

***Glochidion obscurum* Bl. (Phyllanthaceae), a new record for Singapore**Edmund J. J. Chia^{1*}, Z. Y. Ooi¹, H. K. Lua¹, Adrian H. B. Loo¹, W. F. Ang¹, K. H. Ong and K. M. Wong¹¹National Parks Board, Singapore Botanic Gardens, 1 Cluny Road, Singapore 259569, Republic of Singapore; Email: edmund_chia@nparks.gov.sg (*corresponding author)

Abstract. Widely distributed in the Indochinese and Sunda regions, and common throughout Peninsular Malaysia, *Glochidion obscurum* appears to be an overlooked native species in Singapore. We discuss this new finding, here documented as a new record for Singapore, where, based on its known distribution, it is considered a locally threatened species.

Keywords. *Glochidion obscurum*, Phyllanthaceae, Singapore, Mandai, new record

INTRODUCTION

Glochidion Forst. is a genus of over 200 species of shrubs or small trees found mainly from Indomalaya to Australia and the Pacific, as well as Madagascar and South America (van Welzen & Chayamarit, 2007). Placed in the tribe Phyllantheae, recent consensus (Jangid & Gupta, 2016) has continued to regard *Glochidion* as generically distinct despite possible phylogenetic considerations that broadly circumscribe *Phyllanthus* s.l. as including *Glochidion* and other related genera (Hoffmann et al., 2006).

In Singapore, there are 10 species of *Glochidion* recorded in Keng (1990), listed in Table 1.

Table 1. *Glochidion* species previously recorded in Singapore.

S/No.	Accepted Name	Name in Keng (1990)	Localities Recorded
1.	<i>Glochidion borneense</i> Boerl.	<i>Glochidion microbotrys</i> Hook.f.	Gardens Jungle, Reservoir Jungle, Chua Chu Kang, Changi, Pulau Ubin
2.	<i>Glochidion glomerulatum</i> Boerl.	<i>Glochidion glomerulatum</i> Boerl.	None listed
3.	<i>Glochidion littorale</i> Bl.	<i>Glochidion littorale</i> Bl.	Chua Chu Kang, Bukit Mandai
4.	<i>Glochidion lutescens</i> Bl.	<i>Glochidion hypoleucum</i> Boerl.	Bukit Timah, Bukit Mandai, Tuas
5.	<i>Glochidion rubrum</i> Bl.	<i>Glochidion rubrum</i> Bl.	Gardens Jungle, Seletar, Nee Soon
6.	<i>Glochidion sericeum</i> Hook.f.	<i>Glochidion sericeum</i> Hook.f.	Bukit Mandai
7.	<i>Glochidion singaporense</i> Gage	<i>Glochidion singaporense</i> Gage	Reservoir Jungle
8.	<i>Glochidion superbum</i> Baill.	<i>Glochidion superbum</i> Baill.	Mandai
9.	<i>Glochidion wallichianum</i> Müll.Arg.	<i>Glochidion wallichianum</i> Müll.Arg.	Tanglin, Bajau
10.	<i>Glochidion zeylanicum</i> Juss.	<i>Glochidion brunneum</i> Hook. f.	Gardens Jungle, Bukit Timah, Balestier Road
		<i>Glochidion zeylanicum</i> Juss.	Cluny Road

DISCOVERY OF *GLOCHIDION OBSCURUM* IN SINGAPORE

Although a collection was made in 2003 and the species was featured on a web-blog in 2013 (Table 2), it was not realised that this could be a new record until now. In January 2017, two individuals of *Glochidion obscurum* were discovered along a stretch of disturbed scrubland vegetation bordering old-growth forest, which comprised a mixture of cultivated, primary and secondary rainforest species. The identification was subsequently confirmed with flowers as well as immature and ripe fruits.

Description. *Glochidion obscurum* can grow to 15 m tall and bears distichously arranged simple leaves whose laminae are asymmetric with one base oblique and glaucous on the lower surface, as well as triangular stipules (Whitmore, 1973; van Welzen & Chayamarit, 2007; Fig. 1). Its stalked axillary flowers occur in fascicles of three that include a single pistillate flower, which later forms an obscurely 12- to 14-ribbed capsule that reveals red seeds upon ripening and dehiscence (Fig. 1). The staminate flowers have 4–5 stamens each, distally adnate via connective teeth.

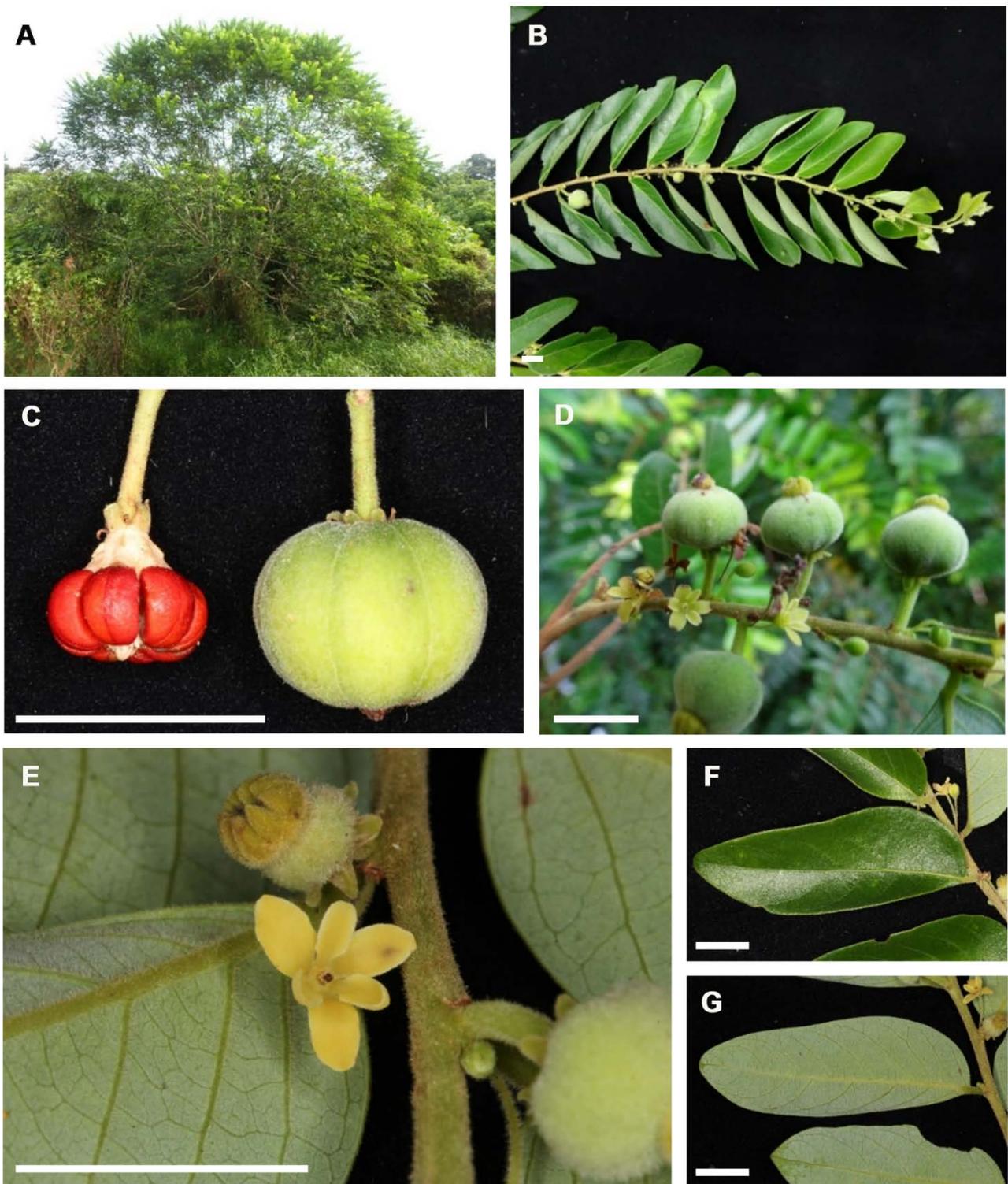


Fig. 1. *Glochidion obscurum*. A, Habit; B, Fertile branch; C, Axillary fascicles each with a pair of staminate flowers and a fruit formed from a single pistillate flower; D, Leaf, adaxial view; E, Leaf, abaxial view; F, Close-up of flowers; G, Seed mass revealed (left) after dehiscence of the intact capsule (right). (Photographs by: Hock Keong Lua [A] and Wee Foong Ang [B–G]). Scale bar = 1 cm.

PRESENT AND PAST RECORDS

Distribution. *Glochidion obscurum* is naturally distributed in Indochina, Peninsular Malaysia, Sumatra, Java and Borneo, so that Singapore is well within the geographical range of this species.

This species has not been recorded for Singapore in Ridley (1900, 1924) or Keng (1990), and an examination of past publication records of *Glochidion obscurum* and the specimen collections in the Singapore Herbarium confirmed the presence of only one previous collection from Singapore made in 2003. Table 2 chronologically summarises the relevant past literature, documented sightings and botanical collection pertaining to a possible Singapore occurrence for *Glochidion obscurum*.

Table 2. Records of *Glochidion obscurum* for Singapore.

Year	Type of Record	Publication/Specimen accession number/Website	Author/Collector	Localities mentioned
1900	Publication	<i>Handleiding tot de kennis der flora van Nederlandsch Indië</i> [Outline of the knowledge of the flora of the Dutch Indies]	J. H. Boerlage	“Malakka, Penang, Singapore, Sumatra, Java”
1911	Publication	<i>An Account of an Expedition to Lower Siam</i>	H. N. Ridley	“Malay peninsula and islands...” [A possibly overlooked entry because this species was not mentioned in Ridley (1900) and Ridley (1924).]
2003	Specimen	SING 0047746	S. K. Ganesan	105 Gerald Drive, “adjacent to a piece of vacant state land”
2013	Documented Sightings	http://www.natureloveyou.sg/Glochidion%20obscurum/Main.html	K. H. Ong	Woodlands Town Park East Mandai Track 15
2017	Specimen	SING 2017-015	J. J. E. Chia, W. F. Ang, A. H. B. Loo & Z. Y Ooi	Mandai

No known Singapore collections of *Glochidion obscurum* seem to have existed prior to 2003, and Boerlage (1900) serves as the only explicit record of this species occurring in Singapore, from his unfinished work on phanerograms of the Dutch Indies region. Boerlage worked mainly with the collections at the herbaria at Bogor (BZ) and Leiden (L), in which Singapore collections of this species are not found (Nicolien Sol & Ridha Mahyuni, pers. comm.). It is therefore assumed that Boerlage had presumed a distribution in Singapore as well because the species seemed common enough in surrounding territories. While this species is noted to have ethnobotanical uses (Burkill, 1930), it is not known to be cultivated and is unlikely to be of cultivated origin (Chong et al., 2009). Hence, the absence of *Glochidion obscurum* in Singapore records (Ridley, 1900; Ridley, 1924; Keng, 1990) between 1900 and 2003 suggests a potentially limited distribution within Singapore. Ridley (1930) notes that seeds of *Glochidion* species are dispersed by birds and although it can be speculated that the individual trees we have recorded could be dispersed from Peninsular Malaysia, there is no reason to doubt that *Glochidion obscurum* could have established in Singapore in the past, given the shared floristic similarities.

Most *Glochidion* species, and in fact many Phyllanthaceae (e.g., *Breynia*) are transient pioneers of open sites such as wasteland and forest fringes; the demise of a local population owing to successional development of a closed vegetation canopy or to land-use changes can normally be expected to be compensated for by other developing populations elsewhere. It is also plausible that *Glochidion obscurum* is uncommon in Singapore. Although common in open sites and forest fringes throughout Malaysia (Ridley, 1924; Corner, 1988), suitable habitat for this species in Singapore is likely to have become reduced as much of open sites are turned over to managed greenery, so that chances of this species maintaining a presence as metapopulations become diminished.

Each *Glochidion* species is half of an obligate, species-specific, pollination mutualism with a species of *Epicephala* moth (Kawakita & Kato, 2006), in which the moth larvae destroy some, but not all of the seeds. This is why there is rarely a complete circle of seeds in the mature fruit capsules. This relationship is analogous to the relationship between figs and their pollinating fig wasps, but has received much less study and the pollinator of *Glochidion obscurum* appears to be currently unknown.

CONCLUSIONS

Our findings indicate that even in a relatively well-botanised place like Singapore, there are still interesting species records to be made. Such new findings have continued to be reported from time to time since the reorganisation of botanical research following World War II, e.g., Sinclair (1953, 1956), Tan et al. (1992) and Turner et al. (1994, 1997), including after the turn of the century, e.g., Leong-Škorničková et al. (2014, 2015). Our particular example demonstrates that these could also include common or well-known species in the region, as has also been the case for new native species records for Singapore discovered in the past.

Although it could be considered that existing specimens of *Glochidion obscurum* are remnants of originally extant vegetation, it is more likely that these individuals have managed to persist because their immediate environment has not changed substantially.

Glochidion obscurum is a new species record for the Singapore native flora with known localities in Woodlands, Mandai and Yio Chu Kang. Presently known only from five individuals, this species should be assigned a threatened status until further reassessment.

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