Syzygium jiewhoei (Myrtaceae), a new endemic tree from Western New Guinea, Indonesia

G.G. Hambali1,2, S. Sunarti3 & Y.W. Low4,5,6

1Taman Buah Mekarsari, Cileungsi, Bogor, Indonesia
2Yatazawa R & D Gardens, Bogor, Indonesia
gregham2010@yahoo.com
3Herbarium Bogoriense, Research Center for Biology, Indonesian Institute of Science, Jl. Raya Jakarta-Bogor KM 46, Cibinong, 16911, Bogor, Indonesia
4Herbarium, Singapore Botanic Gardens, National Parks Board, 1 Cluny Road, 259569 Singapore
5Comparative Plant and Fungal Biology, Royal Botanic Gardens Kew, Richmond, Surrey TW9 3AE, UK
6School of Biological Sciences, University of Aberdeen, AB24 3UU Aberdeen, UK

ABSTRACT. Syzygium jiewhoei Hambali, Sunarti & Y.W.Low, a new species from Western New Guinea, Indonesia, is described and illustrated. It is closely related to Syzygium recurvovenosum (Lauterb.) Diels but differs in a range of vegetative and reproductive morphological characteristics.

Keywords. East Malesia, Papua Province, Sahul shelf, Syzygium recurvovenosum

Introduction

New Guinea, the largest tropical island in the world, is located in the Malesian region with an area of approximately 800,000 km². Politically, it is divided into two roughly equal halves: to the east is Papua New Guinea and to the west is Indonesian New Guinea, comprising the provinces of Papua and West Papua. Biogeographically, New Guinea is part of the Sahul shelf, that also includes Australia and Tasmania, and these regions share similar floristic elements that are distinct from those on the Sunda shelf (Gressitt, 1982; Pieters, 1982). Hence, the phytogeography of the Malesian region has been a focus of research by tropical botanists (Van Steenis, 1950; Van Welzen et al., 2011; Crayn et al., 2015). A comprehensive Flora of New Guinea is still lacking. However, efforts by various botanical institutions have led to checklists, guides and monographs of selected plant groups, such as the orchids (Schuiteman & de Vogel, 2001, 2002, 2005, 2006, 2008; Schuiteman et al., 2010), palms (Heatubun, 2002; Baker & Dransfield, 2006; Heatubun et al., 2012), and alpine plants (Van Royen, 1979a, 1979b, 1982, 1983; Johns et al., 2006), etc.

Syzygium Gaertn. is one of the largest genera in the world, with about 1200–1800 species occurring principally in the Old World (Frodin, 2004; Parnell et al., 2007; Syzygium Working Group, 2016). A recent analysis reveals that Syzygium is
the genus with the largest number of tree species, about 1069 species in all (Beech et al., 2017). Syzygium diversity in New Guinea is expected to be extremely rich, with species occurring from the lowlands to the highlands (Craven, 2006), but identification of Syzygium species has always been difficult due to a lack of good morphological diagnostic characters, resulting in an accumulation of unidentified materials in many herbaria (Hartley & Perry, 1973; Craven, 2006; Craven & Biffin, 2010).

Among the earliest botanists to examine New Guinean Syzygium was Carl Lauterbach (Van Steenis-Kruseman, 1950). He described many new species, including some under segregate genera that are now considered synonyms of Syzygium, such as Aphanomyrtus Miq. and Jambosa Adans. (Lauterbach, 1910, 1912). Later, Friedrich Diels (see Van Steenis-Kruseman, 1950) described many more Syzygium species for New Guinea, some of them under Jambosa (Diels, 1922; Diels et al., 1929). Merrill & Perry (1939a, 1942a, 1942b) meticulously examined the enormous volume of material of New Guinean Syzygium gathered during the Archbold Expeditions. It was Merrill & Perry (1939b), in a treatment of Syzygium in Borneo, who synonymised Jambosa, and also a few other segregate genera in the Syzygium alliance under Syzygium. Later, Hartley & Perry (1973) attempted to revise the by-then much larger Syzygium diversity of Papuasia. They recognised 138 species and also listed 69 species of unknown status or which were to be excluded from Papuasia, citing lack of materials for close examination while preparing the account. A recent enumeration in the World Checklist of Myrtaceae recorded 195 species of Syzygium for New Guinea (Govaerts et al., 2017).

In 1993, while assisting Freeport to establish a plant nursery at Timika under the Incubator Project, the first author stumbled upon several attractive juvenile plants of an unidentified Syzygium species with exceptionally long pendulous leaves in the forested area of Kuala Kencana. Ten years later, the first author visited Timika again and this provided an opportunity to procure seeds and seedlings of the peculiar Kuala Kencana Syzygium species for cultivation. From these materials, one of the plants was successfully established and is growing vigorously in the garden of Mr Tan Jiew Hoe in Singapore. The tree in Singapore eventually produced flowers and fruits, providing us with sufficient materials to examine for this study. The unidentified Kuala Kencana Syzygium is closely related to Syzygium recurvenovosum (Lauterb.) Diels but is distinct based on the suite of morphological characters listed in Table 1. It is concluded that the attractive Kuala Kencana Syzygium is an undescribed novelty from Western New Guinea and is named here as Syzygium jiewhoei Hambali, Sunarti & Y.W.Low.

**Material and methods**

A review of all New Guinean Syzygium species was conducted, based on herbarium specimens preserved in BO, K and SING (herbarium acronyms follow Thiers, 2017, continuously updated). Conventional methods employed in herbarium taxonomy were applied in this study. All measurements were taken from dried herbarium specimens. Photographic documentation is of the living specimen growing in Mr Tan Jiew Hoe’s
Table 1. Comparison of morphological characteristics between *Syzygium jiewhoei* Hambali, Sunarti & Y.W.Low and *S. recurvovenosum* (Lauterb.) Diels.

<table>
<thead>
<tr>
<th></th>
<th><em>Syzygium jiewhoei</em></th>
<th><em>Syzygium recurvovenosum</em></th>
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</thead>
<tbody>
<tr>
<td>Young twigs</td>
<td>Prominently quadrangular and winged</td>
<td>Prominently quadrangular</td>
</tr>
<tr>
<td>Lamina</td>
<td>Slightly bullate</td>
<td>Unknown</td>
</tr>
<tr>
<td>Secondary veins</td>
<td>90–100 pairs</td>
<td>Up to 55 pairs</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>c. 14–16 cm long</td>
<td>Up to 9 cm long</td>
</tr>
<tr>
<td>Peduncle</td>
<td>c. 13–15 mm wide</td>
<td>Up to 3.5 mm wide</td>
</tr>
<tr>
<td>Style</td>
<td>c. 8–18 mm long</td>
<td>c. 4 mm long</td>
</tr>
<tr>
<td>Fruits</td>
<td>Ovoid to broad-ellipsoid, 4–6 cm long, maturing salmon-pink</td>
<td>Pyriform, 2.3 cm long, red (immature)</td>
</tr>
</tbody>
</table>

**Taxonomy**

*Syzygium jiewhoei* Hambali, Sunarti & Y.W.Low, sp. nov.

Similar to *Syzygium recurvovenosum* (Lauterb.) Diels but differs in having 90–100 pairs of secondary veins (vs up to 55 pairs of secondary veins in *S. recurvovenosum*), 14–16 cm long inflorescences with 13–15 mm wide peduncles (vs up to 9 cm long and c. 3.5 mm wide in *S. recurvovenosum*), and 8–18 mm long styles (vs 4 mm long in *S. recurvovenosum*). – TYPE: Native to Indonesia, Western New Guinea, Papua, Timika, Kuala Kencana, living collection cultivated in Mr Tan Jiew Hoe’s garden in Singapore, vouchered on 3 July 2016 as *Hambali, G.G. s.n.* (holotype BO; isotype SING). (Fig. 1, 2)

*Tree* up to 9 m tall, diameter at breast height c. 20 cm, without buttresses. Bark papery, peeling, greyish brown. *Branchlets* glabrescent, green, prominently quadrangular and winged when young, becoming terete on older branches. *Leaves* purple when young, opposite and decussate on erect shoots, becoming secondarily distichous on lateral branches; blades narrowly elliptic to broadly linear, 60–105 × 14–25 cm, with hardly visible minute oil glands; margin entire; base cordate, apex long-acuminate; midrib and secondary veins on lower surface prominent, midrib flat and secondary veins sunken on upper surface; secondary veins 90–100 pairs, rather abruptly curving out from the midrib, intramarginal vein c. 2 mm from the leaf margin; glabrous on
Fig. 1. *Syzygium jiewhoei* Hambali, Sunarti & Y.W.Low. A. Young leaves. B. Cauliflorous habit with many inflorescences at various stages. C. Close-up of inflorescences showing flowers at anthesis. D. Close-up of infructescence. All from type *Hambali, G.G. s.n.* (Photos: G.G. Hambali)
Fig. 2. *Syzygium jiewhoei* Hambali, Sunarti & Y.W.Low. A. Young leafy branch showing winged and angular stem. B. Close-up of cordate leaf base and numerous almost parallel secondary veins arranged very closely together. C. An immature inflorescence. D. Close-up of a mature flower showing the numerous stamens. E. Close-up of a longitudinal section of a mature flower depicting the arrangement of stamens along the rim of the hypanthium. F. A mature fruit. G. Longitudinal section of a mature fruit showing echinate testa intrusions into the cotyledons. Drawn by Subaru from holotype, *Hambali, G.G. s.n.*(BO).
both sides; upper surface green, drying dark brown, lower surface pale green, drying brown; petiole c. 7–10 mm long, 6–13 mm wide, leaves appearing subsessile due to length of blades. **Inflorescences** developing on the stem (cauliflorous), compound cymes 14–16 cm long with up to c. 250 flowers; peduncle dark brown, 3.5–6.5 cm long, 13–15 mm wide, branching to 4 orders, bearing flowers usually in triads at their tips; bracteoles rudimentary, caducous. **Flowers** bisexual, white, 18–24 mm long, hypanthium turbinate, 12–14 mm long, 3–4 mm wide at the top; sepals rudimentary; petals roundish, 3–4 mm across, pale green, caducous at anthesis. **Stamens** numerous, up to 76; filaments 6–10 mm, white; anthers c. 0.3 mm long, dirty white. **Pistil** persistent, green; style 8–18 mm long; ovary inferior. **Fruits** 4–6 × 4.5–5 cm, ovoid to broad-ellipsoid, slightly grooved longitudinally, salmon-pink and sour when fully ripe. **Seeds** 3.5 × 2.8 cm.

**Etymology.** We are pleased to name this handsome tree, with foliage very much resembling that of *Anthurium veitchii* Mast. (Araceae), after Mr Tan Jiew Hoe, a benefactor of science who has a great interest in natural history, particularly in the fields of botany and horticulture (see Kurzweil & Lwin, 2014; Kiew et al., 2015; Leong-Škorničková & Newman, 2015; Lamb & Rodda, 2016).

**Distribution and habitat.** *Syzygium jiewhoei* is so far known only from the lowland forests around the vicinity of Timika, Papua Province, Indonesian New Guinea. However, the species has now been introduced for cultivation as an ornamental tree in Bogor (Java, Indonesia) and Singapore (Fig. 3).

**Provisional IUCN conservation assessment.** Data Deficient DD, following the guidelines in IUCN (2012). *Syzygium jiewhoei* is known only from Kuala Kencana, Timika, Papua Province, Indonesian New Guinea. As the distribution of this species is inadequately known, we propose a status of Data Deficient (DD). As for all species given this status, reassessment will be required as more data is gathered to document the flora of New Guinea. One current initiative is the Tropical Important Plant Areas-Indonesian New Guinea programme (TIPAs Indonesian New Guinea), led by the Royal Botanic Gardens, Kew in collaboration with Universitas Papua (UNIPA), Manokwari, to identify important areas for plant conservation with an emphasis on the Bird’s Head Peninsula, West Papua Province based on a set of criteria proposed by a team of plant conservationists (Darbyshire et al., 2017; Royal Botanic Gardens Kew, 2017).

**Notes.** *Syzygium jiewhoei* is a majestic free-flowering tree with a somewhat broad conical crown, which makes it a highly desirable ornamental tree. At maturity it produces showy inflorescences on its trunk. Flowers of *Syzygium jiewhoei* produce copious nectar for up to three days after anthesis, thereby attracting large numbers of the Asian honey bee (*Apis cerana*) and stingless bee (*Trigona laeviceps*). The mature salmon-pink fruits of *Syzygium jiewhoei* range from ovoid to broad-ellipsoid and somewhat oblong.
It’s worth noting that there is a solitary tree of *Syzygium jiewhoei* growing beside the road at the back of PT Freeport’s Environmental Department building in Kuala Kencana. It was previously erroneously identified as *Syzygium versteegii* (Lauterb.) Merr. & L.M.Perry. *Syzygium versteegii* differs from *Syzygium jiewhoei* in having terete branchlets and oblong leaves with only 15 pairs of secondary veins.

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References


