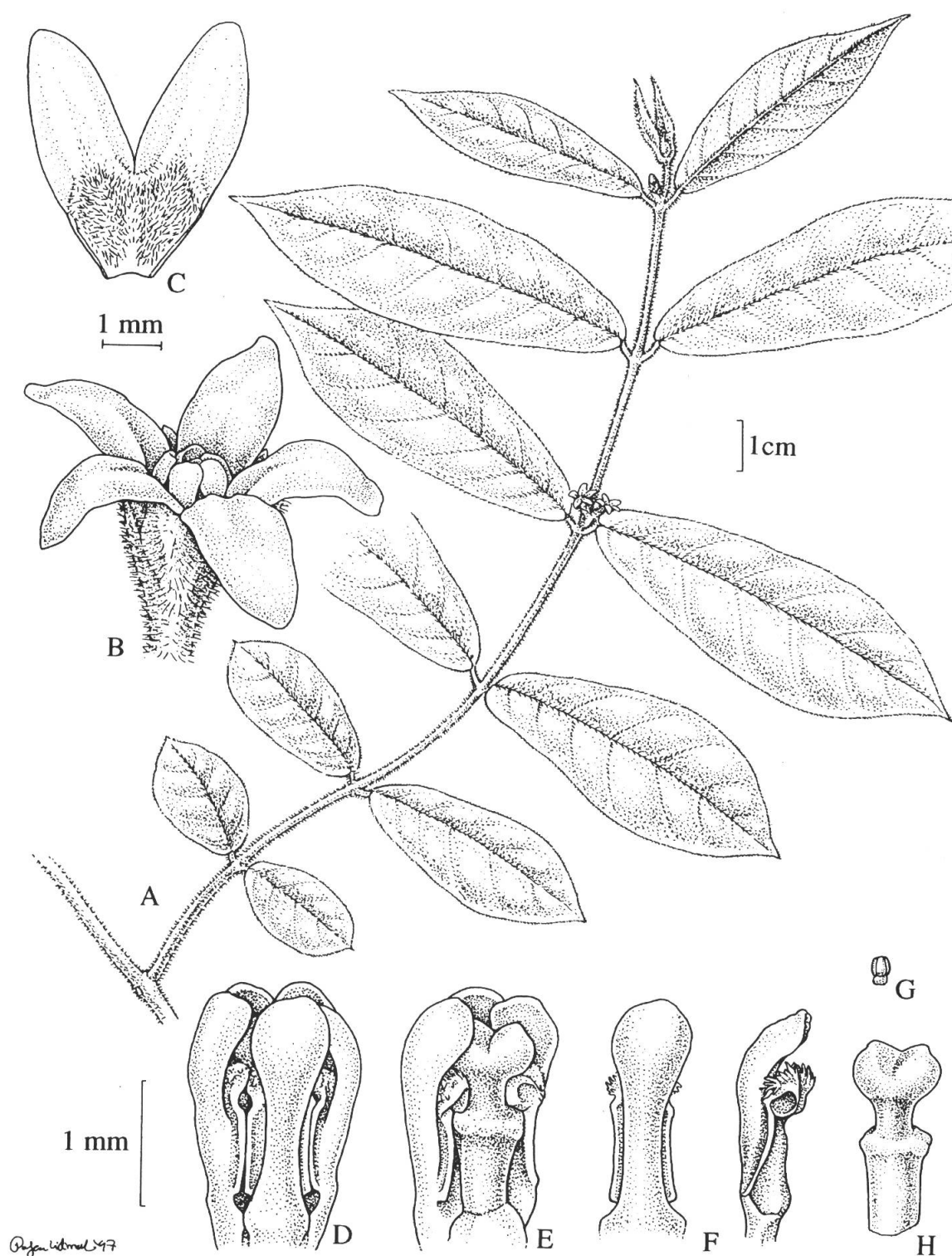


Fig. 4. – *Secamone tsingycola* Klack. – A, Habit; B, Flower; C, Portion of corolla from within; D, Gynostegium; E, Gynostegium with two anthers removed; F, Anther, dorsal (left) and lateral view; G, Pollinarium; H, Style head. – [A–H, Jongkind & al. 3420 – Drawn by Pollyanna Lidmark, Stockholm].

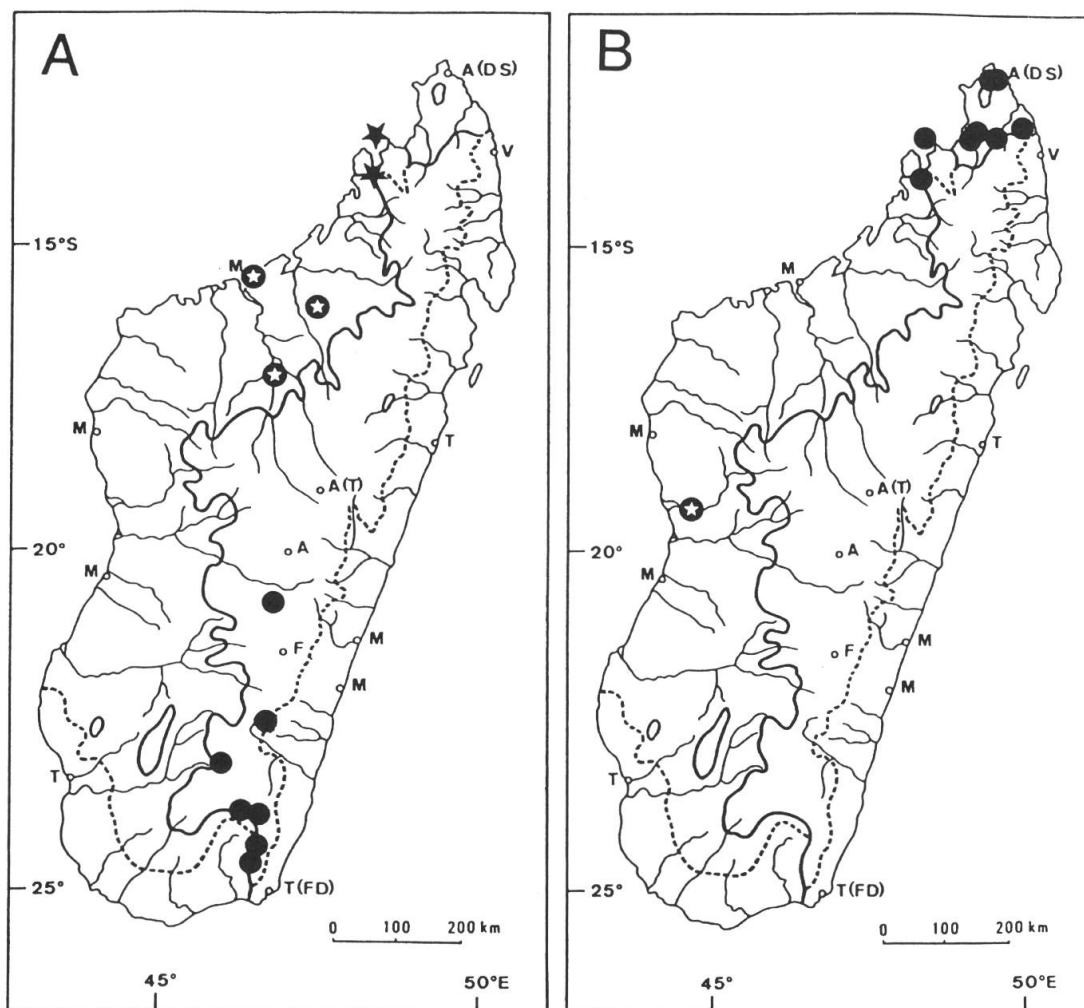


Fig. 5. – Distribution maps of *Secamone*. – A, *S. sulfurea* (Jum. & H. Perrier) Klack. subsp. *sulfurea* (★), *S. sulfurea* subsp. *stylosa* (Klack.) Klack. (★), *S. valvata* Klack. (●); B, *S. toxocarpoides* Choux (●), *S. bemaharensis* Klack., *S. jongkindii* Klack. and *S. tsingycola* Klack. (★).

both sides, soft at touch; venation pinnate, arched to somewhat looped, faint when dry above; midrib densely hairy on both sides, slightly impressed above, together with primary veins distinctly raised below; epidermis smooth; petiole 3-5 mm long, densely hairy.

Inflorescences extra-axillary along the branches, much shorter than the adjacent leaves, dense; cymes 2-3-flowered, with very short axes, densely covered with somewhat reddish hairs; pedicels 1-2 mm long, with several bracts at base; bracts up to 1.5-2.0 mm long, narrowly triangular. Flowers pentamerous, actinomorphic. Calyx lobes ca.  $2.7 \times 1.2$  mm, ovate, rounded at the apex, with long and erect hairs outside, glabrous inside, ciliate along the margin, with 5 small colleters in the lobe sinuses. Corolla fused for 1/4-1/3 of its length into a tube, hairy with white retrorse hairs in the tube and at lower part of the lobes, white becoming orange; tube ca. 1.5 mm long; lobes divaricate, ca.  $3.2 \times 1.7$  mm, oblong, rounded at the apex. Staminal column with corona lobes excluded ca. 1.2 mm high; connective produced into a lacinate membranous tip; filaments with sclerified margins (pollinium collectors) almost to the base. Coronal lobes ca. 1.0 mm long (free part), dorsiventrally compressed but with  $\pm$  rounded back, broadened towards the apex, arched above the staminal column and style head; basal part with slightly rounded back,

narrower than the lobe, attached along ca. 3/4 of the stamen. Pollinia 4 in each pollinarium, glued together on a soft corpusculum, minute,  $\pm$  ascending, ellipsoidal, 0.15 mm long. Ovary of two separate carpels, subinferior, with numerous ovules. Style absent. Style head projecting above the staminal column but shorter than the coronal lobes; upper narrower part about as long as the lower broader part to slightly longer, ca. 0.9 mm long, much broadened at the apex and slightly bilobed.

Fruits not seen.

*Distribution and habitat.* – *Secamone tsingycola* is known only from the type that was collected in flower in December in the southernmost part of Tsingy de Bemaraha.

*Discussion.* – *Secamone tsingycola* is characterized by its orange flowers, very short and few-flowered inflorescences, apically thickened style head, which is partly covered by broad and arched corona lobes, and by its obovate leaves with truncate to slightly cordate base. The leaves are rather densely pilose all over the lamina.

*Secamone tsingycola* is probably a locally endemic segregate of the rather common *S. pachystigma* Jum. & H. Perrier, a species that is widely distributed from north to south along western Madagascar. They have similar flower structure with broad and flat corona lobes as well as apically thickened style head, but the flowers of *S. tsingycola* differ, however, by their orange colour and larger corolla lobes. The only 2 to 3-flowered, very dense and short inflorescences, as well as the truncate to slightly cordate bases of the leaf laminae, are characters that are not found in *S. pachystigma*. Cordate leaves have in fact not been observed elsewhere in *Secamone* and the leaf base of *S. pachystigma* is attenuate or cuneate. Furthermore, the leaves of *S. pachystigma* usually have tufts of white wavy hairs in the sinuses between the midrib and the primary veins (domatia). In addition they are sometimes hairy also along the larger veins, rarely over the whole leaf surface. In *S. tsingycola* the leaf laminae are equally hairy all over their lower surface and densely hairy along the midrib and the primary veins. These hairs are straight and erect as opposed to the wavy ones in *S. pachystigma*. Furthermore, the calyx is pubescent in *S. tsingycola* but usually glabrous in *S. pachystigma*. *Secamone pachystigma* has been collected at the same locality as *S. tsingycola* in Bemaraha (Jongkind & al. 3245, WAG). This specimen has all the characters typical for *S. pachystigma* and differs from *S. tsingycola* in all characters discussed above. Consequently, *S. pachystigma* and *S. tsingycola* are sympatric and distinct and should be recognized as separate species.

#### REFERENCES

- HUMBERT, H. (1955). Les territoires phytogéographiques de Madagascar. *Année Biol.* ser. 3, 31: 439-448.
- KLACKENBERG, J. (1992). Taxonomy of *Secamone* s. lat. (Asclepiadaceae) in the Madagascar Region. *Opera Bot.* 112: 1-127.
- KLACKENBERG, J. (1996). Revision of the Malagasy genus *Pervillea* (Asclepiadaceae) and its phylogenetic relationship to *Calyptranthera*. *Nord. J. Bot.* 16: 165-184.
- KLACKENBERG, J. (1997). *Secamone marsupiata* Klack. (Asclepiadaceae, Secamonoideae), a new species from Madagascar. *Candollea* 52: 301-304.
- KLACKENBERG, J. (1998). *Secamone drepanoloba*, a new species of Asclepiadaceae. *Bot. Jahrb. Syst.* 120: 119-120.
- KLACKENBERG, J. (2000a). Two new species of *Secamone* (Apocynaceae, Secamoneae) from Madagascar. *Novon* 10: in press.
- KLACKENBERG, J. (2000b). *Secamone brevicoronata* and *S. pedicellaris* (Apocynaceae), two new species from Madagascar. *Willdenowia* 30: in press.

