

Rediscovery of the ‘Woolly Frogmouth’, *Philydrum lanuginosum* Banks ex Gaertn. (Philydraceae), in Singapore

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Abstract. *Philydrum lanuginosum* (Philydraceae) has been rediscovered for Singapore after its first and only collection 127 years ago. A brief description of the plant is provided and proposed conservation measures for the species are discussed.

Key words. amphibious, aquatic plant, marshes, monotypic genus, wetlands

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INTRODUCTION

Philydrum Banks ex Gaertn. belongs to one of the three or four genera in Philydraceae, a small Commelinid family of six species centred mainly in Australasia. Philydraceae has been shown to be most closely related to Haemodoraceae and Pontederiaceae (Saarela et al., 2008). The monotypic genus *Philydrum*, represented by its sole species *Philydrum lanuginosum*, is the most widely distributed amongst the other genera in the family and is known to occur from subtropical East Asia and tropical Southeast Asia to Australasia and Micronesia (Skottsburg, 1948; Saunders, 1994; Hamann, 1998; Wu & Larsen, 2016). The generic name *Philydrum* is derived from the Greek ‘philos’ (loving) and ‘hydro’ (water), alluding to the plant’s preference for wet habitats.

While conducting a survey in the vicinity of the Kranji-Sungei Kadut industrial area in late January 2021, botanist Boo Chih Min chanced upon three individuals of a large, yellow-flowered monocotyledonous herb that was growing in an open, sunny area with waterlogged soil. As they did not appear to match any of the herbaceous plant species commonly encountered in Singapore, she thought that they could possibly represent either a rare or unrecorded species, and brought the existence of the plants to the attention of the authors. The amphibious plants were subsequently identified as *Philydrum lanuginosum* Banks ex Gaertn. In Singapore, the species was previously known only from a single collection made by H. N. Ridley in 1894, and has been presumed to be nationally extinct (Keng, 1987; Tan et al., 2008; Chong et al., 2009). The recent sighting is thus a species rediscovery for Singapore. A voucher specimen has been collected and lodged in the herbarium of the Singapore Botanic Gardens (SING) for permanent documentation and future verification.

BRIEF DESCRIPTION & DISCUSSION

As *Philydrum lanuginosum* has been treated in much detail in an earlier account for the Flora of Singapore, only a brief description based on the newly acquired specimen of the species and coloured photographs of the living material before drying are provided in this article. For a complete description and illustration of the species based on the first Singapore collection, see Saunders (1994). Additional information and illustrations of the species have also been provided by Skottsburg (1948: 6, fig. 1), Larsen (1983: 127, fig. 25; 1987: 105, fig. 29), Adams (1987: 45, fig. 29E, F), Saunders (1994: 100, fig. 1), Hamann (1998: 390, fig. 91) and Wu & Larsen (2016: 34, fig. 34).

Philydrum lanuginosum Banks ex. Gaertn., *Fruct. Sem. Pl. 1: 62, pl. 16 fig. 10 (1788)*

Description. Aquatic herb to c. 80 cm tall. Leaves 2-ranked, bilaterally flattened, fleshy, aerenchymatous, sheathing at base. Inflorescence an erect terminal spike, branching or not, to c. 66 cm long, ± glabrous basally, woolly towards the apex. Flowers, zygomorphic, subtended by spathaceous bracts; tepals bright yellow, 2 pairs, outer pair c. 9–15 × 9–10 mm, woolly on adaxial surface, inner pair tepals c. 8 × 2 mm; fruit a 3-locular, ± oblong dehiscent capsule, 3-lobed in cross section, c. 9–16 × 4–5 mm, ripening dull reddish-brown. Seeds numerous, c. 0.7 mm long, brown.

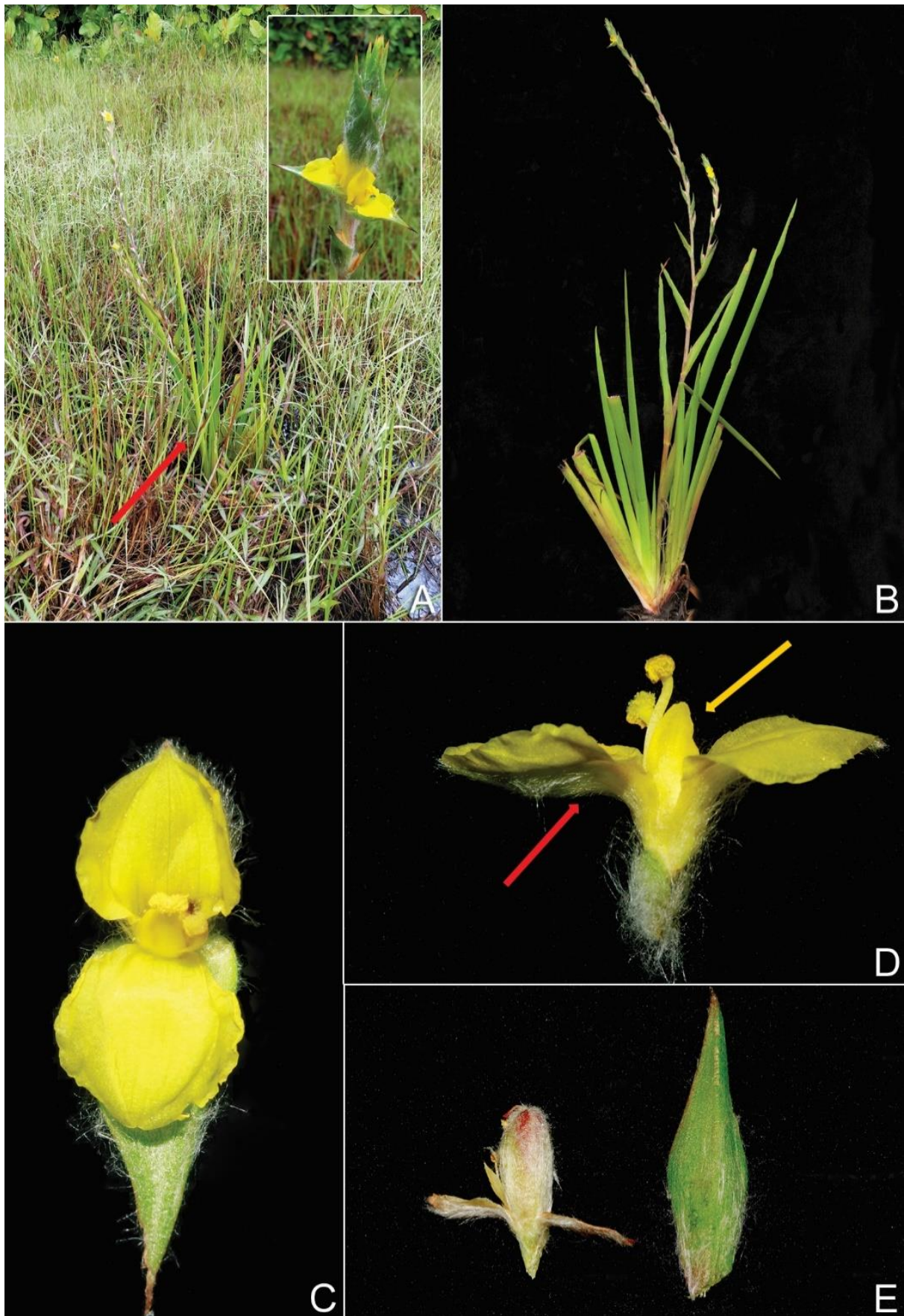


Fig. 1. *Philydrum lanuginosum* Banks ex. Gaertn. A, plant in situ at Sungei Kadut (red arrow); inset shows tip of inflorescence with woolly bracts. B, flowering plant, showing the 2-ranked leaves. C, front view of flower showing the outer tepals and the subtending bract. D, side view of flower showing outer tepals (red arrow) and inner tepal (yellow arrow). E, unripe capsule (left) with subtending bract removed (right). All from Lua H. K. LCMJ 2021-008 (SING). (Photographs by: A, A inset, Lua H. K.; B, Lim W. H.; C–E, Chen L. M. J.).

Occurrence in Singapore. Previously known from Bedok (1894) and newly recorded from Kranji (Fig. 1).

Specimens examined. Bedok, 1894, Ridley H. N. 5907 (SING [SING0012031]); Kranji, Sungei Kadut, 29 January 2021, Lua H. K. LCMJ 2021-008 (SING [SING0291116]).

Distribution. Coastal provinces of southeast mainland China, Hongkong, Taiwan, Southern Japan, Myanmar, Andaman Islands, Thailand, Vietnam, Peninsular Malaysia, Singapore, Borneo, New Guinea, Australia and Micronesia (Guam, Palau) (Skottsburg, 1948; Saunders, 1994; Hamann, 1998; Wu & Larsen, 2016).

Ecology. *Philydrum lanuginosum* is an amphibious species that occurs in permanently waterlogged soils, such as the edges of freshwater bodies, marshes and paddy fields in low elevations rarely occurring beyond 100 m (Prentis et al., 2006; Wu & Larsen, 2016). The species is apparently autogamous (Hamann, 1998), and the minute seeds are water-dispersed, exhibiting buoyancy (Prentis et al., 2006). As the floating seeds cling readily to surfaces (pers. obs.), it may be possible for them to be transported on the plumage of waterfowl, or on the bodies of other amphibious animals such as the smooth-coated otter (*Lutrogale perspicillata* Geoffroy, 1826).

Vernacular names. In Australia, the species is known as woolly frogmouth, from the woolly or lanuginose floral bracts and the pair of inner tepals that resemble a frog's mouth (Adams, 1987; The Australian Botanic Garden, 2021). Malays in Peninsular Malaysia refer to it as 'pokok kipas' or 'rumput kipas', meaning fan plant or fan grass. Unfortunately, this name is shared with several other unrelated plant species (Burkill, 1930). In China, it is known as 'tian cong' (田葱), which translates as field scallion (Wu & Larsen, 2016), most likely because the plant can be found in paddy fields.

Provisional conservation assessment for Singapore. Critically Endangered (CE). This is because of the extremely low number of individuals; the rediscovered population comprises only of three plants, two of which have yet to reach adult/flowering stage. The plants are also at risk of being extirpated due to intensive landscape management practices such as frequent grass cutting, and by any future development of the land parcel, which lies within an industrial estate.

Proposed conservation measures. During the preparation of this report, the flowering specimen was relocated from its habitat to the Native Plant Centre. Seeds were also sent to the Micropropagation Laboratory in the Singapore Botanic Gardens for in-vitro germination. The resulting progenies from the above rescue efforts will subsequently be introduced into suitable wetland habitats in nature areas and parks. The remaining plants in the original habitat will also be monitored and relocated if the necessity arises.

Uses. *Philydrum lanuginosum* has some popularity as an ornamental plant in Australian wetland landscaping and gardening. It has also been cultivated as an aquatic plant in Europe and the United States. However, it is not in the horticultural trade in Singapore. The plant is known to have escaped and naturalised outside its native range only once in North Carolina (USDA, 2016).

CONCLUSION

Philydrum lanuginosum is the second locally extinct, marsh-dwelling species to be rediscovered in the Kranji area during the last two years. Across the Kranji River, at least 3 km away from the *Philydrum lanuginosum* site, *Phragmites karka* (Retz.) Trin. ex Steud. (Poaceae) was recovered from the Kranji Marshes in 2019, after an absence of almost 140 years since its initial collection from Pulau Bukom in the 1880s (Veldkamp et al., 2019; Lim et al., 2021).

Although Singapore is botanically well collected, the emphasis has long been placed on forest-dwelling species, whereas species of open habitats, and especially those that appear 'weedy', are often overlooked and left undocumented. It is therefore no surprise that a 4-metre tall reed and a marsh plant with grass-like leaves would have escaped the notice of those who previously worked on the flora. More surveys of land parcels in open areas such as Kranji may yet turn up other such species that are locally extinct, or have yet to be recorded for the Flora of Singapore.

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