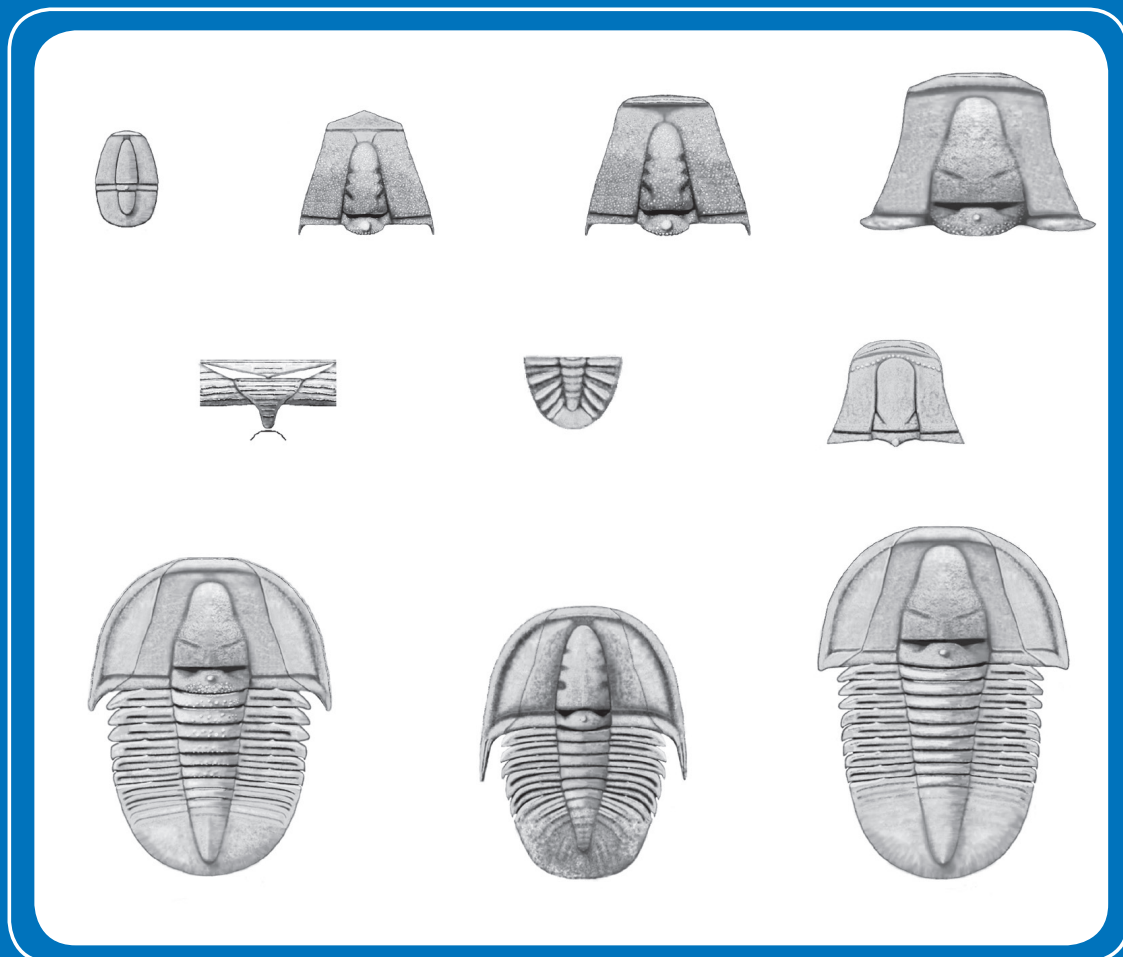


Zitteliana

An International Journal
of Palaeontology and Geobiology

Series A/Reihe A
Mitteilungen der Bayerischen Staatssammlung
für Paläontologie und Geologie

52



München 2012

Zitteliana 52

An International Journal of Palaeontology and Geobiology



Series A/Reihe A

Mitteilungen der Bayerischen Staatssammlung für Paläontologie und Geologie

52

CONTENTS/INHALT

Michael Krings & Thomas N. Taylor	3
Microfossils with possible affinities to the zygomycetous fungi in a Carboniferous cordaitalean ovule	
Martin Basse	9
Revision und Ontogenie des Trilobiten <i>Drevermannia schmidti</i> Richter, 1913 aus dem Oberdevon des Bergischen Landes	
Norbert Winkler	59
<i>Libanocaris annettae</i> nov. sp. (Crustacea: Dendrobranchiata: Penaeidae) from the Upper Jurassic Solnhofen Lithographic Limestones of Eichstätt	
Jérôme Prieto	67
The rare cricetid rodent <i>Karydomys</i> Theocharopoulos, 2000 in the fissure filling Petersbuch 6 (Middle Miocene, Germany)	
Jérôme Prieto	71
Comments on the morphologic and metric variability in the cricetid rodent <i>Deperetomys hagni</i> (Fahlbusch, 1964) from the Middle Miocene of South Germany	
Kurt Heissig	79
The American genus <i>Penetrigonias</i> Tanner & Martin, 1976 (Mammalia: Rhinocerotidae) as a stem group elasmothere and ancestor of <i>Menoceras</i> Troxell, 1921	
Volker Dietze, Volker Dietze, Wolfgang Auer, Robert B. Chandler, Elmar Neisser, Udo Hummel, Norbert Wannenmacher, Gerd Dietl & Günter Schweigert	97
Die Ovale-Zone (Mitteljura, Unter-Bajocium) an ihrer Typuslokalität bei Achdorf (Wutach-Gebiet, Südwestdeutschland)	
Volker Dietze, Axel von Hillebrandt, Alberto Riccardi & Günter Schweigert	119
Ammonites and stratigraphy of a Lower Bajocian (Middle Jurassic) section in the Sierra Chacaico (Neuquén Basin, Argentina)	
In Memoriam Dr. Gerhard Schairer (1938–2012)	141
W. Werner	
Instructions for authors	149

Editors-in-Chief/Herausgeber: Gert Wörheide, Michael Krings
Production and Layout/Bildbearbeitung und Layout: Martine Focke
Bayerische Staatssammlung für Paläontologie und Geologie

Editorial Board

A. Altenbach, Munich
B.J. Axsmith, Mobile, AL
F.T. Fürsich, Erlangen
K. Heißig, Munich
H. Kerp, Münster
J. Kriwet, Vienna
J.H. Lipps, Berkeley, CA
T. Litt, Bonn
A. Nützel, Munich
O.W.M. Rauhut, Munich
B. Reichenbacher, Munich
J.W. Schopf, Los Angeles, CA
G. Schweigert, Stuttgart
F. Steininger, Eggenburg

Bayerische Staatssammlung für Paläontologie und Geologie
Richard-Wagner-Str. 10, D-80333 München, Deutschland
<http://www.palmuc.de>
email: zitteliana@lrz.uni-muenchen.de

Für den Inhalt der Arbeiten sind die Autoren allein verantwortlich.
Authors are solely responsible for the contents of their articles.

Copyright © 2012 Bayerische Staatssammlung für Paläontologie und Geologie, München

Die in der Zitteliana veröffentlichten Arbeiten sind urheberrechtlich geschützt.
Nachdruck, Vervielfältigungen auf photomechanischem, elektronischem oder anderem Wege
sowie die Anfertigung von Übersetzungen oder die Nutzung in Vorträgen, für Funk und Fernsehen
oder im Internet bleiben – auch auszugsweise – vorbehalten und bedürfen der schriftlichen Genehmigung
durch die Bayerische Staatssammlung für Paläontologie und Geologie, München.

ISSN 1612-412X

Druck: Gebr. Geiselberger GmbH, Altötting

Cover illustration: Tentative reconstructions of different taxa and ontogenetic stages in the trilobite genus *Drevermannia*, as well as of *Silesiops?* sp. For details, see Basse, M.: Revision und Ontogenie des Trilobiten *Drevermannia schmidti* Richter 1913 aus dem Oberdevon des Bergischen Landes, pp. 9–58 in this issue.

Back cover: Atrium of the Munich Palaeontological Museum, view from the main entrance.

Umschlagbild: Rekonstruktionsversuche für verschiedene Taxa und ontogenetische Stadien der Trilobitengattung *Drevermannia* sowie für *Silesiops?* sp. Für weitere Informationen siehe Basse, M.: Revision und Ontogenie des Trilobiten *Drevermannia schmidti* Richter 1913 aus dem Oberdevon des Bergischen Landes, S. 9–58 in diesem Heft.

Rückseite: Lichthof des Paläontologischen Museums München, Blick vom Haupteingang.



Bayerische
Staatssammlung
für Paläontologie und Geologie

- Zitteliana A 52, 67 – 70
- München, 11.06.2012
- Manuscript received
03.02.2012; revision
accepted 17.04.2012
- ISSN 1612 - 412X

The rare cricetid rodent *Karydomys* Theocharopoulos, 2000 in the fissure filling Petersbuch 6 (Middle Miocene, Germany)

Jérôme Prieto

Senckenberg Center for Human Evolution and Palaeoecology (HEP), Eberhard-Karls University,
Institute for Geoscience, Sigwartstr. 10, 72076 Tübingen, Germany,
and

Department for Earth and Environmental Sciences, Ludwig-Maximilians-University Munich &
Bavarian State Collections for Palaeontology and Geology, Richard-Wagner-Straße 10, 80333
Munich, Germany

E-mail: j.prieto@lrz.uni-muenchen.de

Abstract

A molar of the rare cricetid rodent genus *Karydomys* Theocharopoulos, 2000 from the Middle Miocene fissure filling Petersbuch 6 (Germany, Bavaria) is described. The specimen shares several morphological features with *K. wigharti* from the German locality Hambach 6C. Provided that the Middle Miocene assemblage from Petersbuch 6 is homogenous, then the molar might represent the last occurrence of the genus in the fossil record, at around 13.8 Ma.

Key words: Bavaria, Cricetidae, biostratigraphy, Rodentia, Mammalia.

Zusammenfassung

Ein Molar der seltenen cricetiden Nagetiergattung *Karydomys* Theocharopoulos, 2000 wird aus der mittelmiozänen Spaltenfüllung Petersbuch 6 (Bayern, Deutschland) beschrieben. Der Zahn zeigt morphologische Übereinstimmungen mit *K. wigharti* von der Lokalität Hambach 6C. Unter der Voraussetzung, dass der mittelmiozäne Teil der Petersbuch Fauna homogen ist, könnte der hier beschriebene Zahn den jüngsten fossilen Nachweis der Gattung (~13.8 Ma) darstellen.

Schlüsselwörter: Bayern, Biostratigraphie, Cricetidae, Mammalia, Rodentia

1. Introduction

The Weissjura- δ quarry of the A. Schöpfel company at Petersbuch near Eichstätt (Frankian Alp, South-Germany) is well known for its extremely rich and well preserved faunas excavated from fissure fillings. While first finds were brought to the attention of the scientific community already in the 1970ies (Koenigswald 1970; Heissig 1978), the main field work did not commence until 1992, and the first detailed results were published by Rummel (1993) and Bolliger & Rummel (1994). Most of the terrestrial vertebrate groups that have been recorded from Petersbuch 6 range in age from Oligocene to Pleistocene. They provide new insights into the intraspecific variability of species, most often small mammals (e.g., Prieto 2007, Rummel 2000, Prieto & Rummel 2009a,b), and the osteology of extinct forms (Klembara et al. 2010), or yield important morphologic and taxonomic data on taxa that are rare elsewhere in the European fossil record (e.g. Rummel 1997). Among the large col-

lection of more than 1000 teeth discovered from Petersbuch 6 and studied by Prieto (2007), only a single molar of the rare genus *Karydomys* Theocharopoulos, 2000 has been recognized. In this paper, the tooth is described and interpreted with regard to taxonomy and biostratigraphy.

2. Locality

Weissjura- δ quarry of the A. Schöpfel company at Petersbuch near Eichstätt (Frankian Alp, South-Germany); for GPS coordinates and elevation, refer to Ziegler (2003b: 618). Bolliger & Rummel (1994) provided a first inventory of the fauna from Petersbuch 6. Detailed descriptions of small mammals remains were published by Rummel (2000, 2001), Ziegler (2003a,b,c, 2005) and Prieto (2007).

The dating of the locality remains somewhat problematic. Besides very rare Oligocene, lower Miocene and Pleistocene remains, the fauna of the fis-

sure filling is composed of species referring either to MN 6, MN 7 or MN 8 (Prieto 2007). Recently Kälin & Kempf (2009) presented a high-resolution stratigraphy of the Swiss part of the North Alpine Foreland Basin. With regard to faunal composition, Petersbuch 6 can best be correlated with the *Megacricetodon gregarius-Deperetomys hagni* interval zone (as MN7 in Kälin & Kempf's concept) at about 13.8 Ma, provided that the Middle Miocene assemblage is homogenous.

3. Material and Methods

The molar is deposited in the collection of the Bay-erische Staatssammlung für Paläontologie und Geologie in Munich (abbreviated BSPG) under accession number 1993 IV. Measurements were taken with an ocular micrometer and are indicated in mm. The terminology used in the description of the molar mostly follows Freudenthal et al. (1994).

4. Systematic Paleontology

Order: Rodentia Bowdich, 1821

Family: Cricetidae Fisher von Walheim, 1817

Genus: *Karydomys* Theocharopoulos, 2000

Remarks: Based on several teeth from the French fissure filling Vieux-Collonges originally described as *Cricetodon* sp. (Schaub & Zapfe 1953), Mein & Freudenthal (1971) define the genus *Lartetomys*. Two species have been described from Vieux-Collonges (figured in Mein & Freudenthal 1981): the larger one, *L. mirabilis*, shows similarities with the *Cricetodontini*, while the second one, *L. zapfei*, is more similar to *Democricetodon*. A few years later, Fejfar (1974) discovered several molars of the smaller species from the Devínska Nová Ves (=Neudorf) fissure 1 and Strakonice. During the following 25 years, only a few additional specimens were described, the larger ones, belonging to the larger species, from Birosse (France, Baudelot & Collier 1978; Mein & Freudenthal 1981), and a questionable m1 of the smaller species from Los Manchones 1 (Spain, Freudenthal & Daams 1988). At the beginning of the 21st century, a rapid increase in knowledge occurred, when Garapich & Kälin (1999), Bolliger (2000), Theocharopoulos (2000) and Kordikova & De Bruijn (2001) described new remains from the Miocene of Switzerland, Poland, Greece, Turkey and Kazakhstan, which greatly improved our understanding of these cricetid rodents. While Garapich & Kälin (1999) suggested that *L. mirabilis* and *L. zapfei* probably belong to two different genera, Theocharopoulos (2000) defined *Karydomys*, in which he included *L. zapfei*. Thus, in Vieux-Collonges, the species *Lartetomys mirabilis* and *Karydomys zapfei* occur. The West-Central Eu-

ropean *Karydomys* record remained quite sparse, however, until Mörs & Kalthoff (2004) published a large sample from Hambach 6C (Germany). Moreover, Kordikova & De Bruijn (2001) were the first to document the occurrence of the genus in the lower Miocene of central Asia (Kazakhstan), and more recently Maridet et al. (2011) extended the known palaeogeographical distribution of the genus even further, into northwestern China (Xinjiang province).

Diagnosis: see Theocharopoulos (2000)

Type species: *Karydomys symeonidisi* Theocharopoulos, 2000

Other species included in *Karydomys*: *Karydomys zapfei* (Mein & Freudenthal, 1971), *K. boskosi* Theocharopoulos, 2000, *K. dzerzhinskii* Kordikova & De Bruijn, 2001, *K. wigharti* Mörs & Kalthoff, 2004, *K. debruijini* Maridet et al., 2011.

Species: *Karydomys* cf. *wigharti* Mörs & Kalthoff, 2004

Fig. 1

2007 *Karydomys* cf. *wigharti* Mörs & Kalthoff, 2004. – Prieto, unpublished, p.76, fig. 34

Type locality: Hambach 6C

Age: Middle Miocene

Material and measurements: 1 M2 (BSPG 1993 IV 1693): 2.30 x 2.02

Description: The two anterolophs are well developed and of the same length; however, the lingual one is lower; they connect to the protocone through a short anterolophule-like crest; the anterior protolophule occurs in the form of a small enamel bud, while the posterior one is well developed and connects to the longitudinal crest; the labial wall of the protocone is concave; the mesoloph reaches the labial border of the M2, and ends in a crest-like mesostyl that connects to the metacone; the sinus is closed by a relatively high cingulum; the metalophule is directed backwards; it connects to the middle of the posteroloph. Both crests delimit a small and rounded posteroin sinus; roots have not been observed.

Remarks: The tooth described above differs from *Democricetodon* in the more inflated cusps, a diagnostic character of *Karydomys*. In size (Fig. 1) and morphology, the tooth from Petersbuch 6 parallels the corresponding molars from Hambach 6C that have been assigned to *Karydomys wigharti*. The single notable difference appears in the reduction of the anterior protolophule, which is always well developed in the population from Hambach 6C. The specimen from Petersbuch 6 can easily be distinguished

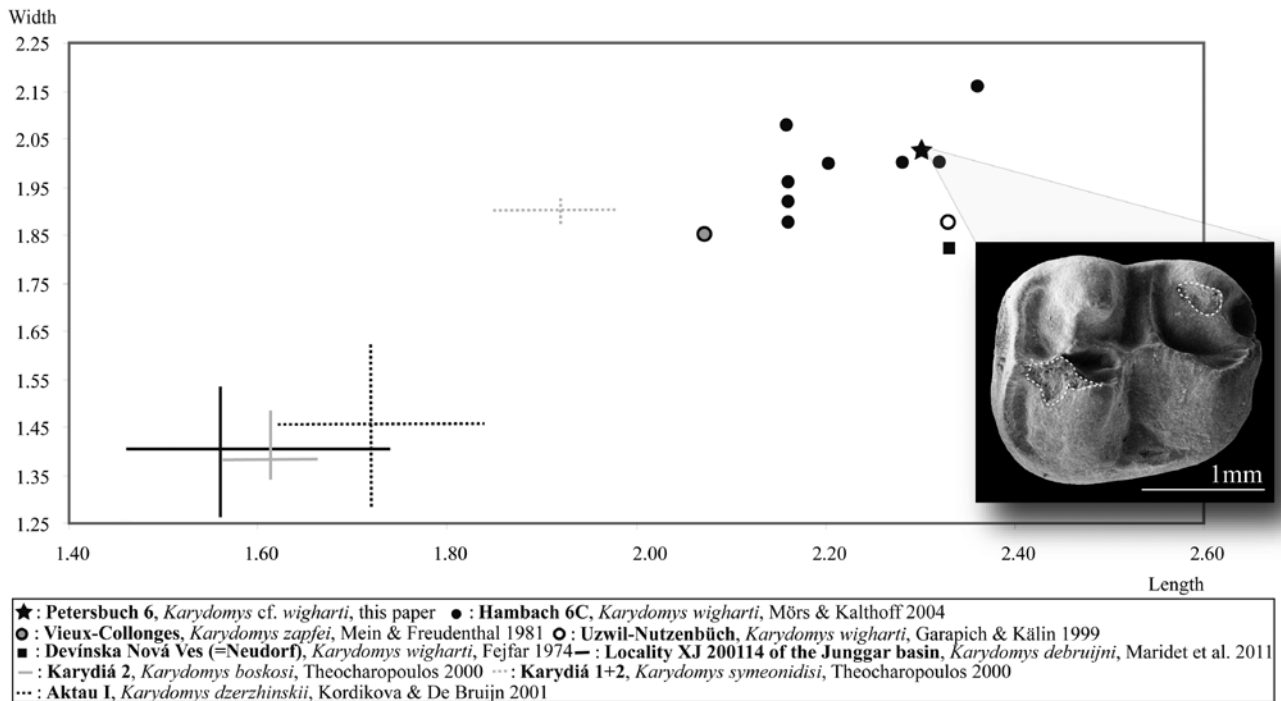


Figure 1: *Karydomys* cf. *wigharti* Mörs & Kalthoff, 2004 from Petersbuch 6, and metric comparison with *Karydomys* upper second molars from Eurasia.

from both *K. dzerzhinskii* and *K. debruijini*, which are noticeably smaller and display a more primitive morphology (see Mörs & Kalthoff 2004; Maridet et al. 2011 for discussion of evolutionary trends within the genus). The Greek species *K. symeonidisi* and *K. boskosi* (both of which also noticeably smaller) are characterized by a strong paraconus-spur (ectolophs in Theocharopoulos 2000). This feature is considered primitive for the genus (Maridet et al. 2011), and is absent in the specimen from Petersbuch 6. Moreover, the presence of the posterior metalophule is one of the arguments used by Mörs & Kalthoff (2004) to separate the M2s of *K. wigharti* and *K. zapfei* from the type locality. Consequently, affinities of the molar from Petersbuch 6 to *K. wigharti* are likely, but cannot be made formal at present because of the isolated and fragmentary nature of the material.

5. Discussion and Conclusions

According to Mörs & Kalthoff (2004: text-fig. 1), the occurrence of *K. wigharti* is restricted to Europe, ranging from Switzerland to Poland, and to the Middle Miocene. The last occurrence of the species, which, at the same time, represents the last occurrence of the genus *Karydomys*, is difficult to precisely identify. The type locality Hambach 6C represents the northernmost occurrence of the species (MN 5-6, 15,2-16 Ma in Nemetschek & Mörs 2003; Mörs & Stefen 2010), and seems to be older than the youngest faunas from the North Alpine Foreland

Basin containing *Karydomys*, which post-date the immigration of *Cricetodon* into the basin (late part of the Bavarian OSM unit E). The genus has been recorded by Kälin & Kempf (2009) in their *Megacricetodon lappi*-*Democricetodon gracilis* and *Democricetodon gracilis*-*Megacricetodon gersii* interval zones, which that authors correlate with the Bavarian OSM unit F. From Germany, *Megacricetodon* aff. *germanicus* (= *M. gersii* in Kälin & Kempf 2009) has only been recorded for the fissure fillings of the Franconian Alb with confidence (e.g. Petersbuch 68, Prieto & Rummel 2009a), and in association with the gymnure *Parasorex socialis* (Prieto & Rummel 2009b). Petersbuch 68 corresponds to the *Megacricetodon gersii*-*Megacricetodon similis* interval zone of the Swiss molasse, and thus is younger than any of the *Karydomys* records from the North Alpine Foreland Basin, and those from all other European localities as well. As Petersbuch 6 postdates these sites (*Megacricetodon gregarius*-*Deperetomys hagni* interval zone), the single m2 might represent the youngest occurrence of the genus in the fossil record, provided that the Middle Miocene part of this fissure filling is homogenous.

Acknowledgements

I thank Gertrud E. Rößner and Kurt Heißig (both Munich) for providing the fossil material, and Kurt Heißig (Munich), Madelaine Böhme (Tübingen) and Bettina Reichenbacher (Munich) for critical com-

ments on the original draft of my thesis. Olivier Mari-det (Vienna) kindly provided useful comments on an earlier draft of the paper. This study was supported by the Deutscher Akademischer Austauschdienst (DAAD).

References

- Baudelot S, Collier A. 1978. Les faunes miocènes du Haut Armagnac (Gers, France) 1. Les gisements. Bulletin de la Société géologique de France 114, 194–206.
- Bolliger T, Rummel M. 1994. Säugetierfunde aus Karstspalten – Die komplexe Genese am Beispiel eines Steinbruches bei Peterbuch, Südliche Frankenalb (Bayern). Mitteilungen der Bayerischen Staatsammlung für Paläontologie und Historische Geologie 34, 239–264.
- Bolliger T. 2000. Wiesholz (canton of Schaffhausen, Switzerland), a peculiar mammal fauna from mica-rich sands (Upper Freshwater Molasse, Miocene, early MN6). Revue de Paléobiologie 19, 1–18.
- Fejfar O. 1974. Die Eomyiden und Cricetiden (Rodentia, Mammalia) des Miozäns der Tschechoslowakei. Paleontographica A 146, 99–180.
- Freudenthal M, Daams R. 1988. Cricetidae (Rodentia) from the type Aragonian; the genera *Democricetodon*, *Fahlbuschia*, *Pseudofahlbuschia* nov. gen., and *Renzimys*. Scripta Geologica, Special Issue 1, 133–252.
- Freudenthal M, Huguency M, Moissonet E. 1994. The genus *Pseudocricetodon* (Cricetidae, Mammalia) in the Upper Oligocene of the province of Teruel (Spain). Scripta Geologica 104, 57–114.
- Garapich A, Kälin D. 1999. New findings on the rare and peculiar genus *Lartetomys* (Cricetidae, Rodentia, Mammalia). Eclogae Geologicae Helvetiae 92, 495–502.
- Heissig K. 1978. Fossilführende Spaltenfüllungen Süddeutschlands und die Ökologie Ihrer oligozänen Huftiere. Mitteilungen der Bayerischen Staatsammlung für Paläontologie und Historische Geologie 81, 237–288.
- Kälin D, Kempf O. 2009. High-resolution stratigraphy from the continental record of the Middle Miocene northern Alpine Foreland Basin of Switzerland. Neues Jahrbuch für Geologie und Palaeontologie, Abhandlungen 254, 177–235.
- Klembara J, Böhme M, Rummel M. 2010. Revision of the anguine lizard *Pseudopus laurillardii* (Squamata, Anguillidae) from the Miocene of Europe, with comments on paleoecology. Journal of Palaeontology 84, 159–196.
- Koenigswald W von. 1970. Mittelpleistozäne Kleinsäugerfauna aus der Spaltenfüllung Petersbuch bei Eichstätt. Mitteilungen der Bayerischen Staatsammlung für Paläontologie und Historische Geologie 10, 407–432.
- Kordikova EG, de Bruijn H. 2001. Early Miocene Rodents from the Aktau Mountains (South-Eastern Kazakhstan). Senckenbergiana lethaea 81, 391–405.
- Maridet O, Wu WY, Ye J, Bi SD, Ni XJ, Meng J. 2011. Early Miocene cricetids (Rodentia) from the Junggar basin (Xinjiang, China) and their biochronological implications. Geobios 44, 445–459.
- Mein P, Freudenthal M. 1971. Les Cricetidae (Mammalia, Rodentia) du Néogène Moyen de vieux-Collonges Partie 1: Le genre *Cricetodon* Lartet, 1851. Scripta Geologica 5, 1–49.
- Mein P, Freudenthal M. 1981. Les Cricetidae (Mammalia, Rodentia) du Néogène Moyen de Vieux-Collonges Partie 2 Cricetodontinae incertae sedis, Melissiodontinae, Platacanthomyinae, et Anomalomyidae. Scripta Geologica 60, 1–11.
- Mörs T, Kalthoff D. 2004. A new species of *Karydomys* (Rodentia, Mammalia) and a systematic re-evaluation of this rare eurasian miocene hamster. Palaeontology 47, 1387–1405.
- Mörs T, Stefen C. 2010. The castorid *Steneofiber* from NW Germany and its implications for the taxonomy of Miocene beavers. Acta Palaeontologica Polonica 55, 189–198.
- Nemetschek A, Mörs T. 2003. *Myoglis meini* (de Bruijn, 1965 [1966]) (Mammalia: Gliiridae) aus dem Miozän von Hambach 6C (NW-Deutschland). Paläontologische Zeitschrift 77, 401–416.
- Prieto J. 2007. Kleinsäuger-Biostratigraphie und Paläoökologie des höheren Mittelmiozäns (MN 8) Bayerns: Spaltenfüllungen der Fränkischen Alb und Lokaltäten der Oberen Süßwassermolasse im Vergleich. Unpublished PhD. Thesis, LMU Munich, Germany, 213 pp.
- Prieto J, Rummel M. 2009a. Small and medium-sized Cricetidae (Mammalia, Rodentia) from the Middle Miocene fissure filling Petersbuch 68 (southern Germany). Zitteliana A 48/49, 89–102.
- Prieto J, Rummel M. 2009b. Erinaceidae (Mammalia, Erinaceomorpha) from the Middle Miocene fissure filling Petersbuch 68 (southern Germany). Zitteliana A 48/49, 103–111.
- Rummel M. 1993. Neue fossilführende Karstfüllungen der Schwäbisch-Fränkischen Alb. Documenta naturae 79, 1–32.
- Rummel M. 1997. *Mixocricetodon dehmi* n. gen., n. sp., ein neuer Cricetide (Rodentia, Mammalia) aus dem Mittelmiozän von Süddeutschland. Mitteilungen der Bayerischen Staatsammlung für Paläontologie und Historische Geologie 37, 75–93.
- Rummel M. 2000. Die Cricetodontini aus dem Miozän von Petersbuch bei Eichstätt. Die Gattung *Cricetodon*. Senckenbergiana lethaea 80, 149–171.
- Rummel M. 2001. Ein neuer *Cricetodon* aus dem Miozän von Petersbuch bei Eichstätt. Stuttgarter Beiträge zur Naturkunde, Serie B 311, 6 p.
- Schaub S, Zapfe H. 1953. Simplicidentata von Neudorf an der March. Sitzungsberichte der Österreichischen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse 162, 181–215.
- Theocharopoulos CD. 2000. Late Oligocene-Middle Miocene *Democricetodon*, *Spanocricetodon* and *Karydomys* n. gen. from the eastern Mediterranean area. Gaia 8, 1–92.
- Ziegler R. 2003a. Bats (Chiroptera, Mammalia) from the Middle Miocene karstic fissure fillings of Petersbuch near Eichstätt, Southern Franconian Alb (Bavaria). Geobios 36, 447–490.
- Ziegler R. 2003b. Shrews (Soricidae, Mammalia) from Middle Miocene karstic fissure fill sites of Petersbuch near Eichstätt, Southern Franconian Alb (Bavaria). Paläontologische Zeitschrift 77, 303–322.
- Ziegler R. 2003c. Moles from the late Middle Miocene of South Germany. Acta Palaeontologica Polonica 48, 617–648.
- Ziegler R. 2005. Erinaceidae and Dimylidae (Lipotyphla) from the Upper Middle Miocene of South Germany. Senckenbergiana lethaea 85, 131–152.