Abstract

Member of the genus *Sicista* rank among the rarest and the least known European mammals. They exhibit a number of outstanding specificities (hibernation, aestivation etc.) and extreme capability of a rare range dynamics. Their fossil record is fragmentary and associated with numerous controversies. The present thesis summarizes results of a detailed revision of the fossil record of *Sicista* from Czech Republic, Slovakia and some other countries. It comprises of about 150 items of the Holocene and Vistualian age as well as from the Middle and Early Pleistocene including earliest records from MN17/Q1 boundary and type material of *S. praeloriger* from Q1 Betfia. Compared to a sample of extant population, variation dynamics of both metrical and nonmetrical dental traits was examined in details with particular attention to phenotype patterns of particular fossil samples. The results demonstrated extensive amount of both within- and between-population variation and rather limited validity of commonly used discrimination criteria of extant clades. Nevertheless, we succeeded in species identification of considerable part of numerous Holocene and Vistulian records which revealed (i) a range expansion of *S. subtilis s.l.* during MIS 3 with persistent distribution in lowland regions of Central Europe in the Late glacial, (ii) an extensive range expansion of *S. betulina* during the late Vistualian and particularly the Preboreal and early Boreal when it colonized most regions of Central and Western Europe, and (iii) extensive local extinctions and range regression with woodland expansion since the late Boreal.

A critical comparison of our own results with further European fossil record of the genus revealed then that: (i) The genus *Sicista* colonized European range first simultaneously with a range expansion of *Microtus* along MN17/Q1 boundary. (ii) The dental phenotype of these and other Q1 items (including type of *S. praeloriger*) shows a broad variation combining dental patterns characterizing both the extant clades. (iii) In a good agreement with results of molecular analyses (Lebedev et al. 2019) the respective form (*S. praeloriger s.str*.) can be looked upon as a common ancestor of *betulina* and *subtilis s.l.* (incl. *severtzovi, loriger, trizona*). (iv) The combinations of dental characters typical of extant *betulina* and *subtilis s.l.* seem to establish (perhaps simultaneously with divergent habitat preferences of these clades) during the Early-Middle Pleistocene transition along Q2/Q3 boundary (MIS 22-14). (vi) At least in some stages of the Middle Pleistocene both clades colonized considerable part of Europe probably with locally surviving relics populations. (vii) The extensive range expansion of *S. betulina* in early Holocene followed by complete extinction of the genus in western Europe can be attributed to the specific features of the present cycle faunal history, eventually.

Key words: *Sicista*, dentition, phenotype dynamics, Pleistocen, Pliocen, Holocen, range dynamics