Pollination of *Dipcadi saxorum* Blatt. (Asparagaceae: Scilloideae)

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Pollination of *Dipcadi saxorum* Blatt. was studied in Thane and Mumbai suburban districts, Maharashtra, India, during the flowering season from June to August for a period of two years. The flowers are nocturnal, producing scent and nectar at nightfall, which extends up to morning hours, attracting many visitors. The study shows that the species is self-incompatible and that its foul-acrid odour is mainly because of aldehydes and esters. Settling moths, *Heliothus peltigera* and *Chrysodexis acuta*, as well as hovering moths, *Macroglossum stellatarum* and *Cephanodes hylas*, are pollinators of *D. saxorum* Blatt.

Keywords: *Dipcadi saxorum* Blatt., nectar production, pollinators and visitors, scent analysis, self-compatibility.

DIPCADI Medik. (Asparagaceae: Scilloideae) comprises 44 species distributed in Africa, Southern Europe up to the Indian subcontinent[1]. In India, the genus is represented by 13 species and 2 varieties[2–8]. It is characterized by bulbous geophyte plants, bearing long, linear, flat or channelled leaves, white–green–brick-red tubular–campanulate flowers, emitting sweet–foul odour, with some being odourless.

Initially, pollination in Hyacinthaceae (now Scilloideae) was known by bees, birds, butterflies, moths and rodents[9–11]. Research on the pollination biology of members from the tribe Dipcadieae Speta ex J. C. Manning & Goldblatt, had not been undertaken until Manning *et al.*[12] studied the pollination of *Dipcadi brevifolium* (Thunb.) Fourc. by owlet moth *Cornutiplusia circumflexa* (L., 1767) syn: *Syngrapha circumflexa* (L.) (Noctuidae).

Of the known species from India, *Dipcadi saxorum* Blatt. is distributed in Maharashtra, Gujarat, Madhya Pradesh and Rajasthan[3,13–16]. It is a foul-scented species which inhabits basalt plateaus and rocky surfaces. This study deals with the pollination of *Dipcadi* (*D. saxorum* Blatt.) from two plateaus. It also includes analysis of the unusual, foul floral scent, observations on self-incompatibility and notes on the floral visitors.

Materials and methods

Study plant and location

D. saxorum Blatt. is a bulbous geophyte known from the Indian subcontinent. The plant begins to sprout within a week after the first rainfall (i.e. May end to June first week) and completes its life span within 1–2 months (i.e. by August last week and, at times, during September first week). During the peak flowering months of July and August, the plant produces a single lax raceme with 2–32 (avg. 16) green–white flowers per scape; outer tepals unite one-third of the tubular flowers while the inner tepals unite up to two-thirds; anthers dorsifixed, introrse; ovary raised on a gynophore bearing a distinct white style and a slightly thicker trilobed stigma, each lobe is vaguely bilobed. The pollination of this species has been studied from two new locations in Maharashtra, India, namely, Manori, Mumbai suburban district (19°13′43.5684″N; 72°46′54.966″E; altitude 21.73 m amsl), and Uttan, Thane district (19°17′-6.9828″N; 72°48′10.0296″E; altitude 60.77 m amsl) in July–August during 2020–22 (Figure 1). Voucher specimens of *Dipcadi saxorum* from each locality are deposited in the RDNCP Herbarium at R.D. & S.H. National College, Mumbai and VCH (VIVA College Herbarium, Virar).

Floral longevity and self-compatibility

Floral longevity was studied on 10 individuals of *D. saxorum* Blatt. that were grown in an experimental plot at the R.D. National College Garden, Mumbai, has one set with garden soil (five individuals) and another with soil from its original location (five individuals). One mature bud of the raceme on each scape was tagged and monitored daily until it withered.

The breeding study was carried out in the experimental plot on five individual scapes by collecting pollen grains with a brush and depositing them on the receptive stigma. Mature flowers were emasculated when they were in bud condition and tagged, suiting the time to floral phenology. Manual pollination (self and cross) was carried out when the anthers were dehiscing and the stigma was receptive. Bagging was done to avoid interference of external factors. The results of these crosses were recorded.

On the field, this study included a bagging experiment for checking autonomous seed sets. The studied locations were surveyed, and a total of 10 nascent scapes in the early stages of development were meticulously enclosed. This was achieved by placing the scapes in ziplock polythene bags measuring 6 × 4 inch, or slightly larger fruit net bags measuring 10 × 6 inch. The main purpose of this enclosure was to effectively prevent pollinating insects from accessing

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