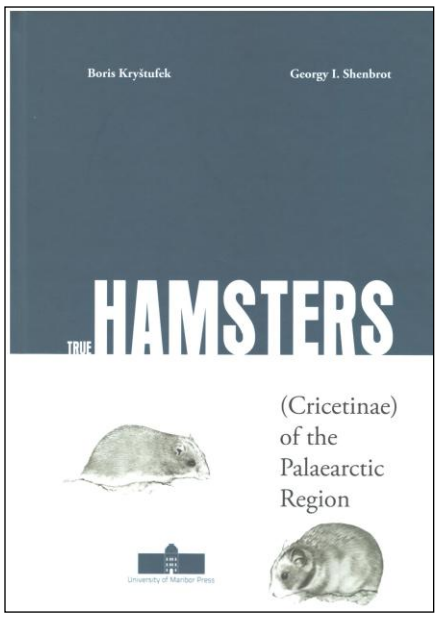
BOOK REVIEW

Boris KRYŠTUFEK, Georgy I. SHENBROT, 2025. *True Hamsters (Cricetinae) of the Palaearctic Region*. University of Maribor Press, Faculty of Natural Sciences and Mathematics, Slovenia, 120 figures, 183 pages.



One of the five classes of vertebrates – Mammalia with approximately 5,500 species is in turn divided into 26 orders. The order Rodentia includes approximately 36% of the species in the entire class. Hamsters are part of the subfamily Cricetinae (true hamsters) of which 19 species belonging to seven genera in the Palearctic bioregion are recognized.

According to authors, the Holarctic voles and lemmings (Arvicolinae subfamily) include 128 species, while the „true hamsters" (Cricetinae) „*are endemic to the Palaearctic realm*". Even if Cricetinae and Arvicolinae are closely related, there are some important differences in their morphology, physiology, ecological role in preferred ecosystems and in their relations to human economy. Printing this volume, the authors promote the continuity between the earlier taxonomy based on morphological characters with delimitation of hamster species based on karyology (genetical variability) and based on current DNA – aided vole phylogenetic reconstructions.

Both authors are very active scientists in mammalogy movement in Europe and on other continents and have impressive contributions to morphological description of different mammal species with keys of identification for varied taxons, mapping of distribution of European and Asian mammal species. In this respect, visits to 27 museums and collections, mainly for the study of hamsters, are telling. They have compiled hamster distribution maps based on data recorded from more than 12,599 localities and for this volume alone they have consulted over 700 scientific articles, monographs, reviews. From the Preface and the section with thanks addressed to specialists (too many to be mentioned) and from the List of

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institutions (27) holding scientific collections, we understand the significant effort invested by the authors, in examining the respective collections, in acquiring photographs of type specimens and prototypes of real hamsters or of individuals of rare, melanic species preserved as wet preparations and stuffed.

After a short history of taxonomy and nomenclature, starting with the 12th edition of **Systema Naturae** (Linnaeus, 1758), continuing with Pallas (1773 and 1779), Erxleben (1777), Leske (1779), with a special mention of the first synthesis of all hamsters published by Johan Friedrich Gmelin (1792 and 1805). Up to him, "*hamsters have pouches in the cheeks, and a short hairy tail*" *or* "*les rats à pochettes dans la bouche*". According to Milne Edwards (1834), Desmarest (1820) and Cuvier (1817) hamsters were diagnosed by their complete clavicle ("rongeurs clavicules"). Waterhouse (1839b) diagnosed hamsters by a curved mandibular corpus and the angular process raised above the line of symphysis. The concept of family group name Cricetinorum for true hamsters to Fisher (1817). Gray (1825) named the family Cricetidae and Murray (1866), and Winge (1887) named subfamily Cricetinae. After Illiger (1811, Gray (1821), Gervais (1854 and 1859), Blasius (1857), Fitzinger (1867), Alston (1876) the genus *Cricetus* was classified as member of Muridae. However, hamster family continued to contain a number of genera, tribes add subfamilies which now are classified into Calomyscidae family, later as Muridae, Spalacidae and Nesomyidae. Simpson (1945) attributed 57 genera to the subfamily Cricetinae, while other authors recognized up to 66 genera. Therefore, Ellerman (1941) considered Cricetidae family, "*the most difficult group of all living Rodents to arrange in any natural order*", while Rinker (1954) mentioned "*... the confusion and disagreement which exist in regard to the interrelationship of the cricetine genera*". The most embarrassed taxonomic question for many taxonomists of the 20th century was interrelationships between true hamsters and the Nearctic hamsters like rodents and the mouse-like hamster species of *Calomyscus*. This genus was included in the Cricetinae subfamily as a closest relative to true hamsters, classified into the new family Calomyscidae with the only recent genus mentioned above. Finally, Ellerman (1941) and Vorontzov 1959a, b) mentioned that no one cricetid genus was with Holarctic distribution. This opinion is confirmed by molecular biology techniques of DNA sequencing. Argyropulo (1933b, c) recognized genera: *Cricetus* (with *Mesocricetus* as a subgenus); – *Phodopus*; – *Cricetulus* (with *Allocricetulus* and *Tscherskia* as subgenera). Currently, the hamsters are classified in the Cricetinae subfamily and three hamsters were considered as Cricetini tribe. Considering the molecular biology investigations since last 20 – 30 years ago, the author of the analyzed volume classified the major hamster lineages as **tribes**:

1. **Cricetini**, with *a* – subtribe Cansumyina – Cricetini with only one monospecific genus – *Cansumys* and *b* – subtribe Cricetina with 5 genera (*Tscherskia*, *Cricetulus*, *Notocricetulus*, *Allocricetulus* and *Cricetus*) for 9 species.

2. **Mesocricetini** with only *Mesocricetus* genus for 4 species.
3. **Urocricetini** with *a* – subtribe Urocricetina with only *Urocricetus* genus for two species and *b* – Phodopina with two genera (*Phodopus* and *Cricetiscus*) for 3 species.

The authors mentioned that from geographical point of view, true hamsters are exclusively a Palaearctic group, with distribution only in temperate parts of Europe and Asia. Paleontologically, in Neogen and Quaternary, hamsters existed in the Palaearctic Africa. On the other hand, along the elevational gradient, hamsters are living from below sea level (*e.g.* in Caspian Depression) up to more than 5,000 m, but half of number of species area distributed between 1,703 – 3,243 m altitude. For Romanian Cricetinae fauna is important to remember that *Cricetus cricetus*, *Mesocricetus auratus* and *M. newtoni* are distributed to lower altitude, below 1,0000 m.a.s.l. Main characteristics of true hamsters reffer to:

– well developed internal pouches;
– a mid-ventral specialized sebaceous gland in the ombilical region;
– rooted, tubercular and brachyodont molars with cusps arranged in two longitudinal row;
– a pair of anteroconids/anteroconulids in 1st upper molar (M^1);
– a high and falcate coronoid process;
– a reduced fibula fused with the tibia on its distal end;
– a two chambered stomach consisting of a corneous forestomach and glandular stomach;
– a primitive pattern of cephalic arterial supply system with stapedial artery preserved in its entirety.

After external morphology, skin derivatives, characteristics of penis and os genitale/penian bone, skull, dentition of all hamsters there is a List of abbreviations, followed by systematic part of tribes and subtribes with etimology of genera names – usually eponyms of well-known scientists –, distribution illustrated with maps, caharcteristics of each species, variation and subspecies – followed by synonyms, etymology, taxonomy, distribution and characteristics.

According to authors' evaluation, "*The most significant original contribution is perhaps revision of the family-group taxa with naming two new subtribes and two new tribes*".

In the final Abstract, it is remembered that this small subfamily (Cricetinae) includes only 19 species, which are endemic to the Palaearctic Region. However, the readers are familiar with hamsters, primarily knowing them as pets, experimental laboratory animals and species of conservation concern. All information from the volume provides an authoritative and up-to-date taxonomic guide to the animal group, which is of great interest to experts and amateurs engaged in medical zoology, epidemiology, biostratigraphy, zooarchaeology, evolutionary research, population ecology, animal systematics, biodiversity conservation, museum scientific

collection management and many other biological subdisciplines. The book's text is rich supplemented by 120 images and 728 titles of references. An index to the technical names is included on pages 177–182. We can say that this book "*True Hamsters (Cricetidae) of the Palaearctic Region*" should be found in each personal library of each people interested about the above-mentioned scientific disciplines and about pets.

Dr. Dumitru Murariu
Calea Victoriei No. 125, 010071, Sector 1
Bucharest, Romania