

## **GOODYERA FUSCA (ORCHIDACEAE): A NEW RECORD FOR KASHMIR HIMALAYA, INDIA**

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**ABSTRACT.** *Goodyera fusca*, a rare orchid species is reported for the first time from the Kashmir Himalaya, India. A brief description and photographs of diagnostic features are provided. Comparative characters are also provided to distinguish *G. fusca* from *Goodyera repens*, already reported from Kashmir Himalaya. This newly reported terrestrial orchid species occurs in alpine habitats of this Himalayan region.

**KEY WORDS:** alpine habitats, flora, Himalayas, new plant record

**Introduction.** Orchidaceae is the second largest family of flowering plants with 870 genera and ca. 25,000 species, distributed worldwide (Swartz & Dixon 2009, Rao *et al.* 2012). Orchids are widely distributed in tropical, subtropical and temperate regions in all continents except Antarctica, but reach their maximum diversity in the humid tropical regions. The family constitutes 9% of the total Indian flora and is represented by 177 genera with ca. 1,195 species (Misra 2007, Singh *et al.* 2001). In India, the Himalayas represent one of the global biodiversity hotspots (Mittermeier *et al.* 2005), and are well-known to harbor a rich diversity of orchids (Vij & Pathak 2010, Jalal & Jayanthi 2015).

In the northwestern extreme of the Indian Himalayas, the Kashmir Himalaya constitutes a biodiversity-rich region (Dar & Khuroo 2013). From this region, 44 orchid species have been recorded (Duthie 1906, Naqshi *et al.* 1989, Akhter *et al.* 2011), including one species of the genus *Goodyera*, i.e. *G. repens* (L.) R.Br. (Kant & Chander 2004, Akhter *et al.* 2011). During recent botanical surveys in the Thajwas Wildlife Sanctuary, Sonamarg, Kashmir, the authors collected a hitherto unrecorded plant species from the region. After a detailed study of diagnostic characteristics of the fresh plant material and perusal

of taxonomic literature, the species was identified as *Goodyera fusca* (Lindl.) Hook.f. which turned out to be a new record for the flora of Kashmir Himalaya. In order to validate this new record, the present paper provides a detailed taxonomic description, microphotographs of diagnostic characters (Figure 1) delimiting characters from its con-generic species occurring in this region (Table 1), which will facilitate its field identification.

**Materials and Methods.** Standard taxonomic methods have been used for collection, drying, and further processing of the herbarium specimens (Bridson & Forman 1998) deposited in the Kashmir University Herbarium (KASH) with a proper voucher specimen number. The fresh plant specimens have been identified using relevant taxonomic literature (Hooker 1897, Stewart 1972, Duthie 1906, King & Pantling 1979, Deva & Nathani 1986). The photographs of the diagnostic characters were taken with Handheld Portable microscope (Make: DINO Lite AM4515ZT4).

### TAXONOMIC TREATMENT

*Goodyera fusca* (Lindl.) Hook. f. *Fl. Brit. India* 6: 112, 1890.

Bas.: *Hetaeria fusca* Lindl. Syn.: *Cystorchis fusca*



FIGURE 1. Figure 1. *Goodyera fusca* (Lindl.) Hook.f. A. Habit. B. Rootstock. C. Leaf. D. Bract. E. Flower. F. Sepal. G. Labellum. H. Pollinia. I. Tuber. J. *G. repens* (L.) R.Br. K. Surface of leaf of *G. repens*. L. Pollinia of *G. repens*. (Photo credits: Anzar A. Khuroo, Gowhar A. Shapoo, Shugufta Rasheed, and Shah Rafiq).

TABLE 1. Comparison of diagnostic characters between *G. repens* and *G. fusca* occurring in the Jammu and Kashmir, India.

Diagnostic characters	<i>G. repens</i>	<i>G. fusca</i>
Leaf	Whitish green, marbled	Thick, fleshy, 5-nerved
Petiole	Sheathing in lower half	Sheathing at the base
Bracts	Linear-lanceolate	Ovate-oblong
Petals	Lanceolate, adhering on the inner margins to the dorsal sepal	Sigmoid, linear-oblong, sub-acute
Lip/Labellum	Sac of the lip papillose without any ridges inside	Sac of the lip glabrous with two ridges inside

(Lindl.) Benth. & Hook. f.; *Epipactis fusca* (Lindl.) A.A.Eaton, *Orchiodes fusca* (Lindl.) Kuntze.

Terrestrial leafy herb, height 16 cm. *Stem* glabrous, 8 cm long. *Leaves* clustered near the base, thick ovate, 4 cm long, 5-nerved, margins revolute, petiole 6 mm broad. *Bracts* leaf-like, oblong, 6 mm long. *Inflorescence* a many-flowered raceme, longer than the stem, 5.5 cm long. *Flowers* 5 mm long, pubescent, white flushed green. *Sepals* sub-equal, oblong, sub-acute, 4.4 mm. *Petals* linear, 5.15 mm long, oblong sigmoid, subacute. *Labellum* (lip) as long as sepals, deeply sub-globose at the base, sac of the lip with two ridges, glabrous inside, base conspicuously projecting beyond the base of the sepals. *Column* 1.5 mm long. *Pollinia* 2, broadly ovoid.

**SPECIMEN EXAMINED.** India. Kashmir: District Ganderbal, Thajwas Wildlife Sanctuary, Sonamarg, 23-08-2017, Khuroo and Shapoo 0157 (KASH).

**HABITAT:** Grows on open mountain slopes, in rock crevices with a dense layer of decomposed humus in the alpine zone at an elevation of 3700 m.

**PHENOLOGY:** Flowering was recorded in August-September.

**GLOBAL DISTRIBUTION:** China, Myanmar, Bhutan, Nepal, India (Arunachal Pradesh to Himachal Pradesh); and now extended further westwards to Kashmir Himalaya.

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