

***Bombus (Alpinobombus) alpinus* in the Italian Central Alps (Hymenoptera: Apidae: Bombinae)**

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RIASSUNTO - *Bombus (Alpinobombus) alpinus* nelle Alpi centrali italiane (Hymenoptera, Apidae, Bombinae). *Bombus (Alpinobombus) alpinus* (Linné, 1754) è stato recentemente trovato in Valle Cedèc, in Valtellina nel Parco Nazionale dello Stelvio, vicino al monte Gran Zebrù e al ghiacciaio del Cevedale, nelle Alpi centrali italiane.

Parole chiave: *Bombus alpinus*, nuova segnalazione, insetto alpino, specie minacciate, Parco Nazionale dello Stelvio.

Key words: *Bombus alpinus*, new record, alpine insect, threatened species, Stelvio National Park.

Introduction

Bumblebees are among the most ecologically important insects at the highest elevations, being key pollinators of many plant species. Moreover, since some of them are considered threatened, monitoring the distribution of such species is crucial to their conservation. On The IUCN Red List of Threatened Species, *Bombus (Alpinobombus) alpinus* (Linné, 1754) is classified as a vulnerable species with decreasing status (CEDERBERG et al., 2013). This species is the unique representative of the *Alpinobombus* subgenus on the Alps, but it also occurs in the tundra biome of Fennoscandia (PITTIONI, 1942). On the Alps, the species can be found in the alpine altitudinal belt, almost exclusively above 1900 mt, according to historical records. The species forage in meadows and pastures (AMIET, 1996). It has been noted that corbicular loads of *B. alpinus* consist almost entirely of pollen from a single species, although foraging preferences change in response to flower phenology (STENSTRÖM & BERGMAN, 1998).

Methods

The area surrounding the Pizzini Hut (46°27'9.42"N, 10°34'43.58"E) in Valle Cedèc (Stelvio National Park, Italy) was surveyed for flower-foraging *Bombus* species, using a jar to capture them. The locality is close to glacier systems, such as the Cevedale Glacier and to Mt. Gran Zebrù, in the central Italian Alps. The capture method consisted of transects crossing flowered patches on a single sunny day in 2013 and on three days in 2014.

Results and discussion

In August 2013, the most notable species captured in the Stelvio National Park was *Bombus (Alpinobombus) alpinus*. A worker of this species was recorded foraging on clover (identified in the field as *Trifolium badium* Schreb. and *Trifolium thalii/pallescens*) at 2700 mt a.s.l., together with individuals of four other *Bombus* species (all specimens identified by M. Cornalba), listed in Table 1. In August 2014, four specimens of *Bombus (Alpinobombus) alpinus* were recorded at an altitude of 2550 mt a.s.l. ca: a queen, two workers and a male. They were all foraging on *Cirsium spinosissimum* (L.) Scop. Such finding confirms the presence of this charismatic and rare species in the Stelvio National Park.

There are no published records of the species for the Italian side of the Alps between the Monte Rosa range and the Adige Valley, the area where Valle Cedèc is located; however, it was observed in Val Malenco in 2007 and 2009 at 2300 mt (M. MEI, *in litteris*) and in 2010 at 2600 mt (M. CORNALBA, *in litteris*). In addition, the collections of the Museo Civico di Storia Naturale of Morbegno (Veltellina) hold three specimens collected in Valle Spluga (municipality of Campodolcino) and one collected in Val Malenco (municipality of Chiesa in Val Malenco) by G. Perego in the early 1980s, but identified only in 2012 by F. Penati. The published records of *B. alpinus* closest to this location are those of the Upper Engadin Valley (AMIET, 1996).

The bumblebee fauna of the Stelvio National Park does not seem to have been investigated in detail in the past, but faunistic data from adjacent areas with similar altitudes such as the high Val Malenco and the Adamello Park listed more



Figure 1 *Bombus* (*Alpinobombus*) *alpinus* (Linné, 1754) captured in the Stelvio National Park, year 2013. In clockwise order: the specimen, the hind tibia with a prominent distal process, the swollen clypeus and centrally depressed labral tubercles.

than 20 species each (23 spp. in CORNALBA 2010, 24 spp. in INTOPPA et al., 1999). Therefore, due to its similarity to the above mentioned localities, the Stelvio National Park might host a considerable number of species, probably including several other rarely recorded ones like *B. alpinus*. In contrast, intense cattle grazing occurs in Valle Cedèc, where this survey took place, even at altitudes of 2700 m a.s.l. Such a high density of livestock reduces the number of available food resources (flowers) to bumblebees. Therefore, a thorough investigation of the *Bombus* of the park is particularly urgent, especially given the crucial role that bumblebees play in pollination and their threatened status.

<i>Bombus</i> (<i>Alpinobombus</i>) <i>alpinus</i> (Linné, 1754)	1 worker
<i>Bombus</i> (<i>Melanobombus</i>) <i>sichelii</i> (Radoszkowski, 1859)	1 worker
<i>Bombus</i> (<i>Kallobombus</i>) <i>soroensis</i> (Fabricius, 1793)	1 worker
<i>Bombus</i> (<i>Pyrobombus</i>) <i>monticola</i> (Smith, 1849)	1 worker
<i>Bombus</i> (<i>Bombus</i>) <i>lucorum</i> (Linné, 1761)	2 workers

Table 1. Species of *Bombus* recorded in Valle Cedèc (the Stelvio National Park, 46°27'9.42"N, 10°34'43.58"E) at 2700 m a.s.l., August 2013.

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BIBLIOGRAPHY

- AMIET F. 1996. Apidae, 1. Teil. Allgemeiner Teil, Gattungsschlüssel, die Gattungen Apis, Bombus und Psithyrus. Insecta Helvetica Fauna 12. 98 pp. Centre Suisse de Cartographie de la Faune
- CEDERBERG B., MICHEZ D., NIETO A., RADCHENKO V., RASMONT P., ROBERTS S. 2013. *Bombus alpinus*. *The IUCN Red List of Threatened Species*. Version 2014.1.
- CORNALBA M. 2010. A preliminary survey of the bumblebees of the Val Malenco (Lombardy, Italy). *Unpublished*, www-dimat.unipv.it/~cornalba/bombi/malenco2010/malenco2010.html
- INTOPPA F., MORESCHI I., PIAZZA M. G., BOLCHI SERINI G. 1999. *Bombus* Latreille e *Psithyrus* Lepeletier del «Parco Naturale dell'Adamello» (Hymenoptera Apidae Bombinae). *Bollettino di Zoologia Agraria e Bachicoltura*, Ser. II, 31(2): 167-178.
- PITTONI B. 1942. Die boreoalpinen Hummeln und Schmarotzerhummeln (Hymen., Apidae, Bombinae). I. *Mitt. K. Naturwiss. Inst. Sofia* 15:155-218.
- STENSTRÖM, M. & BERGMAN, P. 1998. Bumblebees at an alpine site in northern Sweden: temporal development, population size, and plant utilization. *Ecography* 21(3): 306-316.