



# *Angraecum inflatum*, a new species in Angraecinae (Orchidaceae) from Madagascar

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**Summary.** A new species from Madagascar, *Angraecum inflatum* Hermans, is described and illustrated for the first time. It is compared with similar species from section *Lemurangis*. A preliminary conservation assessment is provided.

**Key Words.** IUCN Red List assessments, section *Lemurangis*, taxonomy.

## Introduction

*Angraecum* Bory (subfamily Epidendroideae: tribe Vandaeae: subtribe Angraecinae) (Chase *et al.* 2015) is a large genus of over 200 species occurring mainly in Africa, Madagascar and adjacent islands of the Indian Ocean but it is notably speciose on Madagascar with 148 species, two subspecies, and four varieties. Just over 10% of these taxa also occur in the Mascarenes and the Comoros (Hermans in Goodman 2021, in press). Following the major work on the Madagascan angraecoid orchids by Schlechter (1915, 1925) and Perrier de la Bâthie (1938, 1941), Garay (1973) produced a taxonomic revision of the genus at sectional level. Several investigations of the phylogeny and biogeography of the genus have recently been made (Michenau *et al.* 2008; Szlachetko *et al.* 2013; Andriananjamanantsoa *et al.* 2016; Simo-Droissart *et al.* 2018) which suggest that *Angraecum*, as currently accepted, is polyphyletic. However, because these studies have sampled only a limited selection of species, we do not feel confident in accepting those segregates that have been established based on molecular data and lack morphological support.

## Materials and Methods

As part of ongoing research and fieldwork on the orchid flora of Madagascar at the Royal Botanic Gardens Kew, the University of Vienna and PBZT Antananarivo, specimens of putative new taxa were compared with descriptions, herbarium material and drawings of all of the type specimens and many other specimens, to ascertain their novelty. This has resulted in the recognition of a new species in section *Lemurangis*, a section first established by Garay (1973:

501), for a small group of plants of eight species, predominantly endemic to Madagascar.

The conservation status of the new species given in this paper is a summary of the full IUCN Red List assessments which will be completed and submitted for review and publication by IUCN once the species name is validly published. The assessment has been compiled based on current knowledge of the taxon, by one of the authors (Landy Rajaovelona), who is an IUCN Red List assessor, using the IUCN Red List Categories and Criteria (2012).

***Angraecum inflatum* Hermans sp. nov.** Type: Madagascar, Fianarantsoa prov., Ankazomivady area, c. 1500 m, cult. Malala Orchidées, 1999, *Hermans* 4935 (holotype K!).

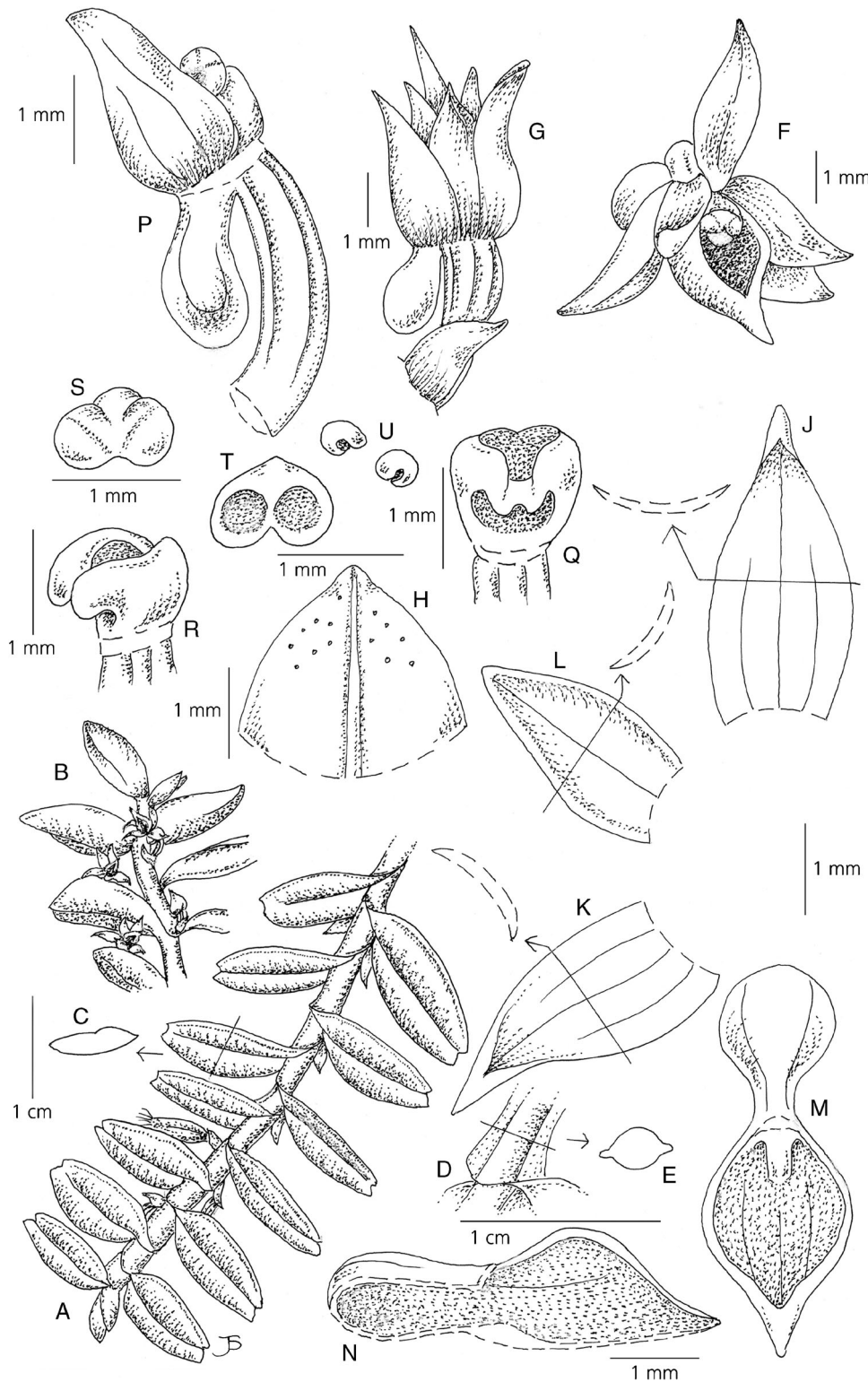
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Pendent to arching, tufted epiphytic *herb* up to 18 cm long, loosely attached to the substrate and forming large overlapping colonies along the mossy substrate; with an extensive mass of branched, wiry, smooth to slightly verrucose basal roots, c. 1 mm in diam. *Stem* branching from the base and rarely re-branching, up to 17 cm long, 4–6 mm wide, more or less flattened, completely covered by winged leaf sheaths with erose to lacerate, recurved apical margins, the base and withered stems covered by grey corrugate leaf sheath remnants. *Leaves* succulent, alternate-distichous along the stem, twisted at the base to almost lie in one plane, elliptic to narrowly ovate, 15–19 × 5–7 mm, elliptic in cross-section, with a canaliculate mid-vein, round underneath, obtuse to rounded at the base, unequally

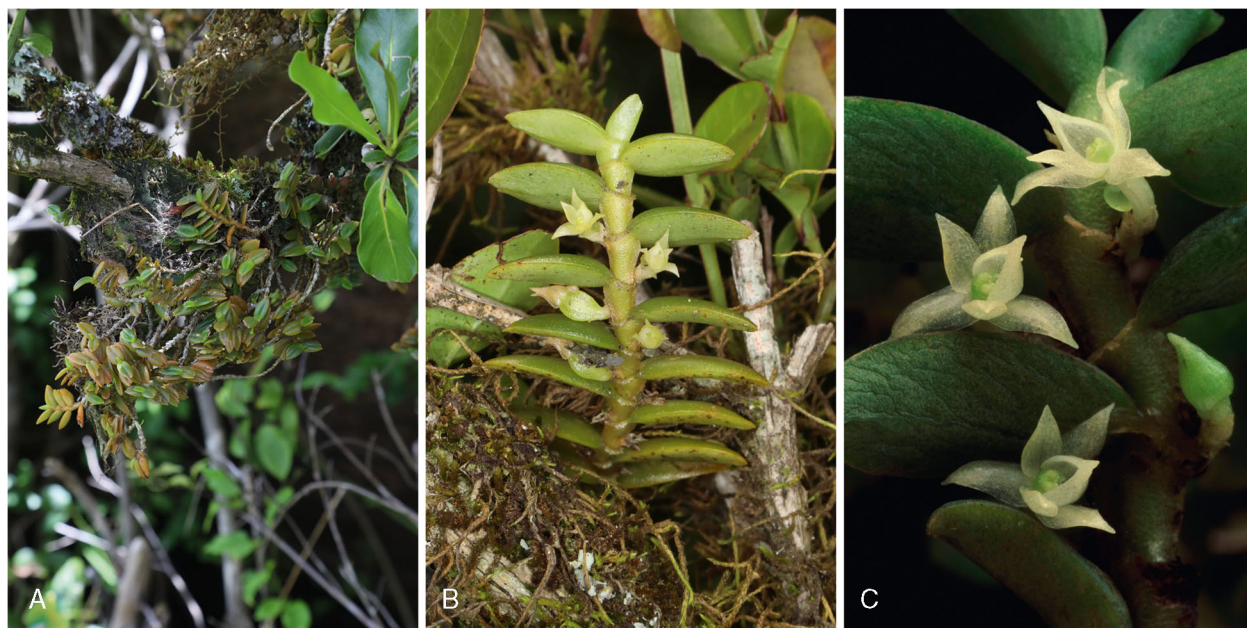
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**Fig. 1.** *Angraecum inflatum*. A plant habit; B detail of plant and inflorescences; C transverse section of leaf; D detail of stem; E transverse section of stem; F flower front view; G flower side view; H floral bract; J dorsal sepal; K lateral sepal; L petal; M lip from above; N lateral section of lip; P column and lip, side view; Q column, front view, anther cap removed; R column, side view, anther cap removed; S anther cap, dorsal view; T anther cap, ventral view; U pollinia. From Hermans 8296, 4935 & photographs. DRAWN BY JUDI STONE.



**Fig. 2.** *Angraecum inflatum*. A plant habit, from the Ankazomivady area, Madagascar; B plant growth and inflorescence; C flowers and developing capsules. PHOTOS: J. HERMANS.

roundly bilobed at the apex, pale to dark green, sometimes becoming orange-brown with age. *Inflorescence* from the axis of the leaf sheaths, very short, generally single-flowered, leaf-opposed; sometimes with a second flower from the same axis. *Peduncle* very short, angular in cross-section, c.  $0.3 - 0.5 \times 0.2$  mm, covered by 1 – 3 thin sterile bracts. *Floral bracts* thin, ovate, conduplicate, dorsally ridged, apiculate,  $1.8 - 2.1 \times 1.2 - 1.5$  mm, pale brown. *Pedicel* and *ovary* fusiform,  $2 - 3.2 \times 0.7 - 0.9$  mm, with a few brownish black verrucae along the longitudinal furrows. *Flowers* generally resupinate, overall  $6 - 7 \times 5 - 7$  mm diam., pale greenish-yellow, the spur, column and ovary pale green. *Dorsal sepal* ovate,  $2.8 - 3.8 \times 1.5 - 1.8$  mm, acuminate, thickened at the apex, recurved in the apical half. *Lateral sepals*, ovate, acuminate, thickened at the apex,  $3.2 - 4 \times 1.2 - 1.7$  mm, spreading, recurved. *Petals* ovate, acuminate,  $2.3 - 3.4 \times 0.9 - 1.3$  mm. *Lip* deeply concave, elliptic, acuminate, the apical margin thickened-incurved, with a short longitudinal callus at the base,  $2.5 - 3.2 \times 1.5 - 1.8$  mm, *spur* opening narrow, cylindrical at the base then ampulliform, more or less flattened against the substrate,  $1.6 - 2.3 \times 1 - 1.2$  mm. *Column* very short, rounded, with distinct dolabriform lateral rostellum lobes folded in front of the distal part, apex of rostellum deeply emarginate with a small rounded central lobe, c.  $1 \times 1$  mm, stigma transversely elliptic. *Anther cap* transversely elliptic in outline, with a raised rounded lobe,  $0.4 - 0.7 \times 0.5 - 0.8$  mm; *pollinia* 2, obovoid, c.  $0.2 \times 0.3$  mm, indistinct stipes and a small viscidium c. 0.1 mm long. *Fruit* c.  $6 \times 4$  mm, subglobose to ovoid, roundly ridged, maturing as other flowers develop. (Figs 1, 2).

**RECOGNITION.** *Angraecum inflatum* fits well in sect. *Lemurangis* Garay which is characterised by the long stem, distichous leaves, few-flowered inflorescences shorter than the leaves and short rachis. It is distinct in having short fleshy ovoid leaves, winged stem sheaths with an erose-lacerate apical margin, inflorescences with a very short peduncle, and flowers with a lip with thickened margins, a small longitudinal callus at the base and an ampulliform spur and the capsule maturing as other flowers develop.

**DISTRIBUTION. MADAGASCAR.** Endemic to Fianarantsoa province in central Madagascar.

**SPECIMENS EXAMINED. MADAGASCAR.** Madagascar, Fianarantsoa prov., Ankazomivady area, c. 1500 m, 1999, *Hermans* 4935 (K — type) cult. Malala Orchidées, 2014; *Hermans* 7024 & 8296 (K); Antoetra, Feb. 2015, *A. & C. Sieder, Pertl & Andriantiana* 6883 (WU); sight records Ankazomivady, Hermans Jan. 2019.

**HABITAT.** Sclerophyllous woodland and forest remnants, on *Ficus* and other small trees. Altitude 1200 – 1700 m.

**CONSERVATION STATUS.** *Angraecum inflatum* is endemic to Madagascar, restricted to the Amoron'i Mania region (Fianarantsoa province). The type locality is now being cleared for charcoal and the cultivation of *Pelargonium*, grown increasingly in the region to produce essential oils. The two collections with the recent observations represent a total of two 'locations' (sensu IUCN 2012) with respect to the main threat, which is shifting agriculture. With the observations and the two collections outside the protected areas, we infer that the destruction of the habitat will induce a

strong continuous decline in the area of occupancy (AOO), habitat extent and quality, the number of subpopulations and mature individuals in the next ten years. *Angraecum inflatum* is therefore assessed as Endangered (EN) under criterion B2ab (i, ii, iii, iv, v).

**PHENOLOGY.** December to February.

**ETYMOLOGY.** The epithet name refers to swollen leaves, lip margin and puffed-up spur.

**NOTES.** *Angraecum inflatum* is most similar to *A. baronii* (Finet) Schltr. from Madagascar but in that species the stem is more extensively branched, the leaves are narrowly lanceolate (vs ovate) and the apex attenuate (vs rounded); the peduncle is about twice as long; and

the flowers are similar in size but the lip is more acuminate and thin towards the apex and the spur is cylindrical and curved at the apex (vs ampulliform). It is also similar to *A. costatum* Frapp. in Cordem. from Réunion but in that species the plant is more erect with slightly longer and less succulent leaves; the flowers are a little larger and the spur about twice as long; the lip lacks a basal callus and the spur is slightly swollen towards the apex (vs ampulliform).

The circumscription of section *Lemurangis* needs further research as part of a revision of all the sections of *Angraecum* but the key below summarises the differential characteristics of the currently recognised species.

### Artificial key to the species of *Angraecum* sect. *Lemurangis*

1. Leaves long (over 3.5 cm), lanceolate . . . . . 2
- 1'. Leaves short (under 3 cm), ovate or falciform . . . . . 3
2. Leaves over 8 cm long, attenuate at the base, flowers over 2 cm long . . . . .  
     . . . . . *Angraecum floribundum* Bosser (Madagascar)
- 2'. Leaves under 6 cm long, obtuse at the base, flowers under 1.5 cm long . . . . . *Angraecum costatum* (Réunion)
3. Leaves falciform, narrow (more than 5 times longer than wide) . . . . . 4
- 3'. Leaves broad (less than 3 times longer than wide) . . . . . 5
4. Lip over 4 mm long, spur over 2.5 mm long. . . . . *Angraecum falcifolium* Bosser (Madagascar)
- 4'. Lip under 3.5 mm long, spur under 2 mm long . . . . . *Angraecum decaryanum* H.Perrier (Madagascar)
5. Plant small (under 3 cm) on a short stem . . . . . *Angraecum humile* Summerh. (E Africa)
- 5'. Plant large (over 7 cm) on a long stem . . . . . 6
6. Leaves distichous, distant, base rounded, not enveloping the stem, single-flowered, spur strongly inflated at apex . . . . . *Angraecum inflatum* (Madagascar)
- 6'. Leaves contiguous, base enveloping the stem, 2- to 4-flowered, spur not much inflated . . . . . 7
7. Inflorescence as long as the leaves or longer, floral bracts half the length of the ovary. . . . .  
     . . . . . *Angraecum alleizettei* Schltr. (Madagascar & Réunion)
- 7'. Inflorescence half the length of the leaves or shorter, floral bracts about as long as the ovary . . . . .  
     . . . . . *Angraecum madagascariense* (Finet) Schltr. (Madagascar)

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