

New results in the study of Hungarian Plio-Pleistocene cricetids

János HÍR

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Abstract. This paper gives some results of the revision Hungarian *Cricetinus*, *Allocricetus* and *Cricetus* with which the author is presently concerned.

János Hír, Municipal Museum, 3060 Pásztó, P. O. B. 15, Hungary.

I. INTRODUCTION

Cricetids are of general importance to the biostratigraphy of the late Neogene. In Hungary, Mio-Pliocene material has recently been discussed by KORDOS (1986, 1987, 1992; FREUDENTHAL & KORDOS 1989). Up till now, uppermost Neogene and Pleistocene finds have been relatively neglected by Hungarian workers, since, from a stratigraphic point of view, the cricetids of this period are of secondary importance to the arvicolids. For a long time, the dental morphology of the different hamster species was regarded as uniform (KRETZOI 1941) and the minor morphological characters were not studied.

The present author has tried to study the metrical and morphological characters of the Hungarian Plio-Pleistocene "small sized" hamster material. In the course of this work I have investigated the *Allocricetus* material from the Tarkő Rockshelter (Hír 1989), the Hajnóczy Cave (Hír 1992a) and Villány 3 and Osztamos 3 (Hír 1993a). I reinvestigated the *Cricetus cricetus nanus* finds from Betfia 2, Osztamos 8 and Osztamos 14 (Hír 1994b) and I described the *Cricetinus beremendensis* n. sp. from Beremend 15. (Hír 1994c). This work is still in progress.

II. METHODS

I have followed PRADEL (1981a, b, 1988) in the measurements taken and for the most part also in the statistical methods used in the analysis.

In the morphological treatment I have followed the nomenclature of FAHLBUSCH (1964) and MEIN & FREUDENTHAL (1971). In special cases I have created new odontomorphological terms.

III. THE *CRICETINUS* PROBLEM

The type species of this genus, *Cricetinus varians* ZDANSKY, 1928, was described from the Middle Pleistocene fauna of Chou-kou-tien, China. KRETZOI (1959) described *Cricetinus euro-*

paeus from the Pliocene fauna of Csarnóta 2. The great geographic distance and age difference between these taxa makes the identification of the finds from Csarnóta disputable in spite of the morphological similarity.

There are only a few available teeth of *Cricetinus europaeus*. Only the holotype (3 molars) was described and figured by KRETZOI (1959, 1962) and reinvestigated by KORDOS (1987), but in my study of the material from Csarnóta 2 I found some additional materials.

Hír (1994c) described *Cricetinus beremendensis* n. sp. from the Lower Villanyian (MN 16a) fauna of Beremend 15, excavated by JÁNOSSY (1987, 1990, 1992). This new species differs from *Cricetinus europaeus* in its smaller size (except m1 which is of equal size). The morphological differences are as follows:

	<i>Cricetinus europaeus</i>	<i>Cricetinus beremendensis</i>
M1	2 specimens have a short mesoloph	no mesoloph
M2	no morphological difference	
M3	all the 3 specimens have a mesoloph	no mesoloph
m1	anterolophulid well developed	anterolophulid well developed in 23%, weakly developed in 57 %, absent in 20 %
m2	5 specimens have a mesolophid	mesolophid developed in 15 %
m3	No morphological difference	

The most characteristic generic character of *Cricetinus* is the undivided anteroconid of the m1. In the material from Beremend 15 the frequency of wholly undivided anteroconids is 69%, while 31% of m1 have slightly divided anteroconids. In this case, the division is visible only on the distal (posterior) surface of the anteroconids. On this basis, we can distinguish *Cricetinus* from *Allocricetus* and *Cricetulus*, where the anteroconid is always well divided. Other statistical morphological differences were found in the frequency of the parastyle of M1, in the posterior metalophule of M2 and in the mesolophid of m2.

Cricetinus beremendensis was also found in the material from Csarnóta 4 (previously identified as *Allocricetus* (?) sp. by KRETZOI 1962).

In the fauna of Osztramos 7, a well founded determination of the small sized cricetids is impossible in the absence of any m1 and we must regard them as Cricetinae indet. JÁNOSSY (1973) published this material as *Cricetinus* cf. *europaeus* or *Cricetinus* sp. (JÁNOSSY 1978, 1979, 1986).

In Hungary the locality Beremend 15 has produced the richest material of cricetids in MN 16. These finds belong to a single species, which differs from *Allocricetus* and which is closer to the *Cricetinus* of Csarnóta 2. *Cricetinus* seems to represent an independent evolutionary lineage in Hungary in MN 15 and 16.

IV. STUDIES OF *ALLOCRICETUS*

In numerous Hungarian faunas *Allocricetus ehiki* SCHAUB, 1930 and *Allocricetus bursae* SCHAUB, 1930 have not been properly distinguished. JÁNOSSY (1979, 1986) separated the two species according to a stratigraphic scheme. He recorded the first appearance of *A. bursae* in the fauna of Osztramos 8 and identified all older *Allocricetus* finds as *A. ehiki*. In the Plio-Pleistocene faunas of Poland, FAHLBUSCH (1969) verified the coexistence of the two species. His results were later confirmed by PRADEL (1988) on the basis of new material.

Hír (1989, 1992a) verified the presence of *A. ehiki* alongside *A. bursae* in the material of Tarkő Rockshelter and Hajnóczy Cave. The cricetid finds of Villány 3 are homogeneous and belong to *A. ehiki*. The first tendency to a bimodal distribution of *Allocrietus* teeth is visible in the material of Osztramos 3 (Hír 1993a).

In the sequence from Tarkő Rockshelter, the last appearance of *A. ehiki* can be observed in layer no. 8. From the 7th layer of Tarkő up to the fauna of the Lambrecht Cave (Varbó phase = Eemian) *Allocrietus* is represented only by *A. bursae* (Fig. 1).

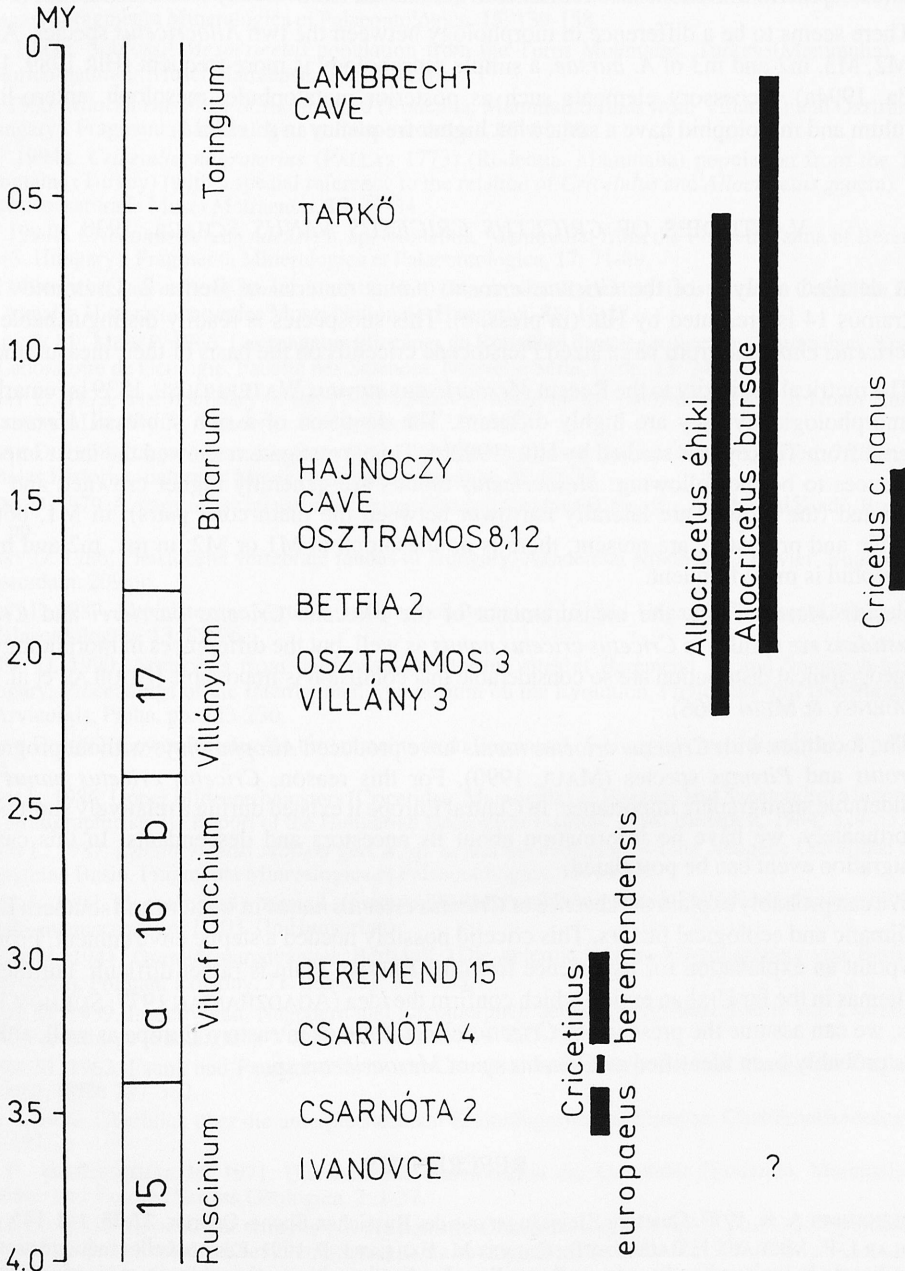


Fig. 1. Stratigraphic ranges of the cricetid species studied.

The metrical differences between the two *Allocricetus* species in Hungary correspond to the results of PRADEL (1988). The rich Hungarian material also forms a good basis for statistical morphological investigations. Among the teeth of Villány 3 and Osztramos 3 there are a few molars with an ancestral morphology: presence of a mesoloph in M1, undivided or 3-partite anteroconid and mesolophid in m1. These features are completely absent in the younger populations, but are frequent in the genus *Kowalskia* and in other Miocene and Pliocene cricetids (e. g., KORDOS 1987; FREUDENTHAL & KORDOS 1989; WU 1991). The high frequency of the antero-lingual cingulum and mesolophid in m2 -m3 is also remarkable in material from Villány 3 and Osztramos 3.

There seems to be a difference in morphology between the two *Allocricetus* species. Among the M2, M3, m2 and m3 of *A. bursae*, a simple morphology is more frequent (Hír 1989, 1992a, 1993a, 1994a). Accessory elements such as posterior metalophule, mesoloph, antero-lingual cingulum and mesolophid have a somewhat higher frequency in *A. ehiki*.

V. STUDIES OF *CRICETUS CRICETUS NANUS* SCHAUB, 1930

A detailed analysis of the *Cricetus cricetus nanus* material of Betfia 2, Osztramos 2 and Osztramos 14 is presented by Hír (in press, c). This subspecies is readily distinguishable from *Allocricetus ehiki* and from large sized Pleistocene cricetids on the basis of their measurements.

The metrical similarity to the Recent *Mesocricetus auratus* WATERHOUSE, 1839 is remarkable, but morphologically they are highly different. The dentition of a rich subfossil *Mesocricetus* material from Turkey was studied by Hír (1992b). This investigation showed the most important differences to be the following: *Mesocricetus* molars are generally higher crowned and better segmented (the crowns are laterally narrower between the main cone pairs); in M1, both the parastyle and protostyle are present; there is no mesoloph in M1 or M2; in m1, m2 and m3 the mesolophid is more frequent.

Beside *Mesocricetus*, the measurements of the Pliocene *Cricetus barrierei* and *Cricetus angustidens* are similar to *Cricetus cricetus nanus* as well, but the differences in morphology, age and geographical distribution are so considerable that confusion is impossible (AGUILAR et al. 1991; HUGUENEY & MEIN 1966).

The localities with *Cricetus cricetus nanus* have produced *Allophaiomys* without progressive *Microtus* and *Pitymys* species (MAUL 1990). For this reason, *Cricetus cricetus nanus* is of considerable stratigraphic importance. In Central Europe it existed during a relatively short period. Unfortunately, we have no information about its ancestors and descendants. In this case, an immigration event can be postulated.

We can probably explain the absence of *Cricetus cricetus nanus* in western and southern Europe by climatic and ecological factors. This cricetid possibly needed a steppe environment. From this viewpoint an explanation for its absence from the Russian Plain is rather difficult, but there are two faunas in the far Uralian region which confirm the idea (AGADZHANIAN 1977; SUKHOV 1970). Thus, we can assume the presence of *Cricetus cricetus nanus* in eastern Europe as well, although it has probably been identified as *Cricetus* sp. or *Mesocricetus* sp.

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