

The Baccharis bloom in the Atacama Depression

Notes on the small bee *Colletes atacamensis* (Colletidae) in the foothills of the Andes in northern Chile

North of the Atacama depression (Region of Antofagasta), the small rivers Río Puripica and Río Puritama converge at the little hamlet of Guatin (3,030 m asl) to form Río Vilama, which flows through thick layers of volcanic rock on its approximately 25 km long course down into the depression, where its waters are then used to supply drinking water to the oasis of San Pedro de Atacama (2,450 m asl).

The Río Vilama forms a narrow lifeline for animals and plants in the middle of the barren mountain desert, including large, dense bushes of *Baccharis scandens* (Asteraceae), which follow its entire course along its banks. The very lush flowering of *Baccharis scandens*, which lasts for several weeks, usually starts in late spring and is visited by a considerable variety of bees, wasps, flies, beetles, and butterflies, much to the delight of reptiles, amphibians, and birds, for whom these insects are on the menu. The following pages illustrate among these insects the small, hairy bee *Colletes atacamensis* (Colletidae), of which a particularly large number, exclusively males, were observed at the beginning of the Baccharis blooming on December 10, 2024, halfway between Guatin and San Pedro.

Several species of *Colletes* are native to the northern part of the Atacama depression, such as *Colletes alocochila*, seen on cactus flowers at higher altitudes, or *Colletes rutilans* on the flowers of the giant tamarugos (*Prosopis tamarugo*, Fabaceae) down by the salt flat at the bottom of the depression.

By the way, the genus *Baccharis* is *dioecious*, meaning it has separate sexes, and grows with separate, exclusively male or female plants, at Río Vilama even in groups. So one always has to walk some distance along the riverbank before bushes of the other sex appear again. Perhaps this is one reason why only male *Colletes* appeared on the exclusively female inflorescences in the following photos: these flowers only carry nectar, but no pollen, and are therefore less interesting to the collecting female *Colletes* than male inflorescences which carry both.

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



img01

-22.82654°, -068.15108°, 2728m asl, Apr06 2018 16:56

Looking northeast toward the ridge of the Andean peaks, where Chile meets Bolivia. Below, the Río Vilama winds its way through mighty layers of ancient and weathered lava ashes. The location of the following photos with the bees is right down here, by the river bends. However, this photo was taken six and a half years earlier, in autumn 2018.



img02

-22.82520°, -068.14825°, 2708m asl, Dec10 2024 16:01

Colletes atacamensis (Colletidae) on freshly blooming female inflorescences of *Baccharis scandens* (Asteraceae). The inflorescence of *Baccharis scandens* follows the structure of a cymose corymb (corymbus), and each head (capitulum) bears around 100 individual flowers, all of which produce nectar. Thus, when *Baccharis* starts blooming on Río Vilama, millions upon millions of flowers open at same time and spread a huge cloud of ethereal attractant, which finally causes an easily recognizable reaction among all the elements of animated nature that are all interconnected and interlinked in their own way in such an isolated biotope.



img03

-22.82516°, -068.14826°, 2708m asl, Dec10 2024 16:06

Concentrated and calm, the *Colletes atacamensis* uses its proboscis to check flower after flower on the densely packed head of the freshly opened female *Baccharis* inflorescence. Engrossed in this patient work, the bee remains in place long enough to give the stressed photographer time to take some appealing shots. Only the never-ending, gusty Andean wind remains, shaking himself and his subject back and forth continuously.



img04

-22.82519°, -068.14828°, 2708m asl, Dec10 2024 16:08

Cleaning of the antennae, these multifunctional sensory organs of insects, which, apart from the eyes, combine all the other sensory organs of us humans: insects use their antennae to feel, touch, taste, hear, and smell, mostly with a sensitivity that is beyond our capabilities, or in spectra that are inaccessible to us. However, cleaning in the case of our *Colletes atacamensis* here is probably just a matter of habit, as the antennae hardly get polluted when sucking nectar from these Baccharis-flowers. The situation is quite different with pollen-bearing flowers, where bees before taking off sit on the petals and first wipe the often sticky pollen from their eyes, wings, and antennae.



img05

-22.82519°, -068.14825°, 2708m asl, Dec10 2024 16:09

First visit to just-opening female flowers of *Baccharis scandens* (Asteraceae) by a *Colletes atacamensis* (Colletidae).



img06

-22.81432°, -068.13330°, 2773m asl, Dec11 2024 15:44

This picture was taken one day after those with the bees, about two kilometers upstream, and shows the male inflorescence of *Baccharis scandens*. The flowers on the heads are significantly larger and fewer in number than on the female inflorescences, and in the center of the heads, a few stunted, inactive female stigmata can still be seen, which no longer serve any function.