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Cover images: Plant and flower of *Appendicula cordata* Wibowo & Juswara. Photos by A. R. U. Wibowo.

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A NEW SPECIES OF *APPENDICULA* SECTION *PODODESME* (ORCHIDACEAE) FROM INDONESIA

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ABSTRACT

WIBOWO, A. R. U. & JUSWARA, L. S. 2017. A new species of *Appendicula* section *Pododesme* (Orchidaceae) from Indonesia. *Reinwardtia* 16 (2): 65–71. — A new species, *Appendicula cordata* (sect. *Pododesme*) from eastern Indonesia, is described and illustrated. Its habit is similar to that of *Appendicula infundibuliformis* J. J. Sm., but it differs in having flowers with a cordate appendage and a lip reflexed to the right. An identification key to the species of *Appendicula* sect. *Pododesme*, a distribution map, photos and line drawing are also provided.

Key Words: *Appendicula*, East Sumba, Flores, Indonesia, new species, section *Pododesme*.

ABSTRAK

WIBOWO, A. R. U. & JUSWARA, L.S. 2017. Jenis baru *Appendicula* Seksi *Pododesme* (Orchidaceae) dari Indonesia. *Reinwardtia* 16 (2): 65–71. — Satu jenis baru dari keluarga Anggrek (Orchidaceae) seksi *Pododesme*, dari Indonesia dipertelakan dan digambar. Jenis baru ini menyerupai *Appendicula infundibuliformis* J. J. Sm. namun memiliki perbedaan pada bentuk perpanjangan seperti jantung dan bibir memuntir ke kanan. Kunci identifikasi pada jenis *Appendicula* seksi *Pododesme*, peta persebaran, dan foto telah dibuat untuk keperluan identifikasi jenis.

Kata kunci: *Appendicula*, Flores, Indonesia, jenis baru, seksi *Pododesme*, Sumba Timur.

INTRODUCTION

The genus *Appendicula* was established by C. L. Blume (1825), is characterized by having the lip joined to the column foot, six pollinia, and usually with an appendage on the upper surface of the labellum pointing towards the base (Wood, 2003). The genus contains approximately 150 species distributed from India to Taiwan, and through Indonesia, Philippines, New Guinea to the Pacific (Seidenfaden & Wood, 1992; e-monocot, 2017). Indonesia has ca. 54 species of *Appendicula*. Thirty-five species have been reported from Sumatra (Comber, 2001) and 19 from Java (Comber, 1990).

A species of *Appendicula* was collected from four localities in Sumba Timur, Flores, Sumbawa, and Sulawesi Tengah simultaneously, grown in Bali Botanic Garden (Bali BG) and its herbarium specimens were stored at Herbarium Bogoriense (BO). The species belongs to section *Pododesme*, and, using literature and herbarium collections (BO), was found to differ from any known species in this section. This novelty is described below completed with the line drawing, ecological information, photos, and identification key to the species.

MATERIALS AND METHODS

Living specimens in Bali Botanic Garden were examined of the following species: *Appendicula cordata* (E200610271; E20060663; E199710152; E200207125; E200010232; E20060613; E198006128); *A. cristata* (E197710100); *A. elegans* (E197806708). Herbarium materials in Herbarium Bogoriense were examined of the following: *Appendicula cordata* (BO 1817838; BO 1817839); *Appendicula infundibuliformis* (BO 0047009); *Appendicula longa* (BO 0046265). Of species otherwise unavailable the protologues were studied (Reichenbach, 1875; Schlechter, 1912; Schlechter, 1914; The plant list, 2017; e-monocot, 2017). Morphology was examined using a dissecting microscope.

TAXONOMIC TREATMENT

Appendicula cordata Wibowo & Juswara, *spec. nov.* — Type: Indonesia: Nusa Tenggara Timur, Sumba Timur, Taman Nasional Laiwangi Wanggameti, 1,085 m, 22 September 2006, *cult.* Bali Botanic Garden E200610271 (*leg. I Nyoman Peneng* PEN 526) (Holotype: BO!, Isotype: BO!, THBB).

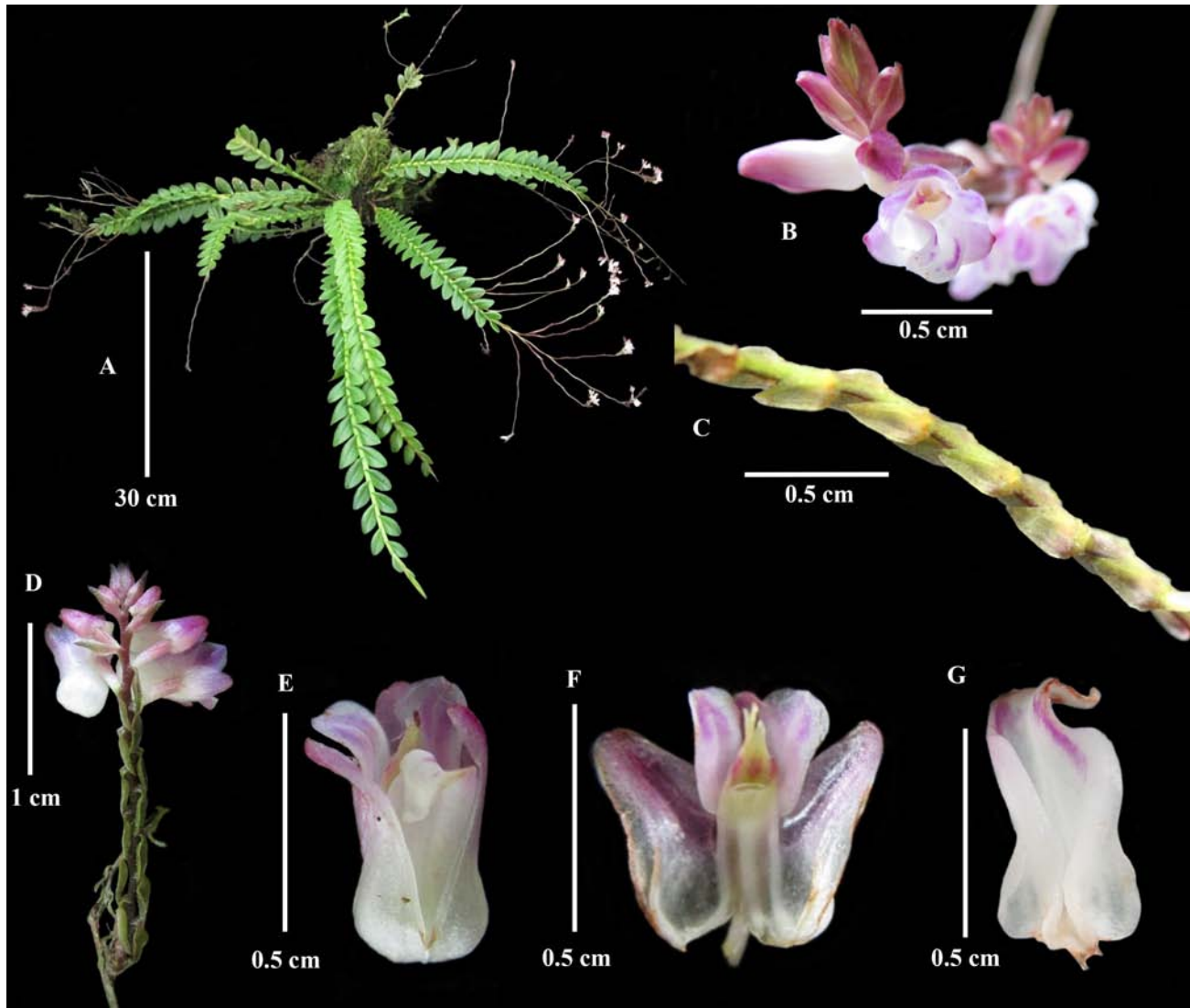


Fig. 1. Plant and flower of *Appendicula cordata* Wibowo & Juswara *spec. nov.* A. Plant; B. Flower, front view; C. Flower bract; D. Inflorescence; E. Flower, ventral view; F. Flower in section; G. Labellum, dorsal view. Photos by A. R. U. Wibowo.

Epiphytic herb. *Stem* tufted, arching–pendulous, branched, slightly flattened, 14–50 cm, *ca.* 3 mm in diam., internodes 0.7–1.5 cm, completely enclosed in tubular leaf sheaths. *Leaves* many, distichous, alternate, twisted at the base, blade ovate-elliptic, 1–2.5 × 0.5–1.2 cm, base with tubular sheaths, articulate, apex unequally bilobed with a small mucro. *Inflorescence* terminal and lateral, up to 21 cm long, branched with up to 7 branches, 1–10 flowers on each rachis but with only 1–3 flowers open at a time, peduncle 3.5–16 cm long, rachis 1–4 cm long; floral bracts ovate-lanceolate, apex acuminate, distichous, 4 × 1.5 mm, green-purple. *Pedicel with ovary* 4–5 mm long, white-purplish. *Flowers* 4–5 mm diam., 7 mm long, facing forwards, white with purple flushes, translucent, successive. *Dorsal sepal* ovate, apex sub-acute, 4 × 2.5 mm. *Lateral sepals* oblique, ovate-oblong, 6–6.5 × 3–4 mm; mentum saccate, yellowish nectar often occur, obtuse, *ca.* 2

mm long. *Petals* oblong, truncate-obtuse, 3 × 2–3 mm. *Lip* concave, broadly oblong when spread out, apex acuminate reflexed 180° to the right, apex irregularly caudate when flattened, margin entire, 6 × 4.5 mm, white with purple flushes on the tip; the appendage extending from the hypochile to the mesochile, forming 2 incurved ridges, erect, cordate, saccate. *Column* white, translucent, 5 × 1.5 mm; pollinia 6 in 3 pairs, unequal, truncate, yellow; anther cap white, 1.5 mm long; rostellum bidentate, concave. *Fruits* capsule, elliptic, 1 × 0.3 cm, green with purple stripes.

Distribution. Indonesia, Nusa Tenggara Timur: Sumba Timur, Flores; Nusa Tenggara Barat: Sumbawa; Sulawesi Tengah.

Habitat and ecology. Epiphyte, growing on trunk or branch 1,085–1,200 m asl.

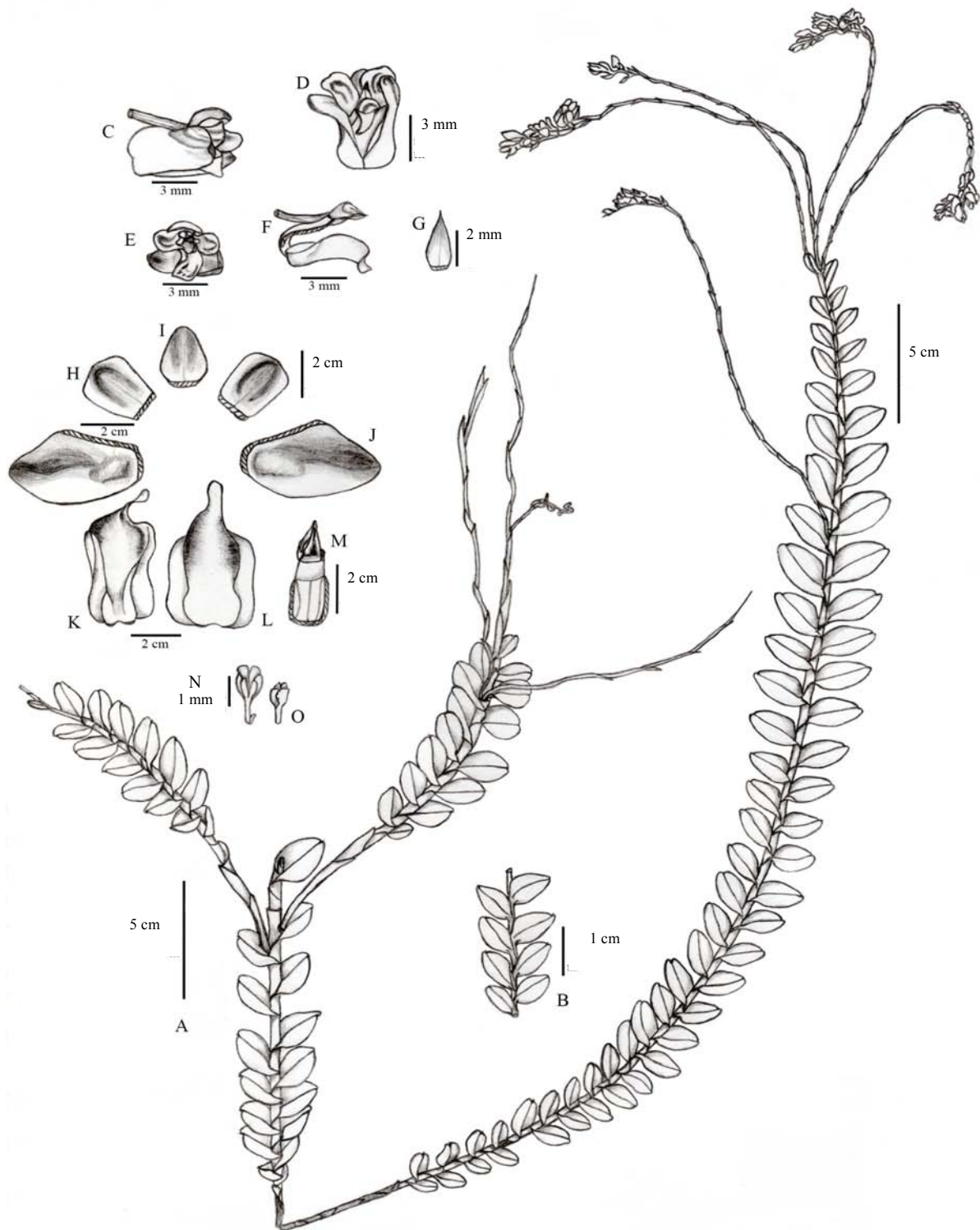


Fig. 2. Line drawing of *Appendicula cordata* Wibowo & Juswara *spec. nov.* A. Plant; B. Leaves, abaxial view; C. Flower, side view; D. Flower, ventral view; E. Flower, front view; F. Lip with column in section, side view; G. Floral bract; H. Lateral sepals; I. Dorsal sepal; J. Petals; K. Lip; L. Lip, flattened; M. Column; N. Pollinia; O. Anther cap, front view. From PEN 526, Sumba Timur – Nusa Tenggara Timur, drawing by A. R. U. Wibowo).

Identification key for *Appendicula* sect. *Pododesme* in Indonesia

- | | | | |
|----|----|-----------------------------------------------------------------|-----------------------------|
| 1 | a. | Lip without appendage..... | <i>A. inermis</i> |
| | b. | Lip with appendage..... | 2 |
| 2 | a. | Plant erect | 3 |
| | b. | Plant hanging..... | 5 |
| 3 | a. | Rachis bearing up to 20 flowers, open 1-2 at a time..... | <i>A. elegans</i> |
| | b. | Rachis bearing 10-15 flowers, open 1 or several at a time | 4 |
| 4 | a. | Lip oblong, not concave, appendage halfmoon-shaped..... | <i>A. krauseana</i> |
| | b. | Lip ovate-circular, concave, appendage bilobed..... | <i>A. isoglossa</i> |
| 5 | a. | Leaves 5 – 8 × 3 – 5 mm, mentum rounded | <i>A. effusa</i> |
| | b. | Leaves larger than 1 × 1 cm, mentum other than rounded | 6 |
| 6 | a. | Lip trilobed | <i>A. cristata</i> |
| | b. | Lip not trilobed..... | 7 |
| 7 | a. | Mentum 4 mm long, spur-shaped..... | <i>A. undulata</i> |
| | b. | Mentum 2 – 3 mm long, obtuse or connate..... | 8 |
| 8 | a. | Lip not concave..... | 9 |
| | b. | Lip concave..... | 10 |
| 9 | a. | Appendage rounded..... | <i>A. longa</i> |
| | b. | Appendage disc-guttter shaped..... | <i>A. polystachya</i> |
| 10 | a. | Apical part of labellum not recurved..... | <i>A. infundibuliformis</i> |
| | b. | Apical part recurved or reflexed..... | 11 |
| 11 | a. | Appendage hippocrepediformi, forming 3 nerves | <i>A. baliensis</i> |
| | b. | Appendage cordate, forming 2 incurved ridges..... | <i>A. cordata</i> |

Etymology. From the Latin *cordata* (heart-shaped), referring to the heart-shaped appendage.

Phenology. Flowering in cultivation throughout the year.

Cultivation. *Appendicula cordata* grows epiphytically. Good air circulation and moderate light intensity, ca. 50-80 %, should be provided. Temperature 15°C - 25°C.

Conservation status. Not assessed.

Other materials examined. Indonesia, Nusa Tenggara Timur: Flores, Ruteng, Ranamese Lake – Longe Hill, *cult. Bali Botanic Garden E20060663* (*leg. Mahyar & Nurdin 060*); Nusa Tenggara Barat: Sumbawa, Mt. Ujung Samu, Tepal, Batulante, *Deden Girmansyah et al. Deden 293* (BO 1817838, BO 1817839); Sulawesi Tengah: Gunung Dako, *cult. Bali Botanic Garden E200010232* (*leg. Bayu Adjie et al. BA 95*).

Notes. The habit of *Appendicula cordata* is similar to that of *A. infundibuliformis* J. J. Sm. The new species differs from that species, and all other species in sect. *Pododesme*, by the lip apex being twisted to the right, much like *A. ovalis* (Schltr.) J. J. Sm. in section *Oligodesme*. In addition, *A. infundibuliformis* has yellowish - green flower, a flat lip, and a horseshoe-shaped appendage, whereas *A. cordata* has white flowers with purple markings, a concave lip, and a cordate appendage. The other species in sect. *Pododesme* do not have long (to 16 cm), branching, pendulous inflorescences like *A. cordata*.

CONCLUSION

A new species described from Sumba, Sumbawa and Flores in the Lesser Sunda Islands shows that many new species from the under collected areas in Indonesia await discovery. This species is one of the species collected and grown *ex-situ* that represents small number of species from the area. This new species is distributed in Flores, Sumba,

Appendix 1. Comparison of morphological characters of *Appendicula* spp. in *Appendicula* section *Pododesme* in Indonesia.

	<i>A. inermis</i> Carr.	<i>A. elegans</i> Rehb. f.	<i>A. krauseana</i> Schltr.	<i>A. isoglossa</i> Schltr.	<i>A. effusa</i> (Schltr.) Schltr.	<i>A. cristata</i> Blume	<i>A. undulata</i> Blume	<i>A. polystachya</i> (Schltr.) Schltr.	<i>A. cordata</i> Wibowo & Juswara	<i>A. longa</i> J. J. Sm.	<i>A. infundibuli</i> formis J. J. Sm.	<i>A. baliensis</i> J. J. Sm.
Stem and length	Erect, 22 cm	Erect, 15 – 25 cm	Erect, 25 – 35 cm	Erect, 70 cm	Hanging, 10 – 36 cm	Hanging, 1 m	Hanging, 60 – 100 cm	Hanging, 60 – 90 cm	Hanging, 14 – 50 cm	Hanging, 75 cm	Hanging; ± 30 cm	Hanging, 37.5 cm
Stem branches	Not branched	Not branched	Not branched or 1–2 branches	-	Not branched	Branched	Not Branched	-	Branched	Branched	Branched	Branched
Shape of leaves	Oblong - elliptic	Ovate	Oblong	Oblong	Oblong	Linear - lanceolate	Oval - elliptic, oblique	Oblong - lanceolate	Ovate - elliptical	Oblong	Oblong - oval	Oval
Size of leaves	10 × 5 mm	7 – 15 × 4 – 7 mm	10 – 12 × 5 – 8.5 mm	4.5 – 5.5 × 1 – 1.6 cm	5 – 8 × 3 – 5 mm	3 – 7 × 1 – 2 cm	3 × 2 cm	7 – 8 × 18 mm	1 – 2.5 × 0.5 – 1.2 cm	2.5 – 3.5 × 1 – 1.6 cm	2.1 × 1.1 cm	2.1 × 1 cm
Peduncle length	8 cm	3 – 6 cm	14 cm	18 cm	2.5 – 11 cm	20 cm	1 – 2 mm	-	3.5 – 16 cm	8 cm	13 cm	1 – 1.5 cm
Flower size (diameter)	-	3.5 mm	-	3 mm	3 mm	6.7 mm	3 mm	5 mm	4 – 5 mm	-	2.5 mm	5.4 mm
Flower colour	Yellow - green suffused with red - purple	Cream base with pale violet nerves	White with red veins	-	Pale green suffused with purple	Greenish - yellow	Pale purple	Reddish - green	White with purple flushes, translucent	Green	Yellowish - green, semi-translucent	Pale yellow with purple bluish
Sepalum dorsal shape and size	Ovate - elliptic; 2.5 × 1.9 mm	Ovate; 2.5 × 2 mm	Ovate, obtuse; 3 mm long	Ovate; 3 mm long	Ovate, concave; 2.6 × 1.8 mm	Ovate; 3 × 1.1 mm	Ovate, concave; 3.5 mm long	Ovate - elliptical; 2.5 mm broad	Ovate; 4 × 2.5 mm	Ovate, concave; 2.7 mm long	Ovate, concave; 2 – 2.5 × 1.5 mm	Ovate, erect, apex recurved, concave; 2.8 × 2.4 mm
Sepala lateral shape and size	-	2.7 × 3.5 mm	Oblong, obtuse, oblique	Oblique	Triangular, oblique; 2.7 mm long	2.2 mm wide	-	Concave; 4 × 3.5 mm	Ovate - oblong, oblique; 6 – 6.5 × 3 – 4 mm	Triangular; 3.3 × 3.3 mm	Triangular, oblique; 2 – 2.5 × 2.7 mm	Triangular, oblique; 3 × 4.4 mm
Mentum shape and size	-	Obtuse, 3 mm deep	Oblong, oblique; 2 mm deep	-	Rounded; 1.3 mm deep	Obtuse	Spure-like, white; 4 mm deep	Conical, obtusely rounded; 2 mm deep	Saccate; 2 mm deep	Broad, obtuse	Saccate, obtuse; 1.5 mm deep	3 mm long, saccate, connate,

Appendix 1. Comparison of morphological characters of *Appendicularia* spp. in *Appendicularia* section *Pododesme* in Indonesia. (continued)

	<i>A. inermis</i> Carr.	<i>A. elegans</i> Rehb.f.	<i>A. krauseana</i> Schltr.	<i>A. isoglossa</i> Schltr.	<i>A. effusa</i> (Schltr.) Schltr.	<i>A. cristata</i> Blume	<i>A. undulata</i> Blume	<i>A. polystachya</i> (Schltr.) Schltr.	<i>A. cordata</i> Wibowo & Juswara	<i>A. longa</i> J. J. Sm.	<i>A. infundibuli</i> <i>formis</i> J. J. Sm.	<i>A. baliensis</i> J. J. Sm.
Petala shape and size	Oblong, oblique, clawed; 2 × 1.1 mm	Lanceolate; 2.2 × 1.2 mm	Oblong, rounded	Ovate, oblique	Oblong—spathulate, concave; 2 × 0.8 mm	Ovate; 1.8 × 1.1 mm	Ovate; 2.5 × 2 mm	Oblong—ovate, concave; 2 × 1.5 mm	Oblong; 3 × 2–3 mm	Lanceolate; 2.4 × 1.2 mm	Oblong, erect	Slightly concave, irregular quin-quanglata, 2.5 × 2 mm
Shape of labellum		Oval	Oblong	Ovate—circular, concave	Vague trilobed, oblong	Trilobed, side-lobes rounded, mid-lobe broad, cristate	Spathulate	Obovate	Oblong, concave	Lanceolate—spathulate	Oblong, concave	Parallel with gynostemium, 2/3 of the basal part concave.
Apical part of labellum	-	Obtuse when flattened, margin folded back makes it looks like acute	Bitobed, blunt	Acute when flattened	-	Recurved, bilobed	Acuminate, obtuse	Decurved, obtusely rounded, bilobed	Irregularly caudate when flattened, reflexed 180° to the right	Lower margin incurved	Broad, obtuse, trilobed	Concave, recurved and forming a canal, white with purple margin.
Size of labellum	-	4 × 2 mm	4.5 × 2 mm	1.75 mm wide	3 × 3 mm	-	-	3.8 × 3.2 mm	6 × 4.5 mm	-	3.3 × 3 mm	3.7 mm long
Appendage	Not present	Erect, V-shaped	Halfmoon-shaped, bilobed, thickening near the base	Short, bilobed, ornate	Horseshoe-shaped	-	Narrow, 1.5 mm long	Disc gutter-shaped, thick, fleshy	Cordate, forming 2 incurved ridges, white	Rounded	Horseshoe-shaped, yellow	Hipocrepiform, concave, 3 nervous
Nectar	-	Present, transparent	-	-	-	-	-	-	Present, yellowish	-	-	-

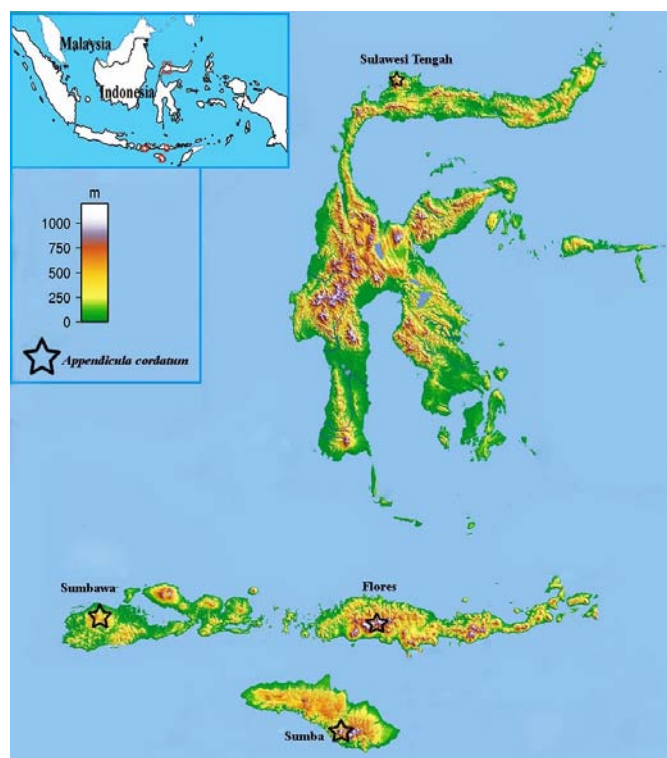


Fig. 3. Distribution map of *Appendicula cordata* Wibowo & Juswara

Sumbawa and Sulawesi Tengah. It is probable that its distribution is wider than this has been recorded. Thus, complete information on distribution and conservation status in nature on this newly described species and other species within the genus *Appendicula* are needed to finish the checklist of Orchids of Indonesia.

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REFERENCES

- BLUME, C. L. 1825. *Bijdragen tot de Flora van Nederlandsch Indie*. Ter Lands Drukkerij, Batavia. Pp. 297–304.
- COMBER, J. B. 1990. *Orchids of Java*. Bentham-Moxon Trust/Royal Botanic Gardens, Kew. Pp. 193–201.
- COMBER, J. B. 2001. *Orchids of Sumatra*. Natural History Publications, Kinabalu. Pp. 524–548.
- THE PLANT LIST. 2013. Version 1.1. Published on the internet: <http://www.theplantlist.org/tp1.1/search?q=Appendicula> (Accessed 5 May 2017).
- E-MONOCOT. Version 1.0.5. Published on the internet: <http://e-monocot.org/search?query=Appendicula>. (Accessed 5 May 2017).
- REICHENBACH, H. G. 1875. Orchideae zollingerianae itineris primirecensentur. *Bonplandia* 5: 41.
- SCHLECHTER, R. 1912. Orchidaceae novae et criticae. *Repertorium Specierum Novarum Regni Vegetabilis*. 1: 140–146.
- SCHLECHTER, R. 1914. Die Orchidaceen von Deutsch Neu Guinea. *Repertorium Specierum Novarum Regni Vegetabilis*. 1: 335–357.
- SEIDENFADEN, G. & WOOD, J. J. 1992. *Appendicula. The Orchids of Peninsular Malaysia and Singapore*. Olsen & Olsen, Fredensborg/Royal Botanic Gardens, Kew. Pp. 324–332.
- SMITH, J. J. 1906. *Icones Bogorienses* [Boerlage] 3: t. 217.
- WOOD, J. J. 2003. *Orchids of Borneo*, Vol. 4. The Sabah Society/Royal Botanic Gardens, Kew. Pp. 31–43.

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- Journal : KRAENZLIN, F. 1913. *Cyrtandraceae* novae Philippinenses I. *Philipp. J. Sci.* 8: 163–179.
MAYER, V., MOLLER, M., PERRET, M. & WEBER, A. 2003. Phylogenetic position and generic differentiation of *Epithemateae* (Gesneriaceae) inferred from plastid DNA sequence data. *American J. Bot.* 90: 321–329.
- Proceedings : TEMU, S. T. 1995. Peranan tumbuhan dan ternak dalam upacara adat “Djoka Dju” pada suku Lio, Ende, Flores, Nusa Tenggara Timur. In: NASUTION, E. (Ed.). *Prosiding Seminar dan Lokakarya Nasional Etnobotani II*. LIPI & Perpustakaan Nasional: 263–268. (In Indonesian).
SIMBOLON, H. & MIRMANTO, E. 2000. Checklist of plant species in the peat swamp forests of Central Kalimantan, Indonesia. In: IWAKUMA, T. *et al.* (Eds.) *Proceedings of the International Symposium on: Tropical Peatlands*. Pp.179 – 190.
- Book : RIDLEY, H. N. 1923. *Flora of the Malay Peninsula 2*. L. Reeve & Co. Ltd, London.
- Part of Book : BENTHAM, G. 1876. *Gesneriaceae*. In: BENTHAM, G. & HOOKER, J. D. *Genera plantarum 2*. Lovell Reeve & Co., London. Pp. 990–1025.
- Thesis : BAIRD, L. 2002. *A Grammar of Kéo: An Austronesian language of East Nusantara*. Australian National University, Canberra. [PhD. Thesis].
- Website : <http://www.nationaalherbarium.nl/fmcollectors/k/KostermansAJGH.html>. (Accessed 15 February 2012).



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