

ORCHID DIVERSITY AT PANGI VALLEY OF HIMACHAL PRADESH, NORTHWESTERN HIMALAYA

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Abstract

Orchidaceae is amongst the most diverse and widespread families of flowering plants with uniquely colourful and fragrant flowers. The status and distribution pattern of orchids was examined in Pangi Valley, District Chamba of Himachal Pradesh, North Western Himalaya. Pangi Valley supports unique, natural, ecologically and economically important orchids of Great Himalayan Range. Quadrat method was followed for the quantitative assessment of orchid species. A total of 17 species of orchids representing 11 genera were recorded. These were distributed between 2100-4500 m amsl and found in shady moist, alpine meadows/thatches, grassland, riverine, rocky, shrubby and dry habitats. The species were analysed for nativity, endemism, threat categories and indigenous uses. Amongst the studied species, 10 were natives, 4 non-natives, 3 near-endemic. Of the total species, 8 species were found in the sites sampled for quantitative assessment of vegetation. *Cephalanthera longifolia* was recorded at maximum sites (9 sites), followed by *Dactylorhiza hatagirea* (8 sites), *Calanthe plantaginea* and *Epipactis helleborine* (6 sites), *Platanthera edgeworthii* and *Malaxis muscifera* (2 sites, each) and *Cypripedium cordigerum* and *Gymnadenia orchidis* (1 site, each). Maximum orchids were found in shady moist habitat (11 species), followed by rocky (3 species), dry (2 species) and alpine, riverine and grassland (1 species each) habitats. The density of *Cephalanthera longifolia* ranged from 0.1-0.25 Ind m⁻², *Dactylorhiza hatagirea*, 0.05-0.85 Ind m⁻², *Calanthe plantaginea*, 0.05-0.50 Ind m⁻², *Epipactis helleborine*, 0.05-0.40 Ind m⁻², *Malaxis muscifera*, 0.20-0.40 Ind m⁻², *Platanthera edgeworthii*, 0.05-0.10 Ind m⁻², *Cypripedium cordigerum*, 0.55 Ind m⁻² and *Gymnadenia orchidis*, 0.85 Ind m⁻². Some of the species have medicinal properties and are used to cure sores, eczema, fever, burns, cough, cold, cuts, sexual disability, rheumatism, nervous disorder, female disorder, kidney disorder, spermopiotic, urinary problems, dysentery, sterility, etc. Maximum species are known to be used as tonic (7 species), followed by blood problems (5 species), fever, cough, spermopiotic and female disorder (3 species, each) and burns, expectorant, cold, rheumatism, urinary disorder, dysentery, epilepsy (2 species, each). Among the species, *Cypripedium himalaicum*, *Dactylorhiza hatagirea*, and *Habenaria intermedia* were Endangered, *Cypripedium cordigerum*, *Malaxis muscifera* and *Platanthera edgeworthii* as Vulnerable, *Herminium monorchis* as Near Threatened and remaining species as Least Concerned. Studies on habitat ecology of these orchids is important for understanding the dynamics of their population, mass multiplication following conventional and *in vitro* propagation methods, conservation.

Introduction

THE HIMALAYAS are the youngest mountains of the world. The Indian Himalayan region (IHR) is one of the mega-diverse bio-geographic regions of India, stretching about 3,000 km in length and 220-300 km in width. It covers nearly 17% of the geographical area and 3.8% of India's population (Kumar *et al.*, 2017); it supports about 8,000 flowering plants species (Samant *et al.*, 1998; Singh and Hajra, 1996). Himachal Pradesh, which forms a part of the Trans and NorthWestern Himalayan biogeographic provinces, is a repository of medicinal and aromatic plants. Five National Parks, 29 Wildlife Sanctuaries and one Biosphere Reserve have been notified so far in the state covering 11% of the total geographical area. It supports several socio-economically important orchids (Chauhan, 1999; Deva and Naithani, 1986; Pathak *et al.*, 2010; Samant, 2002). Orchidaceae is amongst the species rich families of angiosperms (Samant, 2002; Singh and Hajra, 1996) and comprises of about 779 genera and 22,500 species (Mabberley, 2008). It is a widespread family of flowering

plants with flowers often colourful and fragrant. In India, it represents the second largest plant family and contributes about 10% of Indian flora with 166 genera and 1141 species (Kumar and Manilal, 1994). Misra (2007) reported that India is home to 1,331 species, including 400 endemics. Orchids are amongst the most highly prized ornamental plants. The diversity of orchids decreases from NorthEast to NorthWest Himalaya (Deva and Naithani, 1986; Marpa and Samant, 2012; Samant, 2002, 2009; Samant *et al.*, 1995). Studies on orchid diversity have been carried out in Himachal Pradesh (Arora, 1986; Chowdhery and Agrawala, 2013; Deva and Naithani, 1986; Duthie, 1906; Marpa and Samant, 2012; Samant, 2002; Sharma *et al.*, 2015; Verma *et al.*, 2013; Vij *et al.*, 2013). In general, mention of orchids has also been made in the floristic studies by many workers (Barman *et al.*, 2016; Chowdhary and Wadhwa, 1984; Collett, 1902; Dhaliwal and Sharma, 1999; Kaur and Sharma, 2004; Kumar *et al.*, 2016; Rana *et al.*, 2008; Sharma, 2008, Sharma, 2013; Singh and Rawat, 2000; Singh and Sharma, 2006; Sharma *et al.*, 2017), but there are no studies available in Pangi Valley,