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Recollection of *Galeola falconeri* Hook. *f.* (Orchidaceae) from Sikkim Himalaya after 123 years

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Abstract

Galeola falconeri Hook.*f*., a myco-heterotrophic orchid is rediscovered after 123 years in Sikkim. Presently, this plant is located in two places of the state, Upper Dzongu of North Sikkim and Bakhim of West Sikkim. Detailed taxonomy and habitat information are given here for better management practices.

Key words: *Galeola falconeri*, Mycoheterophic, Rediscovery, Conservation.

INTRODUCTION

Sikkim is the second smallest state of the country. In spite of its small occupancy, it greatly contributes to the country's flora by sharing 26% of flowering plant species (about 4558 species) (Maity 2021). Among all the groups of flowering plants of Sikkim, Orchidaceae is the most diversified one. It is represented by 529 taxa of which 12 species are strictly endemic to Sikkim (Lucksom 2007; Maity *et al.* 2019; Maity 2021).

The genus *Galeola* Lour. Of Orchidaceae is represented by six species in India, among them Sikkim shelters four species (Lucksom 2007; Singh *et al.* 2019; Maity *et al.* 2019; Maity 2021). *Galeola falconeri* was first described by Hooker (1890) based on the collections of Falconer from Garhwal-Himalaya and also recorded its occurrence in Sikkim. It is characterized by its tall habit to even 3 m high, laxly many-flowered panicle, bright yellow flowers, large floral bracts and narrow, saccate lip base. In Sikkim, the species is rare and till date only eight collections are available, all were made in late nineteenth century.

After extensive literature search (Hooker 1890; King & Pantling 1898; Srivastava 1996; Chowdhery 1998; Lucksom 2007; Maity *et al.* 2018, 2019) and herbarium consultation it appears that *G. falconeri* never been collected after 1897 in Sikkim.

During floristic survey of North and West districts of Sikkim we could able to locate this rare species in upper Dzongu and Bakhim which constitute its rediscovery in the state after 123 years. The present article provides information on taxonomy of the species, habitat and its conservation status.

MATERIALS AND METHODS

Plant specimens were collected from North and West Sikkim. Geo-coordinates of the habitat were noted. Field photographs have been taken for easy and better recognition of the species. Collected specimens were dried, poisoned and mounted on herbarium sheets following standard herbarium methodologies (Ranjan 2018). The herbarium sheets are deposited at SSFH for future references. Flowers are dissected under stereo-microscope, measurements were

taken for proper characterization of the species. Different digital herbaria of the world like, K, E, BM, P, GH, etc. are visited to found the Indian materials

TAXONOMY

Galeola falconeri Hook. *f*., Fl. Brit. India 6: 88. 1890; Chowdhery, Orchid Fl. Arunachal Pradesh 405. 1998; Pearce & Cribb, Fl. Bhutan 3 (3-Orchids Bhutan) 64. 2002; Lucksom, Orchid. Sikkim NE Himal. 59. 2007; Xinqi & Cribb in Xinqi *et al*., Fl. China 25: 170. 2009.

Terrestrial, rhizomatous, hetero-mycotrophic, erect herb, to 2.5 m tall; rhizomes thick, 4–6 cm diam., branched, scaly; stem woody, terete, sheathed; sheaths lanceolate to triangular, to 5 cm long, acute; leaves absent; inflorescence laxly many-flowered, to 90 cm long, nodding panicle; floral bracts lanceolate, concave, ovate, 1 – 3 × 0.7 – 1.2 cm, acute, shorter than stalked ovary; pedicel and ovary 2 – 5 cm long; flowers bright yellow, *c.* 5 cm long, with vanilla fragrance, spongy; sepals subequal, broadly ovate, elliptic-oblong, 2 – 3 × 1 – 1.6 cm, subacute, sparsely scurfy, rusty tomentose beneath; petals ovate, 1.8 – 2.8 × 1.2 cm, acute, erose, glabrous; lip simple, 1.5 – 2 × 1.5 – 1.8 cm, rounded, ciliolate-undulate, deeply concave, base with small

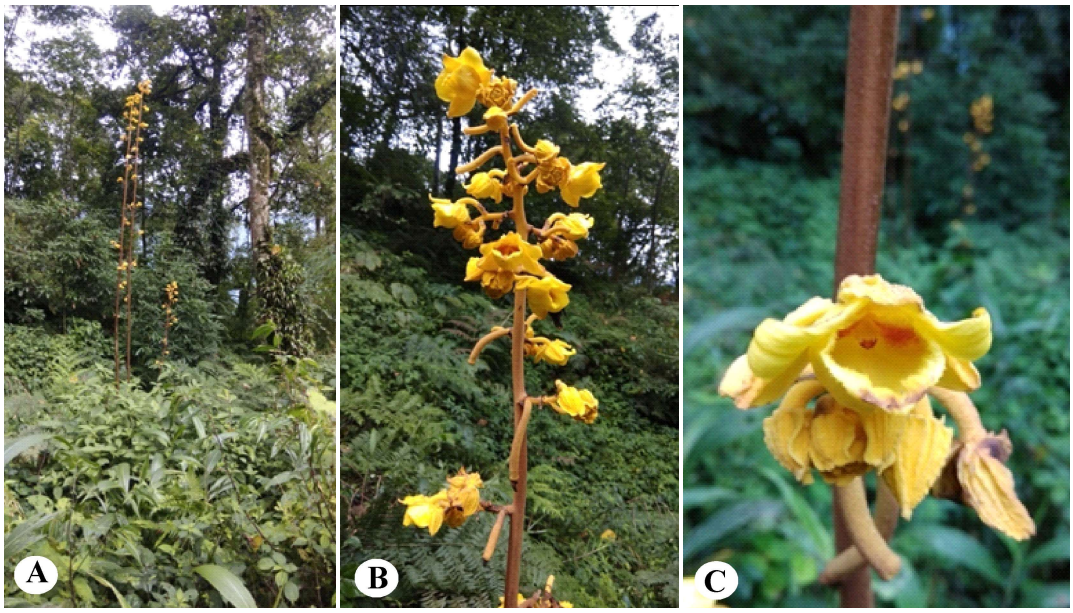

PLATE - I. ***Galeola falconeri*** Hook.f.: **A.** Flowering scapes in natural habitat; **B.** Part of the panicle with flowers and young fruits; **C.** Close view of a flower

fold forming pseudonectary under column, sessile; disc papillose, with glabrous patch in middle; column stout, slightly clavate, 0.7 – 1 cm long, slightly bend forward; fruits capsule, cylindrical, 16 – 22 cm long, 3-angled, weakly falcate.

Flowering & Fruiting: May – August

Distribution: INDIA: Arunachal Pradesh, Sikkim, Uttarkhand, West Bengal; BHUTAN; CHINA; THAILAND. [800 – 2500 m amsl.].

Specimen examined: INDIA: Sikkim: North District, Mamtam, Upper Dzongu, $27^0\ 32^2\ 35^2$ ^{2} N $88^0\ 29^2\ 42^{2\,2}$ E, 1490 m, *s.d.*, *s.n.*; West District, Bakhim, $27^0\ 25^2\ 28^{2\,2}$ N $88^{\ 0}\ 10^2\ 55^2$ ^{2} E, 2427 m, *Pradhan* 20210701, Acc. No. SSFH SK004941 [SSFH]; Nohare, 609–1219 m, 08.07.1862, *Anderson* 1209, Acc. No. 458646; Sikkim, 2431–3048 m, *J.D.H., s.n.*, Acc. No. 459666;Without any precise locality, 1874–75, *King* 670, Acc. No. 458644; Tendong, 6000 ft.

(1800 m), July 1891, *Pantling* 87, Acc. no. 458653; Without any precise locality, 1828 m, 00.07.1891, *Pantling* 87, Acc. No. 458653; Sikkim himalaya, 1828 m, 1893, *Pantling* 87; Sikkim and Terai, *s.d.*, *Kurz, s.n.*, Acc. No. 458645; Sikkim, without any precise locality, 6000 ft. (1800 m), December 1893, *Pantling* 87, Acc. No. 458650; Without any precise locality,1524 m, 00.01.1897, *Pantling* 87, Acc. No. 458652 [all at CAL]; Sikkim, 7/1874, *King* 670 [BM, BM000062834]; Sikkim Himalaya, 6000 ft., 12/1893, *Pantling* 87 [P, P00370384, digital image seen]; Sikkim Himalaya, 6000 ft., 7/1893, *Pantling* 87 [P, P00370385, digital image seen]; Sikkim, *Pantling* 87 [BM, BM000062832, digital image seen]; Sikkim, 12/1893, *Pantling* 87 [BM, BM000062831, digital image seen]; Sikkim, 10/1868, *Kurz s.n.* [BM, BM000062833, digital image seen].

Note: *Galeola falconeri* Hook. f. mostly grows on the shady forest floor in temperate forest dominated by *Sinuarundinaria hookeriana* (Munro) C.S Chao & Renovoize, *Castanopsis hystrix* A.DC., *Macaranga peltata* (Roxb.) Müll.Arg., *Alnus nepalensis* D.Don, *Betula alnoides* Buch.-Ham. ex D.Don, etc. The flowers are bright yellow having an odour of vanilla. Suitable conservation strategies should be adopted to save this iconic species in Sikkim

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