

A revision of the Malagasy endemic genus *Aspidostemon* Rohwer & Richter (Lauraceae)

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Van der Werff H. 2006. — A revision of the Malagasy endemic genus *Aspidostemon* Rohwer & Richter (Lauraceae). *Adansonia*, sér. 3, 28 (1): 7-44.

ABSTRACT

A revision is presented of the genus *Aspidostemon*, endemic to Madagascar. The genus is characterized by its opposite leaves, flowers with three or six two-locular stamens and a fruit which is completely enclosed in the enlarged hypanthium with persistent floral parts attached to the top of the fruit. The genus was described by Rohwer & Richter in 1987; they recognized 11 species. In this treatment 28 species are accepted, of which 18 are newly described, one species is transferred from *Cryptocarya* to *Aspidostemon*, one is excluded from *Aspidostemon* and one is listed as incompletely known because the type specimen is sterile.

KEY WORDS

Lauraceae,
Aspidostemon,
Cryptocarya,
Madagascar,
new species.

RÉSUMÉ

Révision d'Aspidostemon Rohwer & Richter (Lauraceae), genre endémique de Madagascar.

Le genre *Aspidostemon* (Lauraceae), endémique de Madagascar, est révisé. Il est caractérisé par des feuilles opposées, des fleurs avec trois ou six étamines bi-loculaires et un fruit complètement renfermé dans un hypanthium élargi et surmonté par des pièces florales persistantes. Ce genre, décrit en 1987 par Rohwer & Richter avec 11 espèces, totalise, dans la présente révision, 28 espèces dont 18 sont nouvellement décrites, une est transférée depuis le genre *Cryptocarya*, une espèce est exclue d'*Aspidostemon* et une autre est considérée comme incomplètement connue car son spécimen type est stérile.

MOTS CLÉS

Lauraceae,
Aspidostemon,
Cryptocarya,
Madagascar,
espèces nouvelles.

INTRODUCTION

Aspidostemon Rohwer & Richter is a medium-sized genus of Lauraceae, endemic to Madagascar. It was described by Rohwer & Richter (1987) who included 11 species in their genus, and was based on a combination of wood anatomical, vegetative and floral characters. The floral characters had been noted by such earlier botanists as Kostermans (1957), who regarded the species here placed in *Aspidostemon* as belonging to subgenera *Hexanthera* Kosterm. and *Trianthera* Kosterm. of *Cryptocarya* R.Br., and Capuron, who questioned in his annotations on herbarium sheets whether these species truly belonged to *Cryptocarya*. After considering the wood-anatomical differences between the widespread *Cryptocarya* and the anomalous species from Madagascar, Rohwer & Richter (1987) concluded that describing a new genus for these species was warranted; they transferred seven species from *Cryptocarya* to the new genus *Aspidostemon* and described four additional species.

The revision presented here is based on specimens in P, almost all collected by Capuron and either filed with the unidentified Lauraceae or the unidentified collections of *Cryptocarya* as well as collections made during the last 20 years by staff of the Missouri Botanical Garden and their collaborators. A small number of collections were studied by Rohwer and Richter. Overall, the number of collections available is not large. *Aspidostemon* species are no exception among the Lauraceae; trees with small flowers, hard to detect and collect and often overlooked or ignored when plants easier to collect or with showier flowers are at hand. Of the 28 species accepted here, 14 are only known from the type collection and only six are known from more than five collections. Obviously, more collections are highly desirable. In light of the small number of collections, statements about the conservation status seem premature and have not been added to the descriptions.

CHARACTERISTICS OF *ASPIDOSTEMON*

The differences in wood anatomy between *Aspidostemon* and *Cryptocarya* are presented in Rohwer

& Richter (1987) and Richter (1990) and will not be repeated here. The most obvious morphological differences are opposite leaves and flowers with 3 or 6 stamens in *Aspidostemon* vs. alternate leaves and flowers with 9 stamens in *Cryptocarya*. Tepals and stamens persist on top of the fruits in *Aspidostemon*, but are deciduous in *Cryptocarya*. The stamens of *Aspidostemon* are all quite similar, regardless whether there are three or six; the staminodia vary in shape and size from whorl to whorl, but are uniform within a whorl. I consider *A. parvifolium* (Scott-Elliot) Van der Werff as the most primitive species; it is the only member of the genus with the tepals spreading at anthesis and in which the outer 6 stamens have a distinct, short filament (Fig. 13C), similar to the condition found in *Cryptocarya*. In all other species of *Aspidostemon* the tepals are erect at anthesis and the stamens do not have a distinct filament. In some species the stamens have become tepaloid, similar in shape and texture to the tepals (Figs 2B; 7A). In these species the locelli are located on the inner face of the stamens (introrse). Tepals are about as wide as long in these species. In another group of species the stamens become shorter and have a flat, thick apex; locelli move in this group upwards and become apical, rarely lateral, but do not remain introrse (Figs 2C; 7C). The stamens appear thus as short, broad stubs with apical locelli. In the staminodia one finds a parallel change. In *A. parvifolium* the staminodia of the third whorl (staminodia III) are columnar, with a somewhat enlarged tip and are not united. A fourth whorl, staminodia IV, is present, stipitiform, pubescent and can be difficult to find. In the other species the staminodia III have a progressively larger, flat apex; these become tightly pressed together and may become fused, forming a shield-like structure that completely covers the ovary and sometimes part of the stamens (Fig. 2A). As the staminodia III become larger, there is less space for the staminodia IV and these disappear or become fused with the staminodia III. Finally the stamens of whorl II also become staminodial, tightly pressed against staminodia III and difficult to recognize (Figs 11D; 13D). Rohwer & Richter (1987) observed that in some species the staminodia II have rudimentary locelli, which are visible as light-coloured spots, sometimes with flaps,

but smaller than those of the stamens. I noticed in three species that some flowers appear to have three stamens and others, on the same specimen, six stamens. My interpretation of this is that in young flowers only the outer three stamens open and that only in mature flowers the outer six stamens have opened locelli. Most species with free staminodia III have 6 stamens (Figs 9B; 14B) and most species with fused staminodia III have 3 stamens (Figs 9C; 16D), but there are a few exceptions to this general rule. The flower shape is variable as well: in the species with free staminodia III flowers are more or less globose or elongate (Fig. 4C), but in some (though not all) species with fused staminodia III the flowers become depressed globose to mushroom-shaped (Fig. 4D). In other species the flowers are narrowly to broadly cone-shaped. Through all these changes in the androecium, the pistil remains more or less the same: spindle-shaped, glabrous, sunk in the hypanthium, but not fused with it. Fruits are not known for all species and, to the degree they are known, tend to be uniform, ellipsoid, with a small crown of floral parts (Figs 11A; 16A). An inconspicuous character, but one worth noting, is the presence of bracts covering the inflorescence buds. As the buds elongate, the bracts fall off, but leave scars at the base of the inflorescences. *Cryptocarya* species do not seem to have these bracts.

The most important characters used for species delimitation are those of the flowers: number of stamens, shape of the stamens and staminodia, shape of the flowers, and indument of terminal buds, twigs and inflorescences. There are also differences in leaf shape and texture between the species, but these differences are on the whole not sufficient by themselves to recognize individual species. Therefore, sterile or fruiting specimens cannot be identified with much confidence.

All species of *Aspidostemon* have opposite leaves. Unfortunately, species exhibiting this character occur in other genera of Lauraceae on Madagascar as well and this can create confusion. There is one group of species of *Beilschmiedia* Nees with equally strictly opposite leaves (Van der Werff 2003). Of course these species differ in flower and fruit characteristics from *Aspidostemon*, but the identification of non-flowering specimens has led to confusion

(see note under *A. scintillans* (Kosterm.) Rohwer). In general the *Beilschmiedia* species with opposite leaves have leaves with a dense, raised reticulation and black twigs. A few species of *Ocotea* Aubl. have subopposite leaves, with the distal leaves opposite and the older leaves becoming alternate, a character that allows identification to genus. One species of *Cryptocarya*, *C. lowellii* Danguy, reportedly has opposite leaves. The holotype (*Louvel 253*, P) consists of short, terminal twig fragments, none more than 4 cm long with one or two pairs of opposite or subopposite leaves. The flowers fit well in *Cryptocarya*, with nine 2-celled stamens and the inflorescences do not have bract scars at their base. The common name (*Longotra mena*) suggests *Aspidostemon*. Still, I prefer to treat this as an unusual (by its opposite or subopposite leaves) species of *Cryptocarya* and not as an unusual (by its nine stamens) species of *Aspidostemon*.

Capuron commented several times on his labels that the bark of *Aspidostemon* was platanoid or peeling in large, roundish patches. I have also noticed this in the field; one can recognize *Aspidostemon* easily by its bark which is soft and cheese-like.

The leaves of *Aspidostemon* species are not infrequently acuminate, with an acumen that is folded into a short tube, not flat. On opening a few of these inrolled apices I noticed egg-cases similar to those found in leaf domatia; epiphyllous hepatics were also found. Thus, it seems that these inrolled apices function as domatia and shelter mites that clean the leaves.

RELATIONSHIPS OF *ASPIDOSTEMON*

Kostermans (1957) obviously considered the species now placed in *Aspidostemon* as belonging to *Cryptocarya*. Rohwer & Richter (1987) rejected this idea; they noted the marked differences in wood anatomy between the two groups and thought that the similarity in fruit structure (in both *Aspidostemon* and *Cryptocarya* the fruit is enclosed in the enlarged hypanthium) might be a parallel development and not a signal of common ancestry. A representative of *Aspidostemon*, *A. andohabelense* Van der Werff, was included in

a recent generic classification of Lauraceae based on DNA sequence data (Chanderbali *et al.* 2001) and was found to be part of a strongly supported clade that also includes *Beilschmiedia*, *Potameia* Thouars, *Endiandra* R.Br. and *Cryptocarya*. The genera forming this clade share a unique paniculate inflorescence with the ultimate divisions that are not quite cymose; that is, the lateral flowers of what looks like a cyme are not strictly opposite, but tend to be subopposite, while in most genera of Lauraceae with paniculate inflorescences the lateral flowers in a cyme are strictly opposite (Van der Werff 2001). Most species of *Aspidostemon* have small, few-flowered inflorescences, but in a few species, such as *A. glandulosum* Rohwer, inflorescences are sufficiently large and branched that one can observe the inflorescence type is that found in the *Beilschmiedia* clade. Thus, it seems very likely that *Aspidostemon* is part of the *Beilschmiedia* clade and that, based on the presence of fruit included in the enlarged hypanthium, it is most closely related to *Cryptocarya*. The monotypic South African genus *Dahlgrenodendron* Van der Merwe & Van Dyk (Van der Merwe *et al.* 1988), which was not included in Chanderbali *et al.* (2001), probably also belongs to the *Beilschmiedia* clade. It has opposite leaves, 2-locellate anthers and a fruit enclosed in the hypanthium with persistent floral remains in common with *Aspidostemon*, but differs from the latter in having 9 stamens instead of 3 or 6 and in its flower shape which is very similar to that of *Cryptocarya*. *Dahlgrenodendron* has longitudinally striate pollen grains, a unique feature in the Lauraceae. Straka & Friedrich (1988) included two species of *Aspidostemon* (as *Cryptocarya perrieri* Danguy and *C. trianthera* Kosterm.; these collections are now placed in *A. caudatum* Rohwer and *A. longipedicellatum* Van der Werff) in their pollen study and found that both species had round, spinulose pollen grains. Richter & Van Wyk (1990) found that wood and bark anatomy of *Dahlgrenodendron* did not agree with that of other known genera, including *Aspidostemon*, and concluded that *Dahlgrenodendron* was an isolated genus for which they did not find close relationships. I follow Rohwer & Richter (1987) and Richter & Van Wyk (1990) and accept *Aspidostemon* as a distinct

genus largely defined by a floral character (number of stamens) and supported by vegetative characters (leaves opposite and wood anatomy).

Geographic coordinates indicated in square brackets were assigned *post facto* using available information on Malagasy place names and topographic maps, compiled as a gazetteer of botanical collecting localities in Madagascar (<http://www.mobot.org/MOBOT/research/madagascar/gazetteer>). The distribution of the *Aspidostemon* species is presented on maps showing the major bioclimatic zones of Madagascar (after Cornet 1974; see Schatz 2000).

SYSTEMATICS

Genus *Aspidostemon* Rohwer & Richter

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 71 (1987).

Cryptocarya subg. *Hexanthera* Kosterm., *Bulletin du Jardin botanique de l'État* 27: 174 (1957). — Type: not designated.

Cryptocarya subg. *Trianthera* Kosterm., *Bulletin du Jardin botanique de l'État* 27: 174 (1957). — Type: not designated.

TYPE. — *Aspidostemon perrieri* (Danguy) Rohwer.

DESCRIPTION

Trees. Leaves opposite, evenly distributed along the branches, pinnately veined, entire, domatia lacking. Inflorescences axillary, shorter than the leaves, usually few-flowered, paniculate or racemose, usually with scars of fallen bracts at the base. Flowers bisexual, small, to 4 mm in diameter, elongate, globose or depressed globose, white or light green, in a few species stamens red; tepals 6, in 2 series of 3, equal, erect, rarely spreading; stamens 3 or 6, representing the outer whorl or the 2 outer whorls, columnar or tepaloid, 2-locellate, the locelli introrse or apical, staminodia of whorl III conspicuous, columnar, often with the apex shield-like and enlarged, free or fused into a shield-like structure, 2 glands present at the base of staminodia of whorl III; staminodia of whorl IV small, stipitate or absent. Hypanthium

short or deep. Pistil slender, glabrous, immersed in the hypanthium. Fruit completely enclosed in the enlarged hypanthium, floral parts persistent on top of the fruit.

DISTRIBUTION AND HABITAT

A genus of 28 species, all endemic to Madagascar and restricted to wet forests from sea level to about 1000 m altitude.

KEY TO SPECIES OF *ASPIDOSTEMON* ROHWER & RICHTER

1. Flowers with 3 fertile stamens 2
- Flowers with 6 fertile stamens 17
2. Staminodes of whorl III apically papillose or pubescent 3
- Staminodes of whorl III apically smooth 7
3. Staminodes of whorl III fused into a shield-like plate with or without a raised center (umbonate) 4
- Staminodes of whorl III free; the center of flower not umbonate 6
4. Staminodes of whorl III apically pubescent 28. *A. trichandra*
- Staminodes of whorl III apically papillose 5
5. Flowers globose, 1-1.4 mm in diam.; terminal buds pubescent 9. *A. glandulosum*
- Flowers depressed globose, wider than long, 2-3 mm in diam.; center of the flower raised, umbonate; terminal buds glabrous 26. *A. synandra*
6. Locelli apical; fruits to 2.4 cm long, longitudinally ribbed 16. *A. lucens*
- Locelli introrse; fruits to 3.7 cm long, smooth 18. *A. manongarivense*
7. Inflorescences pubescent, the indument covering most of the surface 8
- Inflorescences glabrous or sparsely pubescent, clearly most of the surface visible 10
8. Flowers disc-shaped, much wider than long, 3-3.5 mm in diam.; leaves 4-6 cm wide 11. *A. humbertianum*
- Flowers globose or conical, 1.5-2.5 mm in diam.; leaves to 3 cm wide 9
9. Staminodia of whorl III free; leaf apices blunt or obtuse, flat 6. *A. conoideum*
- Staminodia of whorl III fused, shield-like; leaf apices acuminate, the acumen 4-8 mm long or the apices inrolled 2. *A. antongilense*
10. Terminal or vegetative buds appressed pubescent; locelli of the outer three stamens lateral; base of the staminodes of whorl III and the rim at the top of the perianth pubescent
..... 19. *A. masoalense*
- Terminal or vegetative buds glabrous or with a fringe of hairs; locelli introrse or apical; base of the staminodes of whorl III and perianth rim glabrous or pubescent in *A. andohabelense* 11
11. Tepals cucullate, thickened and bulging outwards, the flower seen from above 6-lobed 27. *A. trianthera*
- Tepals not or scarcely bulging outwards, the flower not appearing 6-lobed when seen from above 12
12. Flowers wider than long 13
- Flowers as wide as long or longer than wide 16

13. Locelli lateral, scarcely visible from above 1. *A. andohabelense*
 — Locelli apical, readily visible from above 14
14. Leaves chartaceous or papyraceous, dull above; reticulation on lower surface immersed ... 15
 — Leaves subcoriaceous, smooth and shiny above; reticulation weakly raised on lower surface
 20. *A. microphyllum*
15. Pedicels 4-5 mm long; outer tepals bulging at the the base 15. *A. longepedicellatum*
 — Pedicels 1-2 mm long; outer tepals similar in size and shape to the inner ones
 21. *A. occultum*
16. Inflorescences sparsely puberulous; staminodes of whorl III fused, shield-like
 4. *A. capuronii*
 — Inflorescences glabrous; staminodes of whorl III free 25. *A. reticulatum*
17. Inflorescences sparsely to rather densely pubescent 18
 — Inflorescences glabrous 25
18. Leaves 15-30 cm long; terminal buds pubescent; outside of tepals pubescent
 17. *A. macrophyllum*
 — Leaves less than 15 cm long or if occasionally exceeding 15 cm, then terminal buds and
 tepals glabrous 19
19. Flowers disc-shaped, wider than long; tepals glabrous 20
 — Flowers conical or globose, about as wide as long; staminodes of whorl III free, columnar,
 somewhat widened towards the tip; tepals glabrous or pubescent 22
20. Leaves 12-20 cm long; inflorescences 3-7 cm long 13. *A. insigne*
 — Leaves less than 12 cm long; inflorescences *c.* 1.5 cm long 21
21. Terminal or vegetative buds pubescent; locelli apical, readily seen 8. *A. fungiforme*
 — Terminal or vegetative buds with a fringe of hairs, otherwise glabrous; locelli apical-lateral,
 small, difficult to see 1. *A. andohabelense*
22. Staminodes III apically densely papillose 18. *A. manongarivense*
 — Staminodes III apically smooth 23
23. Flowers and pedicels glabrous or nearly so; leaves elliptic to broadly elliptic
 14. *A. litorale*
 — Flowers and pedicels pubescent; leaves oblong to elliptic 24
24. Terminal or vegetative buds glabrous; leaves coriaceous, the reticulation raised on the lower
 leaf surface; inflorescences with short, erect, reddish hairs, the surface partially visible ...
 7. *A. dolichocarpum*
 — Terminal or vegetative buds densely pubescent; leaves (firmly) chartaceous, the reticula-
 tion immersed on the lower leaf surface; inflorescences densely pubescent, the indument
 consisting of brown, ascending hairs 10. *A. grayi*
25. Leaves to 6.5 cm long, the tip obtuse or emarginate; tepals and stamens spreading at an-
 thesis; fertile stamens with a short filament 22. *A. parvifolium*
 — Leaves longer or if 5-7 cm long, the tip acuminate or apiculate, not obtuse; tepals and
 stamens erect at anthesis, not spreading; stamens sessile, without a short filament 26

26. Stamines of whorl III fused of nearly so, the apices flattened and forming a shield-like cover over the center of the flower 27
 — Stamines of whorl III free, not forming a shield-like cover over the center of the flower 28
27. Leaves coriaceous, the tip bluntly acuminate, flat; stamens and staminodia III papillose 23. *A. percoriaceum*
 — Leaves papyraceous, the tip sharply acuminate, inrolled; stamens and staminodia III smooth 21. *A. occultum*
28. Leaf apices acuminate; acumens 5-15 mm long 29
 — Leaf apices bluntly acute or apiculate 31
29. Leaves papyraceous; locelli apical 21. *A. occultum*
 — Leaves firmly chartaceous or coriaceous; locelli introrse 30
30. Acumen *c.* 5 mm long; leaves often drying conduplicate 24. *A. perrieri*
 — Acumen 10-15 mm long; leaves drying flat 5. *A. caudatum*
31. Tertiary venation on lower leaf surface immersed; leaves drying flat 32
 — Tertiary venation on lower leaf surface raised; leaves often drying conduplicate 24. *A. perrieri*
32. Leaf apices apiculate; leaves slightly obovate; stamens and staminodia pubescent near the base 3. *A. apiculatum*
 — Leaf apices bluntly acute; leaves elliptic to narrowly elliptic; stamens and staminodia glabrous 12. *A. inconspicuum*

1. *Aspidostemon andohabelense*

Van der Werff, sp. nov.

(Figs 1A; 2A)

Aspidostemoni microphylo simile, sed foliis majoribus, tenuioribus et locellis minutis distinguenda; A. trianthera tepalis non incrassatis, floribus latioribus quam longioribus differt.

TYPUS. — **Madagascar.** Prov. Toliara, Andohahela, Réserve intégrale 11, 24°45'S, 46°51'E, 250-500 m, 17-20.X.1992, fl., Van der Werff, Malcomber, Gray & Rapanarivo 12748 (holo-, MO; iso-, B, BR, HBG, K, L, LE, MO, NY, P, PRE, QRS, TAN, TI, US).

PARATYPES. — **Madagascar.** Ifarantsa, [24°53'S, 46°52'E], bud, Réserves Naturelles 8182 (P). — Col du Maningotry, route d'Ifarantsa à Ranomafana, [24°53'S, 46°52'E], fl., Service Forestier 8512 (MO, P, TEF). — Col du Maningotry, Isaka-Ivondro, Ifarantsa, [24°53'S, 46°52'E], fl., Service Forestier 14161 (P, TEF). — Toliara, Andohahela, Réserve intégrale 11, 24°45'S, 46°51'E, Van der Werff et al. 12737 (BR, CAS, G, HBG, KUN, K, L, LE, MO, P, PRE, QRS, US). — *Idem*, fl., Van der Werff et al. 12738 (HBG, MO, P, QRS, TAN).

DESCRIPTION

Trees, to 10 m. Twigs terete, glabrous or with a few appressed hairs near the tip, lenticellate; terminal buds with a fringe of hairs. Leaves opposite, 6-9 × 2-3 cm, glabrous, thinly chartaceous, the base acute, apex acuminate, acumen 4-8 mm long, margin flat, reticulation immersed on the upper surface, weakly raised on the lower surface, lateral veins 8-10, petioles 4-6 mm long, canaliculate. Inflorescences to 1.5 cm long, with a few scattered, appressed hairs, pedicels 2 mm long. Flowers 3 mm in diam., 2 mm long, glabrous, disc-shaped, tepals wider than long, erect to incurved; stamens 6, their tips peltately expanded, locelli apical-lateral, minute; staminodia III with the tips greatly enlarged, fused, forming a shield-like structure; filaments of stamens and staminodia pubescent with red, curly hairs. Fruits unknown.

REMARKS

Aspidostemon andohabelense is best recognized by its rather thin leaves, presence of 6 (or 3, see

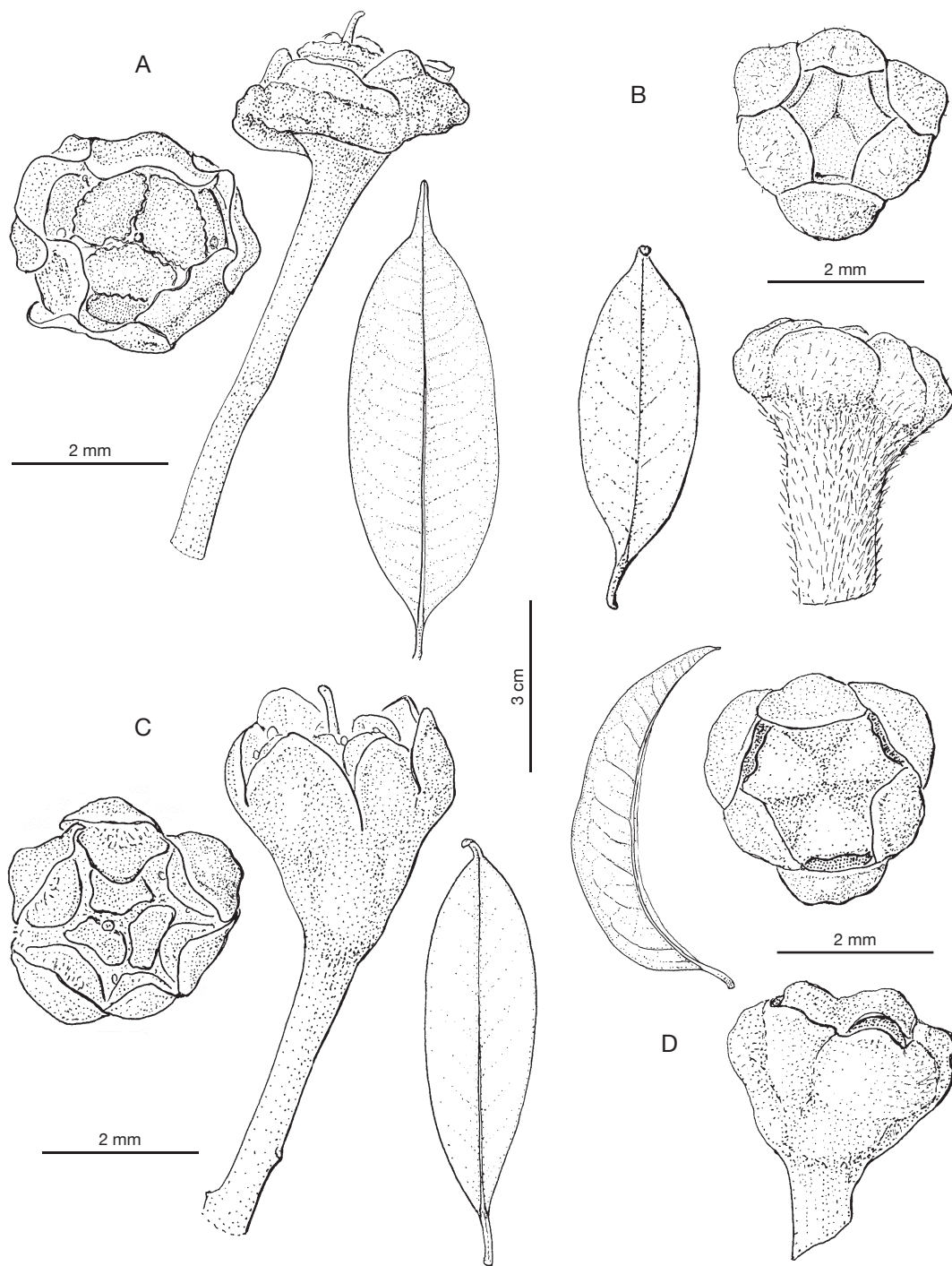


FIG. 1. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. andohahelense* Van der Werff; **B**, *A. antongilense* Van der Werff; **C**, *A. apiculatum* Van der Werff; **D**, *A. capuronii* Van der Werff. A, Van der Werff et al. 12748, MO; B, Service Forestier 18319, MO; C, Service Forestier 15325, MO; D, Service Forestier 28458, MO.

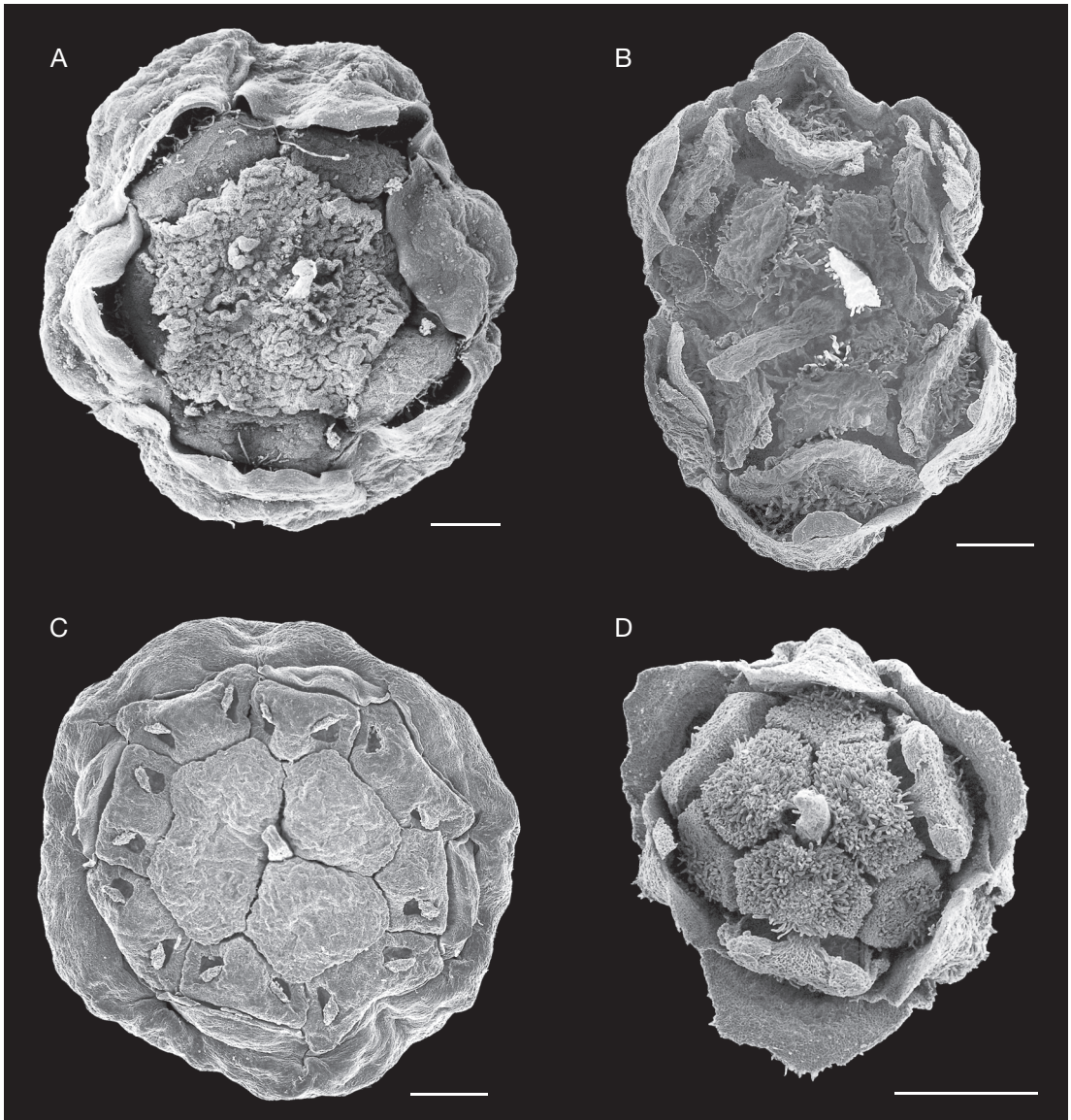


FIG. 2. — Scanning electron microscope images of *Aspidostemon* Rohwer & Richter: **A**, *A. andohahelense* Van der Werff; **B**, *A. apiculatum* Van der Werff; **C**, *A. fungiforme* Van der Werff; **D**, *A. glandulosum* Rohwer. A, Van der Werff *et al.* 12748, MO; B, Service Forestier 18319, MO; C, Schatz *et al.* 3804, MO; D, Service Forestier 16534, MO. Scale bars: 0.5 mm.

below) stamens with small, apical locelli and the scattered hairs on the inflorescence; it is close to *A. microphyllum*; differences between the two species are discussed under *A. microphyllum*. It is only known from the SE of Madagascar (Fig. 3).

The three collections made by Van der Werff *et al.* were found along the same trail, growing not far apart and are vegetatively very similar – same leaf shape, leaf texture, scattered hairs on the inflorescence. However, two of those have mostly

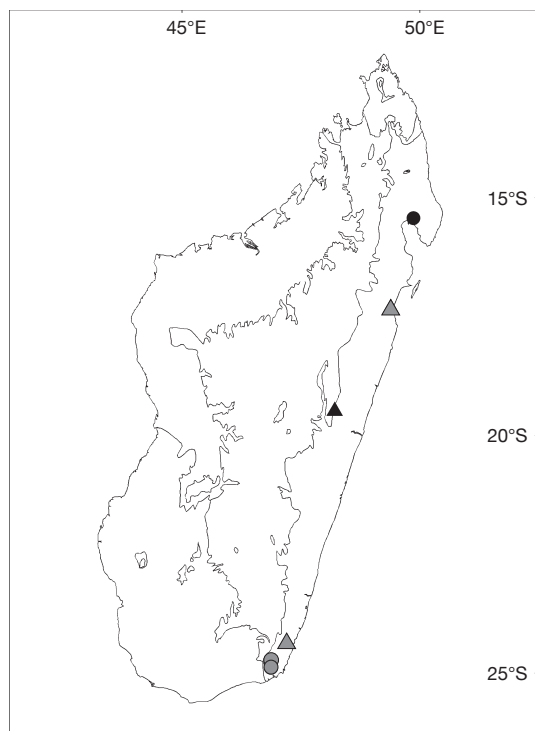


FIG. 3. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: ●, *A. andohahelense* Van der Werff; ●, *A. antongilense* Van der Werff; ▲, *A. apiculatum* Van der Werff; ▲, *A. capuronii* Van der Werff.

flowers with 3 stamens, while one, the type of *A. andohahelense*, has flowers with 6 stamens. The simplest explanation for this is that this species has 6 stamens, but that in young flowers only the outer three open, while in mature flowers all 6 stamens are open. The alternative, regarding the collection with 6 stamens as a different species from the one with 3 stamens, overlooks the very strong vegetative similarity between these specimens. See also comments under *A. occultum* and *A. manongarivense*.

A paratype of *A. andohahelense* was cited by Kostermans as a paratype of *A. trianthera*. As accepted here, *A. trianthera* has strongly thickened tepals, which give the flowers a 6-lobed appearance.

ALTITUDINAL DISTRIBUTION
200-500 m.

PHENOLOGY

Flowers: August, September, October.

VERNACULAR NAMES

Oviary, Hazomasina, Sagna.

2. *Aspidostemon antongilense*

Van der Werff, sp. nov.

(Fig. 1B)

A. congeneris inflorescentiis pubescentibus et floribus late infundibularibus parvis staminibus tribus praeditis, foliis acuminatis recedit.

TYPUS. — Madagascar. Massif de Farankaraina, entre Navana et Andranofotsy, [15°23'S, 49°51'30"E], 0-150 m, 18.XI.1957, fl., *Service Forestier 18319* (holo-, P; iso-, MO, TEF).

PARATYPES. — Madagascar. Sambava, [14°16'S, 50°11'E], bud, *Réserves Naturelles 9077* (MO, P, TEF).

DESCRIPTION

Large tree. Twigs terete, glabrous; terminal buds not seen. Leaves opposite, 5-8 × 1.8-2.5 cm, glabrous, elliptic to narrowly elliptic, the base acute, the apex acuminate with the tip of the acumen not straightened out, but remaining rolled up, the acumen 4-8 mm long, margin flat; reticulation faintly raised on both surfaces, lateral veins poorly visible, 5-8 pairs; petioles 5-8 mm, shallowly canaliculate. Inflorescences to 2.5 cm long, appressed pubescent, more densely so towards the flowers, pedicels short, 1-2 mm long. Flowers broadly funnel-shaped, c. 2.5 mm in diam., 1.5 mm long, tepals erect, broader than long, with some scattered hairs, stamens 3, locelli introrse, with only the flaps visible, staminodes of whorl II tightly appressed against those of whorl III, staminodes of whorl III apically flattened, fused or nearly so and forming a shield-like cover in the center of the flower. Base of stamens glabrous. Fruits unknown.

REMARKS

Aspidostemon antongilense differs from the other species with 3 stamens and pubescent inflorescences in its acuminate leaves, and small flowers which are a little wider than long. The acumen of

the leaves never completely unfolds, and the tip remains a thickened knob. Such leaf tips however are present in other species of *Aspidostemon* as well. The inflorescences of this species are widely branched, like in *A. glandulosum*, but carry fewer flowers than in that species. The second collection differs from the type in having a shorter acumen, but it has a similar pubescent inflorescence and similarly shaped flowers. It is in bud, so its identification is tentative. No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

0-150 m.

PHENOLOGY

Flowers: September.

ETYMOLOGY

This species is named after its type locality at the Baie d'Antogil (Fig. 3).

3. *Aspidostemon apiculatum*

Van der Werff, sp. nov.

(Figs 1C; 2B)

A congeneris foliis coriaceis, apiculatis, floribus staminibus sex, staminodiis libris recedit.

TYPUS. — Madagascar. Tampolo, Fenerive, [17°17'S, 49°23'30"E], 27.XII.1955, fl., *Service Forestier 15325* (holo-, P; iso-, HBG, MO, P, TEF).

PARATYPES. — Madagascar. Tampolo, Fenerive [17°17'S, 49°23'30"E], fr., *Service Forestier 15907* (MO, P, TEF). — Massif forestier de Tsingafy, au N de Fort-Dauphin, [24°28'S, 49°12'E], fl., *Service Forestier 28694* (P).

DESCRIPTION

Tree, 14 m. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 6-8.5 × 2-2.5 cm, glabrous, coriaceous, elliptic or obovate-elliptic, the base acute, the apex acute, obtuse or emarginate, apiculate, the tip often folded into a short tube, margin flat, reticulation immersed on both surfaces; lateral veins scarcely or not visible; petioles 5-10 mm long, canaliculate. Inflorescences 3-5 cm long, paniculate, glabrous, pedicels 3 mm long.

Flowers cup-shaped, 3 mm in diam., 2 mm long, the pedicel gradually widened into the flower, tepals 1 mm long, about as long as wide, erect, stamens 6, tepaloid, locelli introrse, stamens pubescent in their basal half, staminodia III with a peltate apex, free, pubescent as the stamens; staminodia IV stipitiform, densely hairy and easily mistaken for a tuft of hairs; upper rim of the hypanthium pubescent; pistil and inner surface of the receptacle glabrous. Fruits ellipsoid, 2.5 × 1.2 cm, wrinkled, the floral remnants persisting on top.

REMARKS

Aspidostemon apiculatum is best recognized by its coriaceous, apiculate leaves, the tip of the leaves often folded into a short tube, its flowers with 6 stamens, for the genus densely pubescent inside and the free staminodia. It is known from three collections, two from Tampolo, the third much further south, near Fort-Dauphin (Fig. 3).

ALTITUDINAL DISTRIBUTION

0-50 m.

PHENOLOGY

Flowers: December; fruits: June.

VERNACULAR NAME

Tapiky mavo.

4. *Aspidostemon capuronii*

Van der Werff, sp. nov.

(Fig. 1D)

A congeneris floribus subsessilibus, inflorescentiis sparse puberulis, staminibus tribus et staminodiis connatis distinguenda.

TYPUS. — Madagascar. Antanandava, P.K. 45 de la route Moramanga-Anosibe, [19°26'S, 48°12'E], XI.1968, fl., *Service Forestier 28458* (holo-, P; iso-, HBG, MO, P, TEF).

PARATYPES. — Madagascar. Ankazomanitra, Anosibe, Moramanga, [19°26'S, 48°12'E], fl., *Service Forestier 26825* (MO, P, TEF). — Antanandava, km 45 of the road Moramanga-Anosibe, [19°26'S, 48°12'E], fl., *Service Forestier 28397* (HBG, K, MO, P, TEF). — Without locality, fl., *coll. unknown 29* (MO, P).

DESCRIPTION

Trees, to 20 m or more. Twigs terete, glabrous, lenticellate; terminal buds glabrous. Leaves opposite, coriaceous or firmly chartaceous, often conduplicate, glabrous, elliptic, 8-12 × 3-4 cm, the base and apex acute, margin thickened, cartilaginous, reticulation immersed on the upper surface, weakly raised on the lower surface; petioles 5-8 mm long, canaliculate. Inflorescences 2-3.5 cm long, paniculate, sparsely puberulous, pedicels *c.* 1 mm long. Flowers 3 mm wide, 2.5-3 mm long, glabrous, gradually widened from the base, somewhat triangular when seen from above, tepals about as long as wide, not bulging, stamens 3, petaloid, the locelli introrse, staminodia II tightly pressed against staminodia III and covered by the tepals; staminodia III glabrous, with peltate apices, fused, forming a shield-like structure in the center of the flower; pistil and receptacle glabrous. Fruits unknown.

REMARKS

Aspidostemon capuronii is best recognized by its sessile flowers, sparsely puberulous inflorescences, flowers with 3 stamens, fused staminodia and introrse locelli. One of the collections placed here has less coriaceous, non conduplicate leaves, but it agrees in other characters with the type collection. The flowers are gradually widened from the pedicel upwards, the tepals forming a smooth continuation of the expanded hypanthium, giving the flower, when seen from the side, a conical appearance. Altitudinal distribution is not mentioned on the labels. It is apparently restricted to the East-Central slope (Fig. 3).

PHENOLOGY

Flowers: November.

VERNACULAR NAMES

Longotramavokely, longotra fotsy.

5. *Aspidostemon caudatum* Rohwer
(Fig. 4A)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 74 (1987). — Type: Madagascar, forêt littorale orientale, Tampina, [18°31'S, 49°17'E],

without date, fl., *Perrier de la Bathie 14919* (holo-, P; iso-, MO, P).

DESCRIPTION

Very large tree. Twigs terete, glabrous, terminal buds glabrous. Leaves opposite, 8-12 × 2.5-3 cm, elliptic, glabrous, chartaceous, the base acute, apex acuminate, the acumen to 1.5 cm long, margin flat, reticulation immersed on the both surfaces; lateral veins poorly differentiated; petioles 5-8 mm, canaliculate. Inflorescences 1.5-3 cm long, paniculate, glabrous; pedicels 1.5 mm long. Flowers 2.5-3 mm in diameter, depressed globose, tepals glabrous, a little longer than wide, erect; stamens 6, glabrous, tepaloid, locelli large, introrse; locelli of stamens of whorl II smaller than those of whorl I, staminodia III with a peltate apex, free, with 2 glands at the base; top of the hypanthium with some hairs; staminodia IV small, stipitate. Pistil glabrous. Fruits not known.

REMARKS

Aspidostemon caudatum is readily recognized by its long-acuminate leaves, presence of 6 stamens and the free staminodia III. It is only known from the type collection (Fig. 5) made in coastal forest along the east coast.

PHENOLOGY

Flowers: November.

VERNACULAR NAME

Longotra.

6. *Aspidostemon conoideum*

Van der Werff, sp. nov.
(Fig. 4B)

A congeneris staminibus tribus, staminodiis liberis inflorescentiis pubescentibus recedit.

TYPUS. — Madagascar. Toamasina, Ambotavy, 18°51'S, 48°18'E, 1000 m, 3.III.1997, fl., *Rakotomalaza et al. 1203* (holo-, MO; iso-, P).

DESCRIPTION

Tree, 16 m. Twigs terete, appressed pubescent, becoming glabrous with age; terminal buds appressed

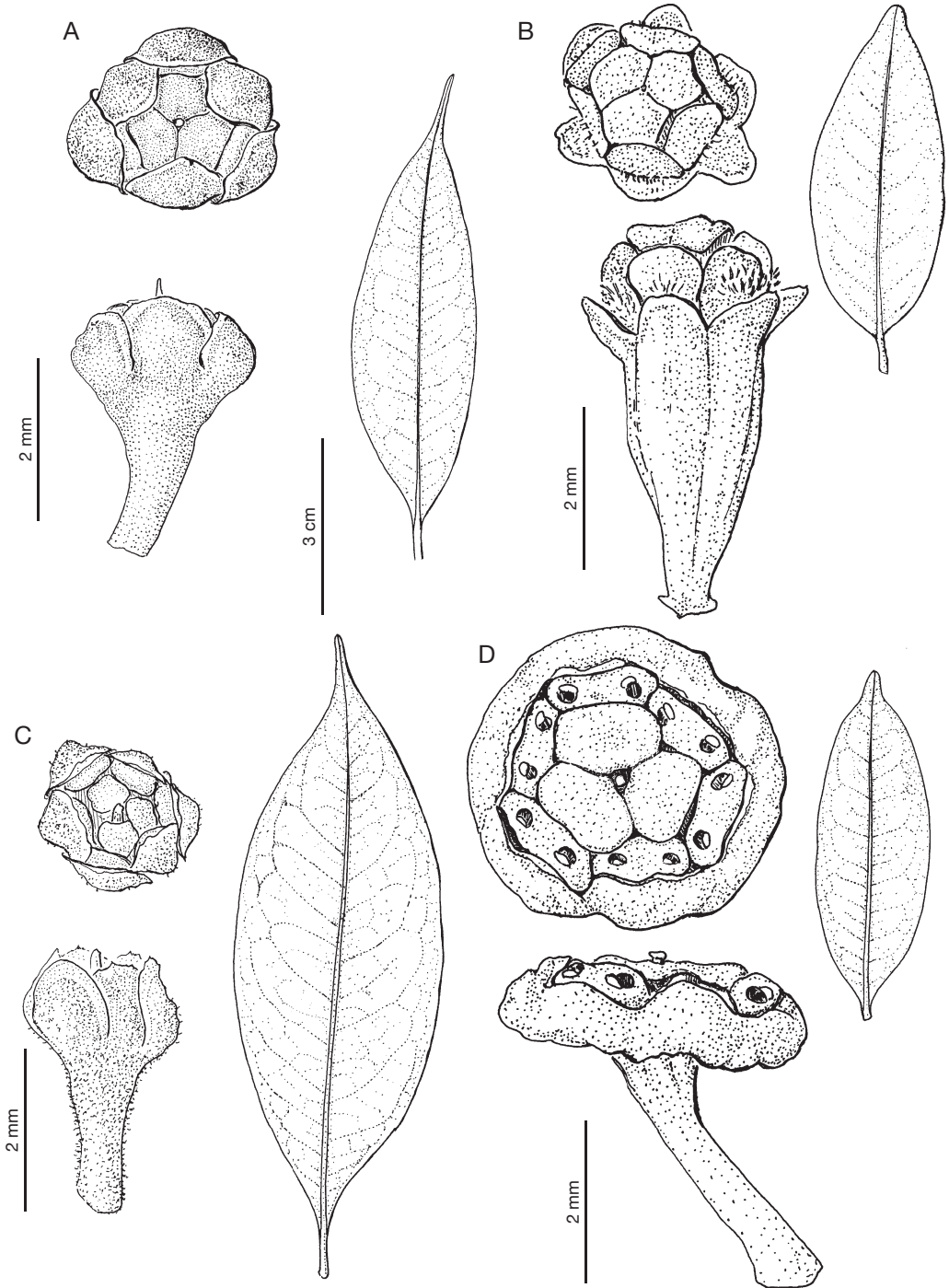


FIG. 4. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. caudatum* Rohwer; **B**, *A. conoideum* Van der Werff; **C**, *A. dolichocarpum* (Kosterm.) Rohwer; **D**, *A. fungiforme* Van der Werff. A, Perrier de la Bathie 14919, MO; B, Rakotomalaza 1203, MO; C, Réserves Naturelles 3261, MO; D, Schatz et al. 3804, MO.

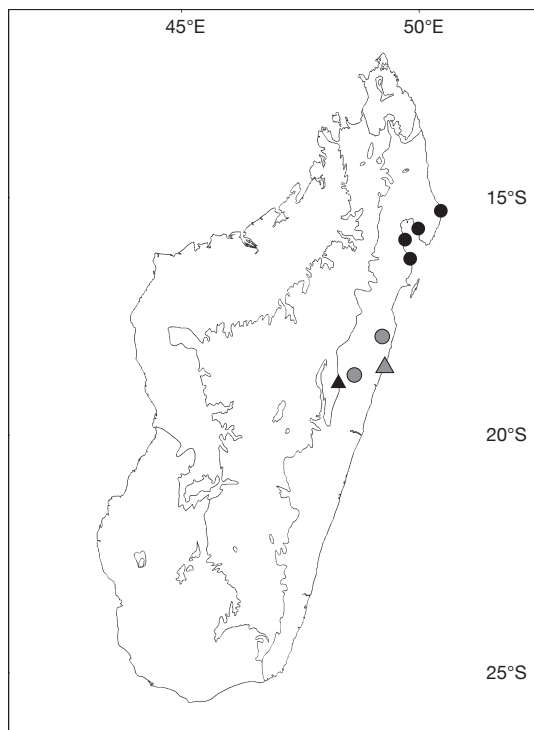


FIG. 5. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: ▲, *A. caudatum* Rohwer; ▲, *A. conoideum* Van der Werff; ●, *A. dolichocarpum* (Kosterm.) Rohwer; ●, *A. fungiforme* Van der Werff.

pubescent. Leaves opposite, 5-7 × 1.5-2.5 cm, elliptic to broadly elliptic, coriaceous, with some appressed hairs on the lower surface when young, becoming soon glabrous, the base acute or obtuse, the apex blunt, often with a small point, or emarginate, the margin flat, cartilaginous, reticulation immersed on the upper surface, slightly raised on the lower surface, lateral veins 6-8; petioles 4-6 mm long, shallowly canalicate. Inflorescences to 1 cm long, appressed pubescent, with less than 10 flowers, pedicels lacking and flowers sessile. Flowers 2 mm in diameter, 4 mm long, narrowly conical, glabrous, green, tepals much shorter than the hypanthium, about as wide as long, erect; stamens 3, a little thicker than tepaloid, the cells lateral-introrse, small, staminodia II pressed against the inner staminodia, tepaloid; stamens and staminodia II dorsally pubescent, the pubescence largely hidden by the tepals; staminodia

III with a peltate apex, free, the columnar filament rather densely pubescent; staminodia IV not seen; upper rim of the receptacle densely pubescent. Fruits unknown.

REMARKS

Aspidostemon conoideum is easily recognized by its flower shape, its pubescent twigs, terminal buds and inflorescences. It is the only species with pubescent twigs and flowers with 3 stamens and free staminodia III. Its leaves are, for the genus, relatively short and wide. It is solely known from the type collection (Fig. 5), which has few flowers. However, its vegetative features are so distinctive that a description seems warranted. No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

1000 m.

PHENOLOGY

Flowers: March.

7. *Aspidostemon dolichocarpum* (Kosterm.) Rohwer (Fig. 4C)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 74 (1987). — *Cryptocarya dolichocarpa* Kosterm., *Bulletin du Jardin botanique de l'État* 27: 177 (1957). — Type: Madagascar, Réserve naturelle 1, Tamatave, [17°55'S, 49°13'E], 14.XI.1951, fr., *Réserves Naturelles 3262* (holo-, P; iso- BO, P, TEF).

MATERIAL EXAMINED. — Madagascar. Réserve naturelle 1, Tamatave, [17°55'S, 49°13'E], fr. buds, *Réserves Naturelles 3261* (P, TEF). — *Idem*, *Réserves Naturelles 3262* (P, TEF). — Brickaville, [18°44'S, 48°38'E], fl., *Service Forestier 12280* (MO, P, TEF).

DESCRIPTION

Tree of unknown size. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 9.5-14 × 3-5 cm, coriaceous, elliptic to elliptic-oblong, glabrous, the base acute, apex acuminate, acumen to 1 cm long, margin flat, the upper surface shiny, reticulation immersed on the upper surface, raised on the lower surface; lateral veins 8-11, poorly visible; petioles 6-

8 mm long, flat above. Inflorescences to 5 cm long, moderately and minutely pubescent, the hairs erect, reddish; pedicels 1-2 mm long. Flowers 2 mm in diameter, globose, below the tepals gradually narrowed into the pedicel, tepals pubescent, about as wide as long, *c.* 1 mm long, stamens 6, petaloid, glabrous, the locelli introrse, large; staminodia III columnar, with a flattened apex, free, at the base with 2 large, globose glands and a few hairs. Staminodia IV not seen. Fruits 4 × 2 cm, ellipsoid to oblong, smooth or with some faint longitudinal ribs, the petals persisting on top of the fruit.

REMARKS

Aspidostemon dolichocarpum can be recognized by the combination of 6 stamens, and puberulous inflorescences and flowers. Its leaves are rather large and coriaceous, shiny on the upper surface and with raised reticulation on the lower surface. It can be confused with *Aspidostemon grayi*, but the latter species has pubescent terminal buds, and narrower, chartaceous leaves with the reticulation immersed on the lower leaf surface. The inflorescences of *A. grayi* are covered with a brown, ascending indument, whereas inflorescences of *A. dolichocarpum* have a sparser indument consisting of short, erect, reddish hairs. The few flowers of *A. dolichocarpum* are not fully mature; their locelli are not yet opened and the known flowers may well be smaller than fully mature flowers. Staminodia IV were not seen in the dissected flower. This may be due to their absence or due to the fact that in the immature flowers the staminodia were still covered by and pressed against the staminodia III. In the similar *A. grayi* staminodia IV are present and can be readily seen. Kostermans (1957) listed as type collection *Service Forestier 3262*, however, the holotype designated by him, with the original label, is *Réserves Naturelles 3262*. Label data suggest that this species occurs at low altitudes (Fig. 5), but no exact altitudinal data are included on the labels.

PHENOLOGY

Flowers: October; fruits: November.

VERNACULAR NAMES

Longotra, Longotra mena.

8. *Aspidostemon fungiforme*

Van der Werff, sp. nov.

(Figs 2C; 4D)

A. congeneris staminibus sex, floribus fungiformibus inflorescentiis puberulis recedit.

TYPUS. — **Madagascar.** Antsiranana, disturbed vegetation, *c.* 1.5 km W of Cap Est, 15°16'S, 50°27'E, 35 m, 24.I.1999, fl., *Schatz, Lowry, Rabenantoandro & Bernard 3804* (holo-, MO; iso-, P, TEF).

PARATYPES. — **Madagascar.** Falaises maritimes au Nord de la Fananehana, [15°53'S, 49°42'E], bud, *Service Forestier 18226* (MO, P). — Ivontaka, au S de Mananara, [16°17'S, 49°49'E], fl., *Service Forestier 22833* (MO, P, TEF). — Masoala Peninsula, near Ambizana, coastal trail, [15°38'S, 49°58'E], fl., *Van der Werff et al. 12765* (BR, CAS, G, HBG, K, L, LE, MO, P, PRE, TAN, TI, US).

DESCRIPTION

Trees, to 15 m. Twigs terete, glabrous, lenticellate; terminal buds appressed pubescent. Leaves opposite, 5.5-12 × 1.8-4 cm, glabrous, elliptic, chartaceous, the base acute, the apex acuminate, acumen to 6 mm long, blunt or the acumen not fully expanded, the margin flat, reticulation immersed on the upper surface, weakly raised on lower surface, lateral veins difficult to discern, petioles *c.* 5 mm long, canalliculate. Inflorescences *c.* 1.5 cm long, sparsely to moderately appressed pubescent; pedicels 3-5 mm long. Flowers cream, 3-4 mm in diam., 1-1.5 mm long, mushroom-shaped, with a slender pedicel and a flat cap, the tepals reduced to short, broad lobes; stamens 6, the tips flat, very wide, touching each other and forming a ring outside the staminodia III, locelli apical, staminodia 3 with greatly expanded tips, forming a shield-like structure in the center of the flower, fused or tightly pressed against each other; staminodia IV not seen; receptacle shallow, glabrous inside. Fruits not known.

REMARKS

Aspidostemon fungiforme is characterized by the combination of 6 stamens with apical locelli, staminodia III with greatly expanded tips, forming a shield in the center of the flower, pubescent terminal buds and sparsely or moderately pubescent inflorescences. The type collection has less densely

pubescent inflorescences than the other collections and there is also some variation in leaf size and texture. However, the similarities seem to outweigh the differences. One collection, *Van der Werff et al.* 12765, has many galled flowers, which appear globose, 4 mm or more in diameter, with a small crown of tepals, often somewhat asymmetrical. A few normal flowers with the typical mushroom shape, 6 stamens, enlarged staminodia III and pubescent terminal buds allow identification. Occasionally a flower with 8 tepals and 8 stamens is found (Fig. 2C). This species is only known from the NE coastal areas (Fig. 5). Vernacular names have not been recorded.

ALTITUDINAL DISTRIBUTION

10-50 m.

PHENOLOGY

Flowers: October, November, January.

9. *Aspidostemon glandulosum* Rohwer (Figs 2D; 6A)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 75 (1987). — Type: Madagascar, Andranofotsy, Maroantsetra, [15°26'S, 49°48'E], 2.II.1957, fl., *Service Forestier 16534* (holo-, P; iso-, HBG, K, MO, P, TEF).

MATERIAL EXAMINED. — **Madagascar.** Andilambe, Maroantsetra, ster., *Service Forestier 4-R-58* (P, TEF). — Jardin botanique de Farankaraina, Maroantsetra, ster., *Service Forestier 37-R-139* (P, TEF). — Farankaraina, Maroantsetra, ster., *Service Forestier 10937* (MO, P). — Farankaraina, Andranofotsy, Maroantsetra, fl., *Service Forestier 16534* (P, TEF). — Tampolo, Fenerive, [17°17'S, 49°23'E], fl., *Service Forestier 16642* (MO, P, TEF). — Ambanizana, Masoala Peninsula, fr., *Vasey & Velo 219* (MO, P); *Vasey & Velo 263* (MO, P); *Vasey & Velo 387* (MO, P).

DESCRIPTION

Trees, to 15 m. Twigs terete to angular, initially moderately or sparsely appressed pubescent, becoming glabrous with age; terminal buds appressed pubescent. Leaves opposite, 6-12 × 1.5-3 cm, lanceolate or narrowly elliptic, the upper surface glabrous, the lower surface sparsely appressed pubescent, especially along the midrib; the base attenuate, apex

acute or obtuse, sometimes mucronate, margin flat, both surfaces mat or the upper surface with a little luster, reticulation immersed or nearly so; lateral veins scarcely distinguishable; petioles 6-8 mm long, canaliculate. Inflorescences 2-4 cm long, appressed pubescent, many-flowered, pedicels c. 1 mm long. Flowers 1-1.4 mm in diam., more or less globose, tepals glabrous, c. 1 mm long, about as wide as long, slightly longer than the hypanthium; stamens 3, petaloid, the locelli introrse, opening towards the tips of the anthers with only the flaps showing in open flowers; staminodia of whorl II covered by the tepals at anthesis and not visible; staminodia of whorl III tightly pressed together, papillose and forming a dome-shaped mass in the center of the flower; pistil and inside of the receptacle glabrous; the rim on top of the hypanthium, where tepals and stamens are inserted, with curly, reddish hairs. Fruits ellipsoid, 3 × 1.5 cm, smooth.

REMARKS

Aspidostemon glandulosum is a very distinct species due to its rather large, many-flowered inflorescences with small, globose flowers. The staminodia are distinctly papillose and dome-shaped, another useful character. It is known from four collections, the type, a flowering collection from Tampolo and two fruiting collections from Ambanizana on the Masoala Peninsula (Fig. 8). The specimen from Tampolo differs from the type in having glaucous pedicels and flowers, with the pedicels less pubescent than the type. In all other characters it agrees very well with the type. The fruiting collections are identified based on leaf shape and pubescent terminal buds. Kostermans annotated both flowering collections as *Beilschmiedia pachysandra* Kostermans, a name which has remained unpublished. Three sterile collections are provisionally placed here based on their leaf shape and pubescent terminal buds.

The two flowering collections come from lowland sites, one from red soil, the other from sandy soil, but without indication of altitude. The fruiting collections were made near the coast, 110-260 m altitude.

ALTITUDINAL DISTRIBUTION

110-260 m.

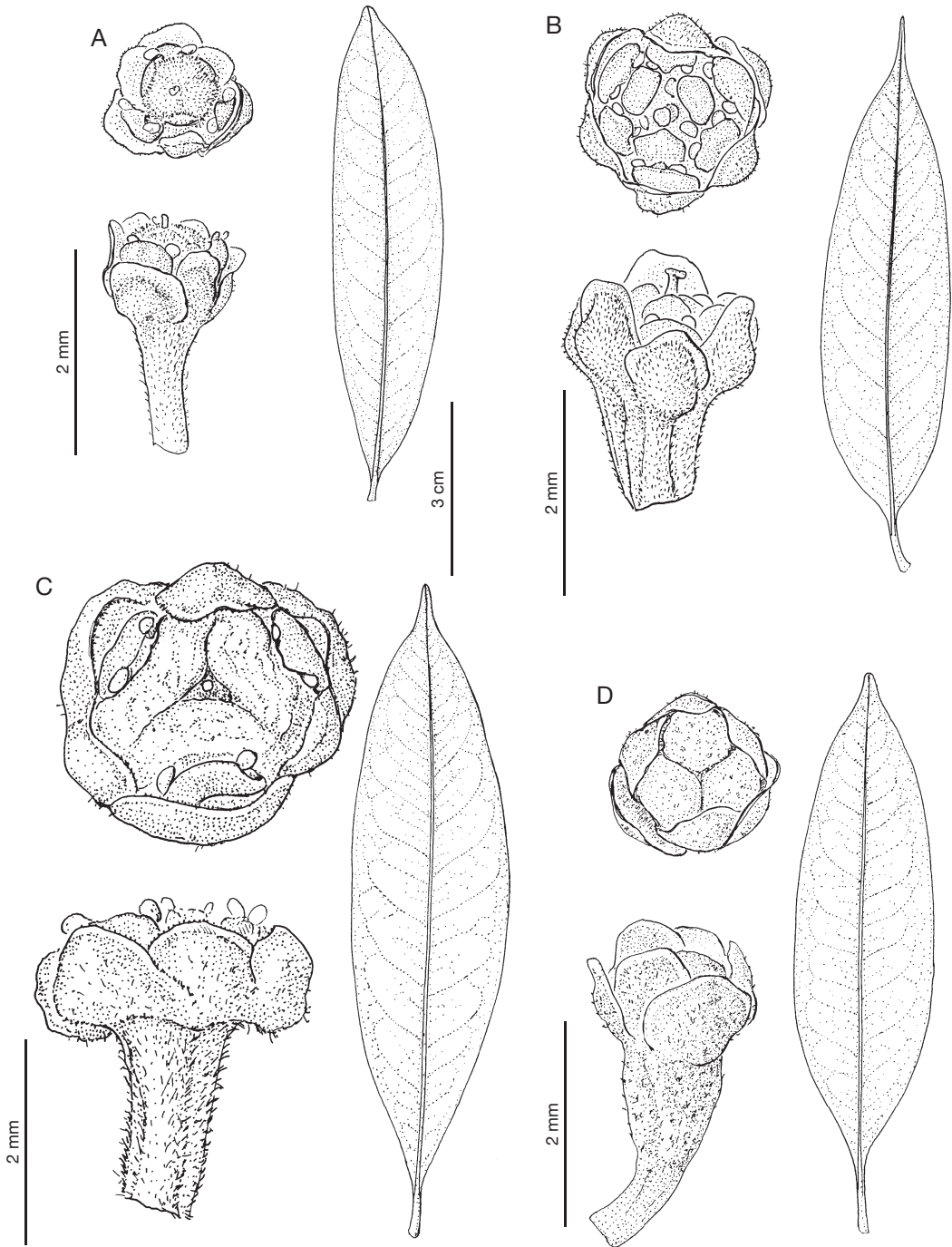


FIG. 6. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. glandulosum* Rohwer; **B**, *A. grayi* Van der Werff; **C**, *A. humbertianum* (Kosterm.) Rohwer; **D**, *A. inconspicuum* Rohwer. A, Service Forestier 16534, MO; B, Van der Werff et al. 12747, MO; C, Turk & Randsianasolo 583, MO; D, Service Forestier 12355, P.

PHENOLOGY

Flowers: February, March; fruits: December.

VERNACULAR NAMES

Longotramena (for the type), Tapika.

10. *Aspidostemon grayi* Van der Werff, sp. nov.
(Figs 6B; 7A)

Aspidostemoni dolichocarpo simile, sed gemmis terminalibus pubescentibus, foliis tenuioribus reticulatione immersa recedit.

TYPUS. — Madagascar. Toliara, Andohahela, Réserve intégrale 11, 24°45'S, 46°51'E, 250-500 m, 17-20.X.1992, fl., Van der Werff, Malcomber, Gray & Rapanarivo 12747 (holo-, MO; iso-, HBG, K, P, QRS, TAN).

DESCRIPTION

Tree, 35 m. Twigs terete, glabrous, lenticellate, very young shoots densely pubescent; terminal buds densely pubescent. Leaves opposite, 9-13 × 2-3 cm, chartaceous to firmly chartaceous, glabrous, narrowly elliptic, the base acute to attenuate, apex acuminate, acumen to 1 cm long, the very tip not fully expanded, margin flat, reticulation immersed on both surfaces, lateral veins faintly visible and not possible to count accurately; petioles 8-12 mm long, flat above. Inflorescences 2-4 cm long, paniculate, densely tomentellous, the surface completely covered by the pubescence; pedicels 1-1.5 mm long, pubescent. Flowers 2 mm in diameter, more or less globose, gradually narrowed into the pedicel, tepals dark yellow tinged with red at the margin, stamens crimson red; tepals pubescent, about as long as wide, 1 mm long, erect; stamens 6, petaloid, the locelli large, introrse, staminodia III columnar, with a flattened apex, glabrous, free, at the base with 2 large glands and some curled hairs, staminodia IV stipitiform, pubescent, shorter than the staminodia III and covered by them, the tip acute; receptacle and pistil glabrous. Fruits unknown.

REMARKS

Aspidostemon grayi is similar to *A. dolichocarpum* and differences between the two species are discussed under the latter. *Aspidostemon grayi* is only known

from the type collection (Fig. 8); it is a large tree, 35 m tall and with a dbh of 130 cm. No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

250-500 m.

PHENOLOGY

Flowers: October.

ETYMOLOGY

It is a pleasure to name this species after Bruce Gray, who found the tree and who is uncommonly skilful in spotting Lauraceae.

11. *Aspidostemon humbertianum*
(Kosterm.) Rohwer
(Figs 6C; 7B)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 78 (1987). — *Cryptocarya humbertiana* Kostermans, *Bulletin du Jardin botanique de l'État* 27: 179 (1957). — Type: Madagascar, Andrambovato, Fologoina, Fort Carnot, [21°51'30"S, 47°26'30"E], 15.X.1952, fl., *Service Forestier 6507* (holo-, P; iso-, P, TEF).

MATERIAL EXAMINED. — Madagascar. Andrambovato, Tolongoina, fl., *Service Forestier 6507* (P, TEF). — Andrambovato, Tolongoina, ster., *Service Forestier 10987* (P, TEF). — Andrambovato, Fort Carnot, ster., *Service Forestier 11111* (MO, P, TEF). — Parcelle B 11, Andrambovato, fl., *Service Forestier 16248* (P, TEF). — Ranomafana National Park, fr., *Turk et al. 161* (MO, P, TAN). — Ranomafana National Park, fr., *Turk & Bernardin 207* (MO, TAN). — Ranomafana National Park, fl., *Turk & Randrianasolo 583* (MO, P, TAN).

DESCRIPTION

Trees, to 25 m. Twigs terete, lenticellate, glabrous; terminal buds glabrous or with a fringe of hairs. Leaves opposite, 12-18 × 4-6 cm, elliptic, glabrous, base and apex acute, the margin flat, upper surface somewhat shiny, lower surface mat, reticulation weakly raised on the upper surface, more so on the lower surface, lateral veins not clearly recognizable, *c.* 10; petioles 7-9 mm long, canaliculate. Inflorescences in the axils of leaves, 1.5-2 cm long, moderately pubescent, the indument becoming

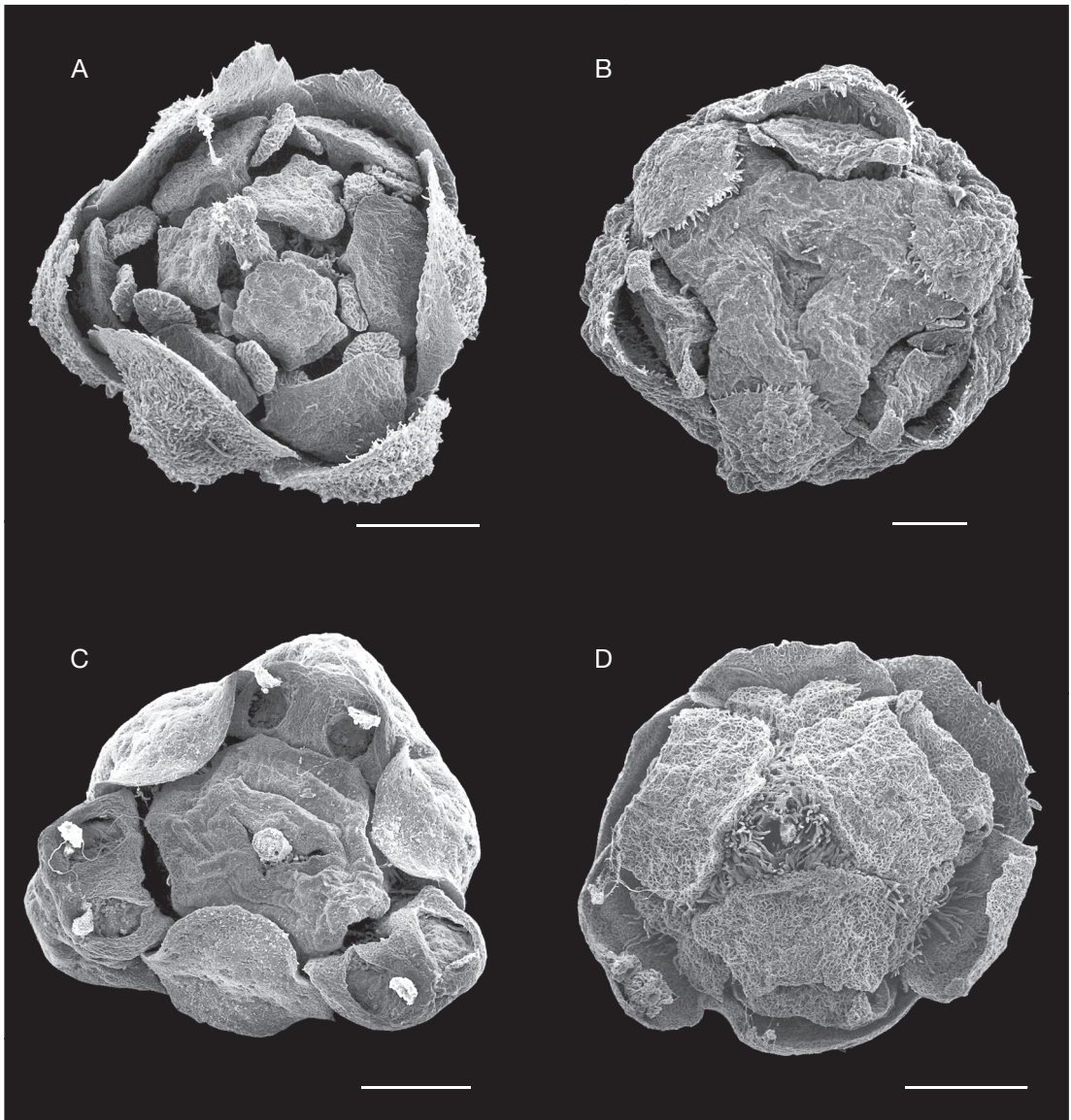


FIG. 7. — Scanning electron microscope images of *Aspidostemon* Rohwer & Richter: **A**, *A. grayi* Van der Werff; **B**, *A. humberianum* (Kosterm.) Rohwer; **C**, *A. longipedicellatum* Van der Werff; **D**, *A. masoalense* Van der Werff. **A**, Van der Werff et al. 12747, MO; **B**, Turk & Randrianasolo 583, MO; **C**, Van der Werff 12838, MO; **D**, Schatz & Modeste 3057, MO. Scale bars: 0.5 mm.

denser towards the flowers; pedicels densely pubescent, 2 mm long. Flowers 3–3.5 mm in diam., with pale yellow tepals and maroon stamens, flat, wider than long; tepals 1.5 mm wide, 1 mm long, appressed, with a few hairs near the base, distally

glabrous except for a fringe of hairs at the margin; stamens 3, petaloid, the locelli introrse, opening towards the tip of the stamens with only the flaps visible; staminodia of whorl II covered by the tepals, not visible, staminodia of whorl III with greatly

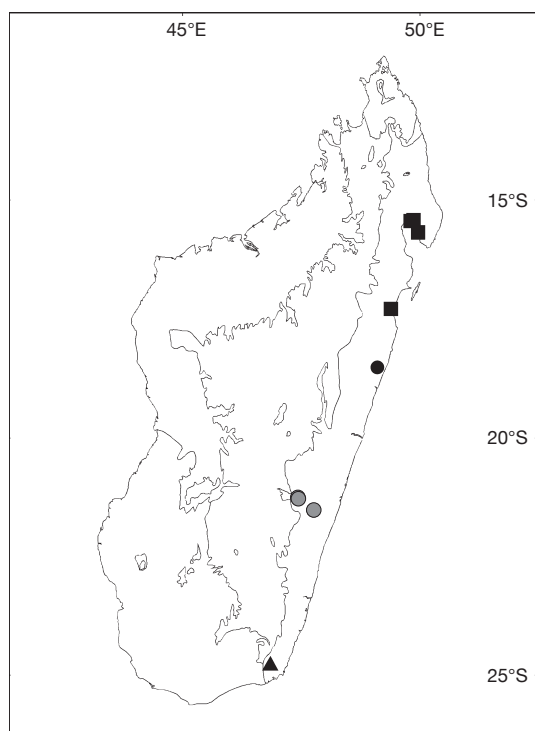


FIG. 8. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: ■, *A. glandulosum* Rohwer; ▲, *A. grayi* Van der Werff; ●, *A. humbertianum* (Kosterm.) Rohwer; ●, *A. inconspicuuum* Rohwer.

expanded apices, fused, covering the center of the flowers, with a central pore for the style. Pistil and inside of the receptacle glabrous. Fruits ellipsoid, 3.5 × 2.5 cm, scurfy, the floral parts persisting on the top.

REMARKS

Aspidostemon humbertianum can be recognized by its rather large leaves with weakly raised reticulation on both surfaces, the pubescent inflorescences, the densely pubescent pedicels and the flat flowers with 3 fertile stamens. It is one of three species with pubescent inflorescences and flowers with 3 stamens and is the only one with flowers wider than long. Its distribution ranges from Andrambovato (Tolongoina) to Ranomafana (Fig. 8). Only the collections from Ranomafana have an indication of altitude, from 950 to 1250 m, which is rather high for the genus.

Kostermans (1957) also cited *Service Forestier 10967*, a sterile collection, under *A. humbertianum*. This specimen has acuminate leaves, was collected near Lorihandava, Brickaville and represents a different species.

ALTITUDINAL DISTRIBUTION

950-1250 m.

PHENOLOGY

Flowers: October-November; fruits: November-December (probably from previous year).

VERNACULAR NAME

Longodranomena.

12. *Aspidostemon inconspicuuum* Rohwer (Fig. 6D)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 75 (1987). — Type: Madagascar, Menagisy, Brickaville, [18°52'S, 49°04'E], 8.XII.1956, fl., *Service Forestier 12355* (holo-, P; iso-, TEF).

DESCRIPTION

Tree of unknown size. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, elliptic to narrowly elliptic, 6-11 × 1.5-3 cm, glabrous, firmly chartaceous, the base acute to attenuate, apex bluntly acute, margin flat, the upper surface shiny, reticulation immersed on the upper surface, weakly raised on the lower surface; lateral veins hard to discern; petioles 6-10 mm long, canaliculate. Inflorescences to 4 cm long, glabrous; pedicels *c.* 2 mm long. Flower buds slightly depressed globose, *c.* 1.5 mm in diam., glabrous, tepals about as long as wide, stamens 6, thick, glabrous, locelli subapical, staminodia III with a peltate tip, free, with two glands at the base; staminodia IV small, subulate. Pistil glabrous. Fruits unknown.

REMARKS

This species is only known from the type collection (Fig. 8) and is best recognized by the small flowers with 6 stamens and the rather long, flexible inflorescences. The type has few flowers or flower buds left and the description given above is largely taken from Rohwer's description and illustration (Rohwer

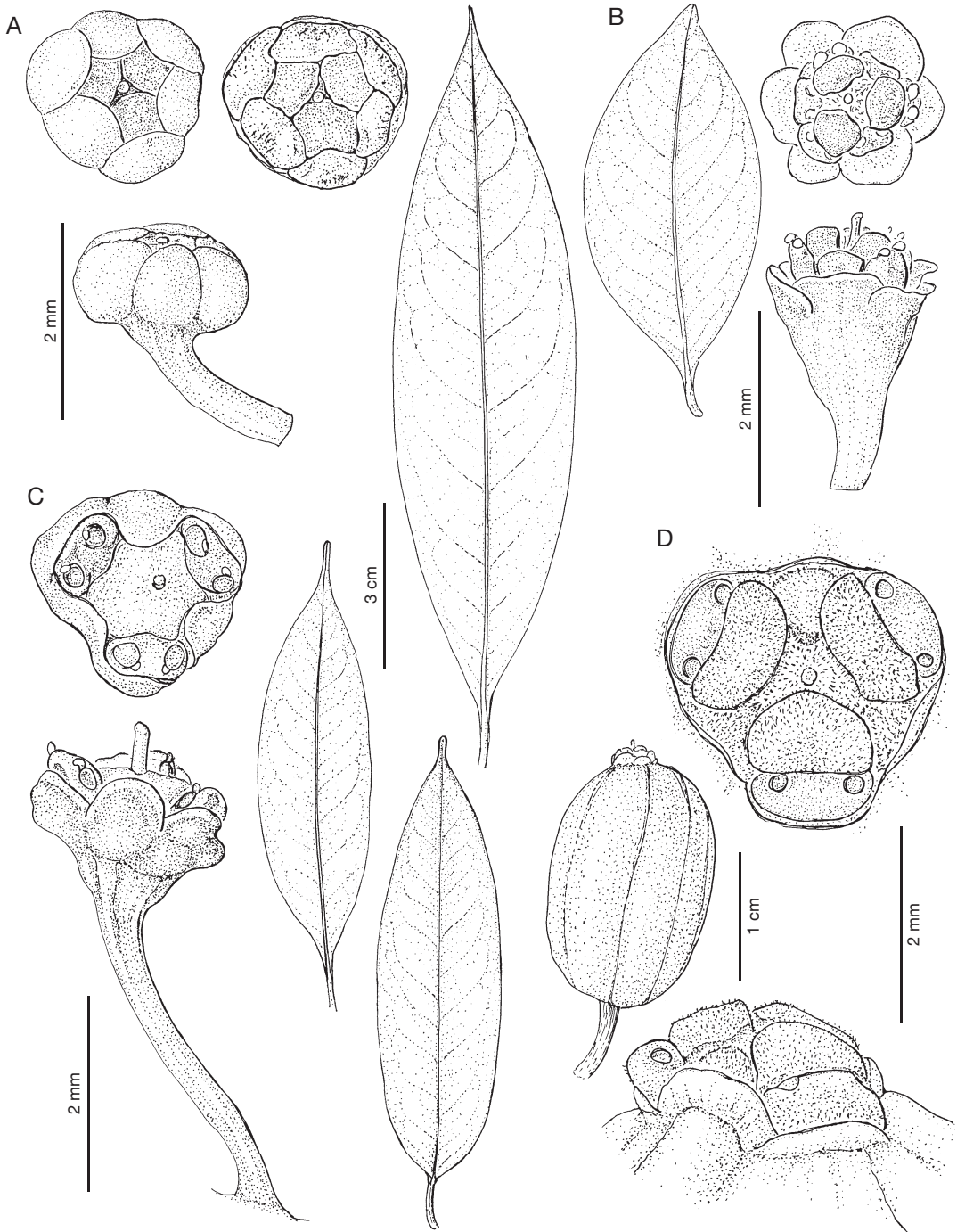


FIG. 9. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. insigne* Van der Werff; **B**, *A. litorale* Van der Werff; **C**, *A. longipedicellatum* Van der Werff; **D**, *A. lucens* Van der Werff. A, Service Forestier 28138, MO; B, Rabevohitra et al. 4246, MO; C, Van der Werff et al. 12838, MO; D, Service Forestier 20009, MO.

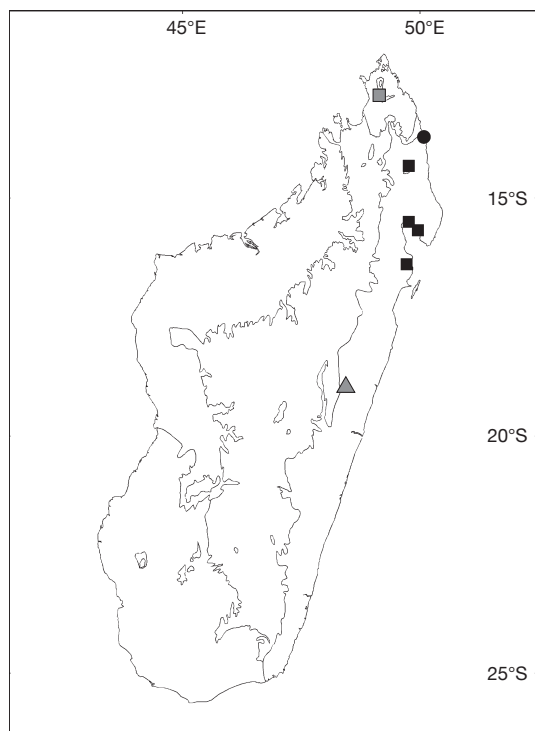


FIG. 10. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: \blacktriangle , *A. insigne* Van der Werff; \bullet , *A. litorale* Van der Werff; \blacksquare , *A. longipedicellatum* Van der Werff; \blacksquare , *A. lucens* Van der Werff.

& Richter 1987). The description is brief and reflects the poor quality of the type specimen.

PHENOLOGY

Flowers: December.

VERNACULAR NAME

Longotra.

13. *Aspidostemon insigne* Van der Werff, sp. nov. (Fig. 9A)

A congeneris inflorescentiis magnis, foliis ellipticis magnis recedit.

TYPUS. — Madagascar. Périnet, vallée de la prise d'eau du village, 22.I.1968, [18°56'S, 48°26'E], fl., *Service Forestier 28138* (holo-, P; iso-, MO, TEF).

DESCRIPTION

Tree, 20-25 m. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 12-20 × 4-6 cm, elliptic, glabrous, base and apex acute or the apex slightly acuminate, margin flat, upper surface mat, with immersed reticulation, lower surface with reticulation raised, lateral veins difficult to discern, *c.* 8 pairs; petioles 1-1.2 cm long, canaliculate. Inflorescences 3-7 cm long, sparsely puberulous, lateral branches to 3 cm long, pedicels 2-3 mm long. Flowers 2 mm in diameter, 1 mm long, wider than long, glabrous; tepals 1.5-2 mm wide, 1 mm long, erect; stamens 6, tepaloid, the locelli lateral; staminodes of whorl III apically enlarged, free, glabrous; stamens and staminodes forming a shallow, dome-shaped structure with stamens and staminodes free and individually visible. Base of stamens glabrous. Fruits unknown.

REMARKS

Aspidostemon insigne can be easily recognized by its large, elliptic leaves, large, sparsely puberulous inflorescences and glabrous terminal buds. It is only known from the type collection (Fig. 10). Although the inflorescences are large and have many flowers, only a few on each inflorescence are in the stage where one can determine the number of stamens. *Aspidostemon macrophyllum* has even larger leaves; it differs from *A. insigne* in its oblong (not elliptic) leaves, pubescent (not glabrous) terminal buds and its pubescent (not glabrous) tepals.

PHENOLOGY

Flowers: January.

VERNACULAR NAME

Longotra Mavokely.

14. *Aspidostemon litorale* Van der Werff, sp. nov. (Fig. 9B)

Aspidostemoni grayi affine, sed foliis ellipticis vel late ellipticis, floribus glabris recedit.

TYPUS. — Madagascar. Antsiranana, Vohémar, Tsarabaria, 13°41'57"S, 50°05'19"E, 29.X.2002, fl., *Rabevohitra, McPherson, Rabenantoandro & Ranarivelo 4246* (holo-, MO; iso-, P, TEF).

DESCRIPTION

Tree, 8 m. Twigs terete, appressed pubescent when very young, soon becoming glabrous, terminal buds densely appressed pubescent. Leaves opposite, 6–9 × 2.5–4 cm, elliptic to broadly elliptic, glabrous or with some appressed hairs when young, the base acute to attenuate, the apex obtuse or bluntly acute, margin flat, venation including midrib immersed on upper leaf surface, faintly raised on the lower surface; lateral veins 6–8, difficult to discern; petioles 6–9 mm, somewhat canaliculate. Inflorescences 1.5–3 cm long and to 3 cm wide, sparsely to moderately pubescent, pedicels 2–3 mm long. Flowers 2 mm in diam., 2 mm long, gradually narrowed into the pedicel, obconical, glabrous; tepals more or less erect, 1 × 1 mm, glabrous; stamens 6, tepaloid, the locelli introrse; staminodia III erect, with an enlarged tip, free, smooth; staminodia IV not seen; pistil glabrous, spindle-shaped; receptacle mostly glabrous, but with reddish, curled hairs near the tip. Fruits unknown.

REMARKS

Aspidostemon litorale is readily recognized by its relatively broad leaves with a blunt apex, its pubescent terminal buds and flowers with 6 tepaloid stamens and free staminodia III. It is only known from the type collection made in littoral forest (Fig. 10). Stamens and staminodia are bright red, an unusual color in Lauraceae, but also found in *A. grayi*. No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

10 m.

PHENOLOGY

Flowers: October.

15. *Aspidostemon longipedicellatum*

Van der Werff, sp. nov.

(Figs 7C; 9C)

A. congeneris inflorescentiis glabris, staminibus tribus, pedicellis longis recedit.

TYPUS. — Madagascar. Toamasina, Nosy Mangabe, 15°30'S, 49°46'E, 0–300 m, 4.XI.1992, fl., Van der Werff,

Schatz, Gray & Razafimandimbison 12838 (holo-, MO; iso-, KUN, MO, P, QRS, TAN).

PARATYPES. — Madagascar. Forêt d'Ibanda, au SW d'Antambe, [16°23'S, 49°43'30"E], fl., *Raharimalala* 446 (P). — Toamasina, Nosy Mangabe, 15°30'S, 49°46'E, fr. buds, *Schatz* 2739 (MO, P, TAN). — Bords de piste Andrahanjo-Antongondrika, [14°18'30"S, 49°46'E], fr., *Service Forestier* 732 (P). — Massif d'Amnohitsitondroina de Mahalevona, N de la presqu'île du Masoala, [14°18'30"S, 49°46'E], 600 m, fl., *Service Forestier* 8689 (MO, P, TEF). — Masoala Peninsula, S of Ambanizana, [15°38'S, 49°58'E], ster., *Vasey & Velo* 28 (MO). — Masoala Peninsula, S of Ambanizana, [15°38'S, 49°58'E], fr., *Vasey & Behasy* 52 (MO, P). — Masoala Peninsula, S of Ambanizana, [15°38'S, 49°58'E], fr., *Vasey & Velo* 88 (MO, P). — Masoala Peninsula, S of Ambanizana, [15°38'S, 49°58'E], buds, *Vasey & Behasy* 108 (MO, P).

DESCRIPTION

Tree, 20 m. Twigs terete, glabrous, lenticellate; terminal buds glabrous. Leaves opposite, 7.5–11 × 2.5–4 cm, glabrous, elliptic to ovate-elliptic, papyraceous, the base acute, apex acuminate, acumen 7–12 mm long, margin flat, reticulation immersed on the upper surface, faintly raised on the lower surface, lateral veins difficult to separate from the tertiary veins; petioles 5–8 mm long, canaliculate. Inflorescences to 1.5 cm long, glabrous; pedicels 4–5 mm long. Flowers 2–2.5 mm in diam., 1.5 mm long, glabrous, tepals about as wide as long, erect, the outer tepals thickened at their base and slightly bulging outwards; stamens 3, thick, but their tips not peltate, locelli apical, readily visible, staminodia II not seen, either lacking, reduced to a few hairs at the base of the inner tepals or fused completely with the staminodia III; staminodia III with their tips flattened, fused into a flat-topped column, and not covering any part of the stamens. Fruits ellipsoid, 2.3 × 1.2 cm, smooth, the floral remnants persisting on top.

REMARKS

Aspidostemon longipedicellatum can be confused with *A. trianthera*; both species have basally thickened tepals that bulge outwards. The tepals in *A. trianthera* are more strongly thickened and give the flowers a 6-lobed appearance. Other differences are the longer pedicels in *A. longipedicellatum*, the fused staminodia III in *A. longipedicellatum* (free in *A. trianthera*),

the apical locelli in *A. longipedicellatum* (introrse in *A. trianthera*) and the absence of visible hairs in the flowers of *A. longipedicellatum* (although a few hairs are present, but hidden, inside the flowers and are covered by the staminodia III). It is only known from the NE part of Madagascar (Fig. 10).

The fruiting paratype was initially identified by Kostermans (in sched.) as a new species; later he cited it as a paratype of *A. trianthera*.

ALTITUDINAL DISTRIBUTION
0-600 m.

PHENOLOGY
Flowers: February, November, December; fruits: November.

VERNACULAR NAME
Tapiramena.

16. *Aspidostemon lucens* Van der Werff, sp. nov.
(Fig. 9D)

Aspidostemoni perrieri simile, sed staminibus tribus, staminodiis papillois recedit.

TYPUS. — Madagascar. Forêt de Marovato, au pied des escarpements de l'Ankarana, [12°48'30"S, 49°09'E], 14.XI.1958, fr., *Service Forestier 20009* (holo-, P; iso-, K, MO, P, TEF).

PARATYPE. — Madagascar. Antsiranana, Analalava, Ambanja, [14°00'S, 48°13'E], ster., *Service Forestier 82-R-152* (P).

DESCRIPTION
Tree, 15-20 m. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 5-12 × 2.5-4 cm, glabrous, elliptic to oblong, the base acute, apex acute, the very top often inrolled and swollen, margin cartilaginous, thickened, the upper surface shiny, reticulation immersed on the upper surface, raised on the lower surface, lateral veins hard to discern, c. 8; petioles 6-10 mm, shallowly canaliculate to flat. Flowers not known. Infructescences 3-5 cm long, glabrous. Fruits 1.8-2.4 cm long, 1-1.4 cm wide, glabrous, longitudinally ribbed; floral parts persisting on top of the fruits. Stamens 3, the tip

thickened, locelli apical, the tip 1.5 × 1 mm, clearly wider than long, papillose; staminodia II smaller than the stamens, triangular, sometimes with rudimentary locelli, papillose; staminodia III free, papillose, the apex enlarged.

REMARKS

Aspidostemon lucens is similar to *A. perrieri* in its stiff leaves with raised reticulation on the lower surface, and the often conduplicate leaves; it differs from that species in having 3, not 6 stamens, in its apical, not introrse locelli, and in its papillose, not glabrous, stamens and staminodia. The distribution is also quite different: *A. lucens* is only known from the NW of Madagascar (Fig. 10), while *A. perrieri* has been reported from the Perinet-Moramanga area on the E slope in the center. It is not uncommon to find in a flower 1 or 2 staminodia II with rudimentary locelli. A fruiting collection of *A. perrieri* (*Perrier de la Bathie 5269*, a syntype) also has smooth, not ribbed fruits, glabrous stamens and staminodia, and the stamens do not have a thickened apex as occurs in *A. lucens*; the locelli are introrse.

Aspidostemon lucens is only known from the type collection and a second, sterile collection. There is no indication of altitude.

PHENOLOGY
Fruits: November.

ETYMOLOGY
The epithet refers to the shiny upper surface of the leaves.

VERNACULAR NAME
Lalombary.

17. *Aspidostemon macrophyllum*
Van der Werff, sp. nov.
(Fig. 11A)

Aspidostemoni grayii affine, sed foliis majoribus, reticulatione pagina inferiori elevata recedit.

TYPUS. — Madagascar. Maroantsetra, Anjahana, 15°30'13"S, 49°55'39"E, 500 m, 7.IX.2002, fr., *Antilahimena 1344* (holo-, MO; iso-, P, TAN).

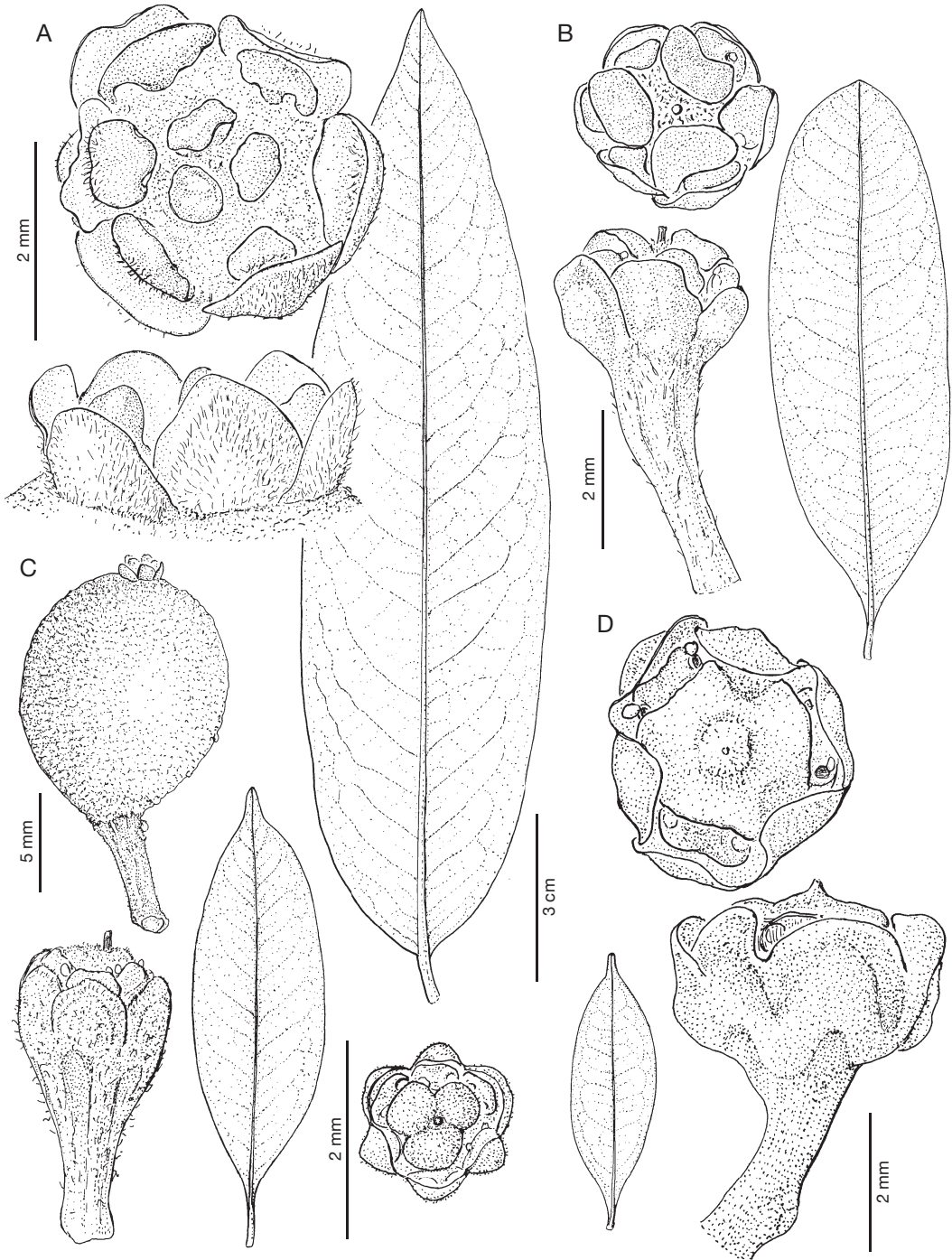


FIG. 11. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. macrophyllum* Van der Werff; **B**, *A. manongarivense* Van der Werff; **C**, *A. masoalense* Van der Werff; **D**, *A. microphyllum* Van der Werff. A, Antilahimena 1344, MO; B, Service Forestier 11492, MO; C, Schatz & Modeste 3057, MO; D, Schatz & Carlson 2925, MO.

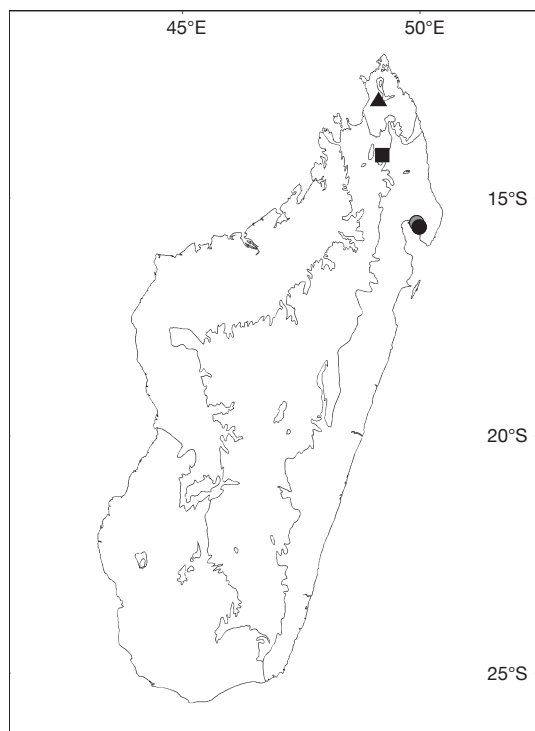


FIG. 12. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: ●, *A. macrophyllum* Van der Werff; ■, *A. manongarivense* Van der Werff; ●, *A. masoalense* Van der Werff; ▲, *A. occultum* Van der Werff.

DESCRIPTION

Tree, 15 m. Twigs angular, glabrous or with some appressed hairs when young; terminal buds densely pubescent. Leaves opposite, 15-30 × 5-8 cm, glabrous or with a few appressed hairs when young, oblong to oblong-elliptic, firmly chartaceous, the base obtuse or somewhat acute, the apex acute or with a short, blunt acumen, the margin flat; venation immersed on the upper surface or midrib slightly impressed, midrib and reticulation raised on the lower surface; lateral veins 12-15 pairs; petioles 1-1.5 cm long, flat. Inflorescences and flowers not known. Infructescences 6-12 cm long, densely appressed pubescent. Fruits broadly ellipsoid to round, to 1.8 cm long, 1.6 cm wide, scurfy. Remains of flowers persisting on top of the fruit: tepals 1.5 × 1 mm, pubescent on the outer surface, stamens 6, glabrous, tepaloid, the locelli introrse, staminodia

III columnar, free, with 2 globose glands at the base; staminodia IV not seen.

REMARKS

This species is related to *A. grayi* and *A. dolichocarpum*, with which it shares the predominantly oblong leaves, pubescent inflorescences and tepals, 6 petaloid stamens and free staminodia III. It differs mainly from these two species in its much larger leaves and the obtuse leaf bases. *Aspidostemon dolichocarpum* also differs from *A. macrophyllum* in its glabrous terminal buds. It is restricted to the area around Maroantsetra (Fig. 12).

ALTITUDINAL DISTRIBUTION

500 m.

PHENOLOGY

Fruits: September.

VERNACULAR NAME

Tapiky.

18. *Aspidostemon manongarivense*

Van der Werff, sp. nov.

(Fig. 11B)

A congeneris inflorescentiis pilis brevibus, rubellis, crispis praeditis, staminodiis papillois et petiolis longis recedit.

TYPUS. — Madagascar. Massif de Antsatroto, vers 1000 m, [14°05'S, 48°23'E], XI.1954, fl., fr., *Service Forestier 11492* (holo-, P; iso-, MO, P, TEF).

DESCRIPTION

Large tree. Twigs terete, ridged, glabrous; terminal buds glabrous. Leaves opposite, 6.5-12 × 2.5-5 cm, glabrous, elliptic, firmly chartaceous, the base acute, the apex acute or shortly acuminate, the margin flat, cartilaginous, reticulation immersed on both surfaces or weakly raised on lower surface; lateral veins difficult to discern, c. 10; petioles 13-17 mm long, canaliculate. Inflorescences 2-3.5 cm long, paniculate, moderately covered with short, curly, reddish hairs, the indument sparse at the base of the inflorescences; pedicel very short, indistinct. Flowers 1.5-2 mm in diam., gradually narrowed

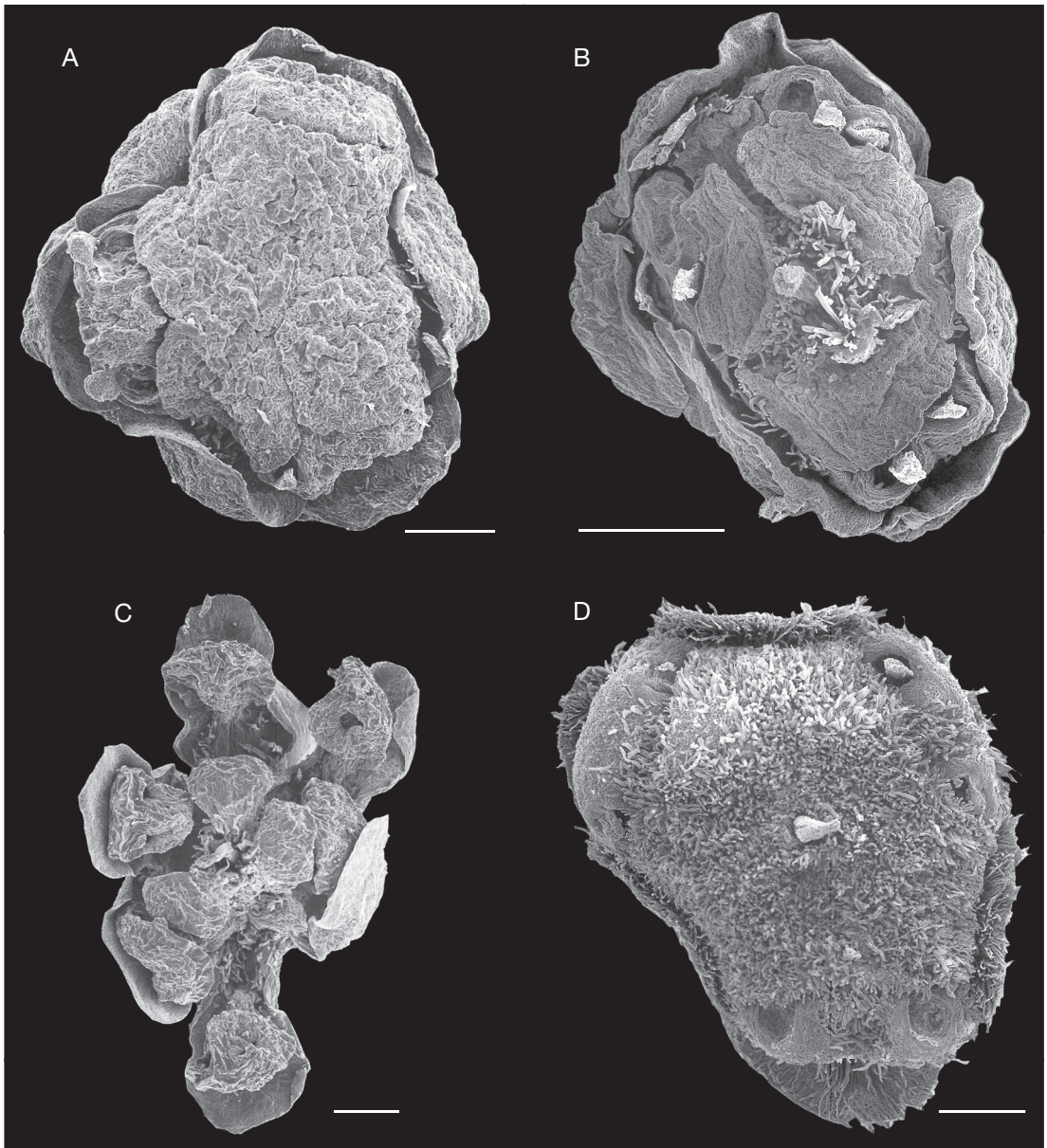


FIG. 13. — Scanning electron microscope images of *Aspidostemon* Rohwer & Richter: **A**, *A. microphyllum* Van der Werff; **B**, *A. occultum* Van der Werff; **C**, *A. parvifolium* (Scott-Elliott) Van der Werff; **D**, *A. trichandra* Van der Werff. **A**, Schatz & Carlson 2925, MO; **B**, Service Forestier 28709, MO; **C**, McPherson 14362, MO; **D**, Ranirison 528, MO. Scale bars: 0.5 mm.

into the pedicel, conical, tepals slightly wider than long, erect, pubescent; stamens 6 (rarely 3), petaloid, sparsely papillose, but largely covered by the

tepals, locelli introrse with only the flaps visible; staminodia III free, with a peltate tip, densely papillose; staminodia IV not seen; pistil slender,

glabrous, receptacle glabrous inside. Fruits smooth, ellipsoid, 3.7 × 2.6 cm, the floral parts persisting on the top of the fruits.

REMARKS

Easily recognized in flower by the short, curly, red hairs on the inflorescences and flowers and the papillose indument on the staminodia III. This indument wears off in fruit. The relatively long petioles are a useful vegetative character. Some of the flowers of the type collection have 3 stamens; others have 6; see also the discussion under *A. andohabelense* and *A. occultum*. This species is vegetatively similar to *A. lucens*, from which it differs in the larger, smooth fruits and the petaloid stamens with introrse locelli. *Aspidostemon manongarivense* is only known from the type collection (Fig. 12).

ALTITUDINAL DISTRIBUTION

1000 m.

PHENOLOGY

Fruits: November.

VERNACULAR NAME

Tapiky.

19. *Aspidostemon masoalense*

Van der Werff, sp. nov.

(Figs 7D; 11C)

A congeneris floribus staminibus tribus praeditis, gemmis terminalibus pubescentibus et inflorescentiis sparse puberulis distinguenda.

TYPUS. — Madagascar. Toamasina, Masoala Peninsula, trail to Ampanavoana, 15°36'S, 49°59'E, 130 m, 14.XII.1990, fl., *Schatz & Modeste 3057* (holo-, MO; iso-, HBG, K, L, LE, NY, P, US, TAN).

DESCRIPTION

Tree, 8 m. Twigs angular, glabrous; terminal buds densely pubescent. Leaves opposite, 9-14 × 3.5-4.5 cm, glabrous, elliptic, the base acute, the apex obtuse, margin flat, reticulation immersed on both surfaces, lateral veins difficult to discern, 10-14, petioles 7-10 mm, canaliculate. Inflorescences 2-

3 cm long, sparsely puberulous, paniculate; pedicels 1 mm long. Flowers 2.5-3 mm in diam., glabrous, gradually narrowed in the pedicel, about as wide as long; tepals c. 1 mm long and wide; stamens 3, the tips flattened, locelli lateral; staminodia of whorl II stipitiform, reddish pubescent; staminodia of whorl III with flat, peltate apex, this glabrous, the columnar filament with reddish hairs; staminodia III free; pistil slender, glabrous; inside of the receptacle glabrous. Fruits unknown.

REMARKS

Distinctive for *A. masoalense* is the combination of flowers with 3 stamens, stipitiform, pubescent staminodia II and staminodia III with peltate, free apices and pubescent base. Vegetatively, the leaves with obtuse apices and densely pubescent terminal buds allow easy identification. *Aspidostemon masoalense* is only known from the type collection (Fig. 12). No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

50-250 m.

PHENOLOGY

Flowers: December.

20. *Aspidostemon microphyllum*

Van der Werff, sp. nov.

(Figs 11D; 13A)

Aspidostemoni andohabelensi simile, sed antheris locellis magnis praeditis, foliis minoribus, crassioribus, pagina superiore lucentibus recedit.

TYPUS. — Madagascar. Bay of Antongil, Nosy Mangabe, 15°30'S, 49°46'E, 0-330 m, 2-19.I.1990, fl., *Schatz & Carlson 2925* (holo-, MO; iso-, P, TAN).

PARATYPES. — Madagascar. Toamasina, Masoala Peninsula, south of Ambanizana, [15°38'S, 49°58'E], fr., *Vasey & Behasy 104* (MO, P).

DESCRIPTION

Tree, 16 m. Twigs terete, glabrous, lenticellate, terminal buds glabrous. Leaves opposite, 4-6.5 × 1.5-2.2 cm, subcoriaceous, glabrous, elliptic, the base acute, apex with short, blunt acumen, acumen

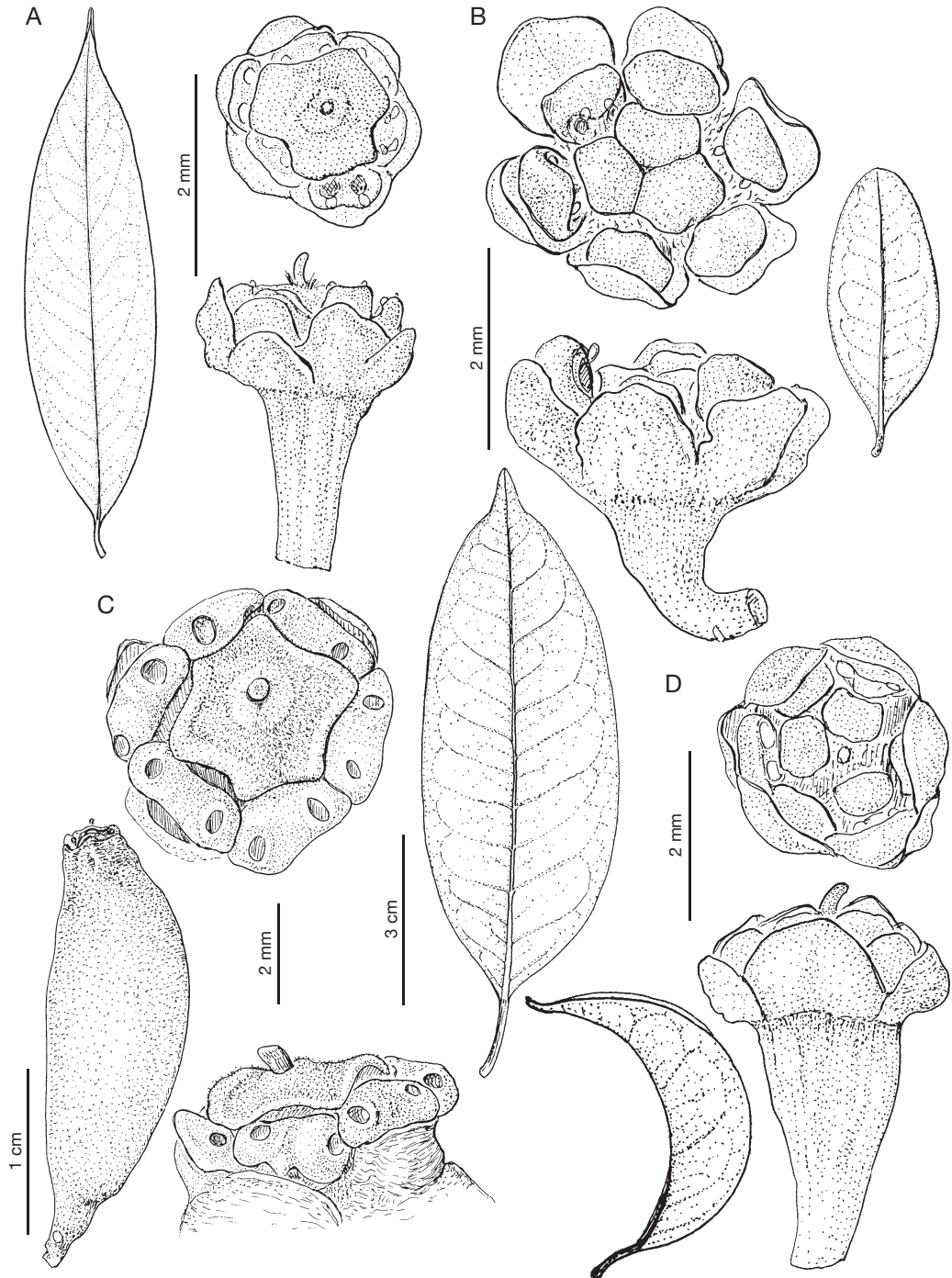


FIG. 14. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. occultum* Van der Werff; **B**, *A. parvifolium* (Scott-Elliott) Van der Werff; **C**, *A. percoriaceum* (Kosterm.) Rohwer; **D**, *A. perrieri* (Danguy) Rohwer. A, Service Forestier 28709, MO; B, McPherson 14362, MO; C, Service Forestier 1983, MO; D, Thouvenot 115, MO.

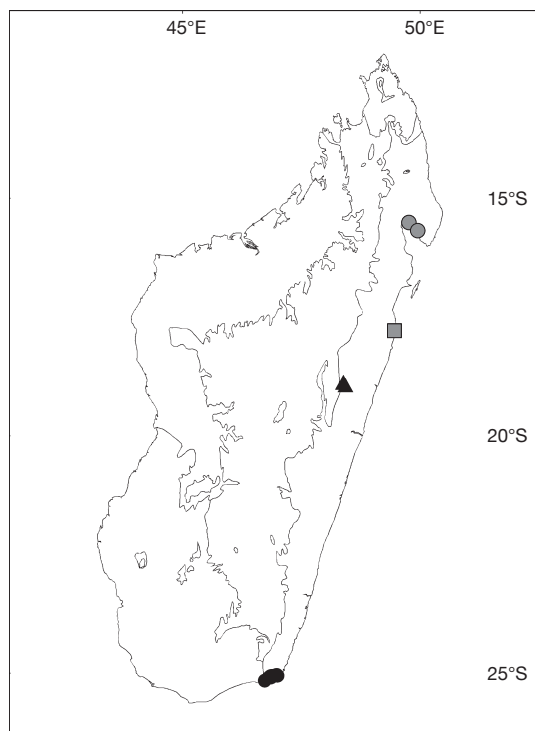


FIG. 15. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: ●, *A. microphyllum* Van der Werff; ●, *A. parvifolium* (Scott-Elliott) Van der Werff; ■, *A. percoriaceum* (Kosterm.) Rohwer; ▲, *A. perrieri* (Danguy) Rohwer.

5 mm long, margin flat, reticulation immersed on the upper surface, slightly raised on the lower surface, lateral veins difficult to discern, *c.* 6; petioles 3-5 mm long, canaliculate. Inflorescences *c.* 1 cm long, with a few scattered hairs, pedicels 1-1.5 mm long. Flowers glabrous, depressed globose, 2.5-3 mm in diam., 1.5-2 mm long, tepals light green and anthers white, much wider than long, erect, stamens 3, the tips of the anthers broad, the locelli apical, large and readily visible; staminodia II covered by the tepals; staminodia III with flattened, peltate apices, fused, forming a shield-like structure; base of the staminodia and the upper rim of the hypanthium with curly red hairs. Fruits ellipsoid, smooth, 2.8 × 1.6 cm.

REMARKS

Aspidostemon microphyllum is similar to *A. andohabelense*. The two can be separated as follows:

A. microphyllum has stiffer, smaller leaves (4-6.5 cm in *A. microphyllum*, 6-9 cm in *A. andohabelense*), and conspicuous (vs. very inconspicuous) locelli. Their distribution is also quite different, *A. microphyllum* only known from a small island in the Bay of Antongil and the Masoala Peninsula in the NE (Fig. 15) and *A. andohabelense* only known from the Col de Maningotry and Andohahela in the SE. *Aspidostemon microphyllum* is only known from two collections. No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

0-330 m.

PHENOLOGY

Flowers: January; fruits: October.

21. *Aspidostemon occultum*

Van der Werff, sp. nov.

(Figs 13B; 14A)

A. congeneris foliis papyraceis, acuminatis, floribus depresso globosis differt.

TYPUS. — Madagascar. À la base du Mur de l'Ankarana, [12°54'S, 49°08'E], 16-28.I.1969, fl., fr., *Service Forestier* 28709 (holo-, P; iso-, MO, TEF).

DESCRIPTION

Tree, to 25 m. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 9-13 × 2.5-3.5 cm, papyraceous, glabrous, elliptic, the base acute, apex acuminate, the acumen 1 cm long, often rolled into a cylinder, the margin flat, reticulation immersed on both surfaces, lateral veins scarcely visible; petioles 7-10 mm long, shallowly canaliculate. Inflorescences to 3 cm long, glabrous, panicle; pedicels 1-2 mm long. Flowers depressed globose, glabrous, wider than long, 2-2.5 mm in diam., tepals short, wider than long, erect; stamens 6, the outer three opening before the inner three and thus younger flowers seemingly with 3 stamens, glabrous, locelli apical; staminodia III with large, peltate apex, free or fused, upper rim of the receptacle and base of the staminodia III pubescent; staminodia IV not seen; pistil slender, glabrous, inside of the receptacle

glabrous. Fruits 2.2×1.5 cm, ellipsoid, smooth, crowned with floral remnants.

REMARKS

Aspidostemon occultum is best recognized by its thin, acuminate leaves, depressed globose flowers with large staminodia III. It is only known from the type collection made in the NW part of Madagascar (Fig. 12). The interpretation of the number of stamens requires some explanation. In most species of *Aspidostemon* the number of stamens, 3 or 6, is easy to determine. Sometimes in a species with 3 stamens the staminodial second whorl may have rudimentary locelli, which are visible as light colored patches. These rudimentary locelli do not open and can thus be recognized as rudimentary. In *Aspidostemon occultum* however, most flowers have 3 stamens, but there are also some flowers with six stamens, all with opened locelli. These flowers can be considered as fully mature and the flowers with 3 stamens as not yet fully mature (the tepals cover the stamens of whorl II in these flowers) or the flowers with 6 stamens can be regarded as anomalous and ignored. I accept the first explanation: mature flowers have 6 stamens, of which the outer 3 open first and the inner 3 later. The same phenomenon has been observed in *A. andohabelense* and *A. manongarivense*: some flowers have 3 stamens, others 6. No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

50–100 m.

PHENOLOGY

Flowers and fruits: January.

22. *Aspidostemon parvifolium*

(Scott-Elliott) Van der Werff, comb. nov.

(Figs 13C; 14B)

Ravensara parvifolia Scott-Elliott, *Journal of the Linnean Society* 29: 45 (1891). — *Agathophyllum parvifolium* (Scott-Elliott) Palacký, *Catalogus Plantarum Madagascariensium* 2: 8 (1907). — *Cryptocarya parvifolia* (Scott-Elliott) Kosterm., *Notulae Systematicae* 8: 113 (1939), non Merrill. — *Cryptocarya elliottii* Kosterm., *Flore de Madagascar et des Comores*, Fam. 81: 79 (1950). — Type:

Madagascar, Fort Dauphin, [25°02'S, 46°59'E], without date, fl., *Scott Elliott 3081* (holo-, K).

MATERIAL EXAMINED. — Vicinioribus Fort-Dauphin, in nemorosis et sabulosis prope Oceanum, fl., *Bernardi 11514* (K). — Forêt de Petriky, Fort Dauphin, fl., 25°05'S, 46°52'E, *Dumetz & McPherson 1098* (MO, P, TAN, TEF). — Baie des Galions (Ranofotsy) au Sud-Ouest de Fort-Dauphin, fr., *Humbert & Capuron 29006* (P). — Petriky, WSW of Fort Dauphin, fr., 25°03'20"S, 46°53'28"E, *Lowry et al. 5024* (MO, P). — Forest of Petriky, Fort Dauphin, fl., 25°05'S, 46°52'E, *McPherson et al. 14126* (MO, P, TAN, TEF); *McPherson et al. 14266* (MO, P, TAN, TEF); *McPherson et al. 14362* (MO, P, TAN, TEF). — Forêt de Petriky, 25°04'S, 46°51'E, ster., *Rabehohitra et al. 1861* (MO, P, TAN). — Fort Dauphin, fl., *Scott Elliott 3081* (K). — Forêt de Vinanibe, près de Fort-Dauphin, [25°03'S, 46°56'E], fl., *Service Forestier 20516* (G, HBG, K, MO, P, TEF). — Forêt de Vinanibe, près de Fort-Dauphin, [25°03'S, 46°56'E], fl., *Service Forestier 27985* (HBG, MO, P, TEF).

DESCRIPTION

Trees, to 10 m. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 4–6.5 × 1–2.5 cm, elliptic, broadly elliptic or obovate, glabrous, firmly chartaceous, base acute or attenuate, apex obtuse or emarginate, margin flat, cartilaginous, lateral veins not always clearly visible, 5–7; petioles *c.* 5 mm long, canaliculate. Inflorescences to 2 cm long, glabrous, up to 7-flowered, flowers gradually narrowed into the pedicel. Flowers glabrous, 4 mm in diameter, yellow-green, tepals 2 mm long, 1–1.5 mm wide, spreading at anthesis; stamens 6, with a short filament, bending outwards at anthesis with the tepals, pubescent at the base, staminodia III columnar, the tips somewhat peltate, arching outward, free, not forming a shield, smaller than the stamens, staminodia IV minuscule, stipitiform, pubescent, hidden between staminodia III; rim of the hypanthium and base of the stamens and staminodia pubescent; pistil and inside of receptacle glabrous. Fruits ellipsoid, 3 × 1.5 cm, smooth, crowned by the floral remnants.

REMARKS

Aspidostemon parvifolium is easily recognized by its rather small leaves with obtuse or emarginated apex, the few-flowered inflorescences and the spreading tepals at anthesis. It is the only species

of *Aspidostemon* with short filaments; all other species have stamens with a broad base. It has only been collected in coastal forest on sand near Fort Dauphin (Fig. 15). Vernacular names have not been recorded.

ALTITUDINAL DISTRIBUTION

5-25 m.

PHENOLOGY

Flowers: October, November, December; fruits: March.

23. *Aspidostemon percoriaceum*

(Kosterm.) Rohwer
(Fig. 14C)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 75 (1987). — *Cryptocarya percoriacea* Kosterm., *Bulletin du Jardin botanique de l'État* 27: 182 (1957). — Type: Madagascar, Antetozana, Foulpointe, [17°47'S, 49°29'E], 21.VI.1950, fr., *Service Forestier 1983* (holo-, P; iso-, MO, P).

DESCRIPTION

Tree of unknown size. Twigs terete, glabrous, lenticellate; terminal buds glabrous. Leaves opposite, 7-13 × 2.5-5 cm, elliptic to broadly elliptic, glabrous, coriaceous or firmly chartaceous, the base acute, apex bluntly acuminate, acumen *c.* 5 mm long, margin flat, the upper surface more or less shiny, reticulation immersed, lower surface with weakly raised reticulation; lateral veins *c.* 10; petioles 7-10 mm long, canaliculate. Inflorescences and flowers not known. Old floral remains with short, broad tepals, much shorter than long; stamens 6, much wider than long, locelli apical, large; staminodia III with a large, flattened tip, these fused into a shield; stamens and staminodia papillose. Infructescences 5 mm long, glabrous. Fruits narrowly ellipsoid, 20 × 8 mm, smooth, crowned with floral remnants.

REMARKS

Aspidostemon percoriaceum is best recognized by its rather broad leaves with a blunt acumen. Nearly all mature leaves are at least 4 cm wide. In most species of *Aspidostemon* the tip of the fruit with

the floral remnants is much smaller in diameter than the fruit itself, but in *A. percoriaceum* the tip of the fruit is *c.* 5 mm in diameter, not much smaller than the fruit itself. Kostermans (1957) cited a second collection, *Service Forestier 10934*, under *A. percoriaceum*. This specimen has densely pubescent terminal buds and belongs to a different species. The only known collection is from the E coast (Fig. 15). Vernacular names and altitudinal distribution have not been recorded.

PHENOLOGY

Fruits: June.

24. *Aspidostemon perrieri* (Danguy) Rohwer (Fig. 14D)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 74 (1987). — *Cryptocarya perrieri* Danguy, *Bulletin du Muséum national d'Histoire naturelle* (Paris) 33: 523 (1927). — Type: Madagascar, without date, fl., *Thouvenot 115* (lecto-, designated here, P; isolecto-, MO, P).

MATERIAL EXAMINED. — **Madagascar.** Forêt d'Anamalazaotra, [18°56'S, 48°26'E], fr., *Perrier de la Bathie 5269* (syntypes MO, P). — Antaniditra, Perinet, [18°52'50"S, 48°22'38"E], ster., *Ratovoarison R. 172* (P). — Perinet, y.fr., [18°52'S, 48°23'E], *Service Forestier 2627* (P, TEF). — Menalamba, Perinet, y.fr., *Service Forestier 14168* (P, TEF). — Without data, ster., *Service Forestier 26689* (P, TEF). — Km 45 Route Anosibe-Moramanga, ster., *Service Forestier 26850* (P, TEF). — Anamalazaotra, fl., [18°56'S, 48°26'E], *Thouvenot 115* (MO, P).

DESCRIPTION

Trees, to 25 m. Twigs terete, glabrous; terminal buds glabrous. Leaves opposite, 4-10 × 1.8-4.5 cm, glabrous, elliptic, coriaceous, often conduplicate after drying, the base acute, apex acuminate, acumen 5 mm long, often not fully unfolded, margin flat, cartilaginous; reticulation immersed on the upper surface, raised on the lower surface; lateral veins *c.* 8 pairs; petioles 5-7 mm long, shallowly canaliculate. Inflorescences 1.5-5 cm, glabrous, paniculate, pedicels gradually widened in to the flower. Flowers glabrous, 2.5-3 mm in diam., tepals erect, about as wide as long; stamens 6, tepaloid, locelli

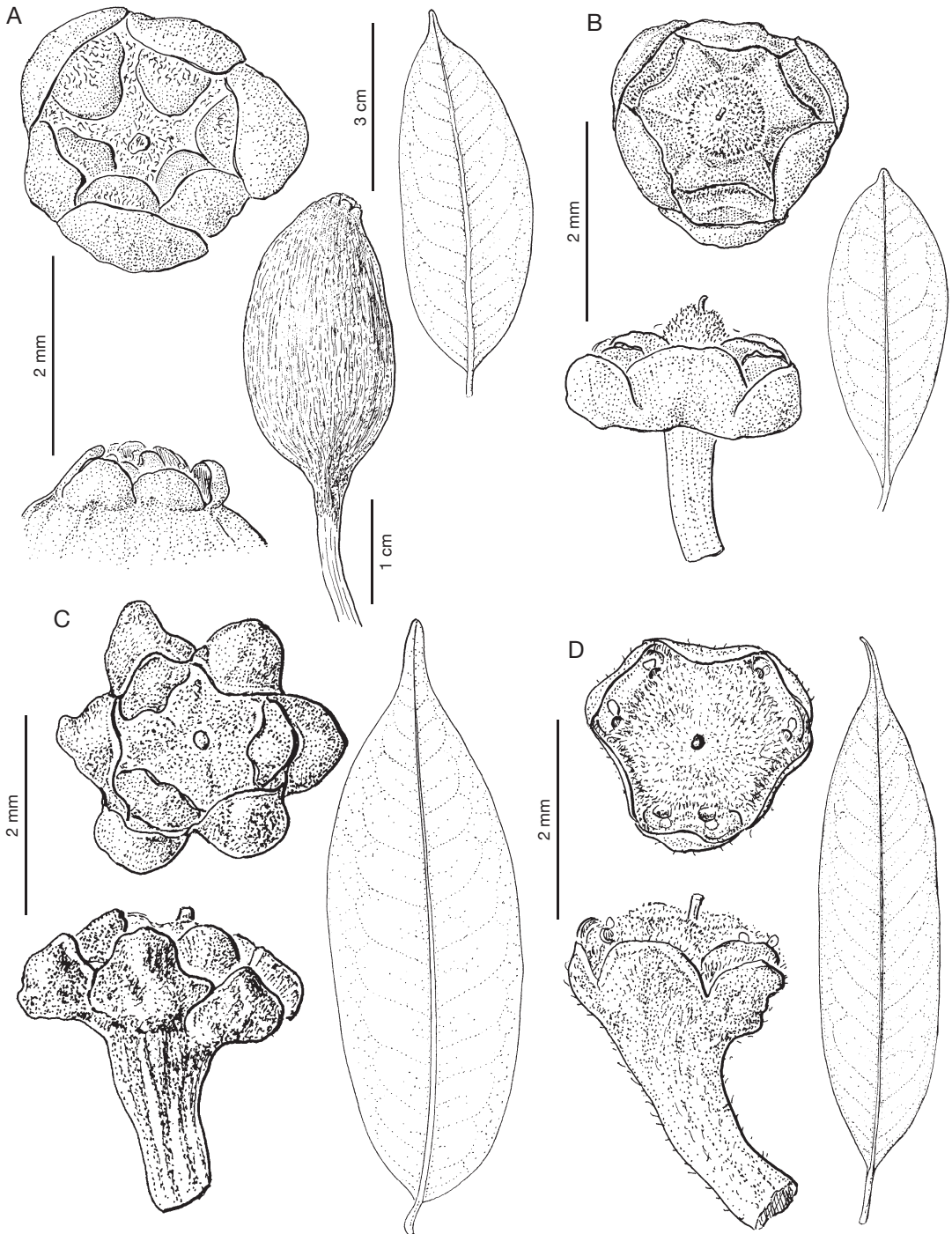


FIG. 16. — Species of *Aspidostemon* Rohwer & Richter: **A**, *A. reticulatum* Van der Werff; **B**, *A. synandra* Rohwer; **C**, *A. trianthera* (Kosterm.) Rohwer; **D**, *A. trichandra* Van der Werff. A, Service Forestier 20011, MO; B, Service Forestier 15610, P; C, Service Forestier 12064, MO; D, Ranirison 528, MO.

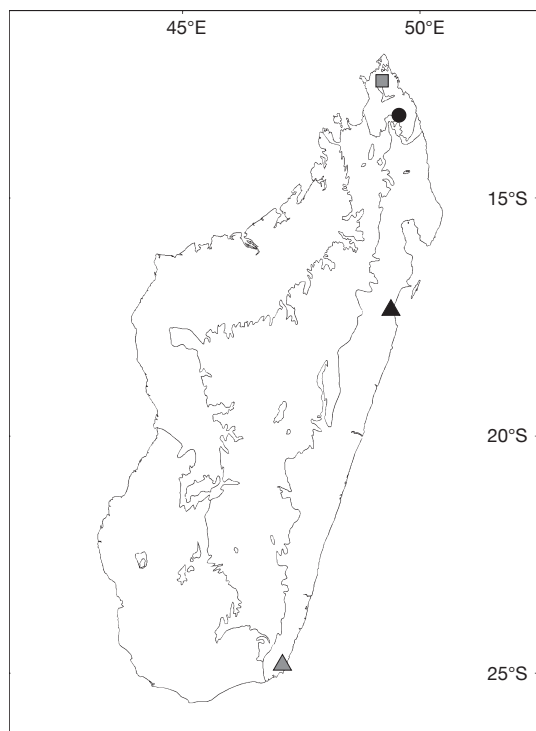


FIG. 17. — Distribution of *Aspidostemon* Rohwer & Richter in Madagascar: ■, *A. reticulatum* Van der Werff; ▲, *A. synandra* Rohwer; ▲, *A. trianthera* (Kosterm.) Rohwer; ●, *A. trichandra* Van der Werff.

introrse, staminodia III with peltate, flattened tip, arching outward, glabrous, free; glands, if present at the base of the staminodia III, fused with the staminodia; staminodia IV not seen; base of stamens and staminodia as well as the upper rim of the hypanthium pubescent; pistil glabrous. Fruits broadly ellipsoid, 2.3×1.6 cm, crowned with the floral remnants.

REMARKS

Aspidostemon perrieri belongs to a small group of species with 6 tepaloid stamens, free staminodia III, gradually widened pedicels and hairs at the base of the stamens, staminodia and on the upper part of the hypanthium. Among those species it stands out by its coriaceous, conduplicate leaves with raised reticulation on the lower leaf surface. Although it occurs in one of the best collected areas in Madagascar (Fig. 15), it has

been collected only once with flowers (the lectotype) and once with fruits (the other syntype); all other collections are sterile or with immature fruits only.

ALTITUDINAL DISTRIBUTION

800-1000 m.

PHENOLOGY

Flowers: February; fruits: no data available.

VERNACULAR NAMES

Longotromena, Longotra mavokely.

25. *Aspidostemon reticulatum*

Van der Werff, sp. nov.

(Fig. 16A)

A congeneris inflorescentiis glabris, nervis subtus prominulis reticulatis, staminibus tribus tepaloideis distinguenda.

TYPUS. — Madagascar. Massif de la Montagne d'Ambre, restes des forêts un peu en dessous de Joffreville, [12°30'S, 49°12'30"E], 17.XI.1958, fl., *Service Forestier 20011* (holo-, P; iso-, MO, P, TEF).

DESCRIPTION

Tree, 10 m. Twigs terete, glabrous, scars of bracts visible at the beginning of the seasonal growth; terminal buds glabrous. Leaves opposite, 6.5-10 × 2.5-3.5 cm, glabrous, subcoriaceous, elliptic, the upper surface shiny, the base acute to obtuse, apex acute or shortly acuminate, reticulation immersed on the upper surface, raised on lower surface; lateral veins difficult to discern, c. 10 on each side, petioles c. 5 mm long, flat or shallowly canaliculate. Inflorescences to 3 cm long, paniculate, glabrous, pedicels 1-2 mm long. Flowers 2.5 mm in diam., 2 mm high, glabrous, tepals about as wide as long, erect, stamens 3, tepaloid, the locelli introrse, staminodia II smaller than the stamens, tightly pressed against the staminodia III; staminodia III free, their apices peltate, but not forming a shield-like structure; base of staminodia glabrous. Fruit ellipsoid, 1.8 × 1 cm.

REMARKS

Aspidostemon reticulatum is easily recognized by the raised reticulation on the lower leaf surface combined

with the glabrous inflorescences and the tepaloid stamens. It is the northernmost representative of the genus (Fig. 17) and is only known from the type collection. No altitudinal data or vernacular name have been recorded.

PHENOLOGY

Flowers and fruits: November.

26. *Aspidostemon synandra* Rohwer
(Fig. 16B)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 78 (1987). — Type: Madagascar, Fenerive, Canton Ampasina, Tampolo, 3 m, [17°17'S, 49°23'30"E], 28.VII.1955, fl., *Service Forestier 15610* (holo-, P; iso-, HBG, K, MO, P, TEF).

DESCRIPTION

Tree, 10 m. Twigs terete, lenticellate, glabrous; terminal buds glabrous. Leaves opposite, 6.5–8 × 2–3 cm, glabrous, elliptic to obovate-elliptic, the base acute, the apex with a short, blunt acumen *c.* 5 mm long, the margin slightly recurved, the upper surface smooth, shiny, lower surface with weakly raised reticulation, lateral veins difficult to discern, *c.* 8, petioles *c.* 5 mm long, shallowly canaliculated. Inflorescences 1–1.5 cm long, very sparsely puberulous, pedicels 1 mm long. Flowers disc-shaped, wider than long, 2–3 mm in diam., glabrous, when seen from above more or less triangular, tepals wider than long; stamens 3, with a broad apex, partly covered by staminodia III, much wider than long, locelli apical, very small; staminodia II not readily visible, possibly fused with staminodia III; staminodia III with strongly enlarged apices, these fused and forming a shield-like structure in the center of the flower, papillose and with a raised center (umbonate). Fruit unknown.

REMARKS

Aspidostemon synandra is best recognized by the combination of flowers with 3 stamens, and the papillose staminodia III, fused and with an umbonate center. The weakly obovate leaves with a short, blunt acumen are a useful vegetative character. Only *A. lucens* possesses flowers with 3 staminodia and papillose

staminodia III, but that species has free staminodia III, lacks an umbonate center of the flower and has larger leaves with an acute apex. *Aspidostemon synandra* is only known from the type and probably came from coastal forest on sand (Fig. 17).

ALTITUDINAL DISTRIBUTION

The only collection is from 3 m altitude.

PHENOLOGY

Flowers: July.

VERNACULAR NAMES

Longotramena, Tapiky-Mena.

27. *Aspidostemon trianthera*
(Kosterm.) Rohwer
(Fig. 16C)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 75 (1987). — *Cryptocarya trianthera* Kosterm., *Bulletin du Jardin botanique de l'État* 27: 186 (1957). — Type: Madagascar, Mahatalaky, Fort Dauphin, [24°47'30"S, 47°05'E], 10.XII.1954, fl., *Service Forestier 12064 Capuron* (holo-, P; iso-, BO, TEF).

MATERIAL EXAMINED. — **Madagascar.** Mahatalaky, Fort Dauphin, [24°47'30"S, 47°05'E], fl., *Service Forestier 10866* (P, TEF). — Mahatalaky, Fort Dauphin, [24°47'30"S, 47°05'E], fl., fr., *Service Forestier 12064* (P, TEF). — Mahatalaky, Fort Dauphin, [24°47'30"S, 47°05'E], buds, fr., *Service Forestier 14862* (P, TEF).

DESCRIPTION

Trees of unknown size. Twigs terete, glabrous; terminal glabrous. Leaves opposite, 9–15 × 3–5 cm, elliptic, glabrous, the base acute, apex acuminate, acumen 7–12 mm long, blunt, the margin flat, the reticulation slightly raised on both surfaces, lateral veins 7–10 pairs but not readily visible; petioles 4–6 mm long, canaliculate. Inflorescences 2–3 cm long, paniculate, glabrous, pedicels 3–4 mm long. Flowers 2.5–3 mm in diameter, glabrous, the pedicel gradually widened towards the flower, abruptly widened at the insertion of the tepals, club-shaped, the tepals thickened and bulging outwards, giving the flower a 6-lobed appearance; stamens 3, petaloid, the locelli introrse with only the flaps visible;

staminodia II and III with flattened apices, free and filling the interior of the flower; reddish curled hairs visible between the staminodia. Fruits broadly ellipsoid, smooth, 2.5 × 2 cm, the thickened tepals still visible on top of the fruits.

REMARKS

Distinctive for *A. trianthera* are the thickened tepals which give the flower a 6-lobed appearance, the presence of 3 tepaloid stamens with introrse locelli, and the reddish hairs in the flowers. The leaves are, for the genus, rather thin and even though the lateral veins are not very obvious, they are more readily visible than in the other species of *Aspidostemon*. The reddish hairs visible in the flowers are probably, as in other species, inserted at the base of the staminodia and stamens; no flowers have been dissected because the few flowers present were tightly glued to the herbarium sheet. Kostermans (1957) used a wide concept of *A. trianthera*. Rohwer & Richter (1987) already mentioned that *Service Forestier 8512* differed from *A. trianthera* in its larger flowers and minute locelli; I exclude this collection also from *A. trianthera*. *Service Forestier 8689* also differs from *A. trianthera*; it has the staminodia III fused, lacks the reddish hairs in the flower and does not have the tepals as strongly thickened and bulging as *A. trianthera*. My concept of *A. trianthera* includes only 3 collections from Mahatalaky N of Fort Dauphin (Fig. 17). Altitudinal data have not been mentioned on the labels.

Aspidostemon longipedicellatum can be confused with *A. trianthera*; differences between the two are discussed under the former.

PHENOLOGY

Flowers and fruits: October and December.

VERNACULAR NAME

Oviary.

28. *Aspidostemon trichandra*

Van der Werff, sp. nov.

(Figs 13D; 16D)

A congeneris staminodiis III omnino pilis brevibus obtectis recedit.

TYPUS. — Madagascar. Province de Diego-Suarez/Antsirananana, sous-préfecture de Voehemar, commune rurale de Daraina, forêt de Binara, 13°15'S, 49°37'E, 625 m, 29.III.2004, fl., *Ranirison 528* (holo-, MO; iso-, G).

DESCRIPTION

Tree, 8 m. Twigs terete, glabrous, lenticellate, terminal buds glabrous. Leaves opposite, 12-15 × 3-4 cm, firmly chartaceous, glabrous, oblong to oblong-elliptic, the base acute, the apex finely acute to acuminate, the tip to 1.5 cm long and with an inrolled margin, reticulation immersed on upper surface, weakly raised on lower surface, lateral veins difficult to discern, *c.* 10 on each side, petioles *c.* 1 cm long, glabrous, terete and narrowly canaliculate above. Inflorescences 2.5-5 cm long, with a few scattered hairs, these denser towards the flowers, pedicels 2-3 mm long. Flowers 2-3 mm in diam., conical to broadly conical, tepals *c.* 0.5 mm long, 1 mm wide, the margin finely ciliate; stamens 3, the tips of the anthers flat, the locelli apical; staminodia II not recognized, either reduced and covered by the tepals or fused with the staminodia III, staminodia III with flattened, peltate apices, fused, densely covered with short, erect hairs, these obscuring the surface, pistil 2 mm long, the ovary spindle-shaped, glabrous, 1 mm long, style glabrous, receptacle glabrous inside. Fruits unknown.

REMARKS

Aspidostemon trichandra can be readily recognized by the densely pubescent, flattened apices of the fused staminodia III. There are two other species with 3 stamens, fused staminodia III and staminodia III not glabrous, *A. glandulosum* and *A. synandra*. However, these species have papillose, not pubescent, staminodia III. In addition, *A. glandulosum* has pubescent, not glabrous, terminal buds and *A. synandra* has the center of the flowers raised, not flat, has smaller leaves (to 8 cm long), and has disc-shaped, not conical flowers. *Aspidostemon trichandra* is only known from the type collection (Fig. 17). No vernacular name has been recorded.

ALTITUDINAL DISTRIBUTION

600 m.

PHENOLOGY

Flowers: March.

IMPERFECTLY KNOWN SPECIES

Aspidostemon lacrimans (Kosterm.) Rohwer

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 78 (1987). — *Cryptocarya lacrimans* Kosterm., *Bulletin du Jardin botanique de l'État* 27: 180 (1957). — Type: Madagascar, Ihorombe, Farafangana, [23°00'30"S, 47°32'30"E], 9.II.1955, ster., *Service Forestier 12809* (holo-, P).

REMARKS

The type of this species is sterile. Vegetatively, it fits well within *Aspidostemon* and a wood sample of the type also agrees with a placement in *Aspidostemon*. Beyond that, nothing can be said about it. There are no other collections of *Aspidostemon* known from the type locality which would help in understanding this species.

ADDITIONAL UNDESCRIBED SPECIES

Three collections probably represent additional undescribed species, but are not complete enough for description. Two come from the same locality and thus it is most likely that they represent the same species. However, there are some vegetative differences (leaf tip, venation) and I think there are two species involved. They are:

1) *Service Forestier 27127*: forêt littorale au S de Sambava (MO, P). The specimen is in bud with a few young flowers. It differs from all other *Aspidostemon* species in having slender, almost tubular flowers with 3 stamens. Leaves are acuminate. More mature flowers are needed for a description.

2) *Service Forestier 27713*: forêt littorale au S de Sambava (MO, P). The specimen has bell-shaped fruits, 8 mm long and 7 mm wide at the tip. The fruits have the floral parts attached; 6 stamens with apical cells, staminodia III fused. Leaves are acute or blunt. I have not seen this fruit shape in the other species of *Aspidostemon*. Again, flowers are needed for description.

3) *Ravelonarivo et al. 194*: réserve spéciale d'Anjarharibe-Sud (MO, P). Has large leaves, to 15 cm long and 6 cm wide. The collection is in fruit, but the fruits are rather old and the usually persistent floral parts are damaged. The large, wide leaves also occur in *A. macrophyllum*, but the latter species differs in its pubescent terminal buds and obtuse leaf bases. Flowers are needed for a description.

EXCLUDED SPECIES

Aspidostemon scintillans (Kosterm.) Rohwer

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 109: 78 (1987). — *Cryptocarya scintillans* Kosterm., *Notulae Systematicae* (Paris) 8: 113 (1939). — Type: Madagascar, Massif de l'Ikongo, [23°00'30"S, 47°32'30"E], 17.X.1926, fr., *Decary 5713* (holo-, P; iso-, P).

REMARKS

The type has a detached fruit. The fruit is globose and shows no trace of persistent floral parts, whereas *Aspidostemon* fruits are ellipsoid and have persistent floral parts on top of the fruits. The coriaceous leaves with their raised, fine reticulation, the black young twigs, the fruit shape and the absence of persistent floral parts on the fruit all fit better in *Beilschmiedia* than in *Aspidostemon*. An investigation of the cuticle characters indicate that *A. scintillans* lacks the bat-shaped and ring-rimmed stomata found in other *Aspidostemon* species and that it shares cuticle features with the opposite-leaved species of *Beilschmiedia* (S. Nishida pers. comm.).

Acknowledgements

The invitation extended by the Muséum national d'Histoire naturelle and the USM Taxonomie et Collections, directeur Dr Philippe Bouchet, to work in P for two months as professeur invité is gratefully acknowledged. I thank Jean-Noël Labat and the staff at the Herbarium national in Paris for their hospitality and help during my stay, and the curators of P and K for loan of specimens. Pete Lowry and Gordon McPherson critically read the manu-

script and suggested improvements. Mary Merello and Fred Keusenkothen kindly prepared the SEM photographs. John Myers skilfully made the line drawings. Trisha Consiglio is thanked for making the distribution maps. Jeannie Raharimompsonona and Sylvie Andriambololoneura kindly provided data on the *Aspidostemon* collections in TAN and TEF. Field work was conducted under collaborative agreements between the Missouri Botanical Garden and the Parc botanique et zoologique de Tsimbazaza and the Direction de la Recherche forestière et piscicole, FOFIFA, Antananarivo, Madagascar. I am grateful for courtesies extended by the Government of Madagascar (Direction générale de la Gestion des Ressources forestières) and by the Association nationale pour la Gestion des Aires protégées. Field work supported by National Geographic Society Grant 4631-91 and National Science Foundation Grant 0102727 yielded important collections for this revision.

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Submitted on 9 September 2005;
accepted on 24 February 2006.