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Juvenile ornithopod (Dinosauria: Rhabdodontidae) remains from the Upper Cretaceous (Lower Campanian, Gosau Group) of Muthmannsdorf (Lower Austria)

Des restes d'ornithopode juvénile (Dinosauria : Rhabdodontidae) du Crétacé supérieur (Campanien inférieur, Groupe de Gosau) de Muthmannsdorf (Autriche méridionale)

Reste eines juvenilen Ornithopoden (Dinosauria: Rhabdodontidae) aus der Oberkreide (Unteres Campanium, Gosau-Gruppe) von Muthmannsdorf (Niederösterreich)

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Abstract

The fragmentary remains of a juvenile rhabdodontid ornithopod from the Coal-bearing Complex of the Gosau Group (Lower Campanian, Grünbach syncline) at Muthmannsdorf near Wiener Neustadt, Lower Austria are revised. The material, probably belonging to a single individual, includes a right dentary (lectotype of *Iguanodon suessi* Bunzel, 1871, designated herein), teeth, a fragmentary parietal, fragments of scapula, ? radius, femur, tibia, two vertebrae (lost) and a manual ungual.

The lectotype dentary does not provide clear autapomorphies or sufficient diagnostic features to determine its position within the Rhabdodontidae at generic level. By this "*Iguanodon suessi*" Bunzel, 1871 and the genus "*Mochlodon*" Seeley, 1881, to which it was latter referred as type species, cannot be characterized sufficiently by differential diagnosis and these are best considered *nomina dubia*. Based upon combined character comparisons (mainly postcranial features) the Muthmannsdorf ornithopod is referred herein to *Zalmoxes* Weishampel, Jianu, Csiki and Norman, 2003, a genus so far known from the late Maastrichtian of Romania. It probably but not evidently represents a yet unnamed species, most closely related to *Zalmoxes shqiperorum* Weishampel, Jianu, Csiki and Norman, 2003. At the present state of knowledge the Austrian material is not further diagnostic at the species level and kept in open nomenclature as *Zalmoxes* sp.

Résumé

Les fragments d'ornithopode rhabdodontidé juvénile du Groupe de Gosau (Campanien inférieur, syncline de Grünbach) à Muthmannsdorf, près de Wiener Neustadt en Autriche méridionale, sont redécrits. Le matériel comprend un dentaire droit (lectotype de *Iguanodon suessi* Bunzel, 1871), des dents, ainsi que des fragments de pariétal, scapula, ? radius, fémur, tibia, deux vertèbres perdues et une phalange unguéale de la main.

Le lectotype de *Iguanodon suessi* Bunzel, 1871 ne montre pas d'autapomorphies ni de caractères diagnostiques suffisants pour déterminer la position de ce genre au sein des Rhabdodontidae. « *Iguanodon suessi* » et le genre « *Mochlodon* » Seeley, 1881, auquel l'espèce-type fût plus tardivement rapportée, ne peuvent donc être suffisamment définis par une diagnose différentielle, et sont considérés comme des *nomina dubia*.

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D'après la comparaison de caractères combinés observés sur le matériel de référence (des caractères postcrâniens pour la plupart), l'ornithopode de Gosau est attribué à *Zalmoxes* Weishampel, Jianu, Csiki and Norman, 2003, un genre jusqu'alors connu dans le Maastrichtien supérieur de Roumanie. Il correspond probablement à une espèce (non nommée) proche de *Zalmoxes shqiperorum* Weishampel, Jianu, Csiki and Norman, 2003. A ce stade de connaissance, le matériel autrichien n'est plus diagnostique à un niveau spécifique et demeure en nomenclature ouverte en tant que *Zalmoxes* sp.

Zusammenfassung

Die fragmentarischen Reste eines juvenilen rhabdodontiden Ornithopoden aus der kohleführenden Gosau Gruppe (Unteres Campanium, Grünbach Mulde) von Muthmannsdorf bei Wiener Neustadt, Niederösterreich, werden revidiert. Das Material umfasst ein rechtes Dentale (Lectotypus von *Iguanodon suessi* Bunzel, 1871), Zähne, ein unvollständiges Parietale, Fragmente von Scapula, ?Radius, Femur, Tibia, 2 Wirbel (derzeit nicht auffindbar), sowie ein Unguale der Hand.

Der Lectotypus (Dentale) zeigt keine klaren Autapomorphien oder hinreichende diagnostische Merkmale die seine Position innerhalb der Rhabdodontidae auf Gattungsebene bestimmen lässt. Daher können "*Iguanodon suessi*" Bunzel, 1871 und die Gattung "*Mochlodon*" Seeley, 1881, zu der ersterer später als Typusart gestellt wurde, nicht hinreichend mittels Differentialdiagnose definiert werden, so dass sie als *nomina dubia* anzusehen sind. Basierend auf einem kombinierten Merkmalsvergleich (überwiegend im Postcranium), wird der Muthmannsdorf-Ornithopode der Gattung *Zalmoxes* Weishampel, Jianu, Csiki and Norman, 2003 zugeordnet, welche bisher nur aus dem Oberen Maastrichtium von Rumänien bekannt war. Vermutlich repräsentiert er eine unbenannte, nahe mit *Zalmoxes shqiperorum* Weishampel, Jianu, Csiki and Norman, 2003 verwandte Art. Nach dem derzeitigen Kenntnisstand ist das österreichische Material aber nicht auf Artebene diagnostisch und wird daher in offener Nomenklatur als *Zalmoxes* sp. bestimmt.

Keywords: Dinosauria; Ornithopoda; *Zalmoxes*; *Mochlodon*; *Iguanodon suessi*; Upper Cretaceous; Gosau Group; Austria

Mots clés : Dinosauria ; Ornithopoda ; *Zalmoxes* ; *Mochlodon* ; *Iguanodon suessi* ; Crétacé supérieur ; Groupe de Gosau ; Autriche

Schlagwörter: Dinosauria; Ornithopoda; *Zalmoxes*; *Mochlodon*; *Iguanodon suessi*; Oberkreide; Gosau Gruppe; Österreich

1. Introduction

The vertebrate fauna of Muthmannsdorf near Wiener Neustadt yielded the first and currently only described dinosaur remains of Austria. Bunzel (1871) reported that in 1859 Professor E. Suess and F. Stolizcka searched for fossils in the dumps of the Felbering Mine in the Neue Welt area, an old coal district northwest of Muthmannsdorf, Lower Austria. Mr. Stolizcka found a tooth, whose shape reminded on a tooth of *Iguanodon,* in a piece of coal. Thereupon, the responsible mining administrator Pawlowitsch undertook extensive explorations and discovered a thin marl layer in the Konstantin mining tunnel that yielded abundant reptile remains.

The first to describe the material was Bunzel (1871), who referred it to crocodiles, dinosaurs, lizards and turtles. It was later re-examined by Seeley (1881) and Nopcsa (1926), including additional specimens not originally described by Bunzel.

At our present state of knowledge (some groups have not been revised recently), aside the ornithopod discussed herein, the vertebrate fauna consists of dinosaurs (*Struthiosaurus austriacus*, Theropoda indet.), crocodiles (*Doratodon carcharidens*, Alligatoridae indet.), chelonians (?*Kallokibotion* sp.), pterosaurs (*Ornithocheirus buenzeli* [1]) and squamates (*Areosaurus gracilis*) (e.g. Buffetaut, 1979; Bunzel, 1871; Nopcsa, 1926; Pereda-Suberbiola and Galton, 2001; Seeley, 1881; Wellnhofer, 1980).

The Gosau Group is a marginal continental to shallow marine succession, deposited in several small synclinal basins along the northern margin of the Eastern Alpine tectonic domain during early alpine orogenesis from the Late Cretaceous (?Santonian) through Paleocene (Faupl et al., 1987; Wagreich and Marschalko, 1995). Among these basins the Grünbach syncline includes the Neue Welt coal mining district from which the material discussed herein originates.

The fossil-bearing horizon belongs to the lower part of the Campanian Coal-bearing Complex, consisting of intercalating argillaceous marls, sandstones and limestones (Fig. 1) with the actaeonellan gastropod genus *Trochactaeon* (Brix and Plöchinger, 1988; Plöchinger, 1961; Thenius, 1974) and other molluscs (Bunzel, 1871). The flora includes charophytes, ferns, conifers, *Pandanus* and palm trees. Fauna, flora and lithofacies indicate an estuarine, brachyhaline-brackish environment of an early Campanian age (Thenius, 1974).

Institutional abbreviation: PIUW: Paläontologisches Institut der Universität Wien (Vienna).

2. Systematic paleontology

The non-hadrosaurid ornithopods from the Late Cretaceous of Europe are known from rich but mostly very incomplete and dissociated material from Spain, southern France, Austria, Romania (Brinkmann, 1988) and Hungary (Ösi, 2004). French and Spanish material has been referred to *Rhabdodon priscus* Matheron, 1869 or *Rhabdodon* sp. (Pereda-Suberbiola and Sanz, 1999; Pincemaille-Quillévéré, 2002). A second species, *R. septimanicus* Buffetaut and Le Loeuff (1991), based on a

[1] The pterosaur material from Muthmannsdorf has been named as *Ornithocheirus Bünzeli* and *O.* sp. by Seeley (1881), honouring apparently the pioneering work of E. Bunzel. However, Bunzel's name has been continuously misspelled by Seeley as "Bünzel" in his (1881) work. The specific epithet has later been emended as *Ornithocheirus bunzeli* by Wellnhofer (1978, 1980), but this emendation is not applicable (ICZN, 1999 Art. 33.2). The appropriate *nomen correctum* for *Ornithocheirus Bünzeli* Seeley, 1881 has to be *Ornithocheirus buenzeli* Seeley, 1881 (ICZN, 1999 Art. 32.3 and 32.5).