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Fossils from the vault: Central Asian Paleogene insectivorous mammals in Russian collections

Alexey V. Lopatin 2005. Early Paleogene insectivore mammals from Asia and establishment of the major groups of Insectivora. *Paleontological Journal* 40 (Supplement to No. 3): 205–405.

Through a series of expeditions in the 20th century, Russian paleontologists, often in collaboration with local scientists, discovered numerous early Paleogene (Paleocene–middle Eocene) localities in Central Asia and collected thousands of fossils. Many of their initial publications focused on the large-bodied mammals from these faunas, and many small mammals, including insectivorous species, remained unstudied. Now a new generation of talented Russian paleontologists is taking another look at these collections, many of which are virtually unknown to Western scientists. In "Early Paleogene Insectivore Mammals of Asia and Establishment of the Major Groups of Insectivora", Alexey Lopatin presents the first comprehensive study on the taxonomy and distribution of fossil Asian insectivorous mammals from Mongolia, Kazakhstan, and Kyrgyzstan. This publication is staggering in its breadth and thoroughness, and will be of interest to those working on insectivorous mammals, faunal change at the Paleocene/Eocene boundary, and the correlation of Asian mammal faunas to those on other continents.

This monograph builds upon more than 20 publications published by Lopatin and co-authors in the past ten years, and relevant information from these publications, including diagnoses and illustrations, are included here. More importantly, 9 new species are described, 3 new subfamilies are named, and new fossils are described of the cimolestids *Naranius infrequens* and *Tsaganius ambiguus*, the nyctitheriids *Oedolius perexiguus* and *Praolestes nanus*, the sarcodontines *Sarcodon pygmaeus* and *Hyracolestes ermineus*, and the didymoconid *Kennatherium shirense*. All the material described consists of teeth, dentaries, and partial maxillae, with the exception of the skull of the didymoconid *Archaeoryctes euryalis* (first published in 1999) and humeri and ulnae of four species of didymoconids. Although apomorphic and plesiomorphic characters are not distinguished in the diagnoses, a comparison section clearly supports the validity of each taxon.

This work is divided into five chapters. The first describes the localities that yielded the fossils studied by the author, presents new classification schemes for upper and lower teeth, and provides lists of small mammals from each of the Asian land mammal faunas. The classification scheme for upper teeth builds upon previous systems and features several improvements. True zalambdodont teeth are divided into two groups that represent independent acquisitions of this morphology: euzalambdomorphy, which lacks a protocone, and parazalambdomorphy, which retains a protocone and usually a small hypocone. A new tooth type, protodilambdomorphy, is designated for taxa that have a nearly straight centrocrista joining a paracone and metacone. While I agree that this morphological group merits naming, it is somewhat of a misnomer because the labial crests in these teeth do not form a lambda shape.

The most useful feature in chapter 2 is a comprehensive table of new and previously named genera and species with key references and stratigraphic and geographic occurrences. The systematic paleontology is presented in chapter 3, and the lower level taxonomic judgments found here are sound with well-written diagnoses. Nine new species, belonging to nine new genera, are erected. Of the nine, *Ordolestes ordinatus* is among the most significant because it extends the record of Plesiosoricidae by 6 Ma to the base of the Eocene. *Bumbanius*, which was placed in the Asionyctiinae by Missiaen and Smith (2005), is here placed with *Praolestes* in Praolestinae, a new subfamily of nyctitheriids. The other new subfamilies named in this work are Asiapternodontinae (monogeneric and monospecific) and Kennatheriinae (Didymoconidae), including *Zeuctherium*, *Kennatherium*, and *Erlikotherium*. My only major point of disagreement with chapter 3 concerns the continued referral of zalambdodont upper teeth to *Nuryctes alayensis* (following Lopatin and Averianov 2004). While possible, it seems much more likely that these specimens represent a new species of apternodontid, instead of a palaeoryctid, based on the vestigial metacone, far lingual paracone, and the greatly reduced protocone.

The fourth chapter presents an ecological analysis of insectivorous mammals, with the most important contribution being a table with estimates of body size for all species in the systematic paleontology section. Chapter 5 discusses the evolutionary history of insectivorous mammals, but the higher-level taxonomy presented there is out-of-step with a growing consensus based on molecular data that places Chrysochloridae and Tenrecidae in Afrotheria and Soricidae as more closely related to Erinaceidae than to Talpidae. A more nested position for Erinaceidae is particularly important because it changes the optimizations of several morphological characters, thus potentially affecting the phylogenetic positions of the extinct groups of Geolabididae, Nyctitheriidae, and Micropternodontidae. Given the growing acceptance of the molecular topology among morphologists, the higher-level phylogeny of insectivorous mammals presented by Lopatin will likely have to be revisited.

This work is without doubt the standard reference for insectivorous mammals from Asia. Now that these important specimens in Russian collections have been published, the onus is on paleontologists from around the world to give this publication the attention it deserves. Given that both large and small-bodied mammals were dispersing across northern continents during the Paleogene, this work, and the findings therein, will almost certainly have a far-reaching and lasting impact.

References

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Jonathan H. Geisler [geislerj@georgiasouthern.edu], Department of Geology and Geography, Georgia Southern University, Statesboro, GA 30460-8149.