

## Pygmy white-toothed shrew *Suncus etruscus* recorded in the Southern Alps of Slovenia

Běložubka nejmenší (*Suncus etruscus*) nalezena v jižních Alpách Slovinska

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**Abstract.** Three new records of *Suncus etruscus* in Slovenia have shifted the known border range northwards. Of a particular interest is the record made at Ladrski vrh near Kobarid, which is already within the southern fringes of the Alps. Mediterranean climate spreads deep into the Alps along the Soča valley where Ladrski vrh is located, enabling dispersion of some thermophilic plants and animals. The record of *S. etruscus* in the Alps is thus within the framework of a broader biogeographic pattern and does not violate any of the climatic borders proposed so far as the limiting factor of the species' distribution range.

### INTRODUCTION

In Europe, the pygmy white-tooth shrew *Suncus etruscus* (Savi, 1822) is restricted to the Mediterranean coasts (SPITZENBERGER 1990). No matter of this, it is also capable of penetrating deeper inland both in Europe (FONS 1984, VOHRALÍK & SOFIANIDOU 2000) as well as in some other regions of the western Palearctic (SPITZENBERGER 1970, KRYŠTUFEK & VOHRALÍK 2001). Various authors found simple climatic variables to be a good predictor of the species' range (but see SPITZENBERGER 1990 for exceptions): mean yearly isotherm of 12 °C (KAHMANN & ALTNER 1956, POPOV & NIJAGOLOV 1991), July mean temperature of 20 °C (FAYARD 1984), or 0 °C isotherm of the coldest month (LIPEJ & KRYŠTUFEK 1991, STOJANOVSKI 1998). The extant to which the species is approaching the Alps, the main mountain chain separating the Mediterranean region from central Europe, is poorly documented. MEYLAN (1966) reports a single specimen from Tessin in Switzerland which, however, was possibly translocated there from the nearby Italy (GENOUD 1995).

### RECORDS

Since the publication of the pygmy white-toothed shrew's distribution in Slovenia and adjacent regions (LIPEJ & KRYŠTUFEK 1991), several new records have shifted the known range border further north and away from the Mediterranean coast (Fig. 1). The find of an owl pellet specimen in central Slovenia (2 km east of Ljubljana; KRYŠTUFEK & TOME 1997), which has not been repeated ever since, might be due to a migrating owl. However, the newly collected specimens impose no doubt regarding collecting spots. The records from Hum and Ozeljan, reported for the first time in this paper, are still within the submediterranean vegetation belt (as defined by WRABER 1970), and approximately at the same latitude as the northernmost records in the adjacent eastern Italy (LAPINI et al. 1995). Two specimens obtained in August / September

2002 at Ladrski vrh have shifted the range further north, into the Alps themselves. Both specimens were obtained at 350 m above sea level, i.e. within the elevation range reported for the species by VOHRALÍK & SOFIANIDOU (2000). In spite of the low elevation of Ladrski vrh, this place is less than 5km away from the nearest Alpine mountain peaks of >1000 m. The locality is from the Soča (Isonzo) valley, along which warm climate penetrates deep into the Alps. Consequently, the mean January temperature of 0 °C seemingly continues to be a good predictor of the pygmy white-toothed shrew in this part of Europe (cf. Fig. 1).

## DISCUSSION

A number of thermophilic species, widespread in warm karst meadows and in thicket vegetation along the north-eastern Adriatic coast, follow the Soča River as far north as its spring. These

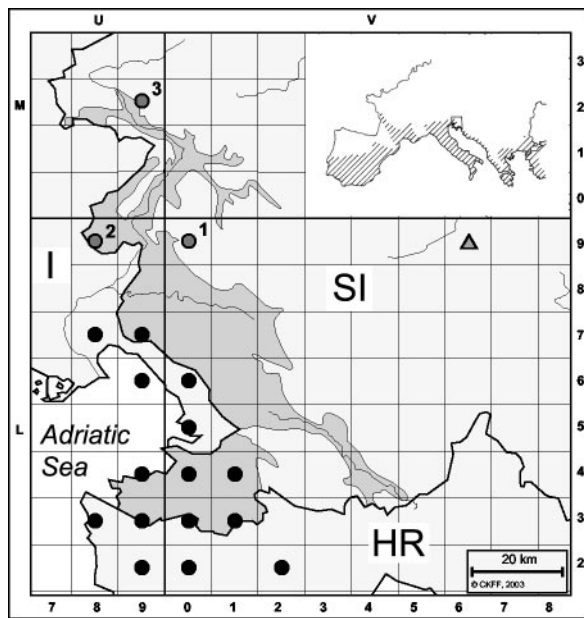


Fig. 1. Distribution of *Suncus etruscus* in Slovenia and adjacent regions of Italy and Croatia. Based on data by LIPEJ & KRYŠTUFEK (1991) and QUADRACCI (1998/99). New records: 1 – Hum (220 m a. s. l.); 2 – Ozeljan, the Lijak spring (130 m); 3 – Ladra, Ladrski vrh (350 m). Triangle indicates uncertain occurrence near Ljubljana, based on an owl pellet record (KRYŠTUFEK & TOME 1997). Area of Slovenia above the 0 °C January isotherm is shaded. Insert shows the position of the study area with a tentative distribution of the pigmy white-toothed shrew. SI – Slovenia; HR – Croatia; I – Italy.

Obr. 1. Rozšíření běložubky nejmenší (*Suncus etruscus*) ve Slovinsku a sousedících oblastech Itálie a Chorvátska. Na základě údajů LIPEJE & KRYŠTUFKY (1991) a QUADRACCIHO (1998/99). Nové nálezy: 1 – Hum (220 m n. m.); 2 – Ozeljan, pramen Lijak (130 m); 3 – Ladra, Ladrski vrh (350 m). Trojúhelník označuje neurčitý výskyt u Lublaně, dokumentovaný nálezem ve vývržku sovy (KRYŠTUFEK & TOME 1997). Území Slovinska nad 0 °C lednovou isothermou je rastrována šedě. Vsunuto je schema posice studovaného území a dosavadní rozšíření běložubky nejmenší. SI – Slovinsko; HR – Chorvátsko; I – Itálie.

include vascular plants (*Ruscus aculeatus*, *Athamanta turbith*, *Campanula pyramidalis*, *Ceterach javorkeanum*, *Iris pallida*, *Micromeria thymifolia* etc., BECK 1913) and birds (*Luscinia megarhynchos*, *Emberiza circlus*, *E. cia*, *E. hortulana*; GEISTER 1995) to mention just a few. The occurrence of several thermophilic species in the upper part of the Soča valley is known to be only temporary, e.g. *Cephalaria leucantha* in the Trenta valley (PRAPROTNIK 1985) and *Monticola solitarius* nesting near Bovec (J. GREGORI in litt.). It is also noteworthy that, during the first invasion of the jackal (*Canis aureus*) to Slovenia in 1952 / 1953, one specimen was killed in the Soča valley not far from Kobarid (KRYŠTUFEK & TVRTKOVIĆ 1990). It is thus beyond doubt that the presence of the pygmy white-toothed shrew on the southern fringes of the Alps is part of a broader pattern. When GHIDINI (1911) comments on the pygmy white toothed shrew, which he presumably obtained from Porlezza in Ticino (record, however, is doubtful; P. VOGEL in litt.), he considered it as part of a broader pattern shared also by other Mediterranean species.

## SOUHRN

Tri nové nálezy bělobuzky nejmenší (*Suncus etruscus*) ve Slovinsku posunuly na sever známou hranici jejího areálu rozšíření. Nejvýznamnější je nález z Ladrského vrhu u Kobaridu, který je už v jižním dosahu Alp. Středomořské podnebí zasahuje hluboko do masivu Alp údolím Soče, kde leží Ladrski vrh, a umožňuje výskyt několika termofilních druhů rostlin a živočichů. Nález *S. etruscus* v Alpách neporušuje tedy hranice hrubého biogeografického členění vymezené podnebí, které je považováno za limitující faktor areálu rozšíření druhu.

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