

INTRASPECIFIC VARIATIONS IN FLORAL MORPHOLOGY OF *PAPILIONANTHE TERES* FROM FOOT-HILLS OF HIMALAYA, IN WEST BENGAL, INDIA

Ashis Kumar Roy

Sri Narasingha Vidyapith, Atharakh, P.O. Kadamtala, Distt.- Darjeeling- 734 011, West Bengal, India

Abstract

Papilionanthe teres was observed to exhibit intraspecific colour variations in its natural populations of West Bengal. Variations were observed in floral parts such as sepals, petals, and lip. The normal floral colour was light pink or purplish and flower lip was purplish red with yellow base and lined with purplish brown colour. The plant that showed variations was observed with flowers having white lip with yellow spur and all other floral parts were comparatively larger in size.

Introduction

THE GENUS *Papilionanthe* Schltr. consists of about 11 species in the world (Gogoi, 2017) and 4 species (*Papilionanthe subulata*, *P. teres*, *P. uniflora*, *P. vandarum*) were recorded in India (Meghalaya, Assam, Manipur, Nagaland, and Andhra Pradesh) (Singh *et al.*, 2019). *Papilionanthe teres*, commonly called *Vanda teres* initiates branching before flowering unlike other vandaceous monopodial orchids that throw branches during spring.

Material and Methods

While working on epiphytic orchids of tea garden in Terai region (foot-hills of Himalaya) of West Bengal, the authors came across an interesting specimen of an epiphytic orchid. After critical examination and comparison with other authenticated specimens and literature (Chowdhery, 1998; Deva and Naithani, 1986; Gogoi, 2017; Hooker, 1894; King and Pantling, 1898; Pearce and Cribb, 2002; Pradhan, 1979; Singh *et al.*, 2019; Yonzon *et al.*, 2012), the unknown specimen (Specimen B) was identified as a colour variant of *Papilionanthe teres* (Specimen A). Herbarium specimens were prepared by standard methods (Jain and Rao, 1977). Voucher specimens were deposited in Herbarium of Taxonomy and Ecology Laboratory, Department of Tea Science, North Bengal University, Darjeeling, West Bengal.

Taxonomic Enumeration

Papilionanthe teres (Roxb.) Schltr.

Plant epiphytic herb. *Stem* 85-155 cm long, terete, branched, dark green. *Leaves* 10-17 cm, long and 2.5-3 cm in diameter, terete, alternate, dark green. *Root*

long and branched. Inflorescence racemose, erect, *rachis* 14-18 cm, erect, floral bract, very short, 2-6 flowered. *Flower* 5-6.5 cm across (petal to petal), *dorsal sepal* and *lateral petals* light pink or purplish, *lip* 3-lobed, purple-red with yellow base and lined with purplish brown colour, *spur* yellowish brown. *Pollinia* 2, yellow.

Flowering and Fruiting

April-July.

Habit

Epiphytic.

Distribution

India, Bhutan, Nepal, China, Thailand, Myanmar, and Bangladesh.

Status in West Bengal

Common.

The detailed variations between two specimens (Fig. 1: Specimen A; Fig. 2: Specimen B) of *Papilionanthe teres* in plant characters *i.e.* plant height, stem height, leaves, inflorescence, and flowers characters are presented in Table 1. It was observed that there were minor variations in plant height, stem height, and leaf size. Significant variations were noted in flower characters, in both the specimens (Figs. 1-2). The flower colour of specimen A was light pink or purplish, whereas in specimen B, the colour of flowers was white having white lip with yellow spur. All the floral parts *i.e.* dorsal sepal, lateral sepals, lateral petals, and lip of variant species were comparatively large in specimen B. The general information of the species is presented in Table 1. The plant was found at the altitudinal range of 600-1500 m



Fig. 1. A-H. *Papilionanthe teres* (Specimen A): A, Inflorescence; B, Flower; C, Perigone; D, Lip with ovary and column; E, Ovary and column; F, Column; G, Anther cap; H, Pollinia.

amsl. It is widely distributed throughout Asia (Luckson, 2007). Locally, it was widely available mostly on tree trunks of phorophytes. The local availability status of

this species is common and the status of variant species is rare. Its natural populations in the nature have drastically reduced as compared to earlier times

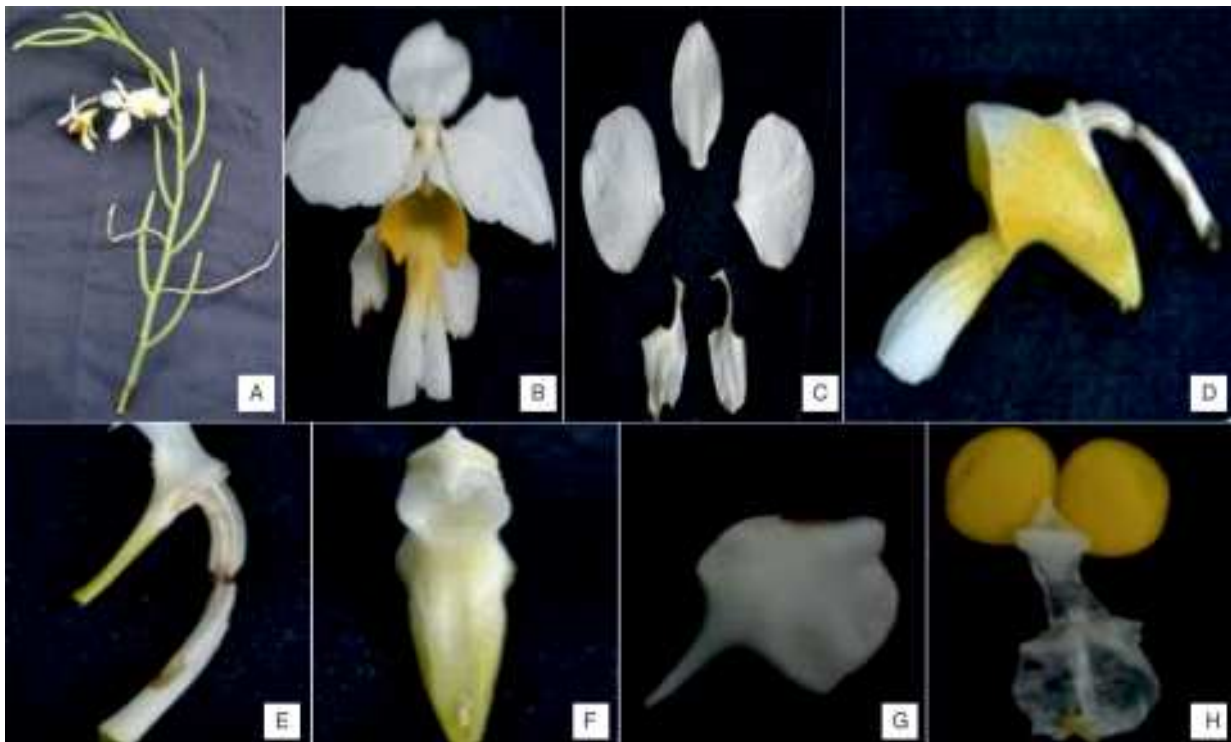


Fig. 2. A-H. Intraspecific variations of *Papilionanthe teres* (Specimen B): A, Inflorescence; B, Flower; C, Perigone; D, Lip with ovary and column; E, Ovary and column; F, Column; G, Anther cap; H, Pollinia.

Table 1. Comparative morphology of normal and variant species of *Papilionanthe teres*.

Characters	Specimen A	Specimen B
Plant height	87-140 cm	95-152 cm
Stem height	75-130 cm	85-140 cm
Leaf size	8.5-14 × 1.2-1.7 cm	7.5-9 × 1.3-1.8 cm
Inflorescence	1-4, rachis 5-7 × 0.5 cm, 2-6 flowers	1-2, rachis 10-12 × 0.5 cm, 2-6 flowers
Flowers	Light pink or purplish in colour; 4-6.3 cm across	White flowers; 6-6.8 cm across
Dorsal sepal	2.9-3.2 × 1.9-2.2 cm, light pink or purplish	3-3.4 × 2.1-2.3 cm, white
Lateral sepals	3.3-3.5 × 1.8-2.1 cm, light pink or purplish	3.1-3.3 × 1.9-2.1 cm, white
Lateral petals	3-3.3 × 3-3.2 cm, light pink or purplish	3.2-3.6 × 3.1-3.5 cm, light white
Lip/labellum	3.9-4.3 × 8-8.6 cm when expanded, <i>lip</i> purple-red with yellow base and lined with purplish brown, 3-lobed, triangular erect side lobes; arched over <i>column</i> , distinct 1.3-1.5 cm deep infundibular yellowish brown spur at the base. <i>Lamina</i> fleshy with 4-5 carunculate ridges emerging from the hypochile proceeding to the mesochile of lip. Apex of the apical lobe with 2 divaricate oblong lobules 0.4-0.6 cm. Under the apex, a horn-like beak 0.7-0.8 cm points downwards	4-4.6 × 8.3-8.9 cm when expanded, <i>lip</i> white with yellow spur, 3-lobed, triangular erect side lobes, arched over <i>column</i> , 1.5-1.8 cm deep widely infundibular yellow spur at the base, apical lobe 1.5 × 1.7 cm wide. <i>Lamina</i> fleshy with 6 carunculate ridges emerges from the hypochile and proceed to the mesochile of lip. Apex of the apical lobe with 2 divaricate oblong lobules 0.6-0.8 cm. Under the apex a horn-like fleshy beak 1.3 cm points downwards
Column	1.4-1.6 × 0.4-0.6 cm, white in colour. Cap 0.4 × 0.3 cm, white	2-2.3 × 0.4-0.6 cm, white in colour. Cap 0.6 × 0.5 cm, white
Pollinia	2, yellow, 0.3 cm across	2, yellow, 0.3-0.4 cm across
Ovary and pedicel	2.4-2.8 × 0.2-0.3 cm, white in color	2.3-2.5 × 0.2-0.3 cm, white in color

when these plants were abundantly available in Terai and Dooars (foot hills of Himalayas) region of West Bengal. The commercialization of forest resource solely for making state revenue seems to be one of the major causes of habitat destruction, in the region.

Conclusion

Variations were observed in the floral morphology of the presently investigated species, *P. teres*. The present status of the species with variations was rare while the type species was common and available throughout the district, in the altitudinal range of 600-1500 m amsl. Presently, though gross variations were not found in the species, the variations were found in just size, shape, colour, and texture of flowers. Additionally, it was also observed that all the floral parts *i.e.*, apical lobes of sepals and petals were curved over the column and lip of flower. It may be concluded that the specimen with variations is not a sub species, variety or form; these were intraspecific variations in the populations of *P. teres*. Such intraspecific variations in floral colour and morphological variations in other orchid species have also been observed by Gogoi *et al.* (2012) from Assam and Yonzone *et al.* (2011, 2012) from Darjeeling Himalayan region of India.

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