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THE SNOW VOLE, *CHIONOMYS NIVALIS* (MAMMALIA, RODENTIA, CRICETIDAE), IS STILL PRESENT IN THE APUAN ALPS (NORTHERN APENNINES, ITALY)

Abstract - P. Agnelli, M. Leonardi, A. Nappi, *The Snow vole,* Chionomys nivalis *(Mammalia, Rodentia, Cricetidae), is still present in the Apuan Alps (Northern Apennines, Italy).*

The presence of the snow vole in the Apuan Alps is confirmed, after the latest reports from the 1980s, thanks to observations made between 2015 and 2017, documented by photos, taken near the Passo del Vestito, in the municipality of Seravezza (Lucca province, Tuscany). The experience here reported is an example of how even non-experts citizens can contribute to the knowledge on the distribution of this elusive species, not always easy to detect on the Apennines.

Key words - *Chionomys*, small mammals, distribution, photography, Apuan Alps, Apennines, Tuscany, Italy

Riassunto - P. Agnelli, M. Leonardi, A. Nappi, *L'arvicola delle nevi,* Chionomys nivalis *(Mammalia, Rodentia, Cricetidae), è ancora presente sulle Alpi Apuane (Appennino settentrionale, Italia).*

Viene confermata la presenza dell'arvicola delle nevi sulle Alpi Apuane, dopo le ultime segnalazioni degli anni Ottanta del Novecento, grazie ad osservazioni effettuate tra il 2015 e il 2017, documentate da foto, effettuate presso il Passo del Vestito, nel comune di Seravezza (provincia di Lucca, Toscana). L'esperienza qui riportata, è un esempio di come anche appassionati cittadini non addetti ai lavori possano contribuire alla conoscenza sulla distribuzione di una specie elusiva, difficile da rilevare sull'Appennino.

Parole chiave - *Chionomys*, piccoli mammiferi, distribuzione, fotografia, Alpi Apuane, Appennino, Toscana, Italia

Introduction

The snow vole *Chionomys nivalis* (Martins, 1842), is a widespread species from south-western Europe throughout south-eastern Europe to the W Caucasus, east to Turkey, Israel, Lebanon, W Syria, W and N Iran and S Turkmenistan (Musser and Carleton, 2005; Kryštufek, 2016; Pardiñas *et al*., 2017). In Italy, it is continuously present along the Alps, while in the Apennines the distribution area is more fragmented (Amori, 2008; Loy *et al*., 2019).
However, the knowledge about the Apennines distribution is still scarce and several old bibliographic references for some localities must be confirmed both for possible misidentifications and for possible local extinctions in recent times. This fact mainly concerns some places outside the Modena Apennines, the Gran Sasso and the Majella (Nappi *et al*., 2007). For example, the presence on the Sibillini Mountains (Marche/Umbria) reported in several publications, but not supported by photographic and/or museological documentation, has recently been confirmed through a skull preserved at the University of Camerino (Department of Biology of the Bioscience and Veterinary Medicine School, without catalogue number) and the capture of a specimen (Nappi *et al*., 2017). Further south, still along the Apennines, the only museum specimen from Calabria, indicated as *C. nivalis* (liquid-preserved body and skull, Museo di Storia naturale, sede "La Specola", Firenze, n. MZUF-7448) turned out to belong instead to *Arvicola italicus* (Nappi & Aloise, 2015). The currently known distribution of the snow vole in Italy is shown in the right side of Fig. 1.
Regarding the Apuan Alps (despite their name, the mountains are part of the northern Apennines, between Liguria and Tuscany), the latest publication reporting the presence of the snow vole dates back to the 1980s (Farina & Cenni, 1985). For this reason, several more recent and unpublished observations collected at the beginning of the XXI century, later on confirmed by photos, turned out to be relevant and are the subject of this short communication.

Study area

The study area is located near the Passo del Vestito (Fig. 1), municipality of Seravezza (Lucca province, Tuscany), on the south-eastern slopes of Monte Pelato at 1150 m a.s.l., just outside the boundary of the protected area "Valle del Serra - Monte Altissimo" (ZSC IT5120010). The habitat is a sparse beech forest on calcareous lithosoils and surrounded by secondary grasslands (Brachypodietea and fescue) in mosaic with rocky outcrops, detrital areas and sparse herba-

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Figure 1. Currently known distribution in Italy (black areas in the small map of Italy, top right corner) and new sighting area in Tuscany (circled area): Lucca province, Seravezza municipality, Passo del Vestito, Monte Pelato

ceous vegetation of the lithosoils with dominance of the genus *Sesleria* (L. Lombardi, pers. com.) (Fig. 2). A quarry and quarry dumps are present too, abandoned at the time of the sightings (from 2015 to 2017) and presently active again.

Materials and methods

The data presented here are the result of about 100 photographic trips carried out in the field by the second author (Matteo Leonardi) during spring, summer and autumn, from 2015 to 2017. The sessions consisted of photographic stalking from the shed, with a reflex camera; seeds were used to attract birds, also consumed by the vole.
The identification of the species was possible by examining several photos (the most representative in Fig. 3), in order to reveal the diagnostic characters reported in the scientific literature.

Results and discussion

Based on about 30 photos examined and 2 movies, the captured vole turns out to be *Chionomys nivalis*. The obtained images show the typical features of this species, when compared with other Italian cricetids, such as the gray hair, the long tail in proportion to the body and the head with pointed snout and visible ears, so as to give a more mouse-like appearance than vole (Amori, 2008; Aulagnier *et al*., 2011; Pardiñas *et al*., 2017).
The species was observed several times between July 2015 and March 2017.
The available previous data on the presence of the species in the Apuan Alps area and surroundings are the following:

- Liguria, La Spezia province, Sesta Godano, Monte Gottero (1640 m a.s.l.) (Farina & Cenni, 1985);
- Tuscany, Pistoia province, Cutigliano, Croce Arcana (1700 m a.s.l.), 10-XII-1981 (Farina & Cenni, 1985);
- Tuscany, Massa Carrara province, Fivizzano, Monte la Nuda (1800 m a.s.l.), 30-XII-1980 (Farina & Cenni, 1985);
- On the border between Toscana (MS, Comano) and Emilia-Romagna (Reggio Emilia, Ramiseto) on Monte Acuto (1750 m a.s.l.), 14-X-1981 (Farina & Cenni, 1985);
- Tuscany, Massa Carrara province, Bagnone, Tecchio dei Merli (1650 m a.s.l.), 7-XI-1981 (Farina & Cenni, 1985);
- Tuscany, Lucca province, Stazzema, neighbourhoods of Campagrina (805 m a.s.l.), 1970 (Lanza & Azzaroli, 1970; skin and skull, Museo Zoologico "La Specola", Firenze, n. 6442).

A field research was conducted in 1998 by the Florence Natural History Museum staff in the area between Mt Corchia and Mt Sumbra, about 4 km SE from Passo del Vestito. 139 specimens of small mammals belonging to seven species were captured using pitfall-traps and Sherman traps, with monthly catches from April to October in three different localities located at altitudes respectively of 850, 1100 and 1250 meters. No snow vole specimens was detected, but the first report of *Neomys fodiens* from the Apuan Alps area was reported (record included in the CKmap project by Ruffo & Stoch, 2006).
In the Apennines, the rarity of the available reports and the difficulties encountered in capturing this species compared to that of other small mammals, attest the difficulty in defining the distribution and consistency of its populations.
Our observations conducted in the municipality of Seravezza represent a verified update on the presence of *C. nivalis* in the Apuan Alps.
In the light of the difficulties in finding and identifying voles, the contribution of naturalistic photography, by people either specialized or not in small mammals,

Figure 2. The environment at the sighting area.

Figure 2. Photo shoot of the snow vole (*Chionomys nivalis*).

is usually negligible, but *C. nivalis* represents an exception. In the same way, for example, the species has also been reported on Monte Greco, in Abruzzo (Nappi *et al.*, 2007).

We know that, unfortunately, the environmental research is one of the first penalized activity during an economic crisis. Thus, in these hard times, some strategies have recently been analyzed to continue contributing to the knowledge of mammals even in inexpensive ways (Cagnacci *et al.*, 2012); the approach used in the present work, at least for some species, can be useful and successful.

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