

## **Angraecum Darainense P. J. Cribb & Nusb. and Aeranthus Unciformis P. J. Cribb & Nusb. (Orchidaceae), Two New Species from Northern Madagascar**

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# Angraecum darainense P. J. Cribb & Nusb. and Aeranthes unciformis P. J. Cribb & Nusb. (Orchidaceae), two new species from northern Madagascar

Phillip Cribb, Louis Nusbaumer & Laurent Gautier

## Abstract

CRIBB, P., L. NUSBAUMER & L. GAUTIER (2012). *Angraecum darainense* P. J. Cribb & Nusb. and *Aeranthes unciformis* P. J. Cribb & Nusb. (Orchidaceae), two new species from northern Madagascar. *Candollea* 67: 269-275. In English. English and French abstracts.

Two new orchid species, *Angraecum darainense* P. J. Cribb & Nusb. and *Aeranthes unciformis* P. J. Cribb & Nusb. (Orchidaceae) from northern Madagascar are described here, illustrated and compared with other species in their respective genera. *Angraecum darainense* appears to be related to *Angraecum melanostictum* Schltr., but differs in having flowers with a longer spur and leaves more densely arranged on the longer stems, leaf blade much shorter and narrower. *Aeranthes unciformis* appears to be related to *Aeranthes caudata* Rolfe, but differs by having flowers borne two or three at a time and having a very distinctive transversely elliptic lip tapering into a long acumen at the tip and a distinctive dorsal sepal curving forwards over the column and lip. The distribution, ecology and conservation status of these two orchids species are briefly discussed.

## Key-words

ORCHIDACEAE – *Angraecum* – *Aeranthes* – Northern Madagascar – Loky-Manambato – Taxonomy

## Résumé

CRIBB, P., L. NUSBAUMER & L. GAUTIER (2012). *Angraecum darainense* P. J. Cribb & Nusb. et *Aeranthes unciformis* P. J. Cribb & Nusb. (Orchidaceae), deux nouvelles espèces du nord de Madagascar. *Candollea* 67: 269-275. En anglais, résumés anglais et français.

Deux espèces nouvelles d'orchidées du nord de Madagascar, *Angraecum darainense* P. J. Cribb & Nusb. et *Aeranthes unciformis* P. J. Cribb & Nusb. (Orchidaceae) sont décrites, illustrées et comparées avec les espèces les plus proches au sein de leur genre respectif. *Angraecum darainense* est proche d'*Angraecum melanostictum* Schltr., mais en diffère par des fleurs présentant un éperon plus long, par ses feuilles plus densément imbriquées sur des rameaux plus longs ainsi que pas son sépale dorsal replié sur la colonne et le labelle, avec un limbe beaucoup plus court et étroit. *Aeranthes unciformis* est proche d'*Aeranthes caudata* Rolfe, mais en diffère par ses fleurs regroupées par deux à trois et ayant un labelle très distinct, elliptique à la base puis étiré et effilé en direction de l'apex. La distribution, l'écologie et le statut de conservation de ces deux espèces d'orchidées sont brièvement analysés.

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## Introduction

*Angraecum* Bory (*Orchidaceae*) is a large genus including more than 210 species mainly distributed in Africa, Madagascar and in the adjacent islands of the Indian Ocean. In Madagascar the genus is rich with over 130 species (HERMANS & al., 2007; CRIBB & HERMANS, 2009). The species of *Angraecum* are mainly epiphytic plants with erect to pendent leafy stems reaching up to 60 cm (CRIBB & HERMANS, 2009). A phylogenetical and biogeographical study on Mascarene angraecoid species and including also African and Malagasy species demonstrates that the genus *Angraecum* is clearly polyphyletic (MICHENEAU & al., 2008). Nevertheless, the Malagasy species of *Angraecum* considered by these authors form a natural monophyletic group.

*Aeranthès* Lindl. is a diverse genus mainly localised in Madagascar with 36 species recorded on the island (CRIBB & HERMANS, 2009), a few species in Mascarene and Comoro islands and two species from south-central Africa. The genus is epiphytic with leafy stems reaching up to 20 cm long. The phylogenetical and biogeographical study on Mascarene angraecoid species by MICHENEAU & al. (2008) showed the monophyly of the western Indian Ocean species of the genus *Aeranthès*.

Several specimens of the two genera *Angraecum* and *Aeranthès* were collected during a flora and vegetation study led in the Loky-Manambato (Daraina) region through collaboration between the Conservatoire et Jardin botaniques de la Ville de Genève, the University of Antananarivo and the Malagasy NGO Fanamby in charge of implementing conservation planning in the area. This region presents steep environmental gradients and a complex topography where four of the six Madagascar phytogeographic domains (sensu HUMBERT, 1955) are entangled, providing a clear example of the complex phytogeography of North Madagascar (GAUTIER & al., 2006; NUSBAUMER & al., 2010). The main part of the field work was realized during three consecutive years from 2003 to 2006 during the rainy season i.e. between November to April of each year, representing more than 300 days spent in the field and more than 54,000 records of plant occurrences in the ten main forest sub-areas of the region. Over 85 new species were discovered among the about 5,000 fertile plants collected during the study; 22 of which have already been published. Here we describe one *Angraecum* and one *Aeranthès*, confirming Madagascar as the centre of diversity for these two genera.

*Angraecum darainense* P. J. Cribb & Nusb., spec. nova (Fig. 1 & 2).

**Typus:** MADAGASCAR: province de Diego-Suarez/Antsi-ranana, sous-préfecture de Vohemar, commune rurale de Daraina, forêt de Bobankora, partie nord, 13°13'S 49°46'E, 535 m, fl., 26.I.2005, L. Nusbaumer & P. Ranirison 1430 (holo-: G!; iso-: P, herbarium of Daraina).

*Affinis* *A. melanosticto* sed *caulibus longioribus, foliis densiore dispositis, vaginis foliorum emaculatis et calcari floris 8-10 cm longo (nec tantum 7 cm) satis differt.*

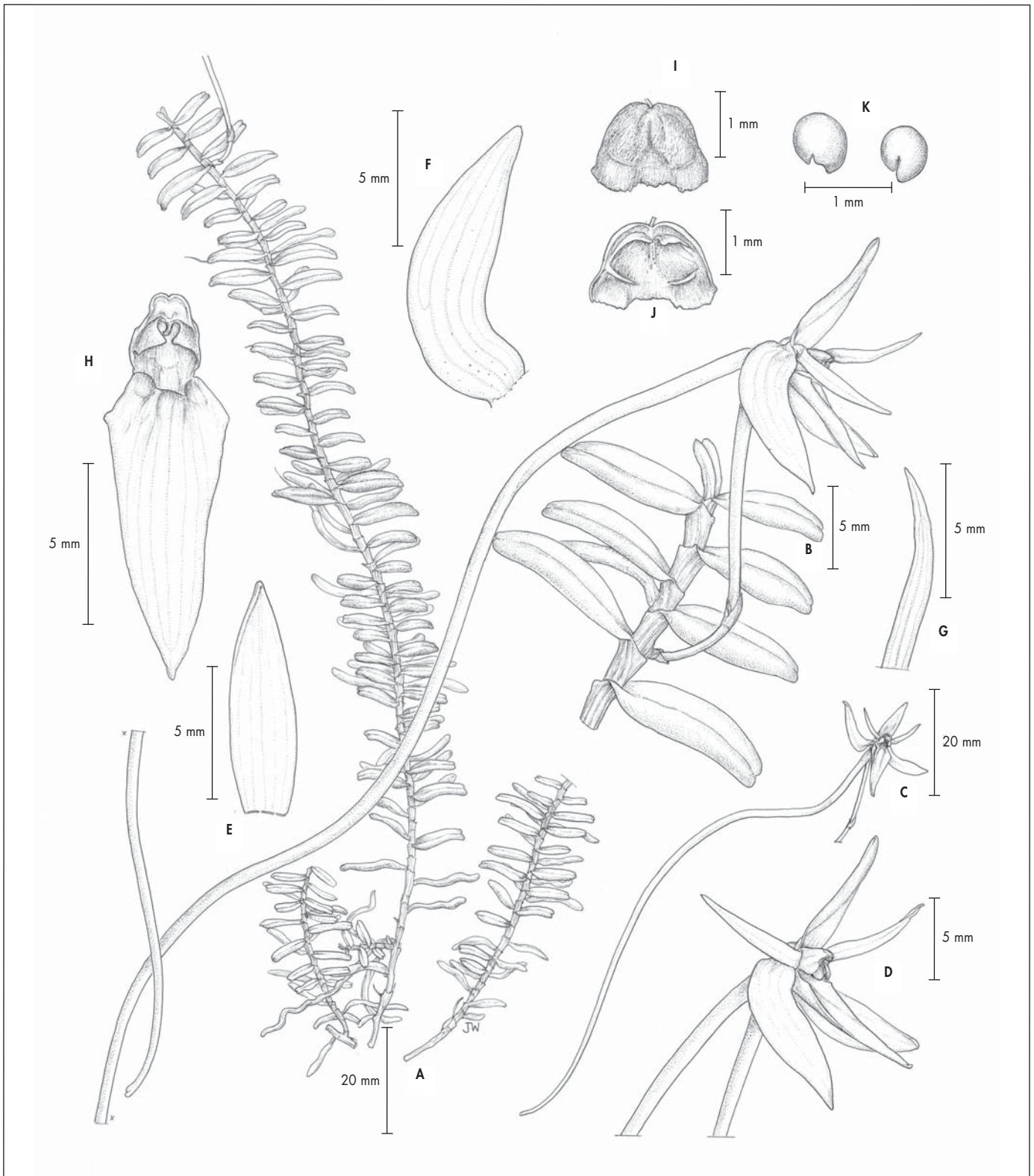
A slender scrambling prostrate lithophytic herb with a stem up to 22 or more cm long; roots adventitious, slender, 1 mm in diam. *Leaves* fleshy, distichous, twisted at the base to lie in one plane, linear-oblong, obtusely obliquely bilobed at the tip mostly with a longer proximal lobe and a shorter distal lobe, of unequal length, 5-11 × 1-2 mm; unspotted leaf sheaths. *Inflorescences* axillary, 1-flowered; peduncle terete, slender, 6 mm long; bracts very small, ovate-triangular, acute, up to 2 mm long. *Flower* resupinate, large for the size of the plant, white; pedicel and ovary 20 mm long. Dorsal *sepal* erect, somewhat concave, lanceolate, acute, 9 × 2.5 mm; lateral sepals decurved, falcate, oblong-lanceolate, acute, 10-11 × 3 mm. *Petals* porrect, narrowly lanceolate, acute, lying each side of the column, 8.5-9 × 2.5 mm. *Lip* somewhat deflexed, concave, lanceolate, acute, 10 × 2.4 mm; spur pendent, somewhat sigmoid-sinuate, narrowly cylindrical, tapering in apical half, 80-100 mm long. *Column* 2 mm long; anther cap broadly obovoid with an erose apical margin.

*Notes.* – *Angraecum darainense*, described here, is allied to *A. melanostictum* Schltr. (sect. *Pseudojumellea* Schltr.), a species described from the Marojejy Massif, 140 km to the south of Daraina. The new species differs in having a flower with a longer spur, 8-10 cm long, more densely arranged leaves on the longer stems, unspotted leaf sheaths, and a much shorter and narrower leaf blade.

*Distribution.* – The species is only known from the Bobankora forest in the Loky-Manambato region in North-East Madagascar. Only 10-20 individuals were observed in the area during the vegetation study of the region.

*Flowering time.* – January.

*Habitat and ecology.* – *Angraecum darainense* was observed close to the ground in evergreen rainforest on large granitic rocks between 520 and 570 m elevation. It grows in forests with canopies reaching 10 to 14 m, with emergent trees reaching 16 m, with two sparse shrub strata at 3 to 4.5 and at 7 to 8 m high, and a very sparse suffrutescent stratum less than 1 m high. The most frequent species recorded together with *Angraecum darainense* in vegetation surveys are, in decreasing abundance: *Cynometra commersoniana* (DC.) Baill., *Treculia africana* subsp. *madagascariensis* (N. E. Br.) C. C. Berg, one unidentified species of *Dypsis* Mart., *Ravenala madagascariensis* Adans. and *Scleria boivinii* Steud.



**Fig. 1.** – *Angraecum darainense* P. J. Cribb & Nusb. **A.** Habit; **B.** Apex of stem, leaves and flower; **C.** Flower; **D.** Flower, side view; **E.** Dorsal sepal; **F.** Lateral sepal; **G.** Petal; **H.** Lip and column, front view; **I–J.** Anther cap, dorsal and ventral views; **K.** Pollinia.

[L. Nusbaumer & P. Ranirison 1430] [Drawn by Juliet Beentje-Williamson from the type collection]





Fig. 2. – Flowering shoot of the type collection of *Angraecum darainense* P. J. Cribb & Nusb.

[L. Nusbaumer & P. Ranirison 1430] [Photo: L. Nusbaumer]

**Etymology.** – The specific epithet refers to Daraina, the main village located in the central part of the Loky-Manambato region, which is the only known region where the new species occurs.

**Conservation status.** – With only one subpopulation included in the Loky-Manambato protected area, *Angraecum darainense* is assigned a preliminary status of “Critically Endangered” (CR) following the IUCN Red List Categories and Criteria (IUCN, 2001). This species was collected rather early during the floristic survey, and we expected that several subpopulations should be observed later, because its habitat, the evergreen rainforest, is the third most frequent forest type in this region. It turned out that no additional fertile material of this species was encountered.

*Aeranthes unciformis* P. J. Cribb & Nusb., **spec. nova** (Fig. 3 & 4).

**Typus:** MADAGASCAR: province de Diego-Suarez/Antsi-ranana, sous-préfecture de Vohemar, commune rurale de Daraina, forêt de Bekaraoka, partie nord, 13°06'S 49°42'E, 177 m, fl., 13.II.2004, L. Nusbaumer & P. Ranirison 1168 (holo-: G!; iso-: P, K!, MO!, TAN, herbarium of Daraina).

*Habitu A. laxiflorae similis sed floribus majoribus et calcari longiore differt; affinis A. caudatae sed planta minore, foliis minoribus, inflorescentiis brevissimis 25-30 mm longis 2-3-floris; pedunculo brevissimo 1-2 cm longo, labello ad basin late elliptico longe acuminato et calcari elongate recto 22-24 mm longo bene distincto.*

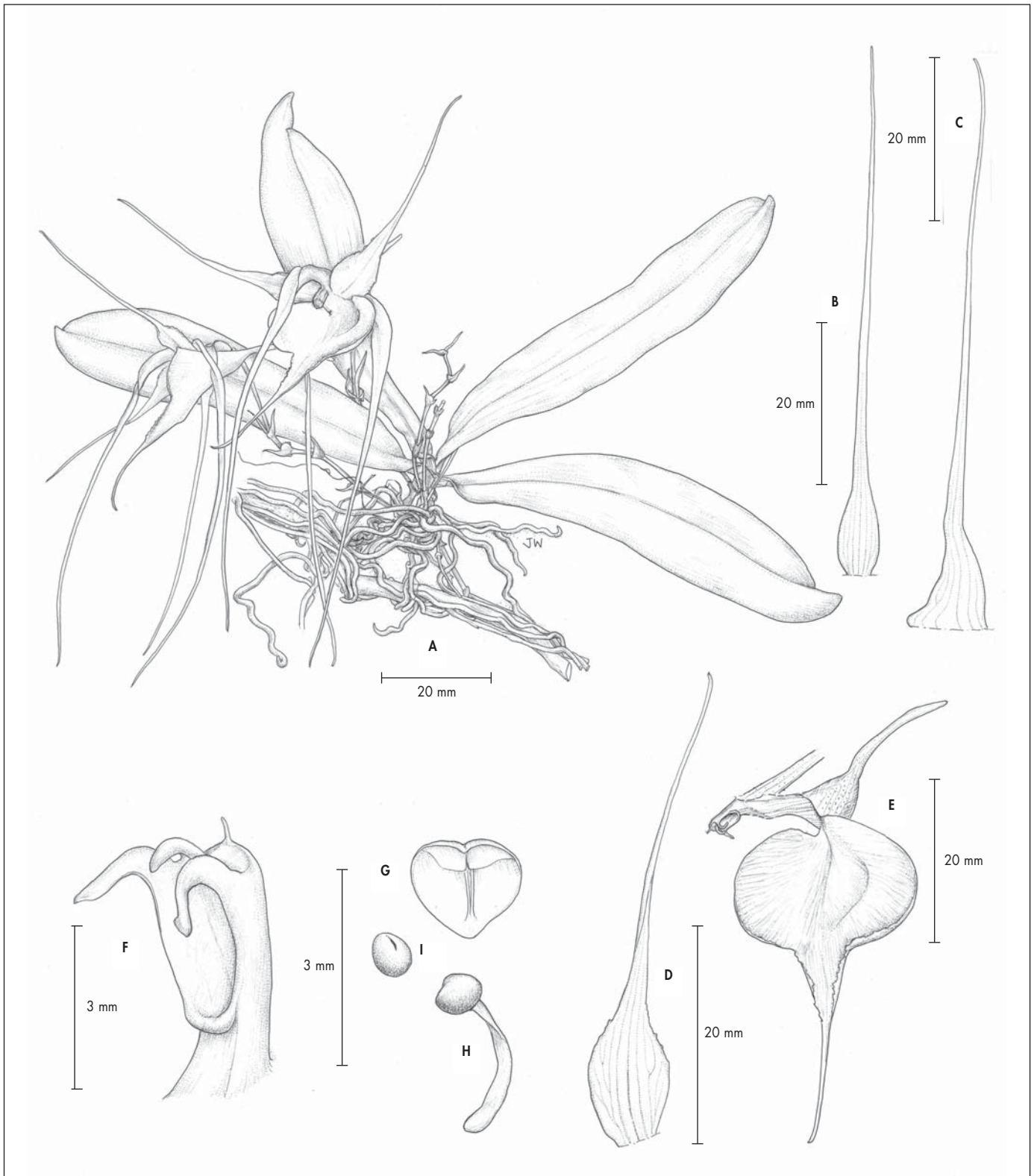
An epiphyte herb on trees with a very short stem; roots adventitious, slender, 1-1.5 mm in diameter. Leaves 4-5, distichous, twisted at the base to lie in one plane, oblanceolate-oblong, obtusely obliquely bilobed at the tip mostly with a longer distal lobe and a shorter proximal lobe, 6-8 × 0.9-2 cm, articulated at the base to a short conduplicate leaf base. Inflorescences much shorter than the leaves, axillary, 1- to 3-flowered, 25-30 mm long; peduncle terete, 10-12 mm long; bracts small, ovate, acuminate, 4-4.5 mm long. Flower resupinate, large for the size of the plant, translucent, white; pedicel and ovary 20 mm long, scabrid. Dorsal sepal curving forwards over the column and lip, linear-tapering, longly caudate, 65-85 × 3 mm; lateral sepals spreading-decurved, falcate at base, linear-tapering, longly caudate, 55-60 × 4.5-5 mm. Petals spreading upwards, linear-tapering, caudate, 29-30 × 5-6 mm. Lip ecallose, somewhat porrect, concave, broadly ovate, caudate, ciliate along the margin of the tapering part, 38-50 × 20-22 mm; spur with a broad mouth then narrowly cylindrical, straight, 22-24 mm long. Column 5 mm long, with two recurved lateral arms at the tip, each 2 mm long; anther cap broadly cordiform; viscidia 2, strap-like, 2 mm long.

**Notes.** – *Aeranthes unciformis* is very distinct in the genus. It has the habit of *A. laxiflora* Schltr., a widespread species in the Mountains of Madagascar, but quite different and much larger flowers. Its flowers are somewhat reminiscent of those of *A. caudata* Rolfe but much larger with longer acumens and are borne two or three at a time in a short inflorescence, rather than appearing in succession on slender elongate wiry branching peduncles. The lip is very distinctive, almost transversely elliptic at the base then drawn out and tapering into a long acumen at the tip. The spur, 22-24 mm long, is also much longer than in most *Aeranthes* species. The dorsal sepal is very peculiar, curving forwards over the column and lip.

**Distribution.** – The species is only known from the type locality in the northern part of the Bekaraoka forest in the Loky-Manambato region in North-East Madagascar. About 20 individuals were observed in the area during the vegetation study.

**Flowering time.** – February.

**Habitat and ecology.** – *Aeranthes unciformis* was recorded in dry deciduous forest close to a seasonal river at 170 m elevation. This epiphytic plant occurs on trunks of trees at 2 to 4 m above ground. It grows in forests with canopies reaching 8 to 12 m, with emergent trees reaching 14 m, with an shrub stratum at 3 to 5 m high, and a sparse suffrutescent stratum less than 0.5 m high.



**Fig. 3.** – *Aeranthes unciformis* P. J. Cribb & Nusb. **A.** Habit; **B.** Dorsal sepal; **C.** Lateral sepal; **D.** Petal; **E.** Lip, ovary and column, oblique view; **F.** Column apex, oblique view; **G.** Anther, ventral view; cap, dorsal and ventral views; **H.** Pollinarium; **I.** Pollinium.

[L. Nusbaumer & P. Ranirison 1168] [Drawn by Juliet Beentje-Williamson from the type collection]



Fig. 4. – Flowering type collection of *Aeranthes unciformis* P. J. Cribb & Nusb. [L. Nusbaumer & P. Ranirison 1168] [Photo: L. Nusbaumer]

The most frequent species recorded together with *Aeranthes unciformis* are: *Dracaena xiphophylla* Baker, *Euonymus pleurostylioides* (Loes.) H. Perrier, *Diospyros pruinosa* Hiern and *Acalypha* aff. *perrierii* Leandri.

**Etymology.** – The specific epithet refers to the morphology of the dorsal sepal curving forwards over the column and lip.

**Conservation status.** – With only one subpopulation, included in the Loky-Manambato protected area, *Aeranthes unciformis* is assigned a preliminary status of “Critically Endangered” (CE) following the IUCN Red List Categories and Criteria (IUCN, 2001). This species was collected rather early during the floristic survey, and we expected that several other subpopulations should be observed later, because its habitat dry deciduous forest is the most frequent forest type in this region. It turned out that no further fertile material has been collected.

### Conservation implications

These two new species add to other numerous botanical and zoological taxa newly discovered in the area. Based on these efforts, the NGO Fanamby succeeded in the establishment of a protected area (“station forestière à usages multiples”) for eight important forest subareas of the Loky-Manambato region, including the forests where the new *Angraecum* and *Aeranthes* species have been collected. Monitoring the populations is the next critical step for the conservation of these species.

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