



Short note

Records of *Marmota marmota* (Linnaeus, 1758) (Mammalia, Rodentia, Sciuridae) below 1.000 meters a.s.l. in the Italian Alps

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Key words

- alpine marmot
- ecology
- distribution
- Lombardy

Parole chiave

- marmotta
- ecologia
- distribuzione
- Lombardia

Summary

The presence of *Marmota marmota* between 850 and 967 m a.s.l. is reported, in the municipality of San Giacomo Filippo, in the province of Sondrio. Even if it is an altitudinal range little frequented by this species, the habitat is suitable. This presence may be the result of the recent expansion of the marmot throughout its range.

Riassunto

Viene riportata la presenza di *Marmota marmota*, tra 850 e 967 m s.l.m., nel comune di San Giacomo Filippo, in provincia di Sondrio. Anche se si tratta di una fascia altitudinale poco frequentata da questa specie, l'habitat risulta adatto. Tale presenza può essere il risultato della recente espansione della marmotta in tutto il suo areale.

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State of knowledge

Alpine marmot, *Marmota marmota*, is a large European rodent distributed through the Alps and High Tatra Mountains, respectively with the subspecies *M. m. marmota* (Linnaeus, 1758) and *M. m. latirostris* Kratochvíl, 1961; some introduced populations, belonging to the nominal subspecies, are found in the Pyrenees (France, Spain,

Andorra), Massif Central (France), Jura (France and Switzerland), Vosges (France), Black Forest (Germany), Northern Apennines (Italy), East Austria, North Serbia, Montenegro, Carpathians (Romania) (Herrero et al. 2008; Koprowski et al. 2016).

In most of the Eastern Alps areas, it seems that the species has become extinct in recent prehistoric times, probably due to excessive hunting. For this reason, it was highly rarefied, in the first half

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of the last century, in other Alps stations. From the second half of the '800, until the beginning of this century, several specimens were released in Veneto (Dolomiti Bellunesi area), in Friuli Venezia Giulia, Austria, and Slovenia (Preleuthner et al. 1995; Lapini & Borgo 2005; Borgo et al. 2009).

Along the Western Alps side, the alpine marmots' releases were very occasional. In Lombardy, Seriana Valley (Bergamo district) a release was carried out in 1933, without success, with four individuals from Valle d'Aosta, later in 1950, with six individuals (Toschi 1954). In the province of Sondrio, in 1963, twenty individuals from Livigno and Lei Valley were released on the Orobie Alps (Bondione Valley and Arigna Valley) (Baggini 1989); more recently, in 2011, forty marmots were captured in Livigno and released in Teglio and Lovero (Ferloni, 2011).

In the Alps, *Marmota marmota* is present at altitudes from 600 to 3.200 m a.s.l., although the preferred region is the belt 400-600 m above the local timberline (Preleuthner 1999). According to Koprowski et al. (2016), the species can be observed in alpine meadows and high elevation pastures, on south-facing slopes, between 1.200-3.000 m. Due to thermoregulation problems during the summer, a stable presence below 800 m is unlikely (Turk & Arnold 1988).

Spitz (1992) states that species of the genus *Marmota* are characterised by an ecological omogeneity and in most cases they live in highly seasonal environments with an intense and short grass growing season. They inhabit accumulations of fallen rocks, usually of old origin and partially covered by vegetation but no colonized by forest; only the North American *M. monax* is a typical forestall species.

In this paper, data on the presence of alpine marmots below

1.000 m are reported, from a locality in Lombardy (North Italy). Taking into account the knowledge of the species in Italy, this is an interesting report.

Field observations

Almost all the observations reported in this paper were made in Lombardy (North Italy), Sondrio province, San Giacomo Filippo municipality, between the localities of Lirone and Vho. Within the province of Sondrio, these localities belong to the subdivision called *Comunità Montana di Chiavenna* (Mountain Community of Chiavenna) and are placed in the lower portion of the San Giacomo Valley.

According to *Suddivisione Orografica Internazionale Unificata del Sistema Alpino - SOIUSA* (International Standardized Mountain Subdivision of the Alps-ISMSA) proposed by Marazzi (2005), San Giacomo Valley is included in the following subdivisions:

Tambò-Quandro Group / Tambò-Forcola mountain range Supergroup / Eastern Lepontine Alps Subsection / Lepontine Alps Section / North-Western Alps Part Sector / Western Alps Part

and Stella-Gallegione Group / Suretta-Stella-Duan mountain range Supergroup / Averro Mounts Subsection / Western Rhaetian Alps Section / Central-Eastern Alps Part Sector / Eastern Alps Part.

The considered area (Figure 1) is a mosaic of stony ground, meadows, shrubberies, forests mainly deciduous, gradually replaced by conifers in Vho. Proceeding north, along the San Giacomo Valley, this landscape continues up to Campodolcino municipality, above 1.000 m. The prevailing plant associations are constituted by secondary prairies and mixed deciduous forests, the potential vegetation would consist mainly of deciduous forests of the *Fagetalia*



Fig. 1 - Particular of the study area, in correspondence with the Cimaganda station. / Particolare dell'area di studio, in corrispondenza della stazione di Cimaganda.



Fig. 2 - The location of the municipalities of San Giacomo Filippo and Campodolcino within the province of Sondrio. / Posizione dei comuni di San Giacomo Filippo e Campodolcino, all'interno della provincia di Sondrio.

silvaticae climax (Credaro & Pirola 1975).

The present work is based on original observations in the field.

The stretch of the San Giacomo Valley between the municipalities of San Giacomo Filippo and Campodolcino (Figure 2), was crossed several times, along the *Via Spluga* (Spluga Road), a historic Roman road, today a hiking trail (Merisio 2014).

Results and discussion

On the basis of several observations carried out, we can say that there is a population of *Marmota marmota*, between the localities of Lirone and Vho, at altitudes between 850 and 967 m a.s.l. (see. Table 1).

A single specimen was also observed in 2005, at Pompaggio locality, 673 m a.s.l. (Mozzetti, pers. comm.); there are no further observations in this locality, so we can say that this seems to be an occasional occurrence.

Close Vho, marmots were also found in the Campodolcino area, above 1.000 m.

As already outlined in the state of knowledge, in the Alps, *Marmota marmota* is present at altitudes from 600 to 3.200 m a.s.l., although the preferred region is the belt 400-600 m above the local timber line (Preleuthner 1999). Out of a total of 405 data considered in Austria, eight are between 1.000 and 1.300 m (Preleuthner & Bauer 2001).

In a survey on the distribution of Italian mammals carried out at the beginning of the twentieth century, the alpine marmot is present above 1.800 m (Ghigi 1911).

In Lombardy, there are not data about the presence of *Marmota marmota* below 1.000 m a.s.l. and the species is preferably found

Tab. 1 - The records of *Marmota marmota*, in the San Giacomo Filippo municipality, considered in this paper. / Dati di *Marmota marmota*, nel comune di San Giacomo Filippo, considerato in questo lavoro.

LOCALITY	PERIOD	SOURCE
Lirone 46°22'5"N 9°21'39"E	mid 1980s-2018	E. Mozzetti and S. Faggi, pers. obs.
Cimaganda 46°22'18"N 9°21'26"E	mid 1980s-2019	E. Guanella, E. Mozzetti and A. Nappi, pers. obs.
Vho 46°22'27"N 9°21'23"E	2011-2019	A. Nappi, pers. obs.

between 1.500 and 2.000 m (Panseri & Frigerio 2001). Also for Italy, in general, there are no reports below 1.000 m (Pigozzi 2008).

Marmota marmota prefers grasslands alternating with stony or at least scattered boulders (Pigozzi 2008); in the absence of rocky boulders, areas with low vegetation, probably to better control the predators, are frequented (Borgo 2003). In any case, for this species, suitable spaces to feed and to monitor constantly the presence of the predators, to have the possibility - at any time - to be able to repair immediately, are necessary. The habitats of San Giacomo Filippo municipality, where the marmots were monitored, can satisfy all the needs of this species.

In tree surveys on the distribution of the alpine marmot in Italy, carried out in 1928, 1933, and 1953 (Toschi 1954), as regards the situation in the province of Sondrio, a decrease is observed due to hunting; in particular, in 1933, it is reported to be present starting from 2.000-2.500 m. The increase of the species, observed in more recent times throughout the Alps has probably led to colonization at lower altitudes.

It would be interesting to monitor this marmot population over time to evaluate its consistency and the chances of survival.

In the Swiss Jura, where the alpine marmots were introduced, the habitats are not very suitable; here the species lives between 1.000-1.450 m, usually below the upper limit of the trees, furthermore, there are several disturbance factors such as farmed areas submitted to pasture, nitrification of the soils, dogs, and foxes (Neet 1992).

Considering also the isolation of these populations, the risk of extinction is very probable. What will happen to the San Giacomo Filippo marmot population? In this case, on the other hand, it is not an isolated population and the presence of rocks is a favorable factor for the species.

Sometimes, in species typically considered as "mountain", the altitude is not always an important factor for their distribution. One of the best-known cases is that of the snow vole, *Chionomys nivalis*, traditionally considered an animal of cold climates and high altitudes, which can be found, sometimes, at low altitudes and in Mediterranean environments if, in any case, there are stony soils, a favorite condition in this species (Nappi 2002; Amori 2008).

Based on the survey carried out, it is possible to establish that the presence of the alpine marmots, in the considered area, at altitudes lower than 1.000 m, represents an interesting finding considering the knowledge of the species from Italy.

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