

Stelis gargantua

Text and Photographs by Eduardo Calderón-Sáenz

Removal of Pollinaria by Diptera-Bibionidae at El Refugio Nature Reservation



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STELIS GARGANTUA PRIDGEON & M.W. Chase, also known as *Crocodelanthegigas* (Luer & R. Escobar) Luer (formerly *Pleurothallis gigas* Luer & R. Escobar), has been cultivated at El Refugio Nature Reservation, near Cali, Colombia, under natural conditions. The species grows usually on road embankments and landslides under recovery, being part of the pioneer vegetation that is commonly comprised of orchids,



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melastomes, aroids and ferns. More rarely, the species can also be found on the trunks of old trees on humid but well-exposed situations. *Stelis gargantua* is known to occur

at the Colombian Western Cordillera in the provinces of Antioquia and Valle del Cauca, and at the northernmost part of the Central Cordillera in Antioquia, at elevations of 3,280–6,560 feet (1,000–2,000 m). Because the species is known to occur spontaneously around El Refugio, and because the plant upon which these observations were made has been grown outdoors on an embankment with plenty of natural vegetation, it is assumed that the interactions here described are also occurring in completely natural populations of the species.

The flowers of *Ste. gargantua* are produced on several spikes that arise simultaneously from a spathe located at the leaf bases, and the flowers open successively during a quite short season, resulting in all flowers simultaneously opening toward the end of a flowering wave. The flowers are

[1] *Stelis gargantua* grown under natural conditions at El Refugio Nature Reservation in Colombia.

fragrant and attract many different insects, but only members of the family Bibionidae have been observed to be able to remove the pollinaria.

Two different species of Bibionidae belonging to the genera *Dilophus* and *Plecia* have been observed removing pollinaria of *Ste. gargantua*. The bibionid flies can be seen walking along the spikes, usually probing every single flower with their long proboscis as they wander along each spike. This procedure is facilitated by the second arrangement of the flowers along each spike, with alternate flowers borne in two rows but facing the same side, usually toward the side away from the leaf blade.



- [2] Bibionid fly of the genus *Dilophus* standing on a leaf of *Ste. gargantua* and carrying two pollinaria attached to the mouth parts.
- [3] Detail of flowers of *Ste. gargantua* in front view showing the two rows of flowers facing to the same side.
- [4] In this detail of the flowers, the arrow shows one lip seen from the edge with a flat tip (yellow) and swollen base (white).
- [5] *Plecia* sp. with several pollinaria attached to the proboscis.
- [6] *Plecia* sp. with several pollinaria attached to the neck region.



After some minutes of activity on the flower racemes, during which the flies inspect with their proboscis the region around the lips' bases, some of the flies can be seen with a pollinarium attached to the proboscis. It has been impossible to ascertain whether the flowers produce nectar or not (i.e., whether the flies are rewarded by the orchid or not), but one thing is clear: the flies are strongly attracted by the flowers, probably by the strong, sweet scent. Even though the lips have a considerable whitish swelling at their bases, it is unclear if such swelling is involved in scent or nectar production.

According to Professor Francisco Serna, from the Universidad Nacional de Colombia, adult Bibionidae apparently feed on nectar and pollen, but are also attracted by plant secretions and by honeydew produced by sap tapping insects. At El Refugio, adult Bibionidae of the genus *Dilophus* have been attracted by the sap secreted by a recently cut tree of the genus *Cecropia*.

Additionally, Serna points out that *Plecia* spp. and *Dilophus* spp. are considered to be beneficial insects that are able to pollinate orchids, and some of them are regarded as exclusive pollinators of some Orchidaceae and Iridaceae.

Even though other Diptera, like anthomyid flies (Anthomyidae) or mosquitolike flies (probably belonging to the family Tipulidae), were found visiting the flowers of *Ste. gargantua*, the only flies capable of removing the pollinaria were the Bibionidae. Removed pollinaria were found attached either to the proboscis or to the of head base (neck zone) of the flies. Sometimes, several pollinaria were attached to the same fly.

More research is needed to ascertain if the flies are rewarded with nectar, and if *Stelis gargantua* is exclusively pollinated by Bibionidae.

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[7–8] *Dilophus* sp. visiting the flowers of *Ste. gargantua* with pollinaria attached to the base of the proboscis.

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