

# Revision of the genus *Jumellea* Schltr. (Orchidaceae) from the Comoros Archipelago

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## ABSTRACT

The genus *Jumellea* Schltr. is revised for the Comoros Archipelago (Grande Comore, Anjouan, Mohéli, Mayotte). Six species occur on the islands: *Jumellea anjouanensis* (Finet) H. Perrier, *J. arachnantha* (Rchb. f.) Schltr., *J. arborescens* H. Perrier, *J. comorensis* (Rchb. f.) Schltr., *J. maxillarioides* and *J. pailleri* F.Rakotoar. These species are not the same as Schlechter covered; *Jumellea arborescens*, *J. maxillarioides* (Ridl.) Schltr. and *J. pailleri* were added to the list whereas *Jumellea phalaenophora* was removed since its presence in Comoros archipelago is doubtful. *Jumellea gladiator* (Rchb. f.) Schltr. is a synonym of *J. arachnantha* (Rchb.f.) Schltr. Three species of *Jumellea* are endemic to the Comoros archipelago whereas the three other are also present in Madagascar.

## RÉSUMÉ

*Révision du genre Jumellea Schltr. (Orchidaceae) de l'Archipel des Comores.*

La révision des espèces de *Jumellea* Schltr. présentes sur l'Archipel des Comores (Grande Comore, Anjouan, Mohéli, Mayotte) a été effectuée. Six espèces appartenant au genre ont été recensées dans les îles: *Jumellea anjouanensis* (Finet) H. Perrier, *J. arachnantha* (Rchb. f.) Schltr., *J. arborescens* H. Perrier, *J. comorensis* (Rchb. f.) Schltr., *J. maxillarioides* (Ridl.) Schltr. et *J. pailleri* F.Rakotoar. Ces espèces ne sont pas les mêmes que celles décrites par Schlechter; *Jumellea arborescens*, *J. maxillarioides* et *J. pailleri* ont été rajoutées et *Jumellea phalaenophora* a été retirée de la liste en raison de sa présence douteuse dans l'archipel. *Jumellea gladiator* (Rchb. f.) Schltr. est synonyme de *J. arachnantha* (Rchb.f.) Schltr. Trois espèces de *Jumellea* sont endémiques des Comores, les trois autres sont aussi présentes à Madagascar.

## KEY WORDS

Grande Comore,  
Mohéli,  
Anjouan,  
Mayotte,  
key to species,  
lectotypification,  
new synonymy.

## MOTS CLÉS

Grande Comore,  
Mohéli,  
Anjouan,  
Mayotte,  
clés des espèces,  
lectotypification,  
synonyme nouveau.

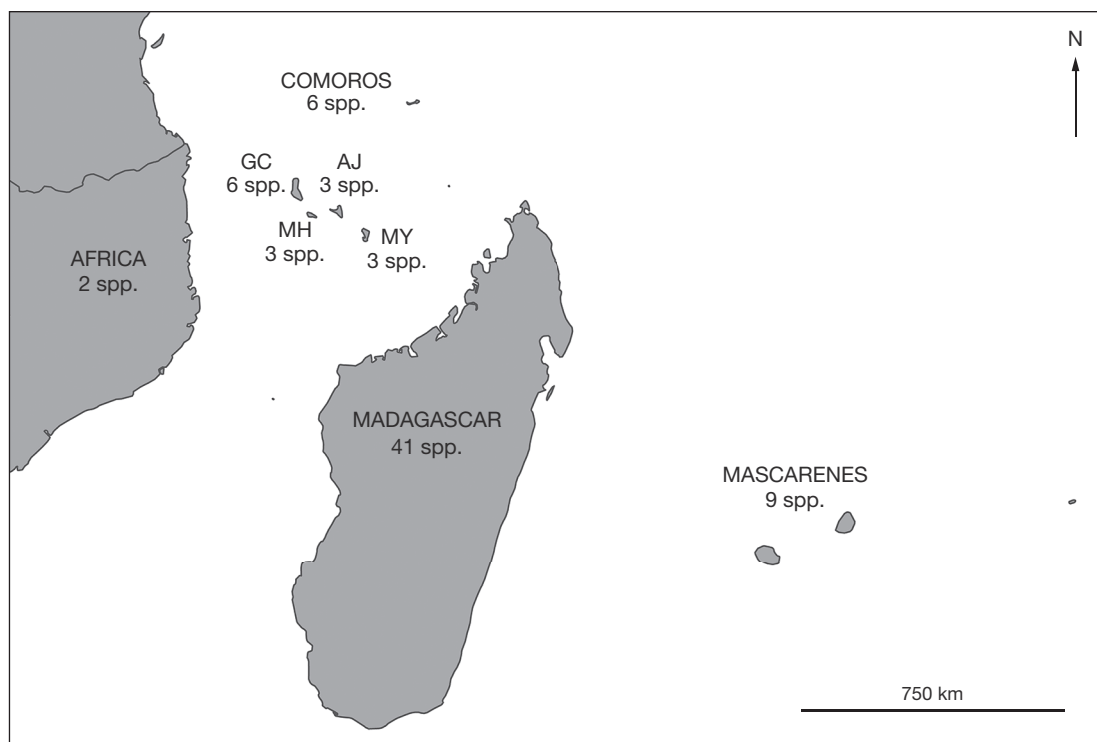


FIG. 1. — Distribution map of *Jumellea* Schltr. in the Indian Ocean (Africa, Comoros Archipelago, Madagascar, and Mascarenes Archipelago). All six Comorian species are present in Grande Comore (GC); three species in Mohéli (MH); three species in Anjouan (AJ); and three species in Mayotte (MY).

## INTRODUCTION

The genus *Jumellea* Schltr. was first described by Schlechter in 1914, for *Jumellea fragrans* (Thouars) Schltr. (basonym: *Angraecum fragrans* Thouars; synonyms: *Aerobion fragrans* (Thouars) Sprgl., *Aeranthus fragrans* (Thouars) Rchb.f., *Epidorkis fragrans* (Thouars) Kuntze) endemic to the Mascarenes Archipelago. It was named in honour of the French botanist Henri Jumelle (1866-1935) who worked on the flora of Madagascar for many years. Prior to the establishment of the genus *Jumellea*, its species were associated with the genera *Aerobion* Spreng., *Epidorkis* Thouars, *Angraecum* Bory and *Aeranthus* Lindl. because of their morphological similarities. Native to Madagascar (Micheneau *et al.* 2008), the genus has colonized the Western Indian Ocean islands (the Comoros and the Mascarenes) and Eastern Africa.

Since the establishment of *Jumellea*, the number of described species has steadily increased and has now reached about 60. From 1915 to 1925, Schlechter included 27 species and one variety to the genus. Perrier de la Bâthie (1941) enumerated 44 species, four subspecies and two varieties from Madagascar and the Comoros. He divided these species in seven groups based on spur length and other morphological characters in order to make the identification easier. Du Puy *et al.* (1999) listed 47 species, four subspecies and two varieties from Madagascar and the Comoros archipelago. Stewart *et al.* (2006) recognized 60 taxa including two species from Africa, 10 species from the Mascarenes, five species from the Comoros, 42 species and two varieties from Madagascar. They shared the *Jumellea* species into six groups based on the growth habit (leaf and stem length). Hermans *et al.* (2007) recognized 46 species, three subspecies and one variety from Mada-

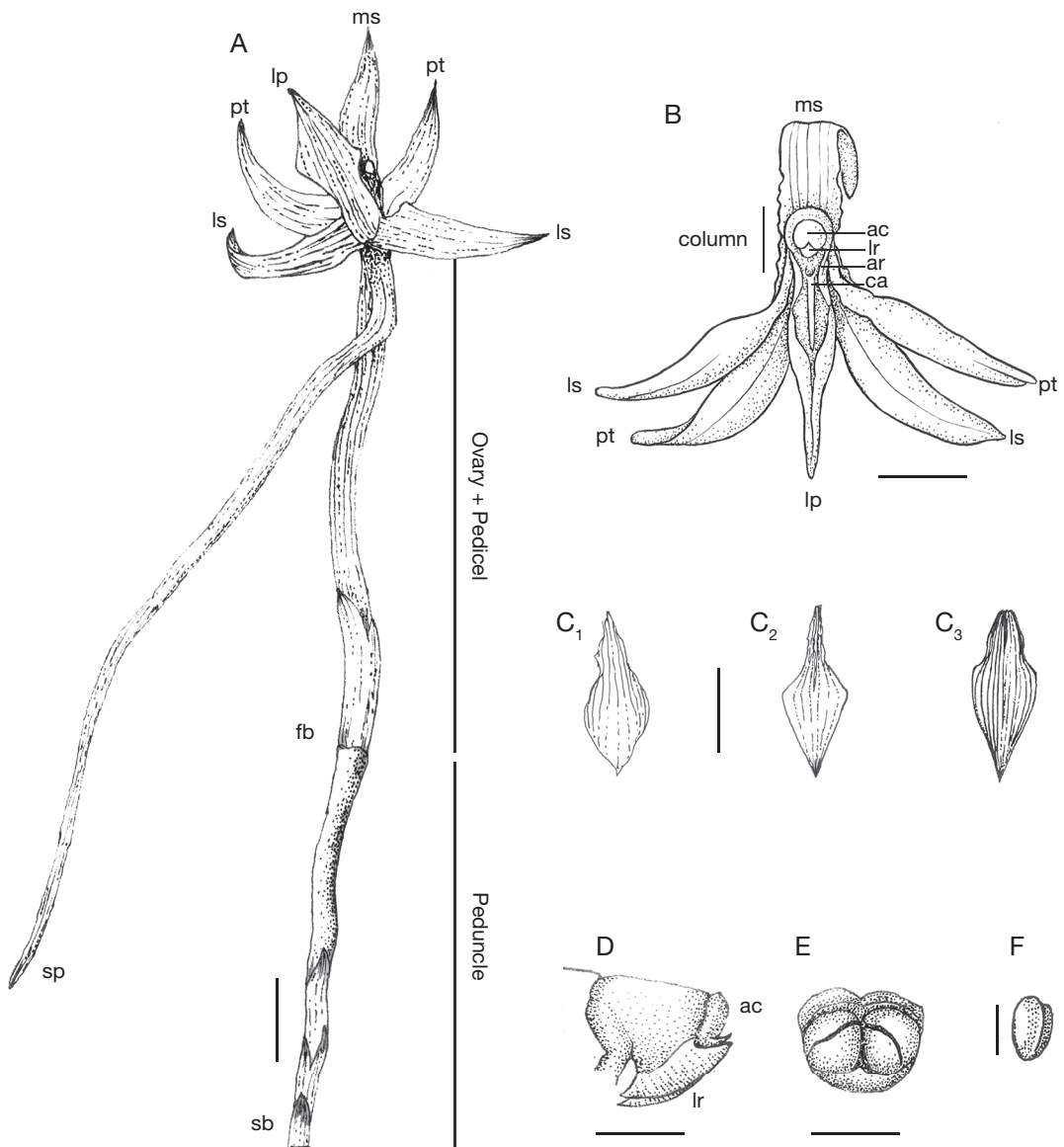


FIG. 2. — Flower description of *Jumellea* Schltr.: **A**, inflorescence; **B**, flower; **C**, lip shape; **C**<sub>1</sub>, ovate or pandurate; **C**<sub>2</sub>, lanceolate; **C**<sub>3</sub>, sagittate; **D**, side view of the column; **E**, inner view of anther; **F**, pollinia. Abbreviations: **ms**, median sepal; **ls**, lateral sepal; **pt**, petal; **lp**, lip; **ac**, anther cap; **lr**, lobe of the rostellum; **ar**, arm of the column; **sp**, spur; **fb**, fertile bracts; **sb**, sterile bracts. Scale bars: A, C, 1 cm; B, 6 mm; D, 3 mm; E, 2 mm; F, 1 mm.

gascar and the Comoros. Lastly, Cribb & Hermans (2009) included 41 species, three subspecies and one variety from Madagascar alone (Fig.1). A brief history of the classification reveals that species from the Comoros archipelago were first recognized in

1915. Initially Reichenbach *filius* (1885) described *Jumellea anachnantha* (Rchb.f.) Schltr., *J. comorensis* (Rchb.f.) Schltr., *J. gladiator* (Rchb.f.) Schltr., and *J. phalaenophora* (Rchb.f.) Schltr. under *Aeranthes* Lindl. But later on Schlechter (1915) transferred

TABLE 1. — Species distribution of the genus *Jumellea* Schltr.

Species	Grande Comore	Mohéli	Anjouan	Mayotte	Madagascar
<i>J. anjouanensis</i>	+	+	+		+
<i>J. arachnantha</i>	+	+	+	+	
<i>J. arborescens</i>	+			+	+
<i>J. comorensis</i>	+	+		+	
<i>J. maxillarioides</i>	+				+
<i>J. pailleri</i>	+				

them to the genus *Jumellea*. In 1941, Perrier de la Bâthie moved the species *Angraecum anjouanense* (Finet) into the genus *Jumellea* (*J. anjouanensis*). *Jumellea confusa* (Schltr.) Schltr. (Stewart 1968, Du Puy *et al.* 1999, Stewart *et al.* 2006, Pailler *et al.* 2009) and *J. maxillarioides* (Ridl.) Schltr. (Pailler *et al.* 2009) were recorded later in the archipelago. In 2011, a new species was described as *J. pailleri* F.Rakotoar. (Rakotoarivelo *et al.* 2011). However, distinguishing between species of *Jumellea* remains difficult since characteristics are usually not well defined. In this paper, we present updated descriptions of the recorded *Jumellea* species from the Comoros archipelago and make one synonym and one doubtful species.

### Genus *Jumellea* Schltr.

*Die Orchideen*: 609 (1914); Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., Orchidées 2: 157 (1941); Du Puy *et al.*, *The Orchids of Madagascar*, 1<sup>st</sup> éd. (1999); Stewart *et al.*, *Angraecoid orchids*: 186 (2006); Hermans *et al.*, *Orchids of Madagascar* 2<sup>nd</sup> éd. (2007); Cribb & Hermans, *Field Guide to the Orchids of Madagascar* (2009). — Type: *Jumellea fragrans* (Thouars) Schltr., *Die Orchideen*: 609 (1914).

### DESCRIPTION

Epiphyte or lithophyte, rarely terrestrial; stem absent or elongated; leaves frequently distichous, generally oval or oblong, conduplicate at the base or along the whole leaf length, relatively bilobate-obtuse at the apex. Easily recognized by their single-flowered inflorescences delivered simultaneously at flowering; inflorescences appear in the upper part of the stem, piercing or emerging from old foliar sheaths. Peduncle covered by 4-6 sterile bracts at the base

(Fig. 2A), separated from the pedicel by a tubular or sigmoid-shaped (upcurved and acuminate at the apex) fertile bract. The fertile and sterile bracts have the same shape but differ in size. The sterile bracts increase in size following the order of their apparition, the last are mostly the same size as the fertile bract. Flower white or cream-colored, changing to clear yellow with age or after pollination. Median sepal triangular often upright or inverted backwards; lateral sepals connected at the base below the spur, projecting forwards with petals and lip, giving a particular shape to the flower. Petals narrow, as long as the sepals. Lip always contracted at the base, sometimes gutter-shaped, and connected to the spur. Lip shape is ovate, lanceolate or sagittate (Fig. 2C). Sometimes an ovate lip may display widened part on the edge that forming a pandurate shape. Therefore both an ovate- and pandurate-shaped lip can sometimes be observed in one species or on one plant. A lanceolate-shaped lip can vary in one species. The widest part of the lip can be placed near the base, in the middle or near the apex. The sagittate-shaped lip differs from the two former lip shapes by the abrupt contraction of the lip just after the widened part. This widened part has mostly a rounded edge and an acute or acuminate apex. Column dilated at the base, extended in two parallel arms related, on the internal side, to the edges of the orifice of the spur and, on the external side, to the lateral sepals. Anther covered by a removable cap and excised in two naked pollinia. Pollinia attached to two viscidia (modified part of the rostellum) by a retractable caudicle, free or barely adhesive to the base. Rostellum divided on two large lobes, joined in the middle, protruding forward as a tunnel-shaped entrance facilitating pollinators visit and support to the anther cap; median tongue of the rostellum rarely absent, dentiform, appearing

between the lobes of the rostellum. Inferior ovary connected directly to the pedicel called pedicellate ovary, often longer than the peduncle. Spur length varies between 6 to 150 mm.

*Jumellea* species are most of the time found in humid or rocky habitat. They are distributed along a

wide elevation range, extending from coastal region to high mountain sites. The genus is present in the four islands of Comoros archipelago (Table 1), the highest record is at 2200 m above sea level in the volcanic mount of Karthala (2361 m) on Grande Comore.

#### KEY TO SPECIES OF THE GENUS *JUMELLEA* SCHLTR.

1. Stem absent or very short ..... 2
- Stem present ..... 3
2. Leaves up to 40 cm long ..... 1. *Jumellea maxillarioides* (Ridl.) Schltr.
- Leaves longer than 40 cm ..... 2. *Jumellea arachnantha* (Rchb. f.)
3. Leaves longer than 9 cm ..... 3. *Jumellea arborescens* H. Perrier
- Leaves up to 9 cm long ..... 4
4. Peduncle less than 10 mm long ..... 4. *Jumellea anjouanensis* (Finet) H. Perrier
- Peduncle over 10 mm in length ..... 5
5. Spur less than 8 cm long ..... 5. *Jumellea pailleri* F.Rakotoar.
- Spur over 8 cm long ..... 6. *Jumellea comorensis* (Rchb. f.) Schltr.

#### 1. *Jumellea maxillarioides* (Ridl.) Schltr. (Fig. 3)

*Feddes Repertorium Specierum Novarum Regni Vegetabilis, Beiheft 33* (2): 299 (1925); Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., Orchidées 2: 166 (1941); Du Puy *et al.*, *The Orchids of Madagascar*, 1st éd.: 163 (1999); Stewart *et al.*, *Angraecoid Orchids*: 186 (2006); Hermans *et al.*, *Orchids of Madagascar*, 2nd éd.: 209 (2007); Cribb & Hermans, *Field Guide to the Orchids of Madagascar*: 310 (2009). — Basionym: *Angraecum maxillarioides* Ridl., *Journal of the Linnean Society, Botany* 21: 479 (1885); *Angorchis maxillarioides* (Ridl.) Kuntze, *Revisio Generum Plantarum*: 651, pl. 2 (1891). — Lectotype (designated here): Madagascar. Fianarantsoa, Ambalavao, Ankafana, 1880, *Deans Cowan* 26 (lecto-, BM [BM539237]; isolecto-, *Parker s.n.*, K! [K000306584]).

**SPECIMENS EXAMINED.** — **Comoros.** Grande Comore, La Grille Massif, 11°27'51.8", 43°20'25.4", 1076 m, 27.II.2009, *Rakotoarivelo et al.* 061 (REU!).

**Madagascar.** Antananarivo, Mont Angavokely, 1920, *Perrier de la Bâthie* 12978 (P[P00094211, P00094212, P00094213, P00094214]!); Toamasina, Maromizaha, II.1924, *Perrier de la Bâthie* 16051 (P[P00094210]!); Angavobe Mont, 1600 m, 8.II.1992, *Pettersson* 508 (P[P00094208]!); Mandraka, 1.IX.2009, *Rakotoarivelo*

*et al.* 029 (TAN!). — Fianarantsoa, Ambondrombe, 21°52'47"S, 47°15'32.9"E, 1853 m, 12.I.2010, *Rakotoarivelo et al.* 215 (TAN!); Andringitra, 21°14'08"S, 47°23'49.8"E, 1118 m, 17.I.2010, *Rakotoarivelo et al.* 227 (TAN!).

**DISTRIBUTION.** — Grande Comore and Madagascar (Antananarivo, Fianarantsoa). In humid forest, from 1000 to 1200 m elevation.

#### DESCRIPTION

Epiphyte, lithophyte or terrestrial plant, acaulescent or sub-acaulous, stem covered by marcescent leaf sheaths. Leaves coriaceous, oblong, (26–41 × 11–15 cm), imbricate, tight, conduplicate at the base, with a released leaf sheath (2.8–4 cm), unequally bilobate at the apex, with rounded lobes. Inflorescences numerous (1–6 per plant); peduncle short (1.5–3.5 cm), thick, covered entirely by 5 sterile bracts. Fertile and sterile bracts tubuliform. Pedicellate ovary twice longer than the peduncle (5–9 cm). Flowers large, thick and leathery. Sepals and petals at the same size (30–36 × 7–9 mm), ivory-white color on the inner face. Sepals oblong, slightly scurfy on the outer face, curved back, acute. Petals slightly crispate at the base,

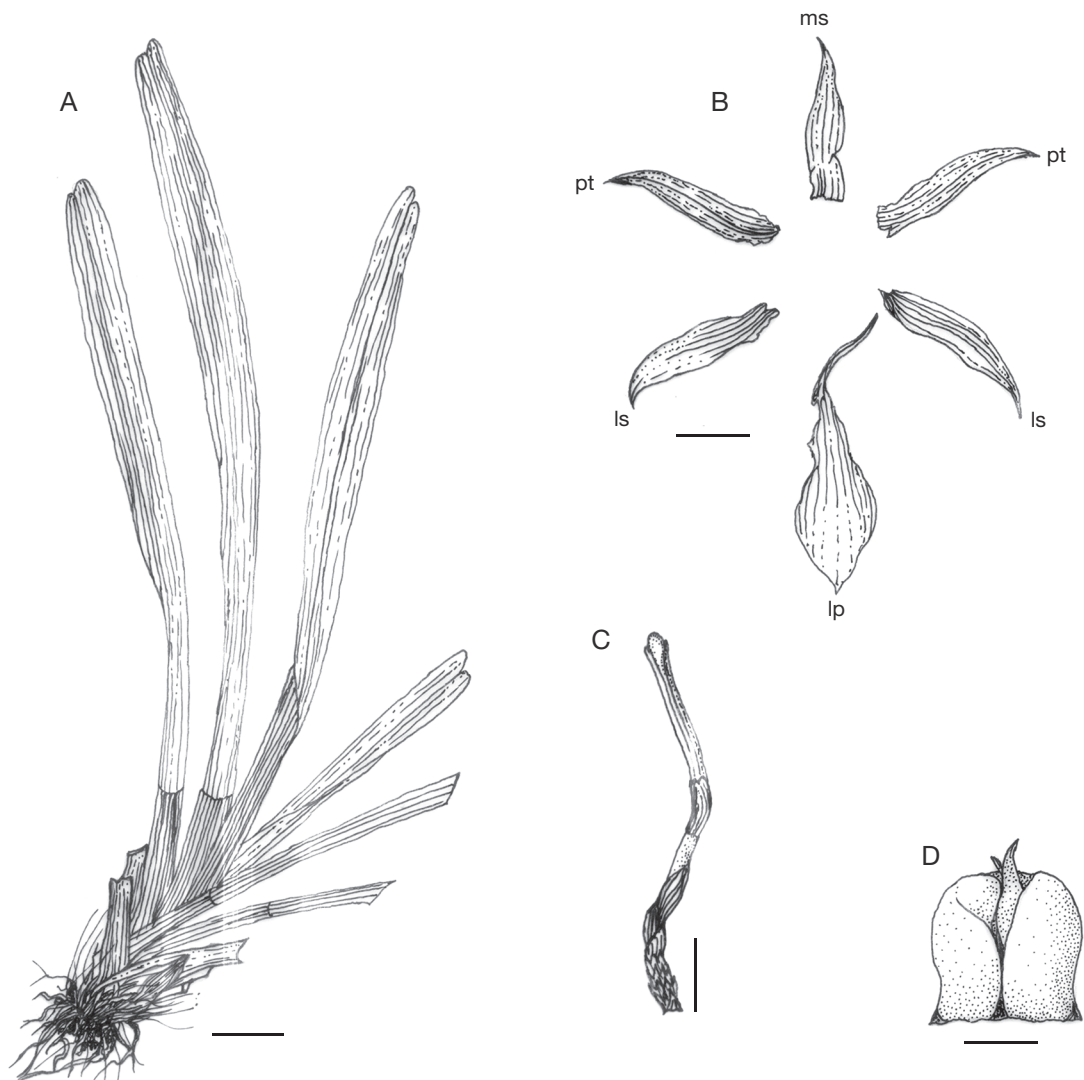


FIG. 3. — *Jumellea maxillarioides* (Ridl.) Schltr.: **A**, habit; **B**, pieces of the perianth; **C**, peduncle and pedicellate ovary; **D**, column of pollinated flower. Abbreviations: **ms**, median sepal; **ls**, lateral sepals; **pt**, petals; **lp**, lip with spur. Scale bars: A, 3 cm; B, C, 2 cm; D, 2.5 mm.

oblong, acute, and bearing a dorsal costule. Lip ovate or pandurate (37-38 × 16-17 mm), narrowed at the base, gutter-shaped, carinate (19-20 mm), widened in the middle, acuminate at the apex. Spur 2.5-5 cm long, slightly curved. Column with very thick arms (5 × 5 mm), lobes of the rostellum acute at the joined tips. Anther cap triangular, supported by the lobes of the rostellum. Capsule fusiform.

## 2. *Jumellea arachnantha* (Rchb. f.) Schltr. (Fig. 4)

*Beihefte zum Botanischen Centralblatt* 33 (2): 428 (1915); Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., Orchidées 2: 164 (1941); Stewart *et al.*, *Angraecoid orchids*: 186 (2006). — Basionym: *Aeranthes arachnanthus* Rchb.f., *Flora* 68: 539 (1885); *Mystacidium arachnanthus* (Rchb. f.) T. Durand & Schinz, *Conspectus*

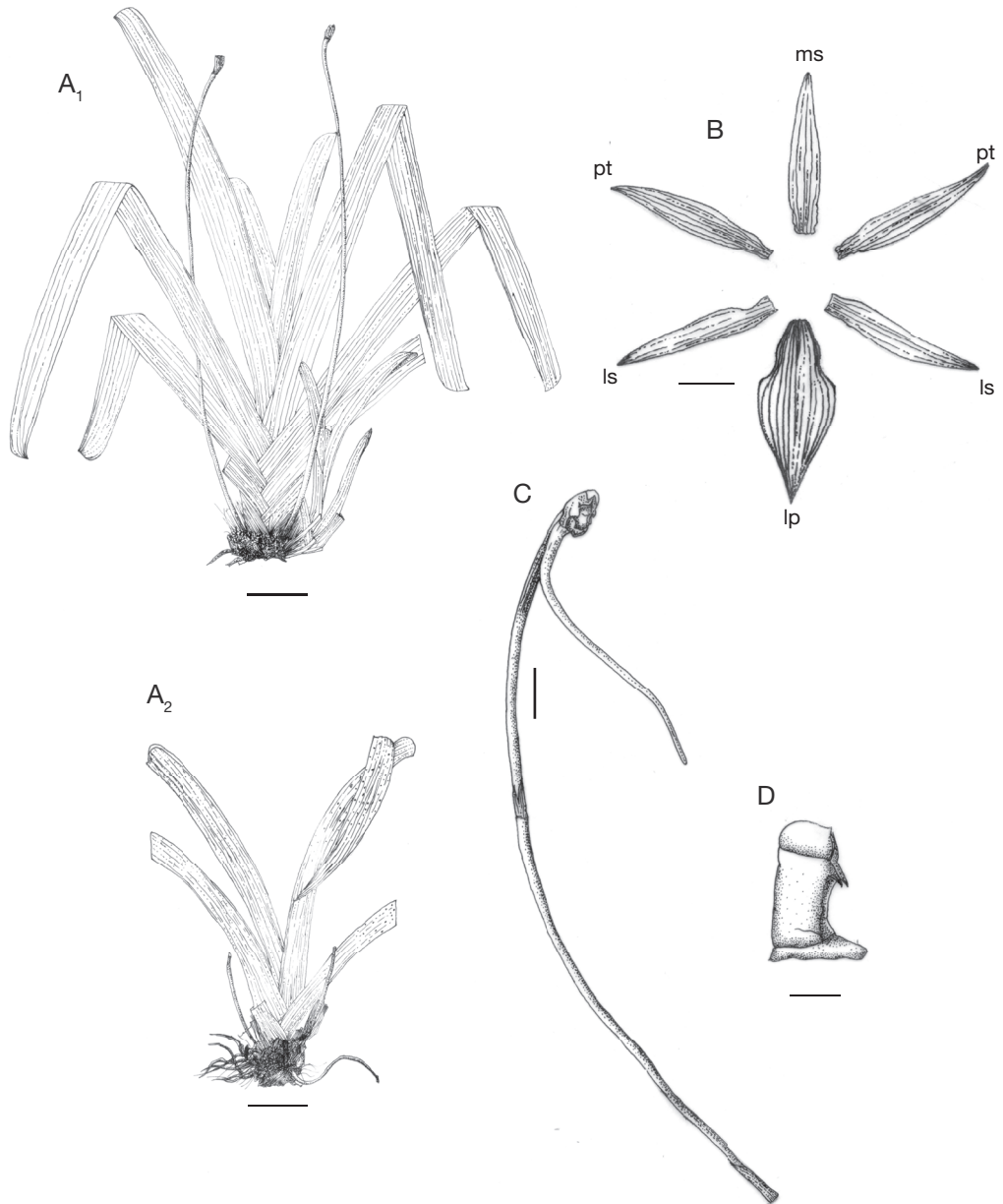


FIG. 4. — *Jumellea arachnantha* (Rchb. f.) Schltr.: **A**, habit; **A<sub>1</sub>**, long pedunculate; **A<sub>2</sub>**, short pedunculate; **B**, pieces of the perianth; **C**, peduncle, pedicellate ovary and spur; **D**, column, side view. Abbreviations: **ms**, median sepal; **ls**, lateral sepals; **pt**, petals; **lp**, lip. Scale bars: A, 4 cm; A<sub>1</sub>, 6 cm; B, C, 1 cm; D, 2 mm.

*Flora Africa* 5: 52 (1895). — Type: Comoros, Grande Comore, XII.1884, Combani, *Humboldt 1423* (Lecto-, W! [W-Rchb.Orch. 0011606, “gladiator”], designated here); isolecto-, P[P00090526, P00090527, P00090528]!).

*Jumellea gladiator* (Rchb. f.) Schltr., *Beihefte zum Botanischen Centralblatt* 33 (2): 429 (1915); Perrier de la Bâthie in Humbert H. (ed.), *Flore de Madagascar*, 49<sup>e</sup> fam., Orchidées 2: 169 (1941); Stewart *et al.*, *An-*

*graecoid orchids*: 186 (2006). — Basionym: *Aeranthes gladiator* Rchb.f., *Flora* 68: 539 (1885); *Mystacidium gladiator* (Rchb.) T. Durand & Schinz, *Conspectus Florae Africae* 5: 53 (1895). — Lectotype (designated here): Comoros, Grande Comore, Combani, XII.1884, *Humboldt 1415* (Lecto-, W! [W-Rchb.Orch. 0011607, "arachnantha"]; isolecto-, P[P00090558, P00090559, P00090560, P00090561]!, W[W-Rchb.Orch. 0011606, "arachnantha"]!). **Syn. nov.**

*Jumellea phalaenophora* (Rchb. f.) Schltr., *Beihefte zum Botanischen Centralblatt* 33: 430 (1915); Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., *Orchidées* 2: 181 (1941); Stewart *et al.*, *Angraecoid orchids*: 186 (2006). — Basionym: *Aeranthes phalaenophora* Rchb.f., *Flora* 68: 539 (1885); *Mystacidium phalaenophorum* (Rchb.f.) T. Durand & Schinz, *Conspectus Florae Africae*, V, 54 (1892). — Type: Comoros, *s.loc.*, *Humboldt s.n.* (holo-, W! [W-Rchb.Orch.0011603]). **Syn. nov.**

**SPECIMENS EXAMINED.** — **Comoros.** Anjouan, Mt. Remani, X.1958, *Benson 238* (BM, P[P00213132, P00213133, P00213134]!); Dindi forest, *Rakotozafy 1091* (P[P00213138]!). — Grande Comore, Maoueni, La Grille forest, 780 m, 11.XI.1999, *Labat et al. 3089* (P[P00183938, P00183939, P00183940]!), BR, CNDRS, G, K, MO); Mt. Karthala, XII.1986, *Pettersson C12* (K); *s.loc.*, IV.1989, *Monnerat s.n.* (P[P00213137]!); Hantsangoma, 19.X.2008, *Rouhan 740* (P[P00684785]!); Hantsangoma, 19.X.2008, *Rouhan et al. 740* (KM); La Grille Massif, Hantsangoma, 11°27'51.8"S, 43°20'25.4"E, 1076 m, 27.II.2009, *Rakotoarivelo et al. 042* (REU!); Karthala, III.2010, *Blambert HB11* (REU!). — Mohéli, Forêt de St Antoine, 1996, *Moulaert 0.5* (P[P00749769]!); Oualah II, 12°21'06.4"S, 43°45'43.6"E, 401 m, 2.III.2009, *Rakotoarivelo et al. 084* (REU!).

**DISTRIBUTION.** — Endemic to the Comoros (Grande Comore, Mohéli, and Anjouan), from 400 to 1400 m elevation.

#### DESCRIPTION

Epiphyte, acaulescent or sub-acaulous, robust. Leaves large (28–45 × 3–6 cm), oblong, conduplicate at the base, bilobate obtuse at the apex. Peduncle long (7–25 cm), bearing 5 to 6 sterile and tubular bracts at the base, the three first are inserted at the base and the three other distributed irregularly along the peduncle. Inflorescences numerous (2–10). Fertile bract (6–11 mm) tubular, inserted at the base of the pedicellate ovary (4–10 cm). Flower white, the perianth parts of the same size, oblong and acuminate (22–30 ×

10–15 mm); lip spatulate (30–45 × 10–15 mm), slightly folded, narrower at the base, widened in the middle, acuminate and carinate at the apex. Spur enlarged, angled, 4–6.5 cm length. Column thin and very short (3 mm long and 2.5 mm in height); lobes of the rostellum acute on the external tips, covered by the anther cap at the upper and joined tips, between which a very small and acute median tongue of the rostellum is visible. Anther cap crested. Capsule fusiform.

#### REMARKS

*Jumellea arachnantha* and *J. gladiator* are very difficult to distinguish from each other (Stewart *et al.* 2006). They occur in the same habitat and have the same vegetative and floral aspects. According to Schlechter (1915), both species differ only in their inflorescence lengths. *Jumellea arachnantha* have a pedicellate ovary longer than the peduncle and the reverse for *J. gladiator*. However, as we noticed with other *Jumellea* species, peduncle length is a character which may vary from one plant to another and may increase between two flowering stages. Therefore we consider *J. arachnantha* and *J. gladiator* to be conspecific. According to the specimen type and the morphological description by Perrier de la Bâthie (1941), *J. phalaenophora* is also synonym to *J. arachnantha* and *J. gladiator*.

### 3. *Jumellea arborescens* H. Perrier (Fig. 5)

*Notulae Systematicae* (Paris), 7 (2): 58–59 (1938); Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., *Orchidées* 2: 188 (1941); Du Puy *et al.*, *The Orchids of Madagascar*, 1<sup>st</sup> éd. (1999); Stewart *et al.*, *Angraecoid orchids*: 186 (2006); Hermans *et al.*, *The Orchids of Madagascar* 2<sup>nd</sup> éd. (2007); Cribb & Hermans, *Field Guide to the Orchids of Madagascar* (2009). — Type: Madagascar, Tsinjoarivo, 1400 m, II.1925, *Perrier de la Bâthie 16968* (holo-, P! [P00090529]).

**SPECIMENS EXAMINED.** — **Comoros.** Grande Comore, flanc Ouest du Karthala, 11°45'S, 43°19'E, 1630 m, 17.VIII. 2000, *Brionnaud et al. 72* (K!). — Grande Comore, La Grille Massif, 11°28'09.2"S, 46°51'38.3"E, 853 m, 27.II.2009, *Rakotoarivelo et al. 058* (REU!). — Mohéli, Oualah II, 12°21'06.4"S, 43°45'43.6"E, 401 m, 2.III.2009, *Rakotoarivelo et al. 123* (REU!).



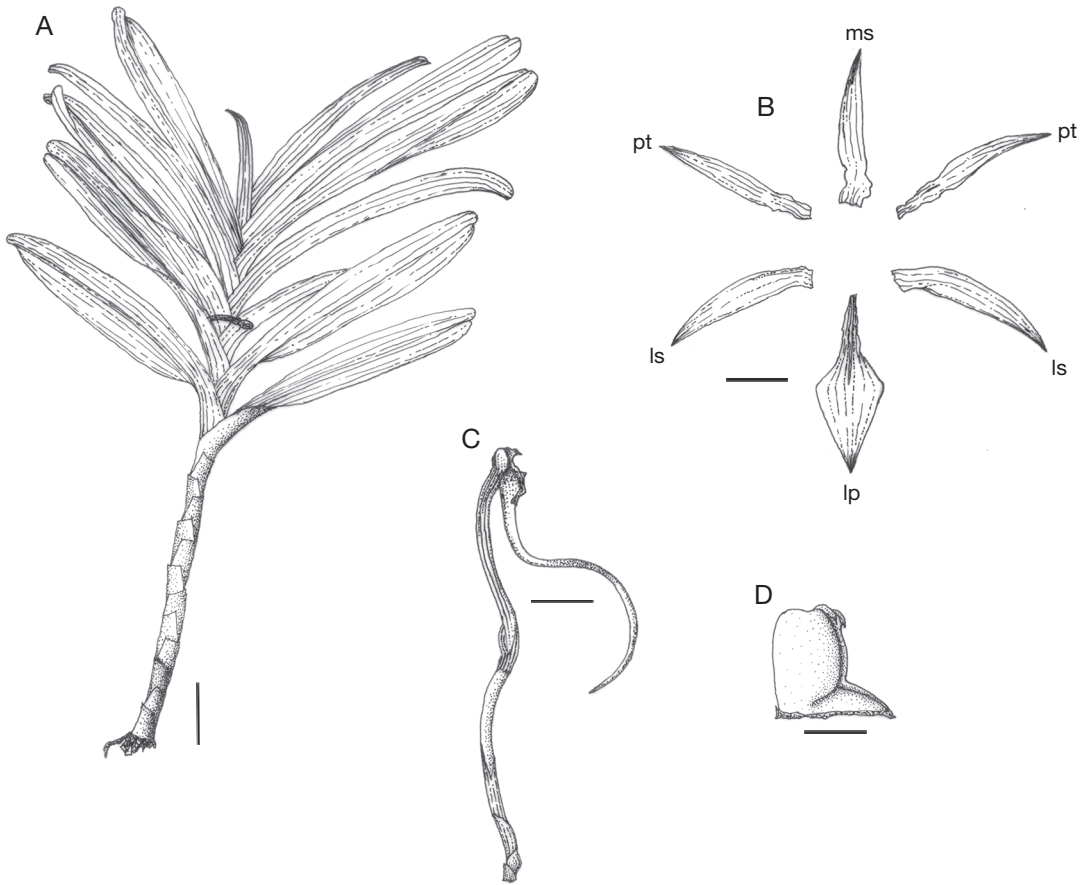


FIG. 5. — *Jumellea arborescens* H. Perrier: **A**, habit; **B**, pieces of the perianth; **C**, peduncle, pedicellate ovary and spur; **D**, column, side view. Abbreviations: **ms**, median sepal; **ls**, lateral sepals; **pt**, petals; **lp**, lip. Scale bars: A, 3 cm; B, 1 cm; C, 2 cm; D, 2.5 mm.

**Mayotte.** Mont Choungui, 18.XI.2002, *Barthelat et al. 1087* (K!).

**Madagascar.** Fianarantsoa, Andringitra, circuit Asaramanitra, 22°08'37"S, 046°53'17.6"E, 1731 m, 13.I.2010, *Rakotoarivelo et al. 218* (TAN!); circuit Imarivolanitra, 22°11'36.9"S, 46°54'00.6"E, 2257 m, 13.I.2010, *Rakotoarivelo et al. 223* (TAN!). — Antananarivo, Ambatolampy, Manjakatampo, 19°21'17.8"E, 47°18'32"S, 1813 m, 19.I.2010, *Rakotoarivelo et al. 235* (TAN!).

#### DESCRIPTION

Epiphyte or lithophyte, up to 70 cm tall. Stems caespitose, erect or pendant, round in section (5–6 mm). Leaves distichous or spirodistichous, conduplicate at the base and flat in the upper part, elliptical (8–15 × 1.5–2.3 cm), slightly bilobed at

the apex, dark green color. Leaf sheaths adnate to the stem. Inflorescence appearing mostly by pair, piercing the leaf sheath. Peduncle long (5–6 cm), covered up to third by 4-sterile bracts. Pedicellate ovary 9.1–10.1 cm long, with a fertile bract (1–1.5 cm) inserted at the base. Fertile and sterile bracts tubuliform. Flower white, the perianth parts crispate at the base. Median sepals upright or slightly curved, same size as the lateral sepals, oblong (21–25 × 2–4 mm), acute. Petals oblong, narrower than the sepals (23–26 × 3–4 mm), acute. Lip lanceolate (23–27 × 8–10 mm), contracted at the base, with a short keel (7–8 mm), widened in the half upper part, acute at the apex. Spur filiform (9–12.7 cm), angled at the base and then

curved, attenuate at the apex. Column 3-4 mm high, lobes of the rostellum acute at the tips. Anther cap with a fine crest covering the lobes of the rostellum at its upper and joined tips. Capsule fusiform of 50-75 mm long.

#### DISTRIBUTION

Madagascar, Comoros, Mayotte. In the humid forest, from 800 to 1850 m elevation.

#### REMARKS

*Jumellea confusa* was recorded in Comoros archipelago (Stewart 1968; Du Puy *et al.* 1999; Stewart *et al.* 2006; Pailler *et al.* 2009). But according to the collections type numbers P00090529 and P00090515, belonging respectively to *J. arborescens* and *J. confusa*, the specimens from the Comoros assigned to *J. confusa* were misidentified and belong to *J. arborescens*. Differences between these two species are mainly in the leaf shape which is elliptical for *J. arborescens* but oblong for *J. confusa*. Compared to *J. arborescens* from Madagascar inflorescences size and number are larger for individuals from the Comoros. (Bossier & Lecouffe 2011).

#### 4. *Jumellea anjouanensis* (Finet) H. Perrier (Fig. 6)

Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., Orchidées 2: 170 (1941); Stewart *et al.*, *Angraecoid orchids*: 186 (2006). — Basionym: *Angraecum anjouanense* Finet, *Bulletin de la Société Botanique de France* 54 (Mémoire 9): 11 (1907). — Lectotype (designated here): Comoros, Grande Comore? Anjouan?, V.1850, Boivin *s.n.* (lecto-, P[P00115682]!), *Lavanchie 35* (isolecto-, P[P00115683]!).

**SPECIMENS STUDIED.** — **Comoros.** Anjouan, Moya road, *Rakotozafy 1094bis* (P[P00115684]!). — Grande Comore, forest above Kourani, Piste du Capitaine du Bois, II.1975, *Floret 929* (P[P00213129]!); La Grille Massif, V.1981, *Doutrelepont s.n.* (P[P00115686]!); Maoueni, La Grille forest, 780 m, XI.1999, *Labat et al. 3090* (P[P00183941]!); Mitsoudje, Nyumbadju, 450 m, XI.1999, *Labat et al. 3134* (P[P00183998]!); Mvouni, 1900 m, XI.1999, *Labat et al. 3165* (P[P00184037]!); Bahani, 950 m, VIII.2000, *Brionnaud et al. 52* (P[P00216043]!), CNDRS); Karthala, 1880 m, VIII., *Brionnaud et al. 62* (P[P00216056, P00216057]!); La

Grille, 27.II.2009, *Rakotoarivelo et al. 038* (REU!). — Mohéli, Ouhala II, 401 m, 2.III.2009, *Rakotoarivelo et al. 081* (REU!).

**DISTRIBUTION.** — Madagascar, Comoros. Mostly in the humid forest, from 400 to 1900 m elevation.

#### DESCRIPTION

Epiphyte up to 50 cm high, stem compressed, stiff, erect or pendant, branched, sometimes covered with small protuberances of aerial roots. Aerial root appearing along the stem, on the internodes covered with old and dry leaf sheaths. Leaves small (20-55 × 5-6 mm), oblong, conduplicate, slightly bilobate. Leaf sheath adnate to the stem. Inflorescence small; peduncle very short (2-3 mm) covered by 4-imbricate sterile and tubular bracts. Pedicellate ovary three times longer than the peduncle (15-16 mm), fertile bract thin (6-8 mm long) and tubuliform. Flower diaphanous white; sepals and petals oval, of the same size (13.5-15 × 2.5-3.5 mm), acute. Lip pandurate or ovate, flat on the surface (15-16 × 4 mm), carinate (2.5 mm), slightly narrowed in the middle, widened at the base and at the upper part, apiculate. Spur 11-12 mm long, swollen at the apex. Column thin and very short (1.5-2 mm long and 1-1.5 mm high); lobes of the rostellum acute at the external tips inbetween which a very small and acute median tongue of rostellum is visible. Anther cap crested on the surface. Capsule fusiform, 2-3 cm long.

#### 5. *Jumellea pailleri* F. Rakotoar. (Fig. 7)

*Plant Ecology and Evolution* 144 (3): 1-4 (2011). — Type: Comoros, Grande Comore, La Grille, 11°27'45.6"S, 43°20'22.2"E, 1076 m, 27.II.2009, *Rakotoarivelo 060* (holo-, REU!; iso-, REU!, KM!, TAN!).

**SPECIMENS EXAMINED.** — **Comoros.** Grande Comore, Karthala, 2100 m, VII.2008, *Boulongne 64* (K!); La Grille, 11°27'45.6"S, 43°20'22.2"E, 1076 m, 27.II.2009, *Rakotoarivelo 059* (REU!); 2.III.2010, *Blambert, HB 71* (REU!).

**DISTRIBUTION.** — Endemic to Grande Comore. In mid-open vegetation from 1000 m elevation.

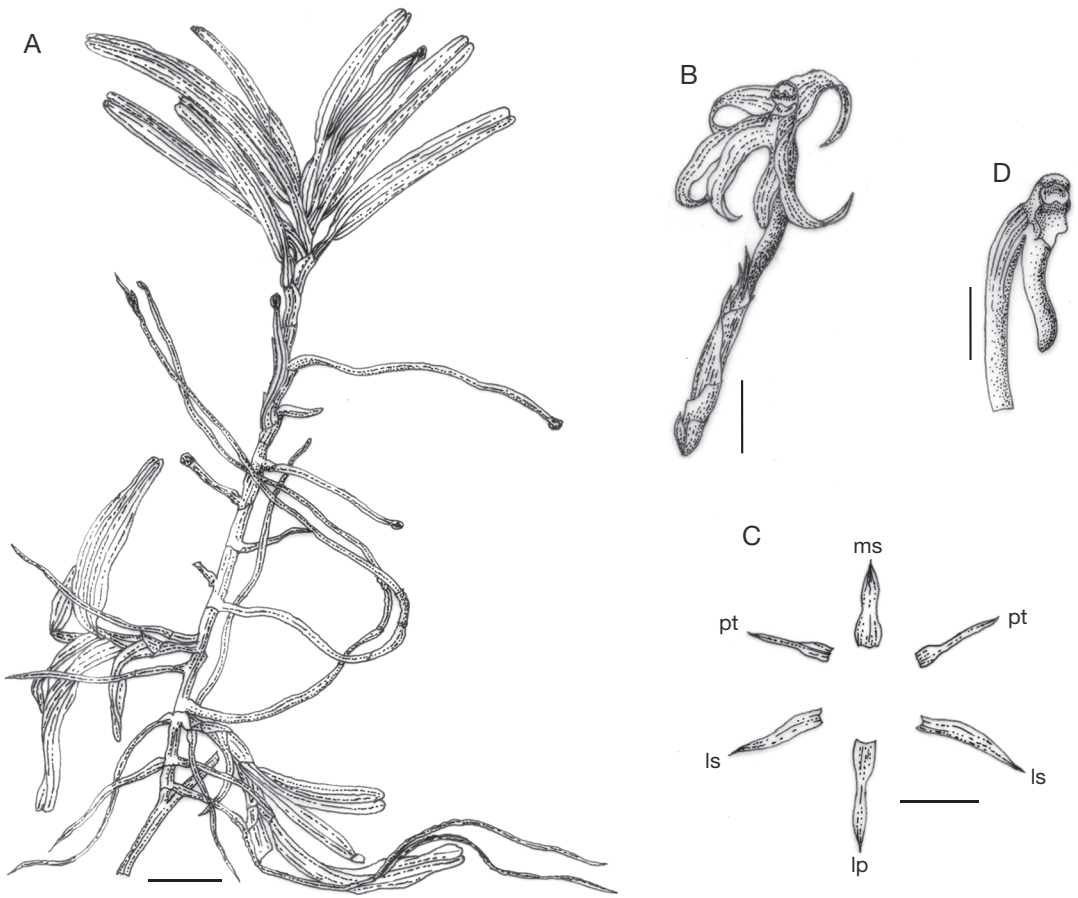


FIG. 6. — *Jumellea anjouanensis* (Finet) H. Perrier: **A**, habit; **B**, flower, side view; **C**, pieces of the perianth; **D**, pedicellate ovary and spur. Abbreviations: **ms**, median sepal; **ls**, lateral sepals; **pt**, petals; **lp**, lip. Scale bars: A, 2 cm; B, 5 mm; C, 1 cm; D, 3 mm.

#### DESCRIPTION

Epiphyte, stem erect, up to 40 cm long, cylindrical in section (4-5 mm), covered by leaves (3-7) in the upper third. Aerial roots persistent, appearing on the opposite position of the remnants of flowers from previous years, piercing leaf sheaths (13-20 mm). Leaves (6-9 × 1.2-1.5 cm) thick, rigid, flat on the surface, non fragrant, elliptical, and inequally bilobate at the apex. Inflorescences lateral, piercing leaf sheaths, sub-perennial, producing flower for two consecutive years. Peduncle short (15-40 mm), with four persistent and imbricate sterile bracts, the fourth is placed in the middle. Fertile bract

tubuliform (6-8 mm), persistent and obtuse, same shape and size as the larger sterile bract. Pedicellate ovary, twice the length of the peduncle (5-6 cm). Flowers small, characterized by perianth parts crispate at the base and apiculate at the apex. Median sepal (12-14 × 1.5-2 mm) upright, outer surface rough, oblong. Lateral sepals slightly curved, identical with the median sepal. Petals oblong, slightly longer than sepals (13-15 × 1.5-2 mm). Lip ovate or pandurate (14-16.5 × 5-6 mm), slightly folded on surface, narrow at the base, carina reaching the middle (7 mm). Spur filiform, curved at the base, 39-41 mm long, longer than the lip but shorter

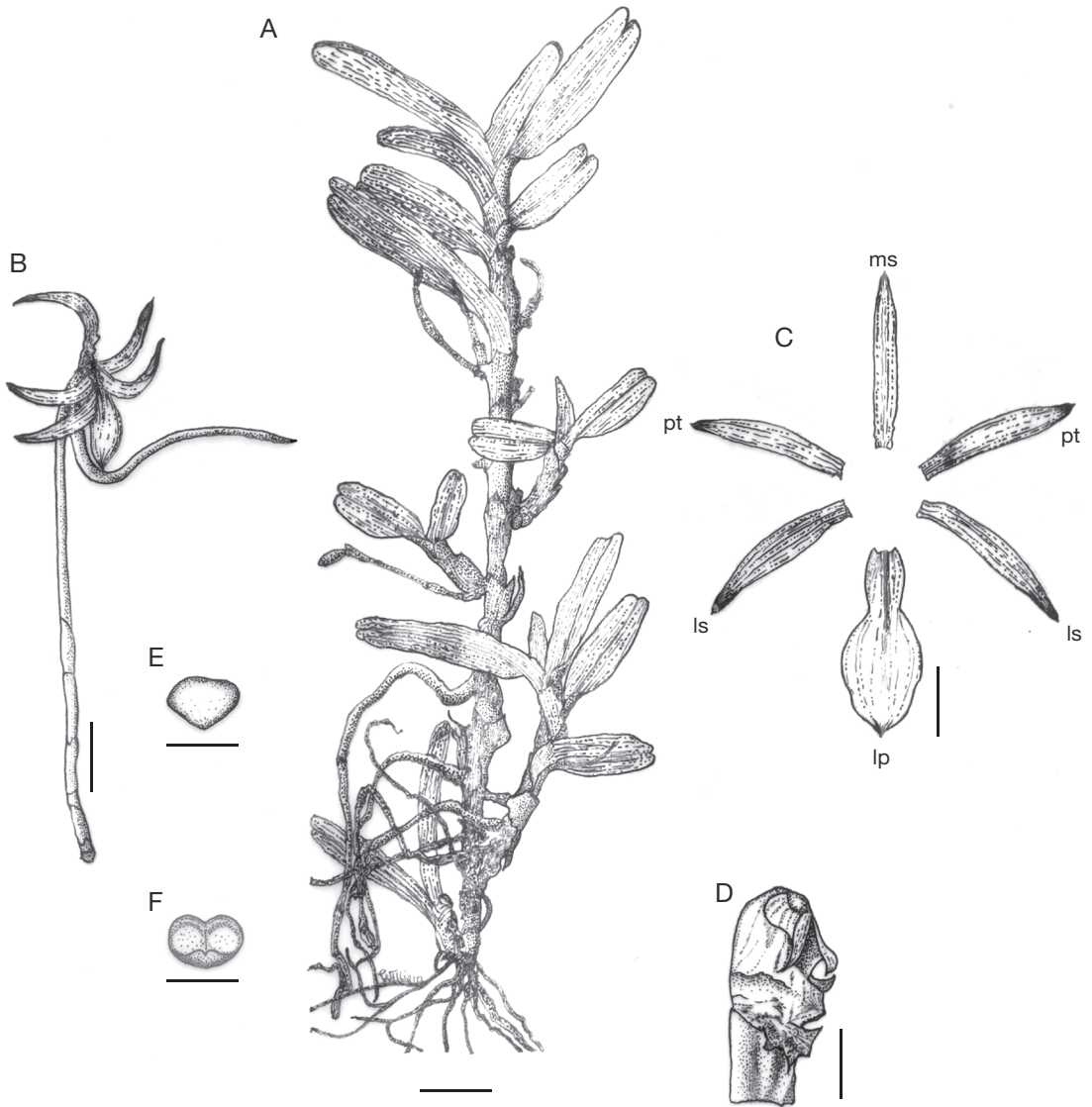


FIG. 7. — *Jumellea pailleri* F.Rakotoar.: **A**, habit; **B**, flower, side view; **C**, pieces of the perianth; **D**, column side view; **E**, pollinium; **F**, cap of anther, inner view. Abbreviations: **ms**, median sepal; **ls**, lateral sepals; **pt**, petals; **lp**, lip. Scale bars: A, 2 cm; B, 1 cm; C, 5 mm; D, F, 2 mm; E, 1 mm. Modified from Rakotoarivelo *et al.* (2011: 365), drawing by William Andriananjavelo.

than the pedicellate ovary. Column 3 mm height and 2-3 mm wide. Cap of anther with a median crest covering the lobes of the rostellum. Lobes of the rostellum acute at the tips, projected forward. Fruit capsule fusiform conforming to other species of the genus, 40-42 mm long.

6. *Jumellea comorensis* (Rchb. f.) Schltr.  
(Fig. 8)

*Beihfte zum Botanischen Centralblatt* 33 (2): 428 (1915); Perrier de la Bâthie in Humbert H. (éd.), *Flore de Madagascar*, 49<sup>e</sup> fam., Orchidées 2: 184

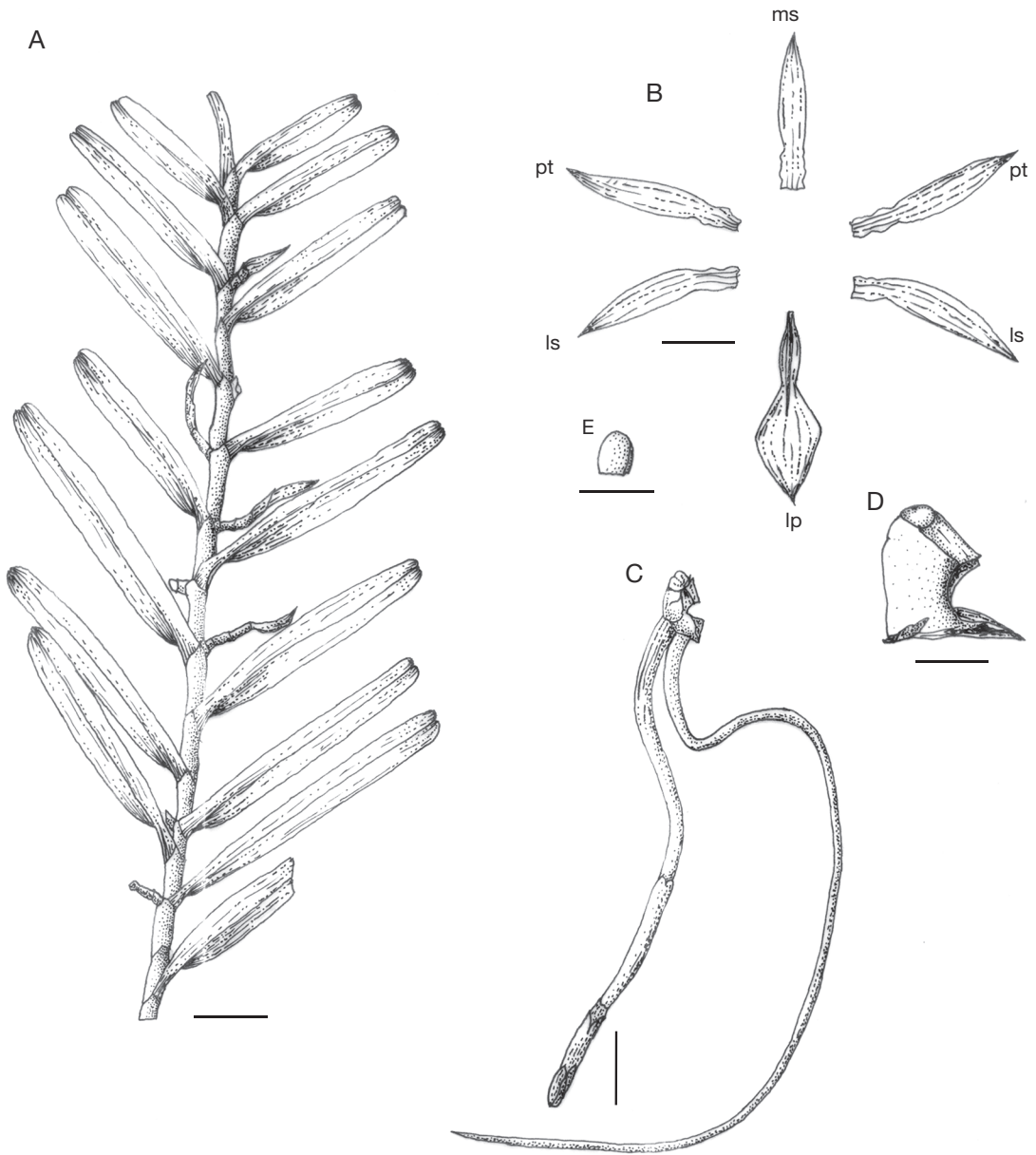


FIG. 8. — *Jumellea comorensis* (Rchb. f.) Schltr.: **A**, habit; **B**, pieces of the perianth; **C**, peduncle, pedicellate ovary and spur; **D**, column, side view; **E**, column  $\frac{3}{4}$  view. Abbreviations: **ms**, median sepal; **ls**, lateral sepals; **pt**, petals; **lp**, lip. Scale bars: A, 2 cm; B, C, 1 cm; D, E, 2 mm.

(1941); Stewart *et al.*, *Angraecoid orchids*: 186 (2006). — Basionym: *Aeranthes comorensis* Rchb.f. (1885: 540), *Flora* 68: 540 (1885). *Mystacidium comorensis* (Rchb.f.) T. Durand & Schinz, *Conspectus Florae Africae* 5: 52 (1892); *Angraecum comorensis* (Rchb. f.)

Finet, *Bulletin de la Société Botanique de France* 54: 13 (1907). — Type: Grande Comore, littoral, 24.IX.1884, *Humboldt 1247* (holo-, W[W-Rchb. Orch. 0011606]!; iso-, P[P00090545, P00090546, P00090547]!).

SPECIMENS EXAMINED. — Grande Comore, littoral, 24.IX.1884, *Humboldt 1247* (P[P00090545, P00090546, P00090547]!); 10.IV.1988, *Monnerat s.n.* (P[P00213135, P00213137]!); Mdjoiezi, 11°50'8"S, 43°19'8"E, 340 m, 13.XI.1999, *Labat et al. 3119* (P[P00183978, P00183979]!); Bahani, 11°38'S, 43°18'E, 620 m, 20.VII.2000, *Brionnaud 17* (P[P00216001, P00216002]!); Hantsongoma, 400 m, 26.II.2009, *Rakotoarivelo et al. 039* (REU!). — Anjouan, Mont Tringui, 3.XI.2006, *Labat et al. 3773* (P[P00527401]!).

DISTRIBUTION. — Endemic to Mayotte and the Comoros (Grande Comore, and Mohéli). Up to 800 m elevation.

#### DESCRIPTION

Epiphytic plant; stem, erect or pendant, branched, can reach more than 50 cm in length, covered by appressed leaf sheaths, roots rarely distributed along the stem. Leaves grouped at the top of the stem, leathery, elliptical, folded (63-80 × 8-11 mm), slightly bilobate at the apex. Each branch often bears a single or two lateral inflorescences. Peduncle 13 to 22 mm long, totally covered by three sterile bracts. All bracts tubuliform, persistent, apex obtuse. Fertile bract 15-17 mm long, inserted at the base of the pedicellate ovary (3.5-6 cm). Flower white; sepals and petals oval, crispate at the base and obtuse at the apex. Median sepal erect, similar to the lateral sepals (20-25 × 2.5-3.5 mm). Petals slightly smaller and thinner than sepals (21-22 × 1.5-2 mm), narrower at the base. Lip lanceolate, surface slightly folded (20-28 × 2.5-3 mm), carinate at the base (7-10 mm), widened at the lower third, apiculate. Spur very long (9-15 cm), angled, narrower toward the hole. Column 2-3 mm long; anther cap smooth, without any crest. Lobes of the rostellum acute at the tips. Tongue of the rostellum small and acute. Capsule fusiform, 2-4 cm long.

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