

Plio-Pleistocene fossil from caves and fissure fillings of Thailand

YAOWALAK CHAIMANEE

Abstrak (Abstract)

The main objective of this work was to contribute to the understanding of the evolutionary history of the rodents of Thailand during the last 3 million years (Late Pliocene-Pleistocene) and to the knowledge of the environmental changes that occurred in that area. Twenty rodents localities were discovered all over the country, from fissure fillings and from caves, and their content was studied. 41 species were identified, 30 Murinae among which two new genera, *Ratchaburimys* and *Prohadromys*, and 7 new species, which are described, and 11 Sciuridae, including 6 flying squirrels. Most fossil species could be identified as belonging to extant species still living in Thailand or in adjacent countries, either in Indochina or in Sundaland. Some important changes in species distributions through time could be demonstrated. As we could use only molar characters for the identification of these fossils, we tested the value of our characters in the light of phylogenetic analysis. Using cladistic analysis, we propose therefore several original phylogenetic relationships between these Southeast Asian fossil and extant rodents. The taxonomic knowledge and the changes in community composition and in species distributions which occurred through time allowed us to build up the frame of a biochronological scale that will allow the date Plio-Pleistocene terrestrial deposits in Southeast Asia by using fossil rodents. A variety of quantitative methods have been used, as multivariate statistical analysis, parsimony analysis method and probabilistic similarity index, to justify on a more rigorous basis our qualitative interpretations. This relative chronology is tentatively calibrated on the availability of a few absolute ages as Uranium/Thorium dates from calcite. Important changes in the composition and in the distribution of species pinpoint to the importance of climatic changes during the Plio-Pleistocene in Thailand. Until now, only data relative to the Holocene were available from that country. The fossil rodents show that during the Latest Tertiary, there was a significative amount of grasslands by comparison to the present day, indicating stronger seasonality. Since that time, climate seem to have become wetter with less seasonality and evergreen forests have become progressively more widespread over the country. In Snake Cave, more than 130,000 years ago, during Late Middle Pleistocene times, the climate was wet and cooler than today, and the rodent composition indicate a downwards shift of at least 1,000 meters in vegetational zones. We relate this development of evergreen forests to the radiation of the genus *Rattus*, whose species become more and more numerous through the Plio-Pleistocene. Also, the climatic history seems in good agreement with some climatic global models which correlate cooling and increasing humidity through Plio-Pleistocene in Southeast Asia to the uplift of Tibet plateau.



STEPHANE DUCROCQ

YAOWALAK CHAIMANEE

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