

Original article

A new interpretation of the Miocene rodent faunas from Comănești 1 and Tauț (W-Romania)[☆]

*Une nouvelle interprétation des faunes de rongeurs de Comănești 1 et de Tauț
(Roumanie de l'ouest)*

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Received 30 April 2010; accepted 14 January 2011

Available online 24 February 2011

Abstract

The rodent faunas from the Comănești 1 and Tauț localities (Western Romania) are revised in light of the latest taxonomical, biostratigraphical and palaeoenvironmental information. The main systematic results show that the two cricetid rodents *Megacricetodon crisiensis* and *Democricetodon iazygum* are invalid, whereas *Democricetodon zarandicus* is retained. The original assignment of the cricetodontini remains from Tauț to *Hispanomys* is emended, as a relationship to *Byzantinia* is more likely. While the geological evidence suggests that the localities are late Middle Miocene (Upper Volhynian–Bessarabian, late Sarmatian *sensu stricto*) in age, the association of *Myoglis ucrainicus* with *Muscardinus hispanicus* rather argues for an MN9 correlation for Tauț. Indeed, uncertainties and discontinuities in the Central and East European mammalian biostratigraphy render any conclusion about the correlation of the localities to the MN “zonation” problematic. The high diversity of squirrels (five genera), as well as the presence of a pliopithecoïd alongside, glirid and eomyid rodents, suggest a forest environment at the time of accumulation of the Tauț fauna, which is in agreement with the indication of humid climate provided by ectothermic vertebrates.

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Keywords: Biostratigraphy; Central Paratethys; Rodents; Miocene; paleoenvironment

Résumé

Une révision des faunes de rongeurs des localités Comănești 1 et Tauț (Roumanie de l'ouest) est réalisée à la lumière des dernières connaissances taxonomiques, biostratigraphiques et paléoenvironnementales. Les principaux résultats systématiques montrent que les deux rongeurs cricétidés *Megacricetodon crisiensis* et *Democricetodon iazygum* ne peuvent être considérés comme valides, alors que *Democricetodon zarandicus* est conservé. L'attribution initiale des Cricetodontini de Tauț au genre *Hispanomys* est corrigée, une relation avec *Byzantinia* étant plus probable. Bien que les informations géologiques suggèrent un âge Miocène moyen tardif (Volhynien supérieur-Bessarabien, Sarmatien tardif *sensu stricto*), l'association *Myoglis ucrainicus* + *Muscardinus hispanicus* est plus compatible avec une corrélation à MN9 pour Tauț. Du fait des discontinuités et des incertitudes liées à la biostratigraphie d'Europe centrale, toute conclusion est rendue fragile en ce qui concerne la corrélation des sites avec la « zonation » MN. La grande diversité des sciuridés (cinq genres) ainsi que la présence d'un plioithécoïde aux côtés de gliridés et d'éomyidés, peuvent être liées à une couverture végétale dense à l'époque de l'accumulation de la faune de Tauț, une proposition en accord avec les données pluviométriques dérivées des vertébrés ectothermes.

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Mots clés : Biostratigraphie ; Parathéthys centrale ; Rongeurs ; Miocène ; Paléoenvironnement

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1. Introduction

Late Middle Miocene to earliest Late Miocene small mammal localities have rarely been reported from Central Europe, and thus the faunal evolution during this period of time remains poorly understood in this area. During the 5th Symposium of the Romanian Palaeontologists in Bucharest (2005), the first author and Márton Venczel therefore took the opportunity to re-study the original fossil material from Tauț and Comănești 1 that is kept in the Speleological Institute of the Romanian Scientific Academy (with the kind permission of the directorship). It became clear already after a first overview, that a detailed and thorough revision was necessary. At the same time, an elaboration of the herpetofauna was completed (Venczel and Știucă, 2008; excluding chelonians). In this paper, we present a taxonomical revision of the rodent faunas, and discuss the consequences of this revision on biostratigraphical and palaeoenvironmental interpretations.

2. Historical and geological settings

2.1. Historical background

The faunas from Comănești 1 and Tauț have an important position in the history of Middle Miocene micromammalian research Europe. Indeed, the original descriptions of fossils from these two localities represent a starting point for the Hungarian and Romanian research in this region (Feru et al., 1979, 1980). During the following three decades, intensive field work was conducted, which provided large collections of Miocene micromammals and small vertebrates in general, that form the basis for the present work (Hír and Kókay, 2004, 2009, 2010; Hír and Venczel, 2005; Hír, 2006; Venczel and Știucă, 2008).

2.2. The localities

2.2.1. Comănești 1

This vertebrate locality is located at the eastern margin of the village Comănești, on the right side of the rivulet Hașmaș. The sediments of the eleven meter-high outcrop crop out in a private yard (GPS: N 46° 30.568', E 22° 02.807; section figured by Istocescu, 1971 and Feru et al., 1980), and are extremely enriched in molluscs. From layer 21, which contains continental vertebrates, Feru et al. (1980) listed *Cardium vindobonense vindobonense*, *C. latisulcum latisulcum*, *C. gracilicostatatum*, *Ervilia dissita podolica* and *Trochus pictus*. This layer belongs to the top of the lower lithological complex of the Sarmatian in the Crișul Alb Basin (*sensu* Istocescu, 1971; Istocescu and Istocescu, 1974) and correlates to the late Volhynian/earliest Bessarabian (Feru et al., 1980) or to the entire *Ervilia* Zone of the Central Paratethys, late Volhynian (Harzhauser and Piller, 2004).

The continental vertebrate fossils collected from the lenses of tufa were initially described by Feru et al. (1980), and subsequently followed by a study of the cricetid rodents with the description of two new species (Rădulescu and Samson,

1988). These authors correlate the fossils to the MN8 (latest Middle Miocene). More recently, Grigorescu and Kazár (2006) described the odontocetes from this locality.

2.2.2. Tauț

This vertebrate locality is located south of the small village Tauț, in the Migieșului Valley (Arad District, Western Romania). The tuffaceous green clay containing *Helix* and *Planorbis* shells was originally reported by Istocescu (1971) and Istocescu and Istocescu (1974). From the microvertebrate material originally described by Feru et al. (1979), the cricetid rodents were emended by Rădulescu and Samson (1988), with the description of *Democricetodon zarandicus* nov. sp. McNulty et al. (1999) reported the lower deciduous premolar of a small-sized Pliopithecoid primate (Crouzelidae gen. and sp. indet.) from the Tauț fauna. The herpetofauna (excluding chelonians) has been described by Venczel and Știucă (2008). During the last decade, Márton Venczel and János Hír tried to rediscover the locality in the field, but have been unsuccessful so far.

Tauț belongs to the middle lithological complex (*sensu* Istocescu, 1971; Istocescu and Istocescu, 1974). Feru et al. (1980) noticed that this complex corresponds to a distal lacustrine facies that was accumulated, at least in its upper part, synchronously with the deposition of the lower lithological complex. Based on the evolutionary stage of the micromammalian fauna, these authors suggest a lower Bessarabian correlation for this locality.

3. Material and methods

The nomenclature of the dental elements follows: Sciuridae: Cuenca-Bescos (1988); Gliridae: Daams (1981); Eomyidae: Engesser (1999); Cricetidae: Mein and Freudenthal (1971); and Rummel (1998) for the special terminology of Cricetodontini and *Eumyarion* teeth. Measurements were taken through a measuring ocular mounted on a MBS 9 stereomicroscope and are given in mm. The micrographs were captured with a Canon Eos 400D digital camera equipped with a Canon MP-E65 mm macro-objective and a Canon MR-14EX macro ring light. Retouches were made by the first author using Photoshop 2 and Photoshop 6.0. Drawings were made using a Zeiss drawing microscope.

4. Systematic palaeontology

Full paleontological descriptions of all identified taxa, as well as the corresponding references, are given in Appendix A. A synoptical overview of the taxon occurrences resulting from the systematic analysis is given in Table 1. In addition, Figs. 1–4 present rodent specimens from the localities Comănești 1 and Tauț.

The main results of our study show that:

- because of the small sample size from Comănești 1, the cricetid rodent *Democricetodon iazygum* is considered as *nomen dubium*;

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