



## Plasterer and leaf-cutter bees (Hymenoptera: Colletidae, Megachilidae) of a steppe community on the Balkan peninsula: floral hosts and diversity in a sub-Mediterranean dry grassland

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### INTRODUCTION & AIM

The apoid fauna of Bulgaria is considered one of the richest in Europe. However, despite the numerous sampling efforts over the last century, it remains insufficiently studied and a clear overview of its diversity and the ecology of species present is lacking. This lack of understanding is further exacerbated by the changing climate, which continually alters the northern and southern limits of species distributions, especially in the warm southern parts of the country.

The aim of this pilot study is to test a monitoring approach in a species-rich habitat, which could be applied in the future for a long-term research effort.

### METHODS

As focus of this study were chosen the plasterer and leaf-cutter bees (Hymenoptera: Colletidae, Megachilidae). The designated study site is a protected sub-Mediterranean steppe in southern central Bulgaria (Besapari Hills, Fig. 1), the fauna and flora of which have been surveyed in the past.

Standardized transect walks were conducted every two weeks for the duration of the flowering season (end of February - end of August). During these, all bees belonging to the two families were collected, and their floral visits were recorded. Flower abundance was noted during each survey, and pollen samples for a reference collection were taken from the identified plants.



Figure 1. Above: The chosen study site at the Besapari hills, a typical petrophytic steppe in the Thracian valley (July 30<sup>th</sup>, 2023). Below: *Pseudanthidium melanurum* collecting pollen on *Centaurea salonitana*.

### RESULTS & DISCUSSION

A total of 76 plant and 31 bee species were observed, with 45 individual plant-pollinator associations being identified at a species level (Fig. 2). The most visited flowers belonged to *Centaurea salonitana* Vis. (six species), *Eryngium campestre* L. (four species), *Ajuga chia* Schreb. (four species), *Ornithogalum montanum* Cirillo (three species), *Onobrychis arenaria* (Kit.) DC. (three species) and *Knautia arvensis* (L.) Coult. (three species).

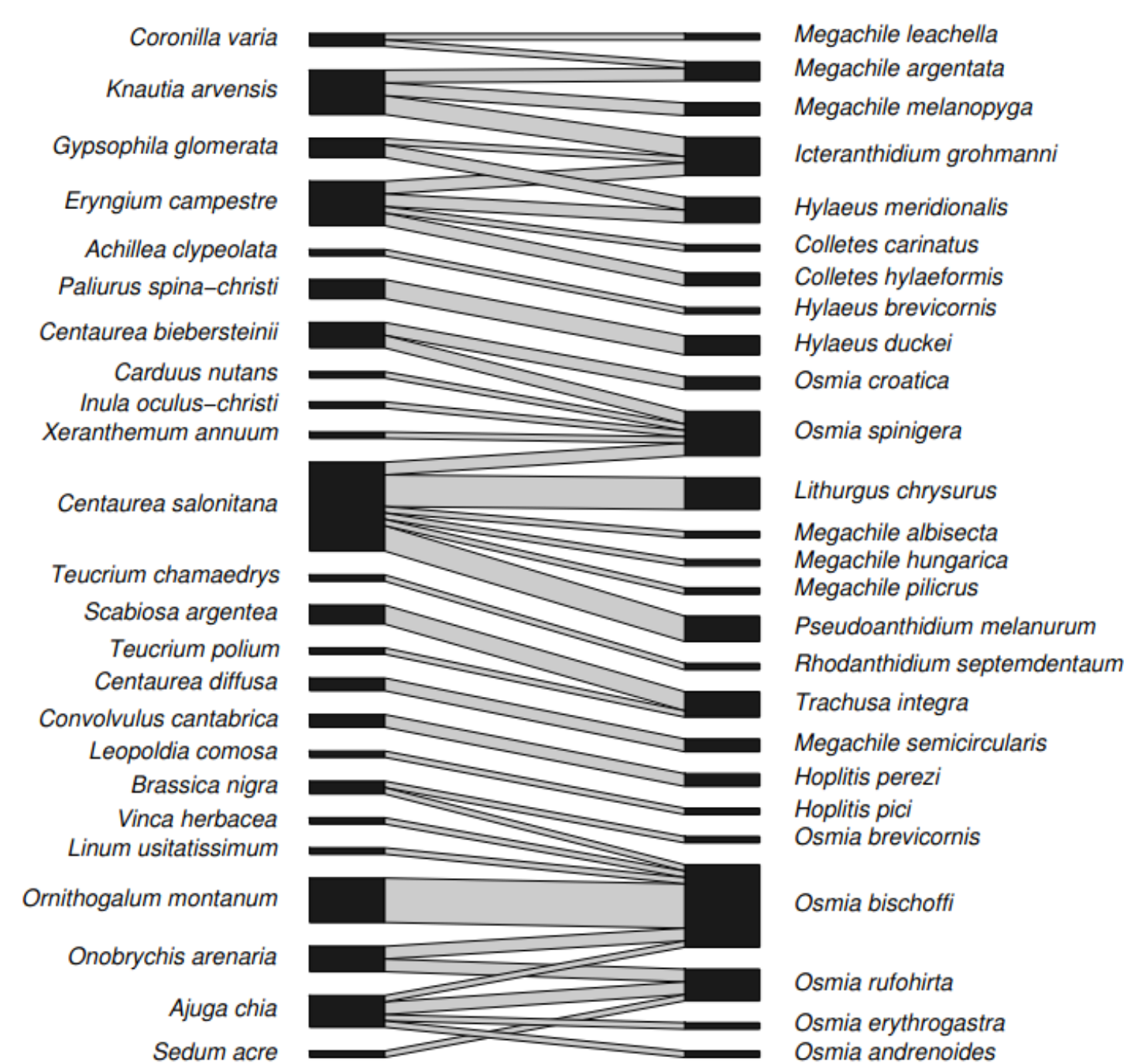


Figure 2. Network representation of plant-pollinator interactions observed. Plant species are indicated on the left and pollinators on the right. Grey lines represent species interactions, and the line thickness indicates the relative frequency of each interaction.

Twenty-two bee species are new for the locality. Two species are of particular interest: *Hoplitis pici* (Friese, 1899) and *Megachile semicircularis* van der Zanden, 1996, both of which are new for Bulgaria (Fig. 3). *H. pici* is an eastern Mediterranean species with a distribution centered around Greece and Turkey, which has been expanding north in the last several years.



Figure 3. *Hoplitis pici* (left) and *Megachile semicircularis* (right).

### CONCLUSION

Considering the relative popularity and available historical data from the study location, the Besapari Hills, these results reconfirm the apoid fauna of the country as severely understudied, furthermore accentuating the need for a comprehensive pollinator monitoring in Southern Europe.