

THE DISTRIBUTION AND STATUS IN SINGAPORE OF THE SNAKE PENNYWORT, *GEOPHILA REPENS* (L.) I.M.JOHNST. (RUBIACEAE)

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INTRODUCTION

The genus *Geophila* currently consists of 28 species (World Checklist of Selected Plant Families, 2010), with *Geophila repens* (L.) I.M.Johnst. being the most widespread (Piesschaert et al., 1999). Distributed throughout the tropics, it extends from America to Africa, Madagascar, Asia, and Micronesia (Lemmens, 2003).

The generic name *Geophila* (Latin, *geo-*, earth; *phila*, love) refers to its creeping habit while the specific epithet *repens* (Latin, creeping) similarly highlights its growth form. Some notable synonyms include *Rondeletia repens* L., *Geophila reniformis* D.Don and *Geophila herbacea* (Jacq.) O.Kuntze. It is commonly known in Malaysia as “pegaga ular” (Malay, snake pennywort), and “pegaga tikus” (Malay, rat pennywort).

The following morphological features are summarised from Ridley (1967), Henderson (1974), and Lemmens (2003). *Geophila repens* is a small herbaceous creeper (Fig. 1), and has opposite leaves whose leaf blades are broadly ovate, with blunt or sub-acute apices and heart-shaped bases. The leaf blade is also glabrous and palmately-veined. The bisexual flowers usually grow singly or in a cluster of up to three. Each flower has a white corolla that has six free lobes. Upon fertilization, the flower develops into a bright orange-red drupe crowned by the remains of the calyx at its tip (Fig. 3). Its pollination and dispersal biology are poorly-documented, though Guppy (1906), and Ridley (1930) suggested it to be bird-dispersed because the brightly coloured fruits. A study by Yumoto (1999) in Colombia confirmed this through the observations of the Salvin’s curassow (*Mitu salvini*), a ground-dwelling bird feeding on the fruits and postulated that it is an important disperser for *Geophila repens*.

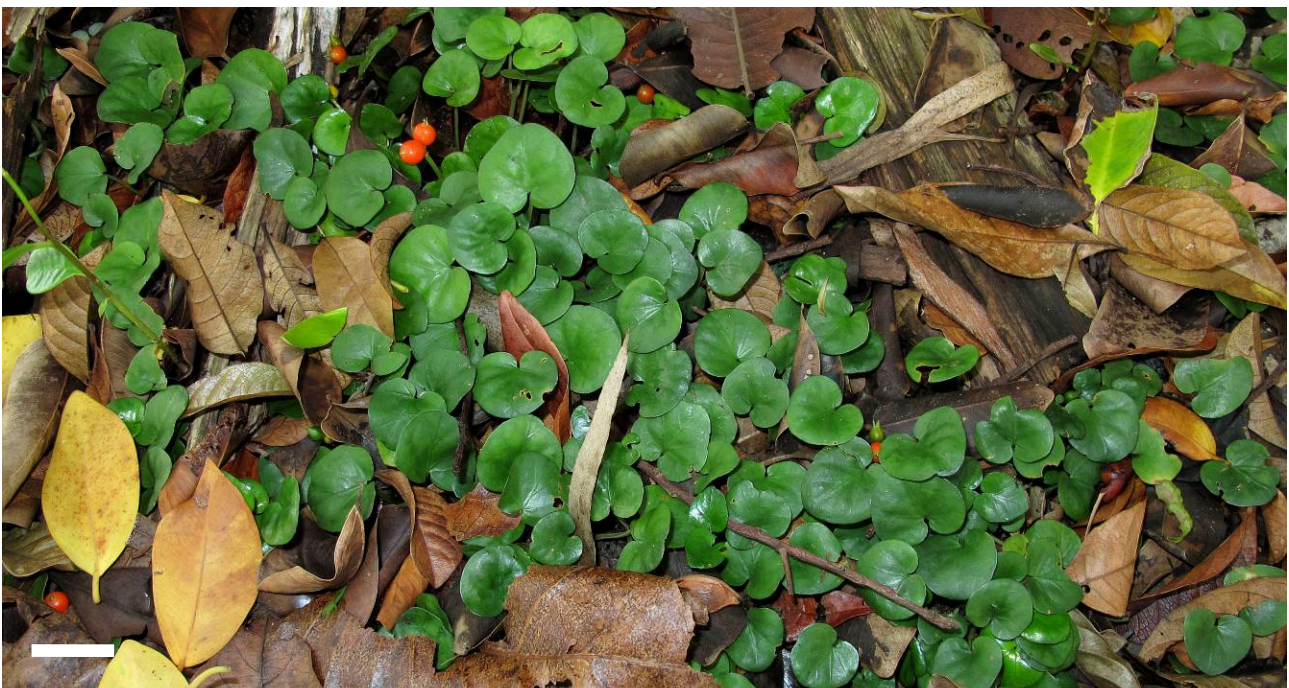


Fig. 1. Creeping habit of *Geophila repens* and its fruits at Pearl’s Hill City Park. Scale bar = 2 cm. (Photograph by: Teo Siyang).



Fig. 2. Close-up of a flower measuring approximately 15 mm across at Fort Canning Park. (Photograph by: Teo Siyang).

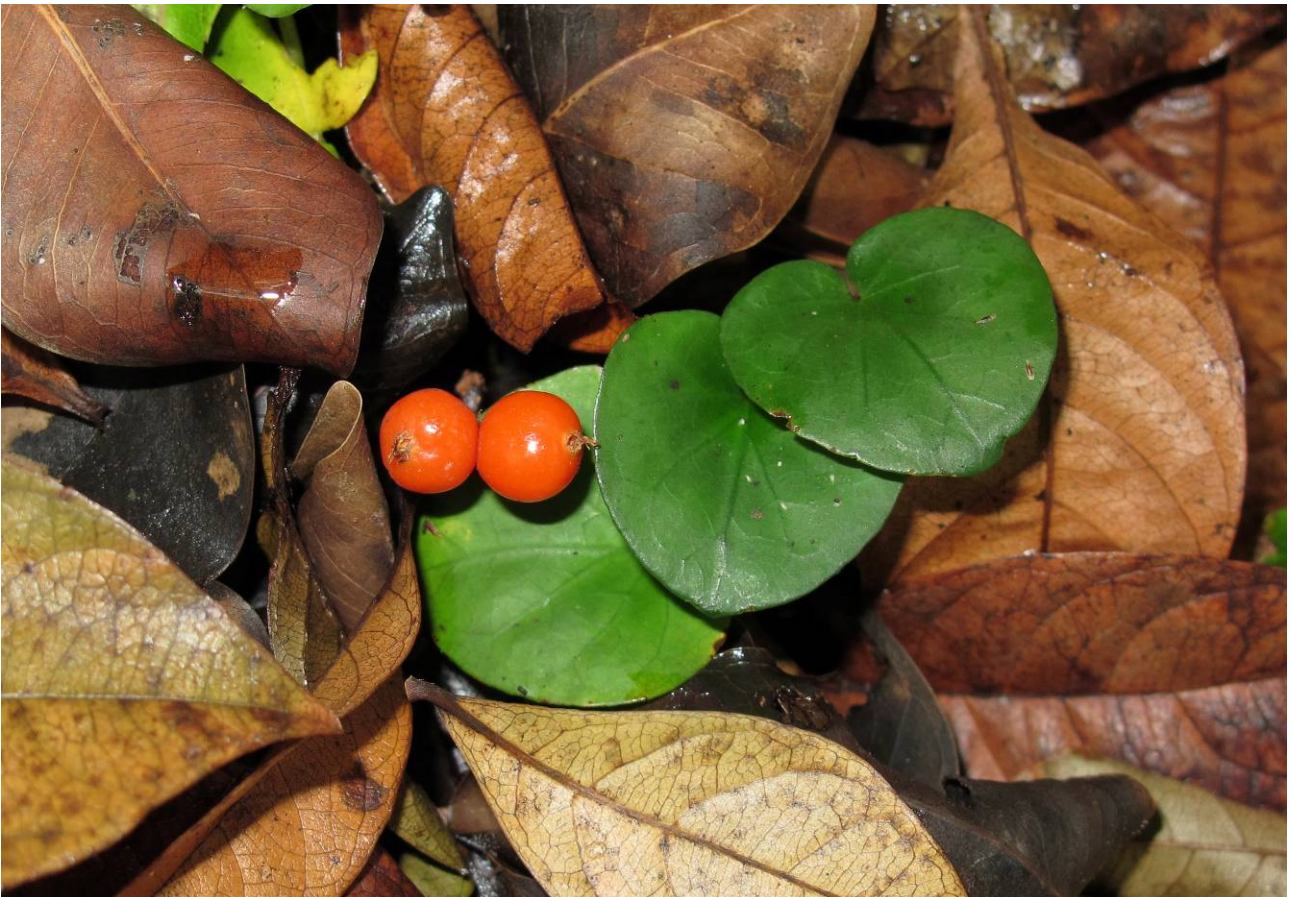


Fig. 3. Fruits measuring approximately 6 mm at Pearl's Hill City Park. (Photograph by: Teo Siyang).

PAST AND PRESENT RECORDS IN SINGAPORE

Of the two *Geophila* species recorded from Singapore, *Geophila pilosa* Pears. is nationally extinct (Chong et al., 2009), leaving *Geophila repens* as the only surviving congener. Scant records of its distribution exist from herbarium specimens (Table 1) as well as past observations (L. M. J. Chen, pers. comm.). Subsequent ground truthing of the sites confirmed seven existing populations that are clustered in the southern region of Singapore Island—near Peirce Road, Henderson Road, Makeway Avenue, in the cemeteries at Jalan Kubor and Outram Road, and in Pearl's Hill City Park and Fort Canning Park.

Table 1. Singapore collections of *Geophila repens* (L.) I.M. Johnst. deposited in the Herbarium, Singapore Botanic Gardens (SING).

S/No.	Bar Code No.	Herbarium	Collector(s)	Collector's No.	Date	Locality
1.	0061613	SING	C. X. Furtado	s.n.	4 Apr.1924	Chinese drug shop
2.	0042206	SING	L. M. J. Chen et al.	s.n.	20 Aug.1997	Kampong Glam
3.	0030094	SING	Ali bin Ibrahim	s.n.	17 Mar.1998	Fort Canning Park
4.	0030093	SING	Ali bin Ibrahim	s.n.	19 Apr.1998	Makeway Avenue
5.	0075764	SING	I. Hassan	s.n.	30 Sep.2005	NParks Peirce Road Depot

The present populations were all well-shaded under canopy cover and each patch had plants bearing fruits at the time of the survey. This indicated that the pollinators of *Geophila repens* are present, or that the species is self-pollinated or apomictic. The clustered distribution may be reflective of its dispersal from one or more of the original sites or that all the present sites are original populations by themselves—the latter being unlikely since some of the sites are more recently developed, e.g., at the ground cover beneath wayside trees at a residential estate. More studies on its reproductive biology should be carried out to understand its ecological value with respect to local pollinators (if any) and dispersers.

While the global status of *Geophila repens* is of least concern owing to its pantropical distribution, it is nationally endangered in Singapore (Chong et al., 2009), likely a result from habitat loss. Careful monitoring should be done to ensure the long-term survivability of the existing natural populations. Also of particular interest is its phytochemistry and pharmacological properties which are relatively unknown but warrants more research because of its traditional medicinal value in treating similar ailments in many remote regions of the world (Lemmens, 2003). Given the attractiveness of the glossy leaves, conspicuous flowers, and brightly-coloured fruits, experimental cultivation of this threatened native species as a ground cover for shaded areas is encouraged, taking note of the potential exploitation as an alternative food resource for urban pest bird species simultaneously.

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