

## REDISCOVERY IN SINGAPORE OF *VRYDAGZYNEA LANCIFOLIA* RIDL. (ORCHIDACEAE)

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**ABSTRACT.** — *Vrydagzynea lancifolia* Ridl. was presumed to be nationally extinct until the rediscovery of a single individual in Bukit Timah Nature Reserve on 29 Oct. 2013. Three inflorescences were observed on a single plant, but there was no fruit set. There were no other individuals found in the vicinity. Conservation is necessary to ensure the continued survival of this species in Singapore. A conservation status of critically endangered is proposed for this species.

**KEY WORDS.** — Orchidaceae, *Vrydagzynea lancifolia*, Singapore, rediscovery

### INTRODUCTION

*Vrydagzynea* Blume of the family Orchidaceae comprises some 40 species distributed from Lower Bengal to Taiwan, New Guinea, and the Pacific (Seidenfaden & Wood, 1992; Pedersen et al., 2011). *Vrydagzynea* is distinguished from other genera in its subfamily, the Orchidoideae by the presence of stalked glands located within the spur of its lip in the flower. Three species have been recorded from Singapore—*Vrydagzynea albida* (Blume) Blume, *Vrydagzynea lancifolia* Ridl., and *Vrydagzynea tristriata* Ridl. These three species were recorded as presumed nationally extinct in Singapore (Tan et al., 2008; Chong et al., 2009). One plant bearing three inflorescences of *Vrydagzynea lancifolia* was recently rediscovered in Bukit Timah Nature Reserve (BTNR), after nearly 80 years of absence (Figs. 1–7, Table 1).

**Description.** — This is mostly based on the individual found in Bukit Timah Nature Reserve (BTNR). *Vrydagzynea lancifolia* is a terrestrial herb with branched, decumbent, grey-green stems each about 15 cm long with roots arising at the nodes in the horizontal portion in contact with the ground, ascending to the erect portion bearing about 8–12 leaves and terminating in an inflorescence (Fig. 1; Pedersen et al., 2011). Internodes are about 1.6 cm long near the basal part of the erect stem portion, reducing to 0.4–0.5 cm long towards the tip, making the spirally arranged, stalked leaves appear crowded apically. The lanceolate leaf blades are 4.0–6.5 cm long and 1.7–1.8 cm wide, narrowed evenly towards the acute tip, with sheathed petioles of about 1 cm long. The leaf blades were observed to have slightly undulating margins and on the upper side, silver-grey longitudinal bands of about 1.0 mm wide on either side of the midrib (Fig. 2). The upper leaf blade surface is glabrous, while the lower leaf blade surface and the petiole are pilose (Fig. 3). The terminal inflorescence with more than 40 flowers (Fig. 4A) is 3.0 cm tall and 1.5 cm across, with a peduncle about 0.5 cm long. The inflorescence bracts are green, boat-shaped, and have margins bearing white hairs, sheathed bases, and acuminate tips. The flowers are resupinate, with the upper ones being held almost vertically. Each flower measures between 3.5–4.0 mm across, with several opening at a time from the base of the inflorescence upwards. Flowers, when fresh, have white petals and sepals with brown markings on the dorsal sepal, and all have their white parts maturing to yellow (Fig. 4B), fading to brown just before abscission. The flowers have narrowly ovate, c. 0.5 mm-long petals, c. 6 mm-long sepals, and an entire lip with a 4.0 mm-long spur. Contained within the lip of the spur at the base is a pair of stalked glands, each with a stalk 1.5 mm long and 0.8 mm across (Fig. 5) which are characteristics of the genus (Holtum, 1964; Seidenfaden & Wood, 1992; Keng et al., 1998). The column and rostellum is very short. Capsules are formed when flowers are pollinated, with the infructescence growing to 6 cm long (Fig. 6).

**Distribution.** — *Vrydagzynea lancifolia* has been recorded in many localities in the understory of lowland forests in Peninsular Malaysia from Kedah to Johor, as well as in Thailand and Sabah, Borneo (Seidenfaden & Wood, 1992; Pedersen et. al, 2011). It also occurs in Singapore.



Fig. 1. A, Plant of *Vrydagzynea lancifolia* in situ in Bukit Timah Nature Reserve. Scale bar = 1cm; B, Decumbent stem (red arrow) with the two erect inflorescences (Photographs by: Reuben C. J. Lim [A] and Yi Fei Chung [B]).



Fig. 2. Upper surface of leaf blades of *Vrydagzynea lancifolia* with silver bands along the midrib. Scale bar = 1 cm. (Photograph by: Reuben C. J. Lim).



Fig. 3. Underside of leaves of *Vrydagzynea lancifolia* and sheathed petiole with hairs. Scale bar = 1 cm. (Photograph by: Ng Xin Yi).

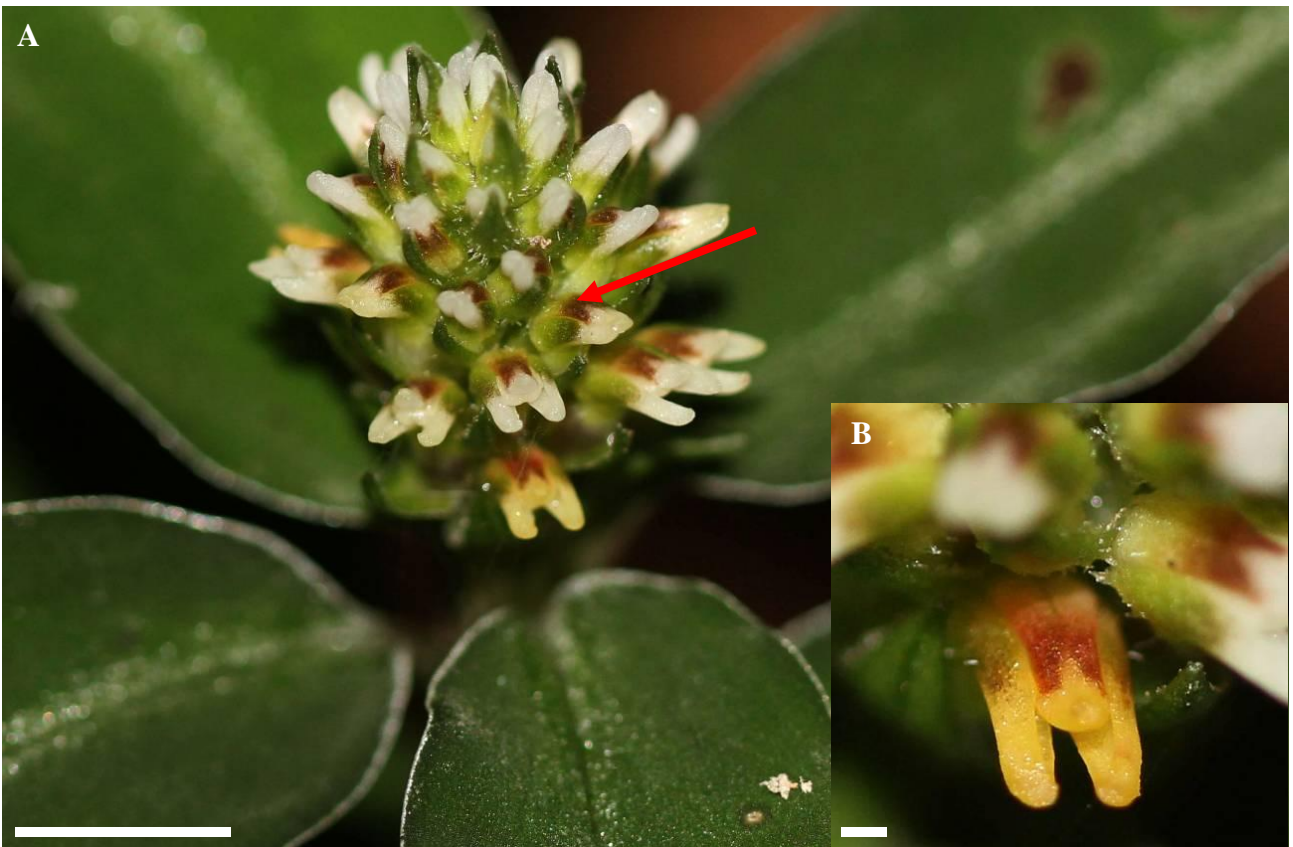


Fig. 4. A, Inflorescence of *Vrydagzynea lancifolia* with new and mature flowers showing the brown marking (red arrow) of the dorsal sepal. Note the fine hairs on the margins of the bracts. Scale bar = 1 cm; B, Close-up of a mature flower. Scale bar = 1 mm. (Photographs by: Ng Xin Yi).



Fig. 5. Parts of *Vrydagzynea lancifolia* flower. i, spur of lip; ii, stalked glands; iii, column; iv, petals; v, dorsal sepal; vi, remaining part of lateral sepal. Scale bar = 0.2 mm. (Photograph by: Paul K. F. Leong & Hubert Kurzweil).



Fig. 6. Elongated infructescence of SING specimen barcode number 0046915, from Gunung Panti, Malaysia. Scale bar = 1 cm. (Photograph by: Ng Xin Yi).



Fig. 7. The habitat of *Vrydagzynea lancifolia*, on a flat rock covered with leaf litter in the densely shaded, forest understory of Bukit Timah Nature Reserve. (Photograph by: Reuben C. J. Lim).

**Etymology.** — *Vrydagzynea* was named by Carl Ludwig Blume in honour of a Dutch pharmacist, Theodore Daniel Vrydag Zynen, (Gledhill, 2008). The specific epithet *lancifolia* is composed of two Latin words, “lancĕa” meaning lance, and “fōlium” meaning leaf, referring to the lance-shaped leaf blade (Marchant & Charles, 1892).

### PAST AND PRESENT RECORDS

*Vrydagzynea lancifolia* was first collected in Singapore in 1889 from Bukit Timah where several subsequent collections were made by various collectors and it has also been recorded once from Seletar (Table 1).

The *Vrydagzynea lancifolia* individual with three inflorescences that was rediscovered on 29 Oct.2013 was encountered as a terrestrial orchid growing on a flat rock on the forest floor (Fig. 7) in the BTNR by HD, YFC, RCJL, JC, and YSY. It gave the impression of being a Commelinaceae species. The area that the plant grew in was elevated terrain consisting of leaf litter-covered boulders that were sparsely populated with herbs such as *Donax canniformis* (Marantaceae), *Zingiber puberulum* (Zingiberaceae), and *Tectaria singaporiana* (Dryopteridaceae) as well as saplings of climbers that have yet to climb, notably from the Araceae as well as a *Pterisanthes* species (Vitaceae). The area was observed to be humid with filtered light under the shade of tall trees. RCJL collected one of the inflorescences and submitted the fresh specimen to the Herbarium, Singapore Botanic Gardens (SING) for identification. PKFL and HK confirmed that it was *Vrydagzynea lancifolia* on 7 Nov.2013 upon dissection of the flowers (Fig. 5), and the specimen was vouchered (Fig. 8).

On 14 Nov.2013, a team of researchers from SING surveyed the area, but no other individuals were found. The flowers on the remaining two inflorescences did not show fruit set, and the remaining flowers could not be pollinated in the field as they were too small. No observation of fruit set was made in the three weeks following the discovery of the orchid.

Table 1. Previous Singapore collections of *Vrydagzynea lancifolia* Ridl. deposited in the Herbarium, Singapore Botanic Gardens (SING).

S/No.	Bar Code No.	Collector	Collector's No.	Date Collected	Locality
1.	0060106	Anonymous	s.n.	11 Jan.1889	Bukit Timah
2.	0011030	J. S. Goodenough	s.n.	25 Oct.1889	Seletar
3.	0011032	H. N. Ridley	2033	1890	Bukit Timah
4.	0046916	H. N. Ridley	3927	1892	Bukit Timah
5.	0046913	H. N. Ridley	6905	Oct.1895	Bukit Timah
6.	0011031	H. N. Ridley	s.n.	1898	Bukit Timah
7.	0011033	R. E. Holttum	19798	12 Nov.1928	Bukit Timah
8.	0011034	R. E. Holttum	19798	12 Nov.1928	Bukit Timah
9.	0011035	Mohd Nur	24641	26 Feb.1931	Bukit Timah
10.	0163766	Mohd Nur	24641	26 Feb.1931	Bukit Timah

### CONCLUSIONS

The BTNR was one of the first areas of tropical forest to be legally protected in Singapore (Corlett, 2011). Despite the many pressures and disturbances it has undergone, it still supports an immensely rich flora. Although the core area is quite small at 70 ha, various species thought to be extinct are likely to still persist in this refuge (Turner & Corlett, 1996). The preservation of this area is important, because “In areas with little rain forest remaining, fragments can be the ‘seeds’ from which to re-establish extensive forest.”—Turner & Corlett (1996). The loss of natural forest habitat, attributable to widespread land use changes in Singapore, is most likely the cause of the near-extinction of the species (Corlett, 1991).

In the past, *Vrydagzynea lancifolia* has been recorded only in two locations in Singapore, Bukit Timah being the most frequent. As there has only been a single individual of *Vrydagzynea lancifolia* rediscovered after 80 years of absence in flower but not fruiting, an extensive survey should be conducted to determine if there are other mature individuals which can be used for propagation of this species. Given the apparent rarity of the species in Singapore, a conservation status of nationally critically endangered is proposed in accordance with the criteria of Davison (2008).

While conducting surveys of this species and trying to locate individuals, special attention should be paid to its unconventional orchid form, as it can be easily mistaken as a member of the Commelinaceae. A conservation plan based on further study of this species should be established to increase the population size for safeguarding against stochastic events, such as prolonged drought as experienced in 2005 and 2009, which may wipe out the species.



Fig. 8. Vouchered specimen of *Vrydagzynea lancifolia* with SING barcode number 0197737, after its rediscovery. Scale bar = 1 cm. (Photograph by: Paul K. F. Leong).

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