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Cover illustration: The ammonite *Dorsetensia liostraca* Buckman from the Lower Bajocian (Middle Jurassic) Giganteuston Member of Öschingen, Middle Swabian Alb, Germany. For details, see Dietze, V. et al.: The Giganteuston Member of Öschingen (Humphriesianum Zone, Lower Bajocian, Swabian Alb), with comments on the genera *Dorsetensia* Buckman, 1892 and *Nannina* Buckman, 1927, pp. 209–236 in this issue.
Back cover: Atrium of the Munich Palaeontological Museum, view from the main entrance.

Umschlagbild: *Dorsetensia liostraca* Buckman, ein Ammonit aus dem Giganteuston des Unter-Bajociums (Mittlerer Jura) von Öschingen, Mittlere Schwäbische Alb, Deutschland. Für weitere Informationen siehe Dietze, V. et al.: The Giganteuston Member of Öschingen (Humphriesianum Zone, Lower Bajocian, Swabian Alb), with comments on the genera *Dorsetensia* Buckman, 1892 and *Nannina* Buckman, 1927, S. 209–236 in diesem Heft.
Rückseite: Lichthof des paläontologischen Museums München, Blick vom Haupteingang.

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The Miocene insectivores and marsupial from Affalterbach (North Alpine Foreland Basin, Germany)

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Abstract

The fossils of insectivores and a marsupial from the Miocene Bavarian locality Affalterbach (top of the OSM C+D) are described. The following taxa have been recorded: *Amphiperatherium frequens* ssp., *Galerix* sp., *Plesiodimylus chantrei* Gaillard, 1897, *Proscapanus sansaniensis* (Lartet, 1851), *Proscapanus* sp., cf. *Talpa minuta* Blainville, 1838 and *Dinosorex* aff. *zapfei* Engesser, 1975. With regard to qualitative and quantitative composition, the fauna from Affalterbach resembles the rich fauna of Sandelzhausen.

Key words: Bavaria, Lipotyphla, Erinaceidae, Talpidae, Soricidae, Didelphidae

Zusammenfassung

Die fossilen Insektenfresser und ein Beuteltier aus der Fundstelle Affalterbach (Bayern, oberste Teil der OSM C+D, Miozän) werden beschrieben. Die Fauna enthält die folgenden Taxa: *Amphiperatherium frequens* ssp., *Galerix* sp., *Plesiodimylus chantrei* Gaillard, 1897, *Proscapanus sansaniensis* (Lartet, 1851), *Proscapanus* sp., cf. *Talpa minuta* Blainville, 1838 and *Dinosorex* aff. *zapfei* Engesser, 1975. In Bezug auf Komposition und relative Abundanz der Arten gleicht die Fauna von Affalterbach der reichhaltigen Fauna von Sandelzhausen.

Schlüsselwörter: Bayern, Lipotyphla, Erinaceidae, Talpidae, Soricidae, Didelphidae

1. Introduction

While the fossil record of micro-mammals from the Miocene of the German part of the North Alpine Foreland Basin (NAFB) generally is remarkably extensive, knowledge of non-rodents from that area and period of time is comparively limited; the available information on non-rodents has largely been assembled R. Ziegler (e.g., Ziegler et al. 2005, 2006, and references therein). The lack of detailed information on non-rodents from the Miocene of the German part of the NAFB is unfortunate because fossils of these animals have recently been documented to represent important proxies in paleogeography (Furió et al. 2011).

In this paper the fossils of insectivores and a marsupial from the locality Affalterbach, located in the northern part of the NAFB (see details in Prieto & Böhme 2007), are described. The locality correlates with the top of the local biostratigraphic unit OSM C+D (Abdul-Aziz et al. 2008, 2010, and references therein), near the base of the Middle Miocene. The fauna from Affalterbach is remarkable because of the presence of the dormouse *Seorsumuscardinus* (Prieto & Böhme 2007, Prieto 2009), a genus presently unknown elsewhere in Germany.

2. Material and methods

The fossils are deposited in the collections of the Bayerische Staatssammlung für Paläontologie und Geologie in Munich, Germany, under accession number BSPG 1987 XX. Measurements were taken with an ocular micrometer and are indicated in mm. SEM images were taken at the Biogeology and Applied Paleontology laboratory of the Eberhard Karls University in Tübingen. The measuring method used with the erinaceids follows Prieto et al. (2010); for the talpids, refer to Ziegler (2003), and for the soricids, to Reumer (1984).

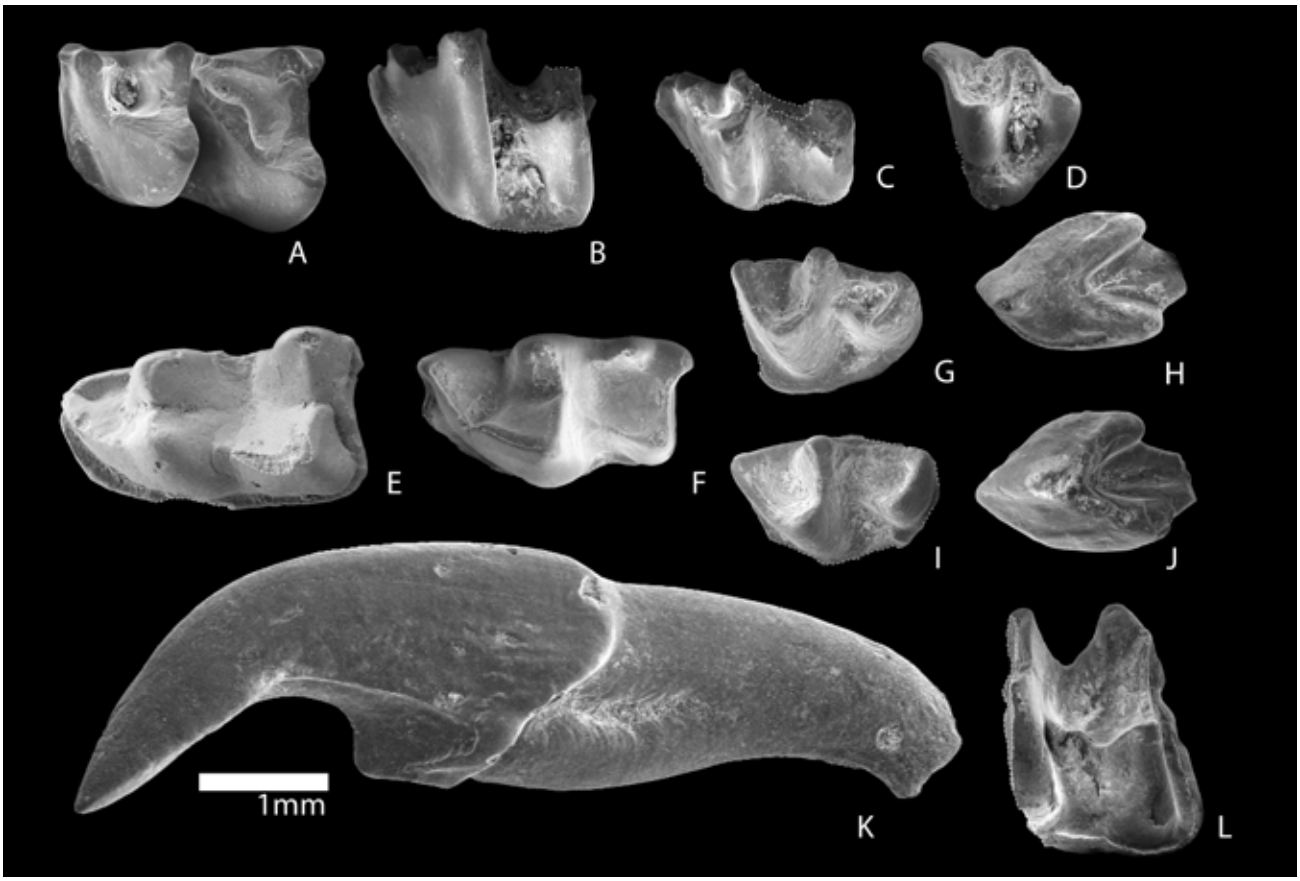

Figure 1: Insectivores and a marsupial from Affalterbach, Bavaria. **(A)** *Proscapanus sansaniensis* (Lartet, 1851). Left m1 (BSPG 1987 XX 34). **(B)** *Talpa minuta* Blainville, 1838. Right m2 (reversed, BSPG 1987 XX 35). **(C, D)** *Proscapanus* sp.; C: right m3 (reversed, BSPG 1987 XX 36); D: right M3 (reversed, BSPG 1987 XX 37). **(E)** *Plesiodimylus chantrei* Gaillard, 1897. Right m1 (reversed, BSPG 1987 XX 27). **(F)** *Amphiperatherium frequens* ssp. Left m1–3 (BSPG 1987 XX 25). **(G–L)** *Dinosorex* aff. *zapfei* Engesser, 1975; G: Left m3 (BSPG 1987 XX 31); H: left a1 (BSPG 1987 XX 30); I: right m3 (reversed, BSPG 1987 XX 32); J: left a1 (BSPG 1987 XX 29); K: left I (BSPG 1987 XX 28); L: left m2 (BSPG 1987 XX 33).

3. Systematic palaeontology

Order Didelphimorphia Gill, 1872
Family Didelphidae Gray, 1821

Genus *Amphiperatherium* Filhol, 1879

Species *Amphiperatherium frequens* ssp.
Fig. 1F

Material and measurements: 1 m1–3 (1987 XX 25): 2.2x1.26 (ltrigonid)-1.05(ltalonid).

Description and discussion: The lower molar can be assigned to *Amphiperatherium frequens*, the only didelphid species in the European Miocene, with confidence. The morphology, especially the lack of the postcingulid, corresponds with that seen in the specimens from Sandelzhausen (Ziegler 2000), which represent an evolved form of *A. frequens* (von Meyer, 1846).

Order Erinaceomorpha Gregory, 1910
Family Erinaceidae Fischer, 1814

Subfamily Galericinae Pomel, 1848

Genus: *Galerix* Pomel, 1848

Species: *Galerix* sp.
Fig. 2

Material and measurement: 14 isolated teeth: 1 P4, 1 M1, 5 M2, 1 M3, 2 m1, 1 m2, 3 m3 (1987 XX 11–24, 26); M1: 2.76x2.85(W1)–3.38(W2); M2: 1.95x2.60–2.21, 2.25x2.91–2.51, 2.00x2.53–2.29; m1: 2.93x1.58(W1)–1.73(W2), 2.83x1.63–1.78; m2: 2.15xdamaged–1.58; m3: 1.98x1.48, 1.83x1.16, 2.00x1.40.

Description and discussion: The extensive record of *Galerix* from the NAFB (Ziegler 2006) indicates that two morphologically and metrically close species were present in the Older and Middle Series, i.e. *Galerix symeonidisi* Doukas, 1986 and *Galerix exilis* (Blainville, 1840). The two basically differ in the number of lingual cusps in the P3, a tooth that has not been discovered from the Affalterbach locality. Thus, assignment of the Affalterbach remains to either of the two species is not possible. It is interest-

ing to notice, however, that one damaged M2 seems to have a longer posterior arm of the metaconule (1987 XX 19, Fig. 2E), a feature unknown in *G. exilis* from Goldberg and Sansan (Ziegler 1983; Engesser 2009).

Family Dimylidae Schlosser, 1887

Genus *Plesiodimylus* Gaillard, 1897

Species *Plesiodimylus chantrei* Gaillard, 1897
Fig. 1E

Type locality: Sansan, Middle Miocene.

Material and measurements: 1 m1 (1987 XX 26): 2.38x1.35.

Description and discussion: *P. chantrei* is variable in size, and very similar to *P. bavaricus* (Schötz 1985), a taxon for which the validity is still debated (van den Hoek Ostende 1995; Fejfar & Sabol 2009, and references therein). Nevertheless, the tooth from Affalterbach lacks the posterolingual metaconid crest that is listed as a characteristic of *P. bavaricus*. Ziegler (2000) described several teeth from Sandelzhausen as *Plesiodimylus* n. sp., but subsequently emendated his assignment to *Plesiodimylus* sp. (Ziegler 2006). Consequently, there is no reason not to assign the m1 from Affalterbach to *P. chantrei*.

Order Soricomorpha Gregory, 1910
Family Talpidae Fischer, 1814
Subfamily Talpinae Fischer, 1814
Tribe Scalopini Trouessart, 1879

Genus *Proscapanus* (Lartet, 1851)

Species *Proscapanus sansaniensis* (Lartet, 1851)
Fig. 1A

Type locality: Sansan, Middle Miocene.

Material und measurements: 1 isolated m1 (BSPG 1987 XX 34): 2.31x(WTrigonid)1.23–(Wtalonid)1.50.

Description and discussion: The m1 morphologically and metrically corresponds very well with the teeth from Sandelzhausen (Ziegler 2000) and Sansan (Engesser 2009). The crista oblica ends at the posterior wall of the metaconid. An enlargement of the crest is observed. A cingulid is present at the anterior part of the tooth and, although lesser developed, reaches the hypoconid. A cingulid is also present posteriorly.

Species: *Proscapanus* sp.
Fig. 1C–D

Material und measurements: 2 isolated teeth: 1 m3 and 1 M3 (BSPG 1987 XX 36, 37); m3: 1.63x1.00; M3: 1.15x1.43.

Description and discussion: In the m3, the area between metaconid and entoconid is damaged, but it can nonetheless be conclude that the crista oblica *in vivo* reached far lingually. This feature is found in the genus *Proscapanus*, but the tooth is distinctly smaller than that of *P. sansaniensis*. A similar species was described by Ziegler (2000), and we link the specimen to the form from Sandelzhausen. The small M3 is tentatively assigned to *Proscapanus* sp. because of its small size, but the mesostyl is undivided. It therefore cannot be ruled out that the tooth actually belongs to another species.

Tribe Talpini Fischer, 1814

Genus *Talpa* Linnaeus, 1758

Species cf. *Talpa minuta* Blainville, 1838
Fig. 1B

Type locality: Sansan, Middle Miocene

Material und measurements: 1 isolated tooth: 1 m2 (BSPG 1987 XX 35): ~1.85x1.33(WTrigonid)–1.15(Wtalonid);

Description and discussion: The type sample of *Talpa minuta* has recently been re-studied by Engesser (2009), and the m2 from Affalterbach is tentatively related to this species based on the presence of strong para- and entostylids, the crista oblica bending the posterior wall of the metaconid and the lack of a distinct entocristid. Because of the lack of sufficient material, important diagnostic features are not available, and thus it is preferable to assign the m2 to cf. *Talpa minuta*.

Family Soricidae Fischer, 1814
Subfamily Heterosoricinae Viret & Zapfe, 1952

Genus *Dinosorex* Engesser, 1972

Species: *Dinosorex* aff. *zapfei* Engesser, 1975
Fig. 1G–L

Type locality: Neudorf an der March, Middle Miocene

Material und measurements: 6 isolated teeth: 1 upper incisor, 2 a1, 1 m2, 2 m3 (BSPG 1987 XX 28–33): a1: 1.45x1.10, 1.64x1.13; m3: 1.63x1.00; 1.60x0.93; I: 4.08–1.08x2.00.

Description and discussion: The specimens from Affalterbach do not differ from the corresponding teeth of *Dinosorex* aff. *zapfei* from Sandelzhausen (Ziegler 2000). The fragmentary m2 shows a perpen-

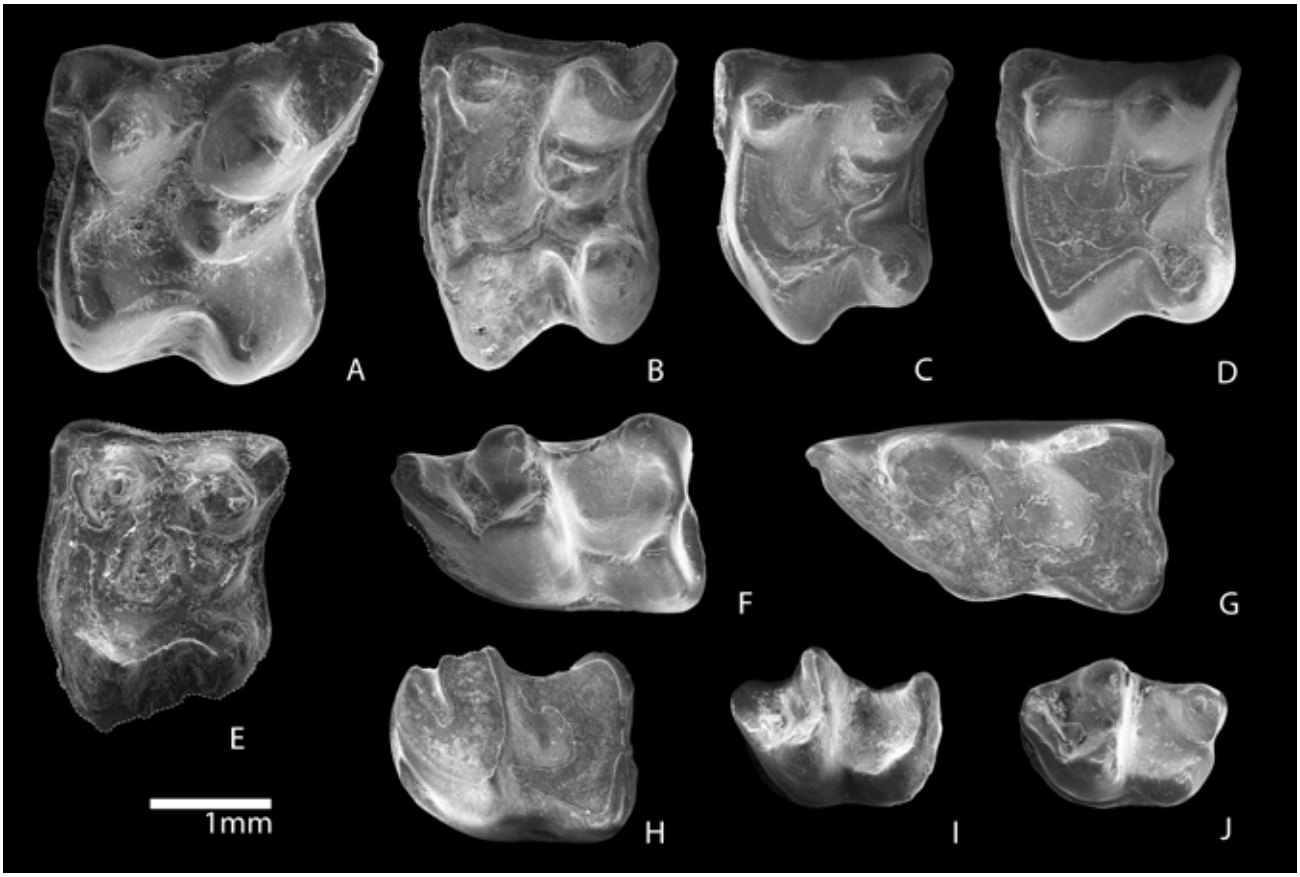

Figure 2: *Galerix* sp. from Affalterbach, Bavaria. **(A)** Left M1 (BSPG 1987 XX 26). **(B)** Right M2 (reversed, BSPG 1987 XX 16). **(C)** Left M2 (BSPG 1987 XX 17). **(D)** Right M2 (reversed, BSPG 1987 XX 18). **(E)** Left M2 (BSPG 1987 XX 19). **(F)** Right m1 (reversed, BSPG 1987 XX 13). **(G)** Right m1 (reversed, BSPG 1987 XX 12). **(H)** Left m2 (BSPG 1987 XX 11). **(I)** Right m3 (reversed, BSPG 1987 XX 14). **(J)** Left m3 (BSPG 1987 XX 12).

dicular crest on the posterior wall of the entoconid, a characteristic also observed by Ziegler in the Sandelzhausen specimens, but missing in *D. zapfei*, and present in *D. sansaniensis*. According to Ziegler (2006), the first occurrence of a *D. sansaniensis*-like species in the German part of the NAFB has been reported from Massendorf (OSM C+D), a locality that is almost contemporaneous with Sandelzhausen (Abdul-Aziz et al. 2010). Ziegler (2006) interprets the overlapping range of the two species as a result of immigrations, because both species do not belong to the same lineage (Engesser 1975). Nevertheless, the assignment of the material from Affalterbach to *D. sansaniensis* can be excluded because Engesser (2009) in the new diagnosis of that species notes that the hypolophid extends clearly behind the entoconid in the French lower molars, while this crest does not leave a clear postentoconid basin in the m2 from Affalterbach. As a result, Ziegler's taxonomic concept is followed and the remains are assigned to *D.* aff. *zapfei*.

4. Conclusions

While the fossils of glirids from Affalterbach contain at least one peculiar element (i.e. *Seorsumus-cardinus*) that has not been reported from elsewhere in Germany, the non-rodent fauna from this locality does not differ much from other faunas within the German part of the NAFB. Structure and composition of the insectivore fauna from Affalterbach resembles that from Sandelzhausen, especially with regard to the high percentage of *Galerix* (larger species excluded) and *Dinosorex* (Sandelzhausen respectively 41,5% and 22,8%; Affalterbach 53,8% and 23,1%) fossils.

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