

Description of two new species and one new section of *Bulbophyllum* (Orchidaceae) from Madagascar

Gunter A. FISCHER

Department of Biogeography and Botanical Garden, University of Vienna,
Rennweg 14, A-1030 Vienna (Austria)
and Department of Organismic Biology, Ecology and Diversity of Plants,
University of Salzburg, Hellbrunnerstrasse 34, A-5020 Salzburg (Austria)

Anton SIEDER

Department of Biogeography and Botanical Garden, University of Vienna,
Rennweg 14, A-1030 Vienna (Austria)

Phillip J. CRIBB

Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB (UK)
p.cribb@rbgkew.org.uk

Michael KIEHN

Department of Biogeography and Botanical Garden, University of Vienna,
Rennweg 14, A-1030 Vienna (Austria)

Fischer G. A., Sieder A., Cribb P. J. & Kiehn M. 2007. — Description of two new species and one new section of *Bulbophyllum* (Orchidaceae) from Madagascar. *Adansonia*, sér. 3, 29 (1): 19-25.

ABSTRACT

Two new orchid species and a new section of *Bulbophyllum* Thouars are described from Madagascar. *Bulbophyllum petrae* G.A.Fischer, Sieder & P.J.Cribb differs from any other known Madagascan species in the size, form and structure of its flowers. It is placed in its own new section *Polyradices* G.A.Fischer, Sieder & P.J.Cribb which is distinguished by its tiny habit with densely clustered and bilaterally flattened, unifoliate pseudobulbs, its sessile, one- or two-flowered inflorescence, and its sepals, petals and lip which bear no hairs but the former are finely papillose on the margin and the latter is slightly papillose beneath. It is also distinguished by its lack of spiral vessels in its tissues, a situation very unusual in Madagascan *Bulbophyllum*. *Bulbophyllum jackyi* G.A.Fischer, Sieder & P.J.Cribb belongs in section *Ploiarium* but differs from other species in its unifoliate pseudobulbs, very short inflorescence, broad, erose bracts that enclose the flowers, broadly ovate, papillose fleshy lip and distinctive broadly winged lateral sepals that are papillose within. Notes on their distributions, habitats and conservation status are provided.

KEY WORDS

Orchidaceae,
Bulbophyllum,
Madagascar,
new species,
new section.

RÉSUMÉ

Description de deux nouvelles espèces et une nouvelle section de Bulbophyllum (Orchidaceae) de Madagascar.

Deux nouvelles espèces et une nouvelle section sont décrites dans le genre *Bulbophyllum* Thouars de Madagascar. *Bulbophyllum petrae* G.A.Fischer, Sieder & P.J.Cribb diffère de toutes les autres espèces malgaches par la taille, la forme et la structure de ses fleurs. Il est placé dans sa propre nouvelle section *Polyradices* G.A.Fischer, Sieder & P.J.Cribb qui se distingue par sa petite taille, ses pseudobulbes densément agglomérés, aplatis bilatéralement, unifoliés, ses inflorescences sessiles uni- ou biflorées, et ses sépales, pétales et labelle glabres, les premiers étant finement papilleux sur la marge et le dernier légèrement papilleux dessous. Il se distingue aussi par l'absence de vaisseaux spiralés dans ses tissus, situation très inhabituelle chez les *Bulbophyllum* malgaches. *Bulbophyllum jackyi* G.A.Fischer, Sieder & P.J.Cribb appartient à la section *Ploiarium*, mais diffère des autres espèces par ses pseudobulbes unifoliés, son inflorescence très courte, des bractées larges et irrégulièrement dentées qui enferment les fleurs, un labelle largement ovale, papilleux charnu et des sépales latéraux distinctifs largement ailés qui sont papilleux à l'intérieur. Des informations sur les distributions, habitats et statuts de conservation sont incluses.

MOTS CLÉS

Orchidaceae,
Bulbophyllum,
Madagascar,
espèces nouvelles,
section nouvelle.

INTRODUCTION

During the last seven years extensive botanical surveys of orchid species have been undertaken in various parts of Madagascar by a team of botanists from the universities of Vienna and Salzburg (Austria) and the Parc botanique et zoologique de Tsimbazaza (PBZT).

Based on the collections made during these excursions and on the literature available (e.g., Perrier de la Bâthie 1939; Bosser 1965, 1969, 1971, 1989, 2000, 2004; Du Puy *et al.* 1999; Bosser & Cribb 2001), a phylogenetic study of the genus *Bulbophyllum* Thouars in Madagascar, comprising about 210 species, is currently being prepared. As a result of these studies, several new taxa have been found; one new section and two new species are described and discussed here.

SYSTEMATICS

Bulbophyllum sect. *Polyradices*
G.A.Fischer, Sieder & P.J.Cribb, sect. nov.

Planta pumila; pseudobulbi caespitosi bilateraliter compressi unifoliati, inflorescentia sessilis uni- vel biflora, floribus glabris, tepala non ciliata.

TYPUS. — *Bulbophyllum petrae* G.A.Fischer, Sieder & P.J.Cribb.

REMARKS

This monotypic section is morphologically different from all other sections of *Bulbophyllum* in Madagascar. In habit it is tiny with densely clustered and bilaterally flattened, unifoliate pseudobulbs, the one- or two-flowered inflorescence is sessile, and the sepals, petals and lip have no hairs but the former are finely papillose on the margin and the latter is slightly papillose beneath. It is also noteworthy that the only species of this section lacks spiral vessels in its tissues, a very rare situation in Madagascan *Bulbophyllum*. Phylogenetically the new species is placed separately on a basal polytomy as sister to all other Madagascan clades, without any relationship to one of the described sections (Fischer *et al.* unpubl. data). The combination of these character states makes the species unique; therefore we propose to place that species in a section of its own.

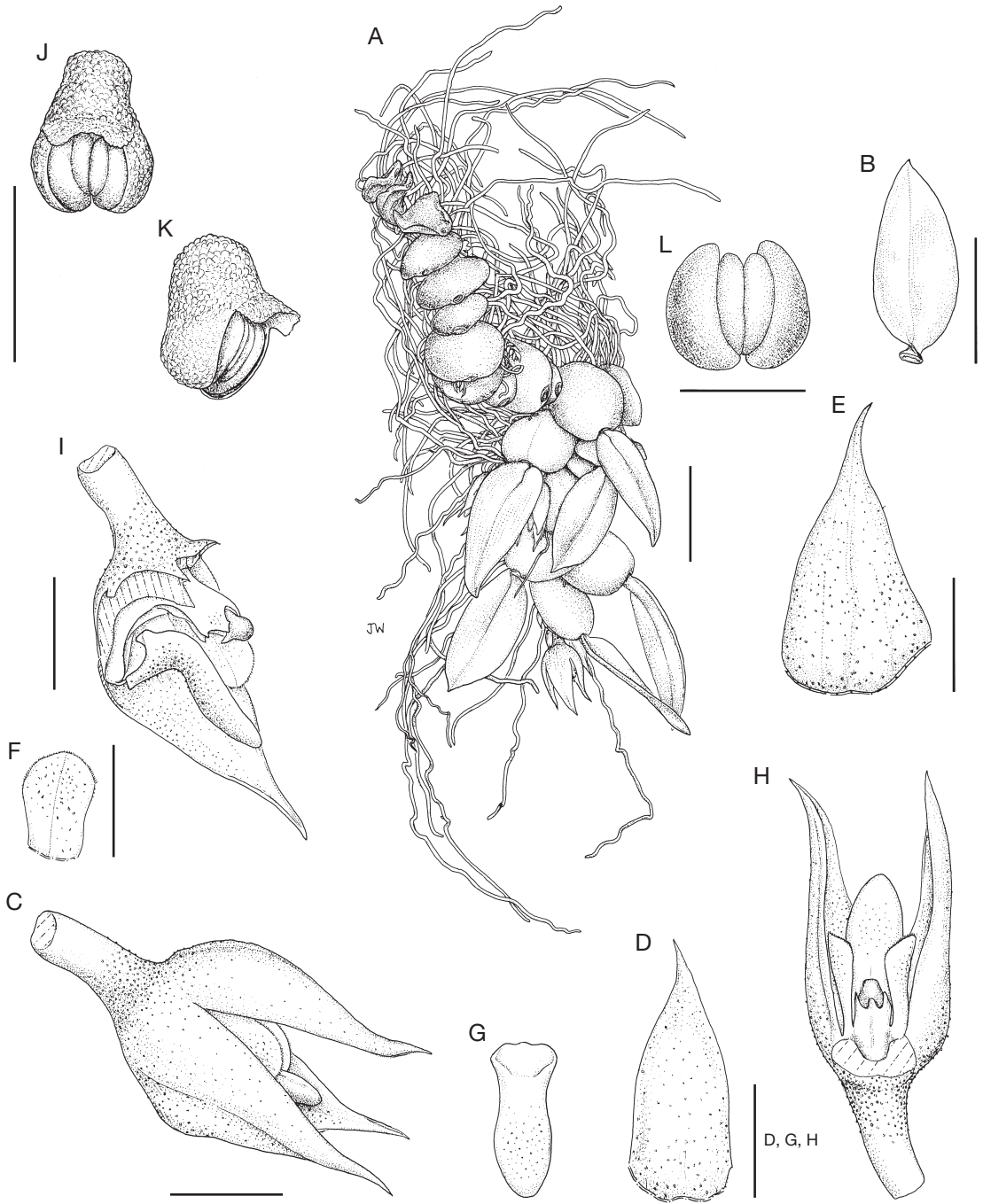


FIG. 1. — *Bulbophyllum petrae* G.A.Fischer, Sieder & P.J.Cribb: **A**, habit; **B**, leaf; **C**, flower, side view; **D**, dorsal sepal; **E**, lateral sepal; **F**, petal; **G**, lip, dorsal view; **H**, flower from above with dorsal sepal removed; **I**, flower from side with dorsal sepal and nearside lateral sepal and petal removed; **J**, **K**, anther-cap, two views; **L**, pollinia. Fischer & *Andriantiana* FS2287. Drawings by Juliet Beentje. Scale bars: A, B, 10 mm; C-I, 3 mm; J, K, 1 mm; L, 0.5 mm.

Bulbophyllum petrae

G.A.Fischer, Sieder & P.J.Cribb, sp. nov.

(Fig. 1)

Affinis B. humblotii Rolfe ex Scott-Elliot (*sed parum similes*) *sed pseudobulbis caespitosis, inflorescentia sessili uni- vel biflore, petalis integris et columna ad margines ventraliter dentes ferenti satis differt.*

TYPUS. — **Madagascar.** Toamasina, Ambatovy, 1088 m, 18°51'17"S, 48°19'03"E, 9.II.2005, *Fischer & Andriantiana* FS2287 (holo-, PBZT!; iso-, K!, P!, WU!).

PARATYPES. — **Madagascar.** Toamasina Province, Ambatovy, c. 1000 m, 6.II.2000, *Sieder & Andriantiana* O00B184 (WU!). — Antananarivo Province, Anjozorobe, *Fischer, Knirsch & Andriantiana* FS1642 (photo, WU!).

DESCRIPTION

Roots numerous, along the rhizome and below the pseudobulbs. Rhizome creeping, subulate to ensiform, 1.8–2.2 mm in diam., sections between pseudobulbs 4–5 mm long, rhizome scales present. Pseudobulbs close together, orbicular, 8–12 × 8–12 mm, 1-leaved. Petiole absent – leaf sessile. Leaf blade elliptic to obovate, 12–16 mm long × 5–8 mm wide, acute. Inflorescence a short raceme, 13–18 mm long, 1- or 2-flowered. Peduncle 7 mm long, Rhachis fractiflex, not thickened, 2–3 mm long. Floral bracts 1–2, acute, 3.5–4 mm long. Flowers with white sepals with dark purple dots, whitish petals, with dark purple specks at the tips, a white lip with dark purple spots suffusing the lip entirely, white anther and white column, with dark purple specks at its base. Pedicel and ovary 2–3 mm long. Median sepal ovate 6.9 × 2.6 mm; acute, margins entire, base broadly attached; fleshy, 3-veined, glabrous. Lateral sepals obliquely ovate, 8 × 4 mm; acute, margins entire, base broadly attached; fleshy, 3-veined, glabrous. Petals ovate-spathulate, 1.8 × 2.8 mm, lower margins ciliate, thin, 1-veined, glabrous. Lip recurved at third of its length, ovate, upper surface glabrous, finely papillose beneath. Column with wings (tooth-like), 4–5 mm long. Stelidia triangular, acute, with a small acute tooth along the upper margin. Anther surface papillose. Pollinia 4; ovoid, the inner 3/4 the length of the outer.

HABITAT

Epiphyte growing in wet montane forests, 1000–1400 m.

DISTRIBUTION

Endemic in east-central Madagascar.

ETYMOLOGY

The plant is named after the first author's wife Petra who supported the work.

CONSERVATION STATUS

Bulbophyllum petrae is only known from two localities. The first site, Anjozorobe, is under threat of logging and through slash and burn agriculture. The type site is located in the middle of a mining area which will be partly cleared within the next 10 years. Following the IUCN (2001) criteria this species must be considered as Endangered (EN B1a+b (iii)).

TAXONOMIC RELATIONSHIPS

This species is morphologically totally different from any other Madagascan *Bulbophyllum* species. Its flower differs from any other known *Bulbophyllum* species in size, form and structure.

In its floral morphology it is superficially similar to *B. humblotii* Rolfe ex Scott-Elliot (section *Humblotiorchis*) but it differs in having caespitose not widely spaced pseudobulbs, its almost sessile, one- or two-flowered inflorescences, and the shape of its petals and sepals, the petals being entire not bifid, and the shape of the column and stelidia. Only the shape and the surface ornamentation of its lip is similar to *B. humblotii*.

Bulbophyllum sect. *Ploiarium* Schltr.

Bulbophyllum jackyi

G.A.Fischer, Sieder & P.J.Cribb, sp. nov.

(Fig. 2)

In sectione Ploiario Schltr. *ponenda sed pseudobulbis unifoliis, inflorescentia nonnihil conica nutanti, bracteis convexis late ovatis erosis flores occultantibus, labello carnosio late ovato papilloso et sepalis lateralibus intus papillosis et extus late alatis.*

TYPUS. — **Madagascar.** Fianarantsoa, Farafangana, labomary shortly before Mahabo-Mananivo, Mahabo forest, 36 m, 23°10'55"S, 47°42'31"E, 14.XI.2002, *Fischer, Sieder & Andriantiana* FS868 (holo-, PBZT!; iso-, WU!).

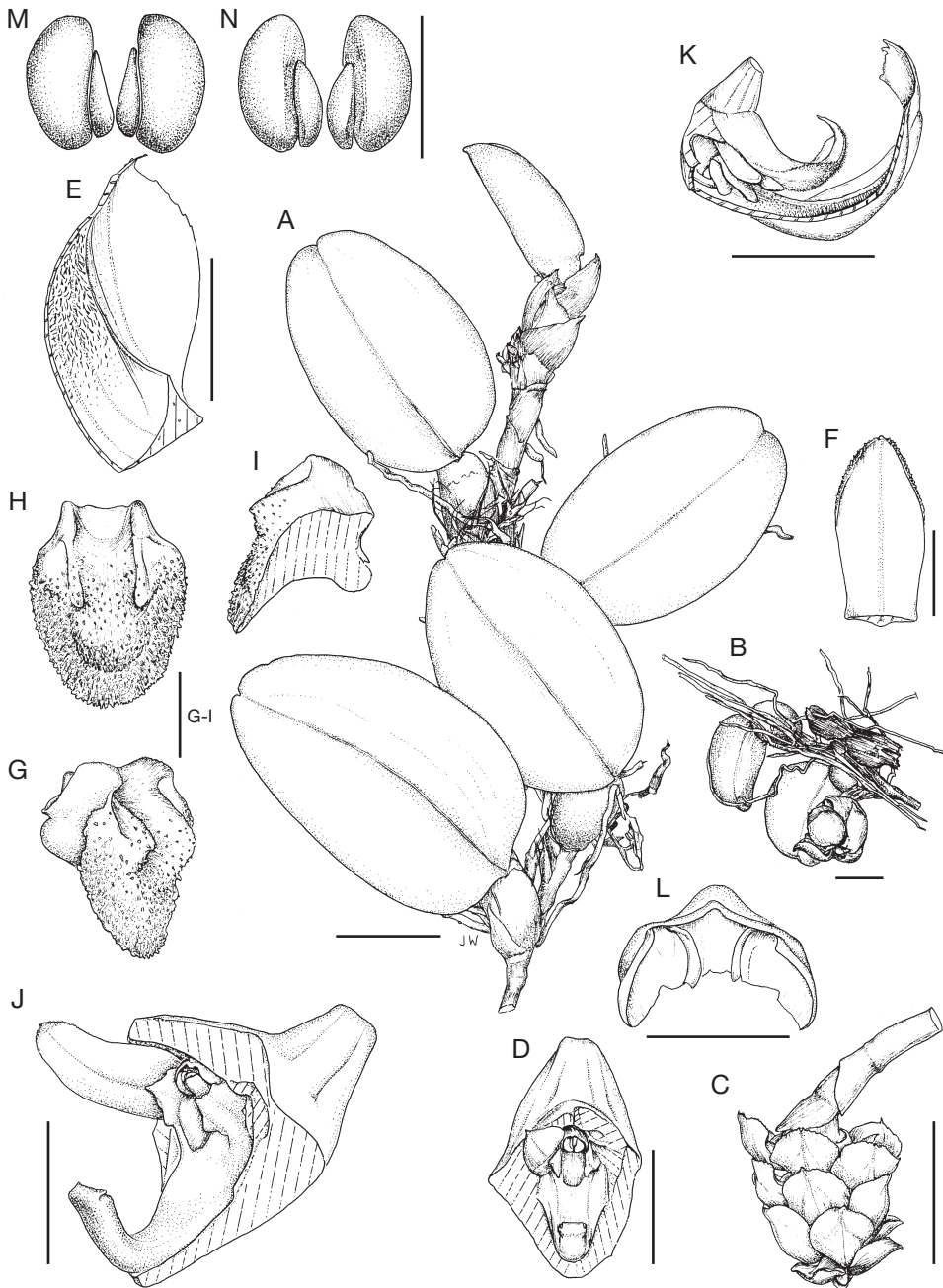


FIG. 2. — *Bulbophyllum jackyi* G.A.Fischer, Sieder & P.J.Cribb: **A**, habit; **B**, pseudobulbs and inflorescence; **C**, inflorescence; **D**, petal, column and ovary; **E**, lateral sepal; **F**, petal; **G**, **H**, lip, two views; **I**, lip, longitudinal section; **J**, flower from side with sepals and near-side petal removed; **K**, young flower with one half of synsepal removed; **L**, anther-cap, ventral view; **M**, **N**, pollinia. Fischer, Sieder & Andriantiana FS868. Drawings by Juliet Beentje. Scale bars: A-C, 10 mm; D, J, 2 mm; E, 5 mm; F-I, K-n, 1 mm.

DESCRIPTION

Roots borne along the rhizome and below the pseudobulbs. Rhizome creeping, subulate, 3 mm in diam., sections between pseudobulbs 30–50 mm long, rhizome scales present. Pseudobulbs distantly spaced, orbicular, 8–10 × 10–12 mm, unifoliate. Petiole absent – leaf sessile. Leaf blade obovate, 40–60 mm long × 25–38 mm wide, obtuse to emarginate. Inflorescence a short raceme, 25–38 mm long, 10- to 15-flowered. Peduncle 22–25 mm long, with 4 bracts. Rhachis, thickened, fleshy, 10–13 mm long, 6–8 mm in diam. Floral bracts 4, acute-obtuse, 7–9 mm long. Flowers entirely dark purple. Pedicel and ovary 3–5 mm long. Median sepal ovate, 6–8 × 4–5 mm; mucronate, margins papillose, inner surface very papillose, base broadly attached; fleshy, 3-veined. Lateral sepals fused to a cap-like structure, recurved, covering all flower parts, 18 × 18 mm (both lateral sepals), acute; margins entire, base broadly attached; fleshy, 3-veined, glabrous except the inner part of the fused sepals around the lip, which is very papillose. Petals ovate, 1–2.2 mm, lower margins ciliate, fleshy, 1-veined. Lip recurved at 1/3 of its length, ovate, surface papillose, thick, fleshy. Column winged, 4–5 mm long. Stelidia triangular, acute with a small acute tooth along the upper margin. Anther surface slightly papillose. Pollinia 4, ovoid, the inner 2/3 as long as the outer.

HABITAT

Epiphyte growing in lowland heath forest on white sand.

DISTRIBUTION

Endemic in East Madagascar.

ETYMOLOGY

The plant is named after Jacky Andriantiana, co-worker at several field trips and specialist for the orchids of Madagascar.

CONSERVATION STATUS

Bulbophyllum jackyi is only known from one locality which is under heavy pressure through forest clearing activities of local people; the surrounding forest already having been cleared. Therefore the species must be considered as Critically Endan-

gered (CR B1a+b (iii)) according to the IUCN (2001) criteria.

TAXONOMIC RELATIONSHIPS

Bulbophyllum jackyi fits morphologically and phylogenetically into section *Ploiarium* but differs from other species in the section in having unifoliate pseudobulbs, very short inflorescences, broad, erose bracts that enclose the flowers, a broadly ovate, papillose, fleshy lip and distinctive broadly winged lateral sepals that are papillose within.

Acknowledgements

We wish to express our thanks to Barbara Graven-deel and Jaap Vermeulen (Nationaal Herbarium Nederland, Universiteit Leiden) for providing useful comments on the taxonomy and molecular systematics of the genus *Bulbophyllum*, Johan Hermanns for the help in identifications, literature and herbarium research, Solo Rapanarivo for providing facilities and hospitality in PBZT, Département des Eaux et Forêts, Madagascar, for the collaboration and collecting permits, and Juliet Beentje (Royal Botanic Gardens, Kew) for the excellent drawings. Jacky Andriantiana (PBZT) is gratefully acknowledged for his company, his support and for his identifications during our field work in Madagascar. The present work was carried out in the context of Austrian Science Fund project FWF-17124-Bio (Austrian Science Fund).

REFERENCES

- BOSSER J. 1965. — Contribution à l'étude des Orchidaceae de Madagascar V. Révision de quelques sections du genre *Bulbophyllum* à Madagascar. *Adansonia*, sér. 2, 5: 375–410.
- BOSSER J. 1969. — Contribution à l'étude des Orchidaceae de Madagascar. VII. *Adansonia*, sér. 2, 9: 135–137.
- BOSSER J. 1971. — Contribution à l'étude des Orchidaceae de Madagascar XVI. Espèces nouvelles du genre *Bulbophyllum*. *Adansonia*, sér. 2, 11: 325–335.
- BOSSER J. 1989. — Contribution à l'étude des Orchidaceae de Madagascar et des Mascareignes. XXIV. *Adansonia* sér. 3, 11: 29–38.
- BOSSER J. 2000. — Contribution à l'étude des Orchidaceae de Madagascar et des Mascareignes. XXIX. Révision de la section *Kainochilus* du genre *Bulbophyllum*.

- Adansonia*, sér. 3, 22 (2): 167-182.
- BOSSER J. 2004. — Contribution à l'étude des Orchidaceae de Madagascar, des Comores et des Mascareignes. XXXIII. *Adansonia*, sér. 3, 26 (1): 53-61.
- BOSSER J. & CRIBB P. J. 2001. — Trois nouvelles espèces de *Bulbophyllum* (Orchidaceae) de Madagascar. *Adansonia*, sér. 3, 23 (1): 129-135.
- DU PUY D. J., CRIBB P. J., BOSSER J., HERMANS J. & HERMANS C. 1999. — *The Orchids of Madagascar*. Royal Botanic Gardens, Kew, 376 p.
- IUCN 2001. — *IUCN Red List Categories and Criteria*. Version 3.1. IUCN Species Survival Commission, Gland, Switzerland; Cambridge, UK, ii + 30 p.
- PERRIER DE LA BÂTHIE H. 1939. — Orchidaceae 1. *Flore de Madagascar* 49 (1). Imprimerie officielle, Tananarive, 477 p., 41 pls.

*Submitted on 18 September 2006;
accepted on 6 February 2007.*