

The hover-bee

Notes on an unusual bee in the Valles Calchaquíes

In the Valles Calchaquíes with their semi-arid landscape at the foot of the Andes in northwestern Argentina, during the summer flowering season, along with other bee species, appears one that stands out for its unusual flight technique and is supposed to belong to the tribe of long-horned bees (Eucerini, Apidae). Same as the other wild bees in this area, it also is solitary and mainly visits the flowers of smaller cactus species, but can also be found on the flowers of other small plants. The females have huge brushes, called *scopae*, on their hind legs for collecting pollen. These scopae may even be larger than those of the pantaloon bee (*Dasypoda hirtipes*, Melittidae) named after them and are apparently so obstructive for the insect that they usually remain spread out from the body without further use. Unlike most other bees, which fly directly to the flowers and land on the anthers of the stamens or the stigmas of the carpels, this bee hovers above the flower for a long time and then often lands in the flower for just a fraction of a second before immediately hovering above it again. It therefore behaves similarly to hoverflies (Syrphidae), which, however, tend to remain in the flower for a longer period of time after landing in order to feed on pollen and nectar. The hovering flight of this bee above the flowers is also by no means as calm as that of hoverflies, as it constantly jerks back and forth. During its extended stay above the flowers, conflicts often arise with bees

of other species flying in, but it prefers then to avoid quarrels and simply leaves. It is not disturbed by beetles in the flowers. The situation is quite different with ants, which generally are feared by the bees of any species. It is worth mentioning the introduced honeybee (*Apis mellifera*, Apidae), some of whose feral colonies disturb and hinder the mostly solitary native wild bees in their natural habitat. These also tend to hover above the flowers before landing, albeit only briefly, which leads to the well-known loud buzzing wherever they appear in large numbers.

The following images illustrate this bee's activity in the field while visiting flowers. They were taken over several years in the area around the hamlet of Angastaco, situated at the confluence of Río Angastaco with Río Calchaquí. By the way, the technical challenge of taking appealing pictures of this hyperactive insect deserves a mention. Macro shots in particular, which require focusing on the object with tenth-of-a-millimeter precision at long exposure time, are virtually impossible. Furthermore, this bee is also very shy and moves as soon as a larger object approaches.

Full resolution of the images is achieved by setting the reproduction scale to 100% or 1:1 in the PDF reader.



img01

-25.72098°, -066.18032°, 2462m asl, Feb02 2025 13:22

View from the slopes of Cerro Negro to the north over the Valles Calchaquíes. At the foot of the mountain lies the small oasis of Angastaco at the confluence of the Río Angastaco and Río Calchaquí, and on the left horizon rises the 6,380-meter-high Nevado de Cachi some ninety kilometers away. All of the following pictures featuring bees were taken in the area around Angastaco.



img02

-25.68101°, -066.17533°, 1905m asl, Dec25 2016 11:58

Shortly before, the bee landed for a brief instant on the large flower of *Opuntia sulphurea* and presumably gathered some nectar. Now it is hovering above the flower again, with a few pollen grains remaining stuck to its proboscis.



img03

-25.67764°, -066.17859°, 1925m asl, Dec29 2017 12:44

Visiting flowers on the tiny *Parodia microsperma*. This cactus blooms in masses, thousands upon thousands all on the same day. Despite the presence of countless honeybees, they don't take any notice of the floral splendor, and our hover-bee is almost the only one among the visiting bees. Thus, pollination of this species is mainly carried out by the flower flies, especially hoverflies (Syrphidae) and bee flies (Bombyliidae).



img04

-25.69241°, -066.17055°, 1895m asl, Feb23 2020 11:48

In the flowers of the succulent *Portulaca confertifolia* (Portulacaceae), which grows mainly on sandy ground in valleys and whose family is distantly related to cacti via the common superorder Caryophyllales.



img05

-25.68157°, -066.17463°, 1897m asl, Jan27 2019 16:07

The bee hovers above the dense thorns of a *Gymnocalycium spegazzinii* globular cactus, for which it is one of the two main pollinators. This cactus opens its flowers for about an hour and a half in the afternoon from 3 p.m. and is clearly protandrous: on the first day of flowering, the (male) anthers release pollen and the visiting insects become completely dusted with it. On the second day of flowering, the anthers are empty and the (female) stigma opens its branches and is receptive. This prevents the flower from self-pollinating. However, the nectar, whose scent attracts insects, is produced throughout the entire flowering period.



img06

-25.67827°, -066.18175°, 1948m asl, Jan28 2016 15:02

The bee plunges headfirst into the small opening of the anther tunnel through which it reaches the prized nectar of this *Gymnocalycium spegazzinii* flower. This is produced by the nectaries located far below at the base of the pistil. The image on the right shows a cross-section of this flower with a total length of 7 cm. In contrast to its quick visits to other flowers, this bee often lingers in this flower for a long time and probably also mates in it, especially since males and females occasionally crawl out of it together.



img07

-25.67826°, -066.18175°, 1942m asl, Jan26 2016 15:21

Unsuccessful landing on the flower of *Gymnocalycium spegazzinii*. At the moment of touchdown, a second bee of the same species, completely covered in pollen, crawls out of the anther tunnel and immediately leaves without first wiping the pollen off its body, which must be quite a hindrance. Despite hovering over the flower for a long time, it was obviously not noticed.



img08

-25.67816°, -066.18187°, 1945m asl, Feb18 2020 15:11

Take-off from the flower of *Gymnocalycium spegazzinii*. This is the second day of flowering and there is no pollen left on the anthers, which is why the bee is still completely clean even after crawling through the anther tunnel. Its visit was purely dedicated to nectar.



img09

-25.70330°, -066.17037°, 1944m asl, Dec27 2018 11:44

Acanthocalycium thionanthum, another globular cactus with mass flowering. It grows sympatrically with the one in img02 and blooms shortly after it. While the honeybees avoid the flowers of the former, they really go crazy for those of *Acanthocalycium thionanthum* and mostly occupy them in such numbers that the wild bees for which they are intended get no chance to access. Here, however, on a quiet plant, a male of our hover-bee appears, easily recognizable by its long antennae and lack of scopae.



img10

-25.68303°, -066.17257°, 1883m asl, Dec15 2022 14:35

One more male hover-bee, here on the flower of the tiny *Tephrocactus molinensis*. The long antennae probably give the males an enhanced sense of smell, which helps them successfully locate females that attract them for mating. Unlike humans, who mainly use acoustic and visual communication signals, insects live largely in a world of olfactory communication and perception.



img11

-25.70102°, -066.17125°, 1930m asl, Dec16 2019 13:32

Here we find the female hover-bee on the flower of same cactus species as in the previous picture, img09. Even when its flowers are already open, *Tephrocactus molinensis* keeps their stamen tightly pressed against the pistil of the carpel, thus hindering access to the nectar below. Only when the sun is directly overhead (1:00 p.m.) does it release it. Attracted by the scent that already emanates beforehand, bees of various species try in vain to reach the precious juice with their proboscis, as is the case here with our hover-bee.



img12

-25.68321°, -066.17263°, 1885m asl, Jan18 2020 13:48

Tephrocactus weberi has a long-lasting bloom, usually the last one among the cactus species found here, and it does not bloom each and every year. The color of its flowers varies from pale yellow to purple-red, but this does not detract from the hover-bee's attention to these cactus flowers.



img13

-25.71595°, -066.17980°, 2183m asl, Mar19 2025 13:09

Now, at beginning of autumn, the cactus blooming season is mostly over. However, the hover-bee still is active and now increasingly collects pollen and nectar from autumn flowers too, such as *Herissantia crispa*, Malvaceae, shown here. It is therefore certainly a polylectic generalist, although with a preference for cactus flowers.