

FLORAL CONSTANCY OF URUGUAYAN NATIVE BUMBLEBEES: *Bombus atratus* and *B. bellicosus* (HYMENOPTERA, APIDAE)

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Bombus atratus

Bombus bellicosus.

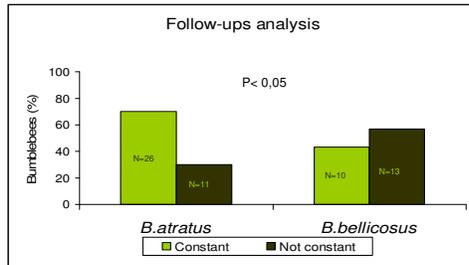
FOLLOW-UPS

Individual bumblebees were followed while foraging in a mixed meadow of red clover, bird's foot trefoil and white clover, and the sequence of flowers visited was registered.



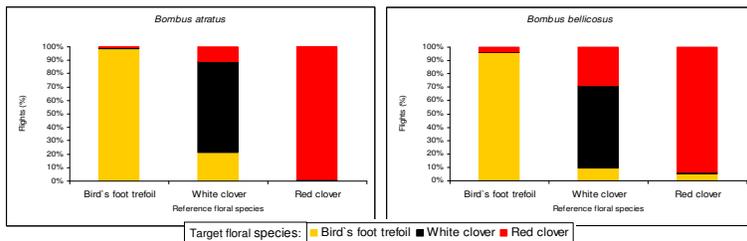
Mixed meadow.

In both species some individuals visited more than one floral resource, this being more frequent in *B. bellicosus* ($\chi^2 = 4,24$; $P < 0,05$).



However, 80% of the flowers visited by most bumblebees were of a single plant species, indicating that even these individuals could be efficient pollinators.

Additionally, for each species, all flights from one inflorescence to another were analyzed together considering the reference and the target floral species.



Most flights made by both bumblebee species were between inflorescences of the same species, which suggests a high constancy. The proportion of constant flights apparently differ depending on the reference floral species, but this issue needs further analysis.

Through pollen and nectar analysis it was not bare out the minor flower constancy of *B. bellicosus* determined by the follow-ups. This could be due to different availability of resources in the two study sites: follow-ups were conducted in a meadow where resources were mixed while in the vicinity of the nests where the bumblebees were collected red clover was very abundant which could mask different trends. This aspect must be taken into account in future investigations.

Bumblebees (*Bombus* sp) are considered world wide as excellent pollinators of several economic important crops. One characteristic that makes an efficient pollinator is its tendency to visit flowers of a single species. This phenomenon, known as flower constancy, was studied in two Uruguayan native species: *B. atratus* and *B. bellicosus*, using two methodological approaches.

POLEN AND NECTAR ANALYSES

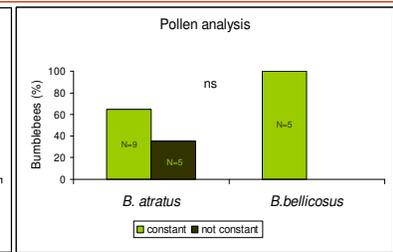
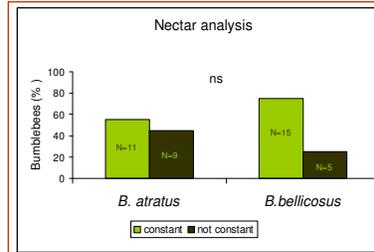
Bumblebee behavior was inferred by determining the botanical origin of nectar and pollen loads from foragers caught returning to the nest.

Nectar samples were obtained by pressing the abdomen of the bumblebees.



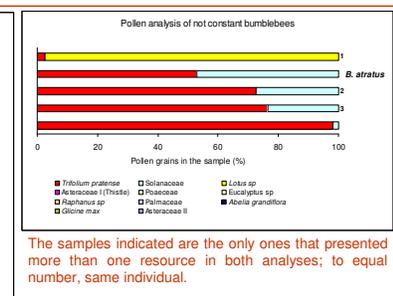
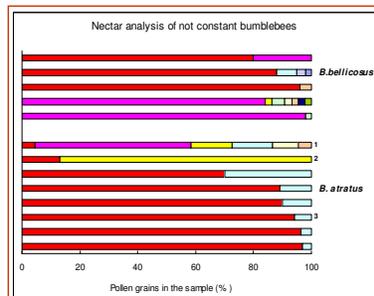
An homogeneous mixture was obtained from the pollen loads of both legs.

Once the samples were fixed the different types of pollen were identified and quantified. Those resources that represented less than 2% of the pollen grains were discarded from the analysis.



Nectar analysis showed that in both species some individuals visited more than one floral resource, while pollen analysis showed that *B. bellicosus* individuals were all constant to one floral species.

Nevertheless, there were no significant differences between the species (nectar analysis: $\chi^2 = 1,03$, $P > 0,1$; pollen analysis: $\chi^2 = 2,42$, $P > 0,1$).



The samples indicated are the only ones that presented more than one resource in both analyses; to equal number, same individual.

Red clover was the main resource in almost all bumblebees in both analyses, which could be explained by the abundance of this legume in the vicinity of the nests.

Most not constant individuals exploited only two resources.

The results suggest that both species of bumblebees have great potential as pollinators, because even those individuals that exploit more than one resource per foraging trip visit a great proportion of a single species. It is necessary to increase the knowledge about the behavior of these insects in order to implement its management for the benefit of agriculture