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Conference Abstract

Nebria germari Heer, 1837 – insight about the distribution and ecology of a climate-sensitive species of the Eastern Alps

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Abstract

Nebria germari (Coleoptera: Carabidae) is a cold-adapted species currently restricted to high altitude habitats of the Eastern Alps and exhibits fragmented distribution patterns suggesting refugial occurrence. It is a brachypterous species (thus with low dispersal ability) and it has nocturnal forage behaviour (mainly predating springtails and midges).

Since *N. germari* is an endemic and a climate-sensitive species, we performed a study aimed at describing the past distribution on the Dolomites (Italy), the ecology and the current population dynamic on debris-covered glaciers of this area where it is still abundant.

The past distribution was investigated by reviewing literature and analysing the labels of the specimens preserved in some Museum collections. We found that, until the second half of the last century, the lower altitudinal limit of this species was around 2000 m asl. Specifically, it was abundant in alpine grasslands on carbonate substrata (*Carex firma*-dominated). Field data collected in the last ten years demonstrated the current extinction in this grassland type of the Southern Alps, with a consequent contraction of the distribution.

Currently, *N. germari* is still abundant in high altitude, north-faced, scree slopes with macroporal soil structure, in deep underground and on debris-covered glaciers due to its preference for cold temperatures (i.e. terrains with average annual temperature of ca. 0°C).

Preliminary results obtained analysing, through the snow-free period, the larval, sub-adult and adult abundance patterns on debris-covered glaciers suggest that, in this kind of harsh habitat, *N. germari* is a spring rather than an autumn breeder as was documented in the last century for the populations found in high alpine prairies. In addition, the population size seems to decrease from the snowmelt to the beginning of the snow period and to increase with the percentage of coarse fraction of the terrain. Conversely, no significant relation was found between the population size and the abundance of preys (Collembola) and competitors (Araneae).

Keywords

Carabidae, Cold-adapted species, Debris-covered glaciers, Dolomites.

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