



Preliminary results on the wild bee fauna of Lebanon mountains: The race between a checklist and a climatic risk assessment

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On the wild bees of Lebanon

Wild bees play an important role in ecosystems as pollinators of native plants (Tuell et al, 2008). In Lebanon, there are no recent studies on the wild bee fauna. The only published findings are that of Mavromoustakis (1962) reviewed by Grace (2010). The topography of Lebanon with two mountain chains makes different habitats, especially in the northern part of the western mountain chain where the culminating point reaches 3000 m. These higher elevations are rich with endemic plants (Bou Dagher-Kharrat et al, 2018). In addition, the bee fauna of these regions can be potentially vulnerable to extreme climatic events such as heat waves. To assess this risk we focused on species from the Apidae family as a model.



Fig 1: Three collection areas at 1500 m, 1800 m and 2800 m representing the chosen altitudinal range (Photos M. Boustani)

The aim of the present work :

- Present the current advancement on wild Apidae inventory in Lebanon
- Preliminary results of heat stress resistance for chosen species

Materials and Methods

❖ Tested species

- Collection of wild bees in all habitats between 1000 m and 3000 m of altitude in North Lebanon.
- The most abundant species found along the altitude interval were chosen as a model for the heat stress resistance test.

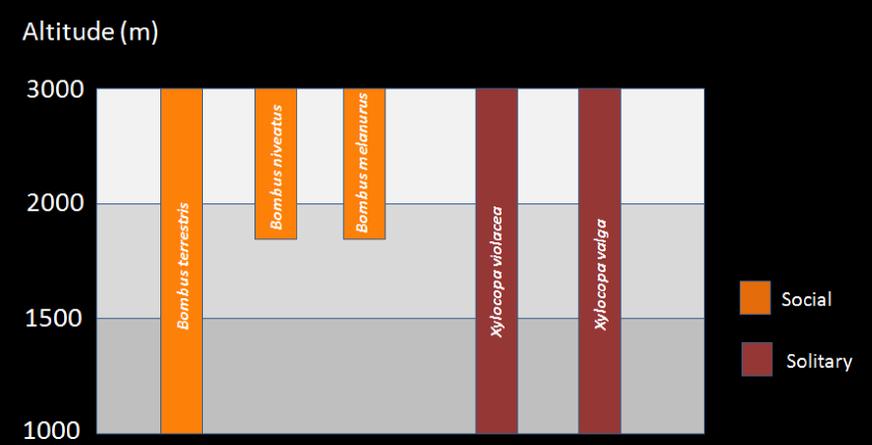


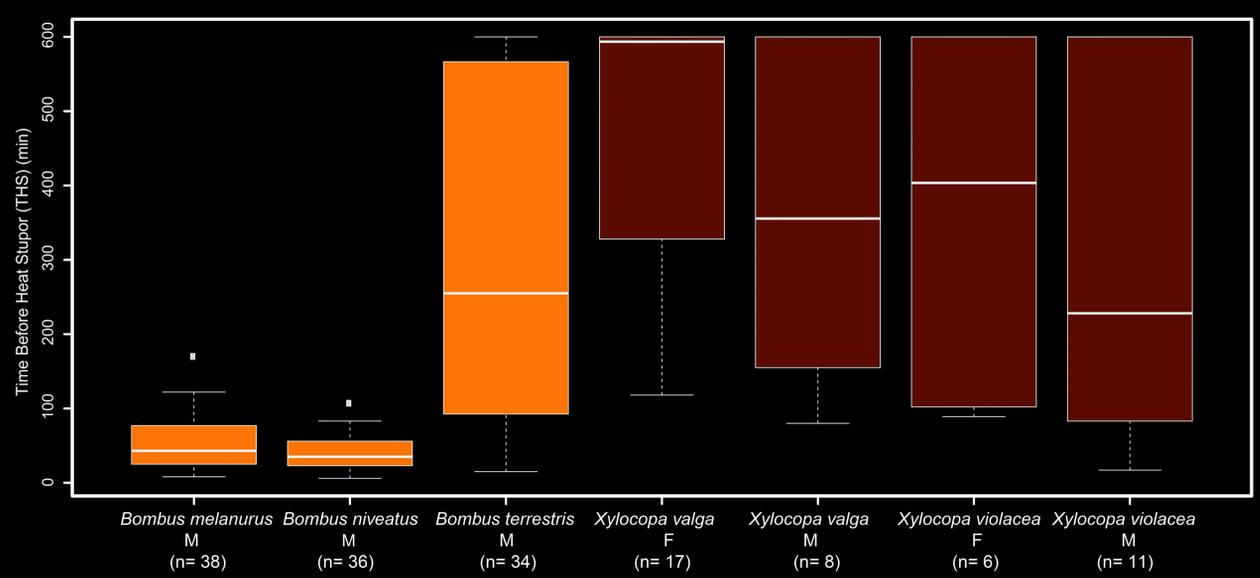
Fig 2: Chosen social and solitary species for heat stress resistance testing and their distribution in the altitudinal range

❖ Heat stress resistance

- Heat stress tests were performed following the protocol established by Martinet et al (2015) to measure time before heat stupor (THS).



Preliminary results and discussion



❖ Advancement on species list

Identified specimens from our collections currently amount to 34 species over 7 genera of Apidae

❖ Who is more resistant ?

- *B. terrestris* is much more resistant to heat stress than *B. niveatus* and *B. melanurus*.
- *X. valga* females also show high resistance to heat stress
- More specimens need to be tested for the *X.valga* males and *X. violacea* males and females



Fig 3: Boxplots of Time before Heat Stupor for *Bombus* species males, and *Xylocopa* species males and females. From left to right, *Bombus melanurus*, *B. niveatus*, *B. terrestris*, *Xylocopa valga*, *X. violacea* (photos M. Boustani).

Not only does it seem that alpine species are more sensitive than the species distributed further to the South (Martinet et al, 2015), but the species with a distribution restricted to the altitudes seem to be more sensitive to heat stress. This concurs with the findings of Oyen (2016) where species from lower altitude are more resistant to extreme heat conditions. This accentuates the risk of population decline due to heat waves on species like *B. melanurus* that lives mostly above 2000 m (Rasmont et al, 2009) and in Lebanon is confined in the highest altitude strip of the North.