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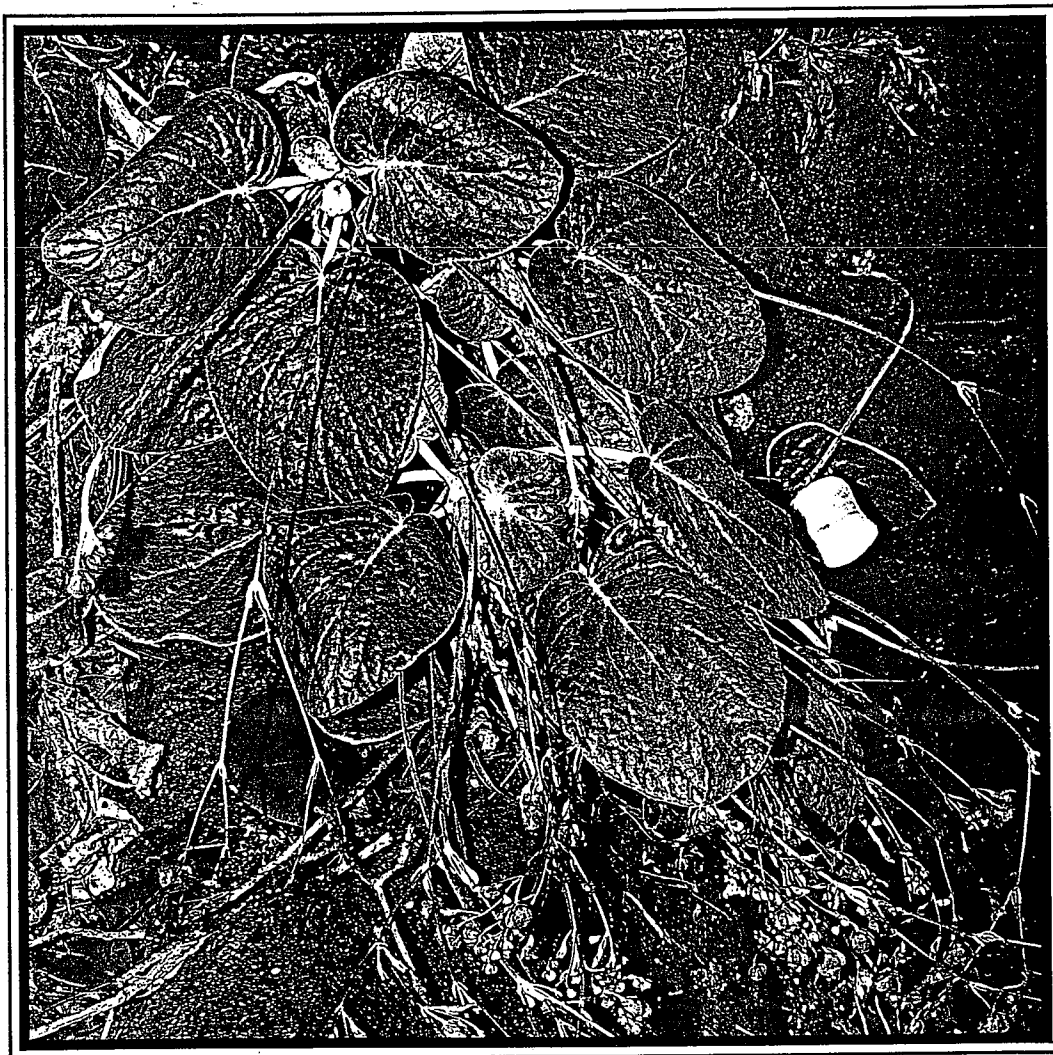
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A new species of *Paraboea* (Gesneriaceae)
from the volcanic islands off Semporna, Sabah

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Summary. *Paraboea leopoldii* is newly described from the volcanic islands of Bodgaya and Boheydulong off Semporna in Sabah, Borneo. Its closest relatives appear to be *P. minahassae* from Sulawesi and *P. schefferi* from Kalimantan (Indonesian Borneo).

During a survey of the vegetation and flora of the islands off Semporna in Sabah during October 1998, an interesting species of *Paraboea* was collected. This taxon is a small plant growing as localized populations on parts of the exposed volcanic rock faces, from just 4 m above the shoreline to high up on near-vertical cliff faces. It develops a prostrate woody stem up to about 40 cm long, bearing pairs of leaves borne at the upcurved distal part, and similar branch shoots that grow only from the base of very old stems.

A comparison with material and literature at the Sandakan herbarium revealed that this taxon is different from the other species known from Sabah, viz., *P. madaiensis* Xu & Burt (known from the Madai limestone outcrops) and *P. sabahensis* Xu & Burt (known from the Sopiloring limestone hill), in its leaf arrangement (leaves in pairs, not in whorls of three), longer petioles (typically 3-6 cm long, whereas those species have very short petioles 2 cm long or less), inflorescence position (axillary, not terminal), and fruit capsules (which are straight, not spirally twisted). However, it appears to be the same as a collection (*Meijer* SAN 23322) (at SAN) from the Bukit Menundut limestone in the Kinabatangan district, which has only a leafy stem with a young inflorescence with some flower buds.

This brought us to discussion with Mr B.L. Burt of the Edinburgh herbarium, who has

conducted specialized studies of this genus (Burt 1984, Xu & Burt 1991) and annotated much of the material at Sandakan. He pointed out that the alliance of this taxon from Semporna did not belong with the two species known from Sabah or other species in Borneo that have twisted capsules but in fact lay with two other species which also have straight capsules. These allied species are *P. minahassae* (Teijsm. & Binn.) B.L. Burt (of the Minahassa province in northern Sulawesi) and *P. schefferi* (H.O. Forbes) B.L. Burt (known from Central Kalimantan, with an associated plant described as *Didymocarpus schefferi* var. *ambigua* C.B. Clarke collected from the Karimata islands in West Kalimantan).

It also became necessary to compare the material with two other collections from the Sulu islands that, together with the Bodgaya and Boheydulang islands off Semporna, form a series in that volcanic arc. One was from Tawitawi island and the other from Jolo island. These appeared to have some affinity with *P. minahassae*.

DISTINCTIVE CHARACTERS OF THE SEMPORNA ISLANDS TAXON

A Teijsmann collection from Likoepong (= Likupang) in Minahassa, Sulawesi at the British Museum (BM) is probable isotype material for *P. minahassae* (Burt, pers. comm.). The leaves in this specimen are narrowly ovate (3–7 cm × 1.5–4 cm), with a rounded or very shallowly subcordate base, whereas those of the Semporna taxon are ovate to subrotund (5–9 cm × 3.5–8 cm), with a distinctly cordate base. The infructescence structure in the Teijsmann specimen has only 2–3 orders of branching with short primary branches (1–1.5 cm long), whereas that in the Semporna taxon is branched to 3–6 orders with long primary branches (5–6.5 cm long). Also, the corolla of *P. minahassae* was recorded to be 17 mm across (*vide* Forbes 1882: 298), much larger than those of the Semporna taxon which are only 7–8 mm across. Furthermore, fruit capsules in the Teijsmann specimen measured 18–26 mm long, much longer than the fruits of the Semporna collection, which were only 10–12 mm long. These comparisons suggest that the Semporna taxon is not *P. minahassae*.

The Tawitawi specimen (*Gaerlan & Sagcal* PPI 10037) (PNH) is superficially very similar to *P. minahassae*, although in not having flowers or fruits it is difficult to be sure of such an identification. Its leaves, also, are narrowly ovate and thus easily distinguished from those of the Semporna taxon. The Jolo specimen (*Kondo & Edaño* PNH 36896) (PNH) is superficially quite different from *P. minahassae* in that it has much longer petioles (7–10 cm long) and a somewhat longer inflorescence peduncle (14–17 cm long), although its fruit capsules are 20–24 mm long and thus similar to those of *P. minahassae*. These two specimens therefore, might only be provisionally named *P. minahassae* but are quite different from the Semporna taxon.

P. schefferi is typified by *Teijsmann* 8430 (BM) collected from a locality called Pulo Pandan in Central Kalimantan. Xu, in the determination of an Endert collection (L) of this species

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from Pulau Sepandan on Danau Luara, in the headwaters of the Kapuas near the Kalimantan/Sarawak border, considered this as the type locality and was probably correct (Burtt, pers. comm.). Besides the record by Forbes (1882: 298) of the fruit capsules of *P. schefferi* as 40 mm long (and therefore very different from capsules of the Semporna taxon, which are much shorter), there are other differences between the Endert specimen and the Semporna taxon to be considered. The Endert specimen shows a more robust, rigid 1-cm-thick stem just below its distal leafy portion (also, Forbes describes the habit as "erecta"); stems of the Semporna taxon are conspicuously twisted and crooked, as typical of a prostrately growing stem, and only develop to 3–4 mm thick even in very old plants. The Endert specimen has a much longer inflorescence peduncle (18–20 cm long) with shorter primary branches (3.5–4 cm long) compared to the Semporna taxon (peduncle 8–13 cm long, primary inflorescence branches 5–6.5 cm long). Otherwise, there is a superficial similarity in that both taxa have broadly ovate leaves with cordate bases.

Clarke's *Didymocarpus schefferi* var. *ambigua* was based on material from Karimata and here it is possible also to make some comparison between material collected by Monde (L) from Karimata, typical *P. schefferi* and the Semporna taxon. The var. *ambigua* resembles typical *P. schefferi* in its habit and leaf form but has shorter inflorescences (the peduncle seen is only 12 cm long) resembling that of the Semporna taxon. The fruit capsules in the var. *ambigua*, 16–18 mm long, are much shorter than recorded for typical *P. schefferi* by Forbes (see above) but much longer than those of the Semporna taxon (10–12 mm long). Again, therefore, the Semporna taxon may not be identified as *P. schefferi*.

A comparison of the main characteristics of these taxa is provided in Table 1.

DESCRIPTION OF THE NEW SPECIES

It might be thought preferable to wait for "complete" material of all taxa being compared presently before naming the Semporna taxon. This, however, may not be obtained in a very long time to come and is unnecessary as it is clear that the two most closely related species, *P. minahassae* and *P. schefferi*, have distinctively longer fruit capsules, as discussed above. Moreover, there are also differences in leaf form and degree of inflorescence branching between the Semporna taxon and *P. minahassae*, and in stem form compared with *P. schefferi*. Clearly, however, these taxa are in the same taxonomic alliance, as suggested by Mr Burtt.

There is also another, apparently as-yet-unnamed taxon represented by *Stone* 6767 (KLU) collected along a shady forest stream on sandstone between Tamparuli and Tangilan on the west coast of Sabah, which was noted to have white flower buds (the Semporna taxon has violet flowers). This appears to be the same as *Dransfield et al.* JD 5823 (SAN) from volcanic breccia in dipterocarp forest in VJR 70, Silabukan Forest Reserve at Bagahak, collected in October 1979, which has lavender flowers and only young fruit. This taxon will have to be assessed when more evidence is available.

Table 1. A comparison of characters among *Paraboea mindhassae*, *P. schefferi* and *P. leopoldii*.

	<i>P. mindhassae</i>	<i>P. schefferi</i>	<i>P. leopoldii</i>
<i>Stem form</i>	twisted and crooked, c. 0.5 cm thick, probably prostrate with upcurved tip	robust, rigid, c. 1 cm thick, probably suberect	conspicuously twisted and crooked, c. 0.5 cm thick, prostrate with upcurved tip
<i>Petiole in fully expanded leaves</i>	2-5 cm	3-7 cm	3-6 cm
<i>Leaf shape and base</i>	ovate, base rounded to slightly cordate	ovate, base conspicuously cordate	broadly ovate to subrotund, base conspicuously cordate
<i>Lower leaf surface</i>	interwoven, arachnoid, white tomentum	interwoven, arachnoid, white tomentum	interwoven, arachnoid, white tomentum
<i>Inflorescence peduncle length</i>	7-11 cm	(12-)18-20 cm	8-13 cm
<i>Inflorescence branching</i>	2-3 orders	3-4 orders	3-6 orders
<i>Inflorescence primary branches, length</i>	1-1.5 cm	3.5-4(-5) cm	5-6.5 cm
<i>Corolla shape</i>	broad subcampanulate*	broad subcampanulate*	broad subcampanulate
<i>Corolla diameter</i>	17 mm*	(not known)	7-8 mm
<i>Corolla colour</i>	violet	(not known)	violet
<i>Calyx lobes at fruiting, length</i>	1-1.5 mm	2-3 mm	2-3 mm
<i>Fruit length</i>	18-26 mm	(16-18-) 40* mm	10-12 mm

*information from Forbes (1882)

Calyx lobes at fruiting, length	1-1.5 mm	2-3 mm	2-3 mm
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*information from Forbes (1882)



Fig. 1. *Paraboea leopoldii*, on volcanic rock on Bodgaya Island off Semporna (WKM 2864). (Photo: K.M. Wong)

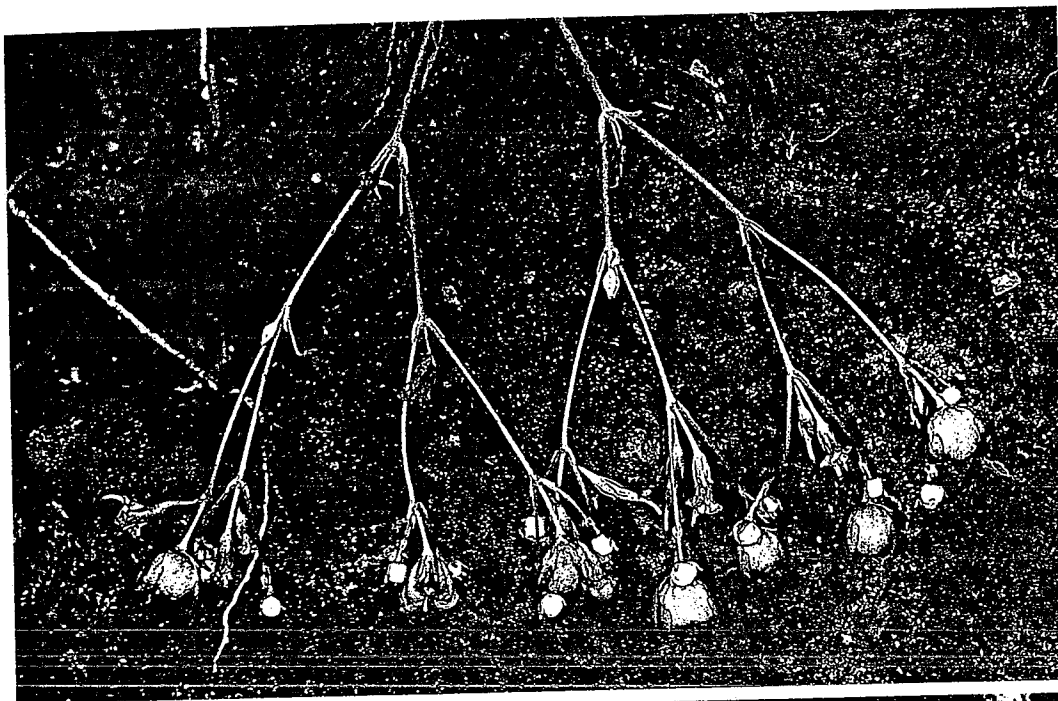


Fig. 2 (Above). Flowers of *Paraboea leopoldii*. Fig. 3 (Right). Fruits. (Photo: K.M. Wong)

Determination of the status of the Semporna taxon is important because it occurs on islands that are being proposed as part of the Semporna Islands Park in Sabah and there is now a need to point out rare and interesting forms of plant life there as the decision to formalize the Park is awaited.

Paraboea leopoldii K.M. Wong, J.T. Pereira, J.B. Sugau & S.P. Lim **sp. nov.** *P. minahassae* (Teijsm. et Binn.) B.L. Burtt similis, sed foliis late ovatis vel subrotundatis basi conspicue cordatis, inflorescentiis ter sexiesque ramosis ramulis primariis longioribus, corolla minore 7–8 mm late tantum et capsulis brevioribus 10–12 mm longis (nec 18–26 mm) differt. Typus: K.M. Wong, Postar Miun & Ahmad Sappan WKM 2864, Sabah, Semporna, Bodgaya island, sea fringe on north side, steep tuff scarp (holotypus SAN, isotypi E, K, KEP).



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The habit of the species is shown in Fig. 1, its flowers in Fig. 2, and fruits in Fig. 3.

We are pleased to name this new species for Mr Leopold Madani of the Forest Research Centre's Sandakan herbarium, in recognition of his role in maintaining the herbarium through different periods of botanical development there as well as his friendship and kindness to us all.

ACKNOWLEDGEMENTS

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