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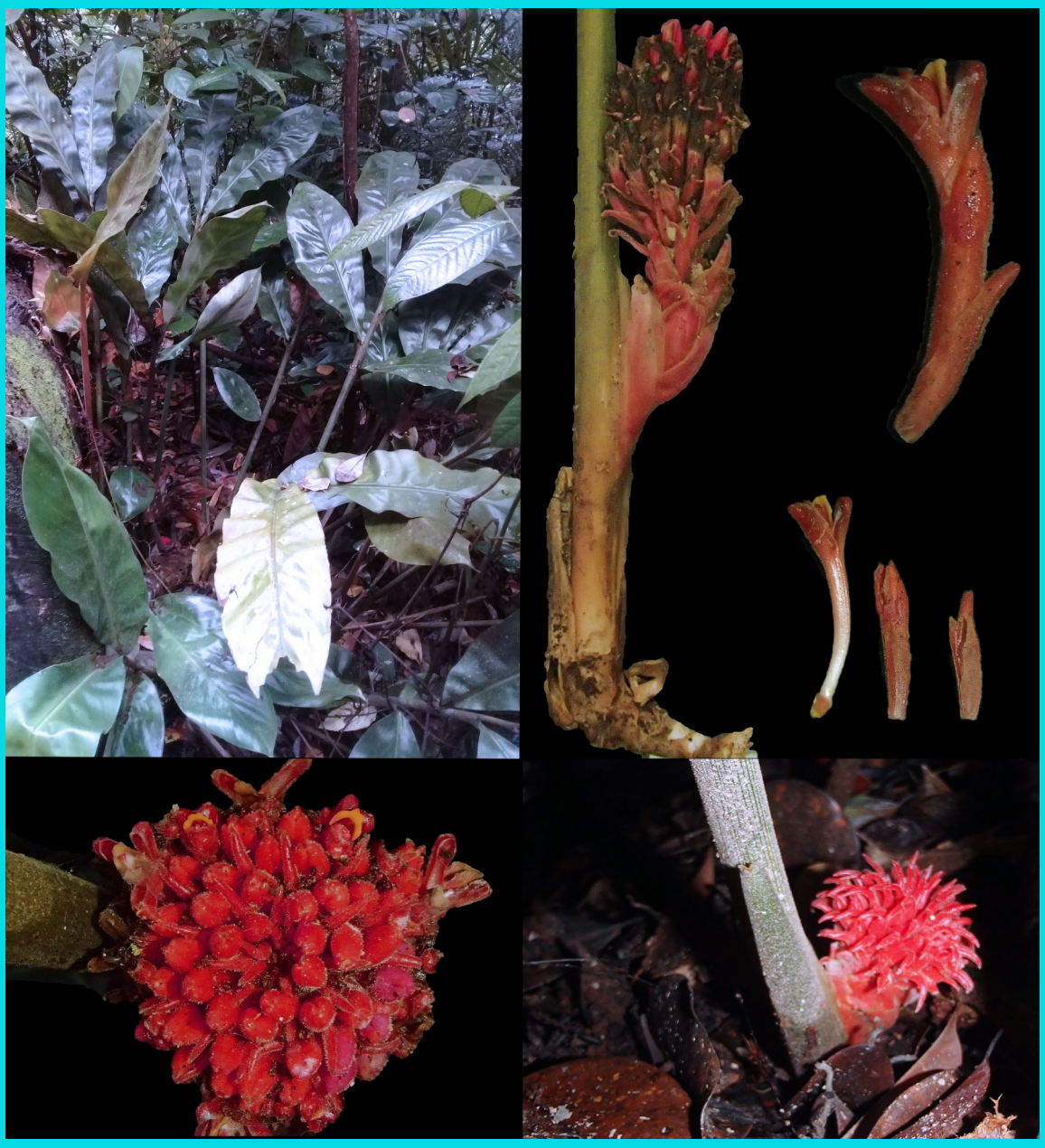

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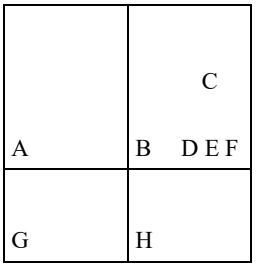

Cover images: *Plagiostachys strobilifera* var. *conica* Salasiah & Meekiong. A. Habit. B. Inflorescence, lateral view. C. Whole flower, lateral view. D. Flower with calyx removed. E. Calyx. F. Bracteole. G. Inflorescence, aerial view. H. Young inflorescence. A–G. *Salasiah 0003*; *H. Salasiah et al. 0014*. Photos by Salasiah Mohamad.

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SYZYGIUM TINOMBALUM (MYRTACEAE), A NEW SPECIES FROM CENTRAL SULAWESI, INDONESIA

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ABSTRACT
SUNARTI, S. 2020. *Syzygium tinombalum* (Myrtaceae), a new species from Central Sulawesi, Indonesia. *Reinwardtia* 19(2): 87–91. — *Syzygium tinombalum* Sunarti *spec. nov*. proposed as a new species from Central Sulawesi. *Syzygium balgooyi* and *S. schumannianum* are considered as the most closely related to *Syzygium tinombalum*. A full description of this species is given.

Keywords: Central Sulawesi, *Syzygium balgooyi, S. schumannianum, S. tinombalum.*

ABSTRAK
SUNARTI, S. 2020. *Syzygium tinombalum* (Myrtaceae), satu jenis baru dari Sulawesi Tengah, Indonesia. *Reinwardtia* 19(2): 87–91. — *Syzygium tinombalum* Sunarti *spec. nov*. adalah jenis baru dari Sulawesi Tengah. *Syzygium balgooyi* dan *S. schumannianum* dianggap paling dekat hubungannya dengan *Syzygium tinombalum*. Pertelaan jenis ini akan disampaikan dalam makalah lengkap.

Kata kunci: Sulawesi Tengah, *Syzygium balgooyi, S. schumannianum, S. tinombalum.*

INTRODUCTION

Syzygium is one of the largest genera of Myrtaceae with 901 species distributed in Malesia and is actually estimated to be 1,335 species (SYZWG, 2016). In Java, Backer & Bakhuizen van den Brink (1963) enumerated about 60 species. In Sulawesi, the species number is estimated *ca.* 105 species (SYZWG, 2016). In the Checklist of Woody Plants of Sulawesi only 11 species have been recorded, however seven are synonymous names, *i.e. Syzygium aqueum*, *S. claviflorum, S. cumini, S. samarangense, Acmena acuminatissima* (*S. acuminatissimum*), *Eugenia beccarii* (*S. beccarii*), *E. calubcob* (*S. calubcob*), *E. densiflora* (*S. pycnanthum*), *E. polycephala* (*S. polychephalum*), *E. polycephaloides* (*S. polycephaloides*), *E. spicata* (*S. zeylanicum*) and many local names and collections left as unidentified species (Keβler *et al*., 2002). According to Craven *et al.* (2006), the genus *Acmena* was included in the genus *Syzygium*. Rugayah *et al.* (2015) have listed 16 species of *Syzygium* from Wawonii Island, eight species of them have not been identified yet. Therefore, there is still a possibility that new taxa will be discovered. Brambach *et al*. (2017) have discovered five new species from Sulawesi, among others *S. balgooyi*, *S. contiguum*, *S. devogelii*, *S. eymae* and *S. galanthum*.

From 2013 to 2017, morphological observations of the living collection of Myrtaceae in Bogor Botanic Gardens have been carried out. Sari *et al*. (2010) have reported that about 40 species of *Syzygium* (Myrtaceae) have been collected and planted in the Bogor Botanic Gardens, but many of them have not been identified yet. During the observation, one unnamed collection, planted in Plot V.A.187, at 9-4-2005 (Ir. Rismita Sari collection, originated from Mountain nature reserve Tinombala, village of Tinombala, district of Bolano Lambunu, Central Sulawesi, 540–660 m asl), has flower looks like those of hypanthium of *Syzygium*. So, it needs to be studied further.

MATERIALS AND METHODS

One unnamed collection as mentioned before, which had similar flowers to hypanthium of *Syzygium*, was collected from Bogor Botanic Garden. Morphological and field data (such as flower and fruit color, size) were recorded and identified.

RESULTS AND DISCUSSION

After viewing the specimens and also studying the publication of Brambach *et al.* (2017), Schumann & Hollrung (1889) and Haron *et al*. (1995) it appears that from the leaf morphology, the species is easier to distinguish from *S. balgooyi* and *S. schumannianum* especially in petiole, leaf base, leaf shape and size, also intramarginal nerve. While the latter two species are rather difficult to distinguish. As for the morphology of the flowers it appears that the species has flower similar to the

flowers of *S. balgooyi* and *S. schumannianum*, but differ mainly in the surface of the hypanthium, the position of the ovary, the number of stamens, the size of the flowers and the number of flowers in one inflorescence. The fruit is somewhat different, both in shape and color. Some morphological characters that support that this species is proposed as a new species, among others. The *leaves* of the new species has sub-sessile leaves, larger size (18–29.3 × 9.5–16.8 mm), and shallowly cordate of its base and has a wider intramarginal nerve (up to 11 mm from the leaf margin) whereas *S. balgooyi* and *S. schumannianum* have almost similar leaves that have petioles, and cuneate or attenuate bases (Table 1). *Inflorescence*: the number of flowers in one inflorescence in the three species is different. In the new species up to 30 flowers, *S. balgooyi* up to 15 flowers (Brambach *et al.*, 2017) and *S. schumannianum* up to seven flowers (Schumann & Hollrung, 1889). *Flower*: the hypanthium of the new species and *S. balgooyi* are slightly shorter than *S. schumannianum*; but the surface of the three species is very different. The surface of the new species and *S. schumannianum* are striate, but *S. schumannianum* obviously striate (Haron *et al.*, 1995), while the surface of *S. balgooyi* is smooth (Brambach *et al.*, 2017). *Stamens*: the new species have up to 188 stamens, *S. balgooyi* has *ca*. 100 stamens, while *S. schumannianum* is not known. *Ovary*: the position of the ovaries in the three species is very different. *Fruit*: the new species has a fruit shape that is almost the same as *S. balgooyi*, but the bottom of the fruit is truncate, while *S. balgooyi* is obtuse. The color of the fruit is different, the species is dark green to reddish and *S. balgooyi* is yellowish green. *Syzygium schumanianum* is the most distinctive fruits of the two, because the fruit with prominently ribbed and the color is white (Haron *et al.*, 1995).

Morphological observation of several sterile specimens in BO collected by *Brambach et al. 0176, 0206, 0283, 0319, 0332, 0466* & *Culmsee 125*, were firstly identified by Brambach *et al.* (2017) as *Syzygium balgooyi*, indicate that its do not seem to get into the species.

Table 1. Morphological differences between *Syzygium tinombalum* Sunarti *spec. nov.*, *S. balgooyi* Brambach, Byng & Culmsee and *S. schumannianum* (Nied.) Diels.

Characters	*Syzygium tinombalum*	*S. balgooyi*	*S. schumannianum*
Leave size	18–29.3 × 9.5–16.8 cm	(4–)7–11.5(–16) × (1.5–) 3–5(–9) cm	9–18 × 4.5–8 cm
Petiole	Sub-sessile	2–12 mm, flat and sometimes narrowly winged above	7–10 mm, thickened at the base
Blade	Ovate to elliptic	Commonly obovate or oblanceolate	Elliptic to oblong - elliptic
Apex	Acute or slightly acuminate	Usually rounded or obtuse, sometime emarginate	Very obtuse or slightly acute
Base	Shallowly cordate	Cuneate-attenuate at the very base or obtuse to rounded	Cuneate-attenuate
Secondary vein (pairs)	17-26, clearly prominent	(9-)11-14(-16), slightly prominent	10-13, prominent
Intramarginal vein	2, 1–3 mm & 4–11 mm from the leaf margin	2, > 1 mm & 1–5 mm from the leaf margin	2, *ca*. 1 mm & 3 mm from the leaf margin
Inflorescence	4-30 flowers	5-15 flowers	5-7 flowers
Hypanthium (length)	2.4–3.2 cm, slightly striate	2–3 cm, smooth	3.8 cm, obviously striate
Petals	5.5 × 5 mm, ± suborbicular	*ca.* 4 × 3 mm, ± obovate, pale green	2 × 2 mm, suborbicular
Stamens (number)	184-188	*ca*. 100	unknown
Filaments (long)	2.1–2.5 cm	1–2 cm	2 cm
Fruit	3.7–4.2 cm long, yellowish -reddish (mature), dark green (immature); smooth; the bottom of the fruit is truncate	2.7–3.3 cm long, yellowish green (immature?), smooth; the bottom of the fruit is obtuse	*ca*. 4 cm long, white, prominently ribbed, the bottom of the fruit is obtuse

Syzygium tinombalum Sunarti *spec. nov.* — TYPE: INDONESIA, West Java, Bogor, Bogor Botanic Gardens, plot V. A. 187, 28 October 2017, *Siti Sunarti SS 821,* 28/10/2017 (Holotype BO; Isotype BO, SING). Figs. 1A-G & 2A-C.

Leaves ovate to elliptic; base shallowly cordate; sub sessile; intramarginal veins up to 11 mm from the leaf margin. Inflorescence compound corymb. Hypanthium 24–32 mm long, 6–8 mm wide, cylindrical, slightly striate, mostly pale green.

Small *tree* up to 7 m tall. Bark smooth, pale brown. Branches terete, on younger part somewhat rectangular, flat light brown. Young leaves reddish brown. *Leaves* opposite decussate, ovate to elliptic, 18–29.3 × 9.5–16.8 cm; oil dots visible on both surface; base shallowly cordate, apex acute or slightly acuminate; petiole sub-sessile, slightly swollen; margin entire; midrib and secondary nerves prominent on the lower surface; secondary nerves 17-26 pairs, ascending at 70° with midrib; upper surface glabrous, dark green, lower surface glabrous, greyish green (fresh); inner intramarginal vein 4–11 mm from the leaf margin; outer intramarginal vein 1–3 mm from the leaf margin. *Inflorescence* terminal, 3.8 cm long, a compound corymb of 4-30 flowers; pedicels olive, with 2 small bracteoles subtending in each individual flower; bracteoles triangular, *ca.* 3.5 × 1.5 mm, caducous. *Flowers* bisexual, mostly pale green, hypanthium 24–32 mm long, 6–8 mm wide, cylindrical; sepals triangular, 4.4 × 3 mm, pale green, with oil dots, persistent; petals ± suborbicular, 5.5 × 5 mm, free, yellowish white, with oil dots, soon falling after anthesis. *Stamens* 184-188; filaments 21–25 mm long, yellowish green; anthers yellow. *Stylus* 3.5 cm long, green. *Ovary* inferior, 2 locular, ovules numerous. *Fruits* urceolate [like a measuring flask with short neck (*ca.*13 mm)], sepals persistent, 3.7–4.2 cm long, 2.1–2.5 cm diam.; young fruits dark green and mature yellowish-reddish. Seed 1.

Habitat. Grows in primary forest in Mountain Nature Reserve Tinombala, 540–660 m asl.

Etymology. Tinombala is the name of the village where this species was first collected.

Distribution. Sulawesi: Mountain nature reserve Tinombala, village of Tinombala, district of Bolano Lambunu (Central Sulawesi).

Specimens examined. All specimens were collected from Bogor Botanic Gardens *Siti Sunarti 724a,* 26/10/2014 (BO1979613); *Siti Sunarti SS 809a*, 15/3/2016 (BO1979614); *Siti Sunarti SS 821,* 28/10/2017 (BO1979615 & BO1979616); *SS 822,* 9/11/2017 (BO1979617 & BO1979618).

Notes. In Bogor Botanic Gardens flowering in March-May, fruiting in September-November.

The three species can be distinguished using a key below:

Key to the three related species

1a. Leaves with petiole 3–10 mm long; blade (5–) 8–18 × (2–) 3.5–8 cm; commonly obovate, elliptic to oblong-elliptic; base cuneate and attenuate; intramarginal veins up to 5 mm from the leaf margin; petal 2–4 × 2–3 mm; the bottom of the fruit is obtuse ……...……. 2

b. Leaves sub-sessile; blade 18–29.3 × 9.5–16.8 cm; ovate to elliptic; base shallowly cordate; intramarginal veins up to 11 mm from the leaf margin; petal 5.5 × 5 mm; the bottom of the fruit is truncate ……..…….…...… *S. tinombalum spec. nov.*

2a. Leaves commonly obovate. Petal 4 × 3 mm. Hypanthium smooth, up to 3 cm long. Fruits smooth, yellowish green ……..…..... *S. balgooyi*

b. Leaves elliptic to oblong elliptic. Petal 2 × 2 mm. Hypanthium obviously striate, up to 3.8 cm long. Fruits prominently ribbed, white ….....……..…….... *S. schumannianum*

Fig. 1. *Syzygium tinombalum* Sunarti *spec. nov*. A. Flower buds. B. Branchlet with open flowers. C. Young fruits. D. Mature fruits. E-F. Flower, style & ovary. G. Sepals & stamens. Photos by Siti Sunarti.

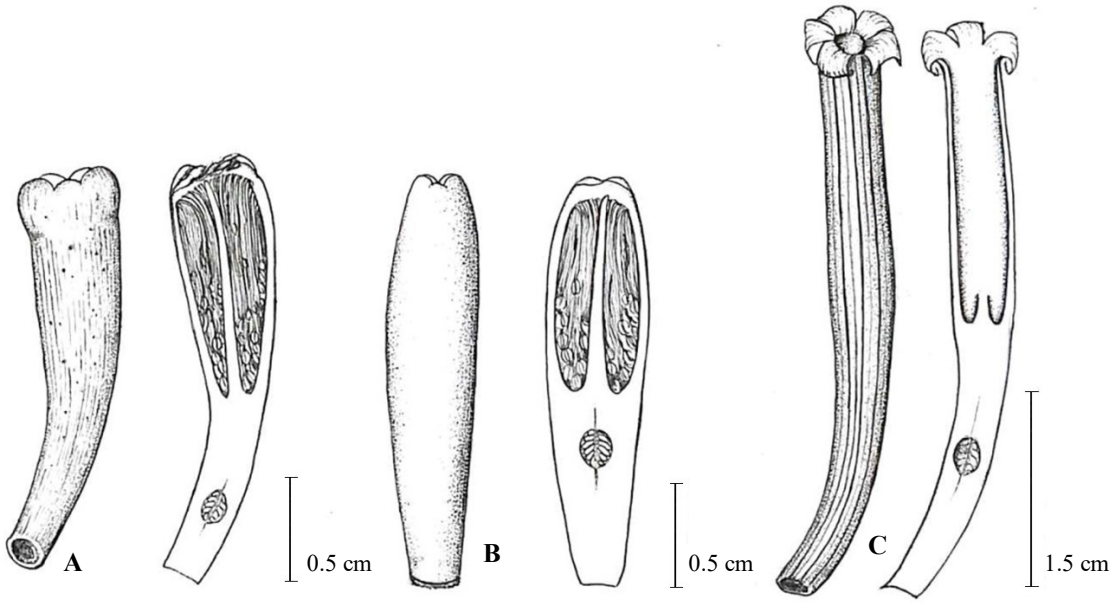

Fig. 2. A. Flower of *Syzygium tinombalum* from *Siti Sunarti SS 809a* 15/3/2016 B. Flower of *S. balgooyi* from *Brambach et al. 1564*. C. Flower *S. schumannianum* from *M. Hollrung 749*. Drawn by Anne Kusumawaty (BO).

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REFERENCES

BAKHUIZEN VAN DEN BRINK Jr. R. C. 1963. *Myrtaceae*. In: BACKER, C. A. & BAKHUIZEN VAN DEN BRINK Jr. R. C. *Flora of Java*. 1. NVP Noordhoff, Groningen. Pp. 333–349.

BRAMBACH, F., BYNG, J. W. & CULMSEE, H. 2017. Five new species of *Syzygium* (Myrtaceae) from Sulawesi, Indonesia. *Phytokeys* 81: 47–78.

CRAVEN, L. A., BIFFIN, E. & ASHTON, P. S. 2006. *Acmena, Acmenosperma, Cleistocalyx, Piliocalyx* and *Waterhousea* formally transferred to *Syzygium* (Myrtaceae). *Blumea* 51: 131–142.

HARON, N. W., LAMING, P. B., FUNDTER, J. M. & LEMMENS, R. H. M. J. 1995. *Syzygium* Gaertner. In: LEMMENS, R. H. M. J., SOERIANEGARA, I. & WONG, W.C. (Eds.). 1995. Timber trees: Minor commercial timbers. *Plant Resources of South-East Asia* 5 (2): 470.

KEβLER, P. J. A., BOS, M. M., SIERRA DAZA, S. E. C., KOP, A., WILLEMSE, L. P. M., PITOPANG, R. & GRADSTEIN, S. R. 2002. Checklist of woody plants of Sulawesi, Indonesia. *Blumea Supplement* 14: 98–99.

RUGAYAH, SUNARTI, S., SULISTIARINI, D., HIDAYAT, A. & RAHAYU, M. 2015. *Daftar Jenis Tumbuhan di Pulau Wawonii, Sulawesi Tenggara*. LIPI Press. Jakarta.

SARI, R., RUSPANDI & ARIATI, S. R. 2010. *An Alphabetical List of Plant Species Cultivated in the Bogor Botanic Gardens*. Bogor Botanic Gardens, Center for Plant Conservation. Indonesian Institute of Sciences, Bogor.

SCHUMANN, K. & HOLLRUNG, M. 1889. *Die Flora von Kaiser Wilhelms Land*. Kommissions -Verlag: Asher & Co. Berlin W., Miter den Linden 5: 90–91.

SYZWG (AHMAD, B., BAIDER, C., BERNARDINI, B., BIFFIN, E., BRAMBACH, F., BURSLEM, D., BYNG, J. W., CHRISTENHUSZ, M. J. M., FLORENS, F. B. V., LUCAS, E. J., RAY, A., RAY, R., SMETS, E., SNOW, N. W., STRIJK, J. S. & WILSON, P. G.). 2016. *Syzygium* (Myrtaceae): Monographing a taxonomic giant via 22 coordinated. Regional revisons. *PeerJ Preprints* 4: e 1930v1.

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Journal : KRAENZLIN, F. 1913. *Cyrtandraceae* novae Philippinenses I. *Philippine Journal of Science* 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 American Journal of Botany* 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. Pp. 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., INOUE, T., KOHYAMA, T., OSAKI, M., SIMBOLON, H., TACHIBANA, H., TAKAHASHI, H., TANAKA, N. & YABE, K. (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. (Eds.). *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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