

ON THE STRATIGRAPHIC YOUNGEST OCCURRENCE (LOWER KEUPER) OF *NOTHOSAURUS* (DIAPSIDA: SAUROPTERYGIA) IN THURINGIA

[Sobre los más jóvenes restos de Nothosaurus (Diapsida: Sauropterygia) del Keuper de Turingia (Alemania)]

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RESUMEN: En agosto de 1996 un bloque de roca del Grenzdolomit cuya descomposición dejó ver algunos fósiles interesantes fue desenterrado en el área del Drosselberg, cerca de Erfurt. La publicación del material se justifica por los restos de *Nothosaurus* de edad muy baja. Se discuten su morfología y aspectos estratigráficos y sistemáticos.

Palabras clave: Diapsida, *Nothosaurus*, sistemática, estratigrafía, Keuper, Triásico, Turingia, Alemania.

ABSTRACT: A boulder from the Grenzdolomit (Lower Keuper: ku2) was dug out in the area of the Drosselberg near Erfurt. Besides *Costatoria goldfussi*, which occurs in abundance, remains of *Nothosaurus* is reported as the stratigraphic youngest find from Thuringia.

Key words: Diapsida, *Nothosaurus*, systematics, stratigraphics, Keuperian, Triassic, Thuringia, Germany.

INTRODUCTION

The location of the *Nothosaurus* remains is at Drosselberg, southeast of Erfurt opposite the “dog surfacer station”, in a NW-direction behind the street, just below the top of the road embankment (figure 1). The material which has been used for the dam is the same as the surroundings. The stratigraphic classification is done by petrologic comparison according to DOCKTER, LANGBEIN & KLAUA (1974). The samples, which were collected in 1996, are from the “Grenzdolomit”, a stratigraphic key bed for the uppermost Lower Keuper in Thuringia. The sediment is a yellow-grey to a yellowish dolomite, sometimes in plates, sometimes banked, and it often shows the bivalve *Costatoria goldfussi* (Alberti) in abundance. The dolomite is alternating with grey marls which correspond with the Lower Keuper (ku 2). Besides this, sporadic chips of grey-green Schilfsandstein can be found with impressions of “*Equisetites*”. Not far away from the -find location layers of the Lower Keuper (ku 2) are outcroppings which have been described by SEIDEL (1972): “Explanation F 1: Hollow way at Drosselberg, south of Erfurt-Melchendorf, MTB: Erfurt, N.º 5032”.



Figure 1. Dorsal processus of *Nothosaurus spec.* in situ on dolomitic rock (A).
Scale in decimetre. Photograph by Dr. H.-V. Karl.

ACCOMPANYING FAUNA

1. Remains of Bennettitea (?*Bennetticarpus wettsteini*, Cycadophyta): Two nearly complete fruits and leaf-fragments.

On the stratigraphic youngest occurrence (Lower Keuper) of *Nothosaurus* (Diapsida: Sauropterygia) in Thuringia

2. *Heterodontus* spec. (Selachoidei, Heterodontiformis): One half teeth-plate of the “*Acrodus*”-type.

3. *Saurichthys* spec. (Actinopterygii, Saurichthyiformes): A 10 mm long characteristic fang and some complete dermal plates of the lateral row.

4. Pisces inc. sed.: Many fragments of ribs, skull and scales.

5. *Nothosaurus* spec. (Diapsida, Sauropterygia): A complete neural arch of the last neck vertebra or first thoracic vertebra of a small-grown *Nothosaurus*. This find represents the stratigraphic youngest occurrence of the genus *Nothosaurus* in Thuringia and Central Germany. Coll. IGPS N.º 626 (figure 2).

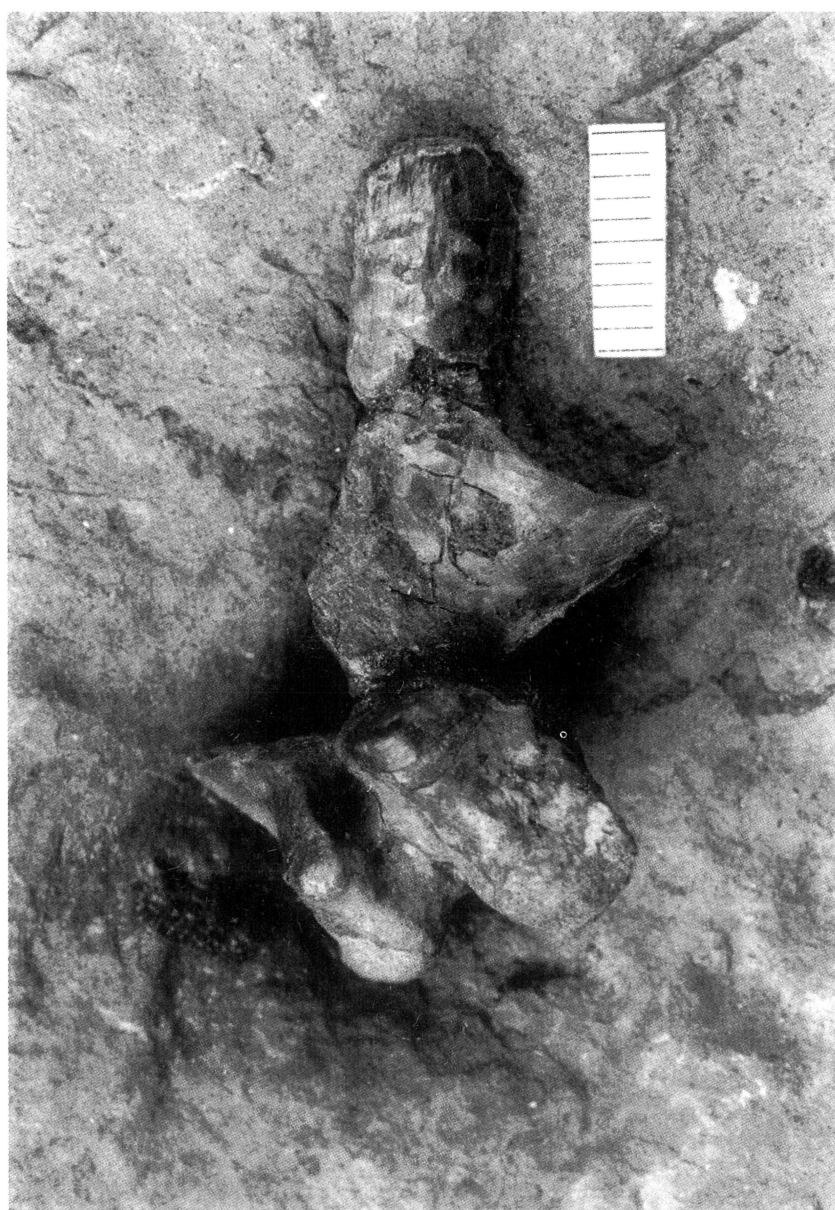


Figure 2. *Nothosaurus* spec., together with remains of *Heterodontus* spec. and *Bennettitea-detritus*. Scale 1 cm. Picture made after preparation. IGPS N.º 625. Photograph by Dirk Urban (Erfurt).

SYSTEMATIC PALAEOLOGY**Subclass Diapsida****Order Sauropterygia Owen, 1860****Suborder Eosauropterygia Rieppel, 1994****Family Nothosauridae Baur, 1889****Genus *Nothosaurus* Münster, 1834*****Nothosaurus spec.***

TYPE SPECIES: *Nothosaurus mirabilis* Münster, 1834.

KNOWN SPECIES AND THEIR DISTRIBUTION: The following species are considered to be valid: *Nothosaurus marchicus* (Koken, 1893) of the Röt till Mo 2; *Nothosaurus winterswijkensis* Alberst & Rieppel 2003, the most related species to the first from the Lower Muschelkalk of the Netherlands; *Nothosaurus baasi* Rieppel, Mazin & Tchernov, 1997; and *Nothosaurus tchernovi* Haas, 1980, both from the Lower Ladinian of the Negev in Israel; *Nothosaurus jagisteus* Rieppel, 2001 of the same age as that in SW-Germany, *Nothosaurus cymatosauroides* Sanz, 1983 from the Upper Ladinian of Tarragona in Spain; *Nothosaurus juvenilis* Edinger, 1912 from the Upper Anisian (Mo 1); *Nothosaurus giganteus* Münster, 1834 from Anisian (Mo 3) to Lettenkeuper; *Nothosaurus mirabilis* Münster, 1834 from the Mu 3 to Lettenkeuper; and *Nothosaurus edingerae* Schultze, 1970, which have been described from the uppermost Ladinian or lowermost Carnian (Gipskeuper). The latter from the Gipskeuper (km 1) at Grundmühle near Bayreuth is considered to be the stratigraphically latest member of this genus. The distribution of *Nothosaurus* is all over Europe and comprises S-Tunisia in the Middle Triassic (HUENE, 1956).

REMARKS: The most important remains in the present taphozoenosis is the neural arch of *Nothosaurus spec.*, which was directly compared with related original material from the Upper Muschelkalk from the Thuringian basin, located in the Erfurt Natural History Museum. In general, all finds of *Nothosaurus* in Keuperian are important, because the precise distribution areas during the time of the extinction are still unclear.

The genus *Nothosaurus* Münster, 1834 was revised by RIEPPEL & WILD (1994, 1996) and RIEPPEL (2000). RIEPPEL (2001) and ALBERS & RIEPPEL (2003) describe further taxa of this genus. ALBERS (2005) discussed an incomplete skull of *Nothosaurus marchicus* which was found in the Lower Muschelkalk of Winterswijk below the type layer where *Nothosaurus winterswijkensis* normally is found. Although this skull resembles *Nothosaurus marchicus* more closely than is true of the *Nothosaurus winterswijkensis*, several features can be noticed which suggest an intermediate position. However, a more precise determination is not possible at this point in time. Already EDINGER (1922) stresses the striking smallness of *Nothosaurus*-remains of the Keuper, which also substantiates our material. Nevertheless, the small size of all osseous structures already show an adult character: "Obviously everything belongs together to a small species" (EDINGER 1922). Because no skull

remains have been found, it is impossible to determine whether the bones can be classified as a small *Nothosaurus mirabilis*, *Nothosaurus giganteus* or as *Nothosaurus edingeri*.

PALAEOECOLOGICAL ASPECTS

The representatives of the genus *Saurichthys* (Agassiz, 1834) showed nearly a world-wide distribution during the Triassic Period and this genus is considered to be one of the top predators of the ichthyofaunas. The dental records of *Heterodontus* (syn. *Acrodus*) are common in all Mesozoic deposits of Europe, Spitsbergen and America. According to SCHWEZER (1961) all teeth described as *Acrodus* are synonymous with *Heterodontus*.

The fossils and the surrounding rocks give prove of a marine influenced facies. The Bennettiteen-remains are evidence of their proximity to land. However, marine ingressions are characterized by dolomitic limestone bearing exclusively marine animals. Fossils are extremely abundant in the marlaceous lime and limestone, while the grey crystalline inclusions are almost free of fossils. The coquinas points to a rough water during the time of deposition.

The durophagous *Heterodontus* probably ate on *Costatoria goldfussi* (Alberti) which is abundantly found in the "Grenzdolomit". The juvenile *Heterodontus* was a prey for the carnivorous *Saurichthys*. Both *Heterodontus* and *Saurichthys* were eaten by *Nothosaurus*, indicating that he might have stood at the end of the food chain.

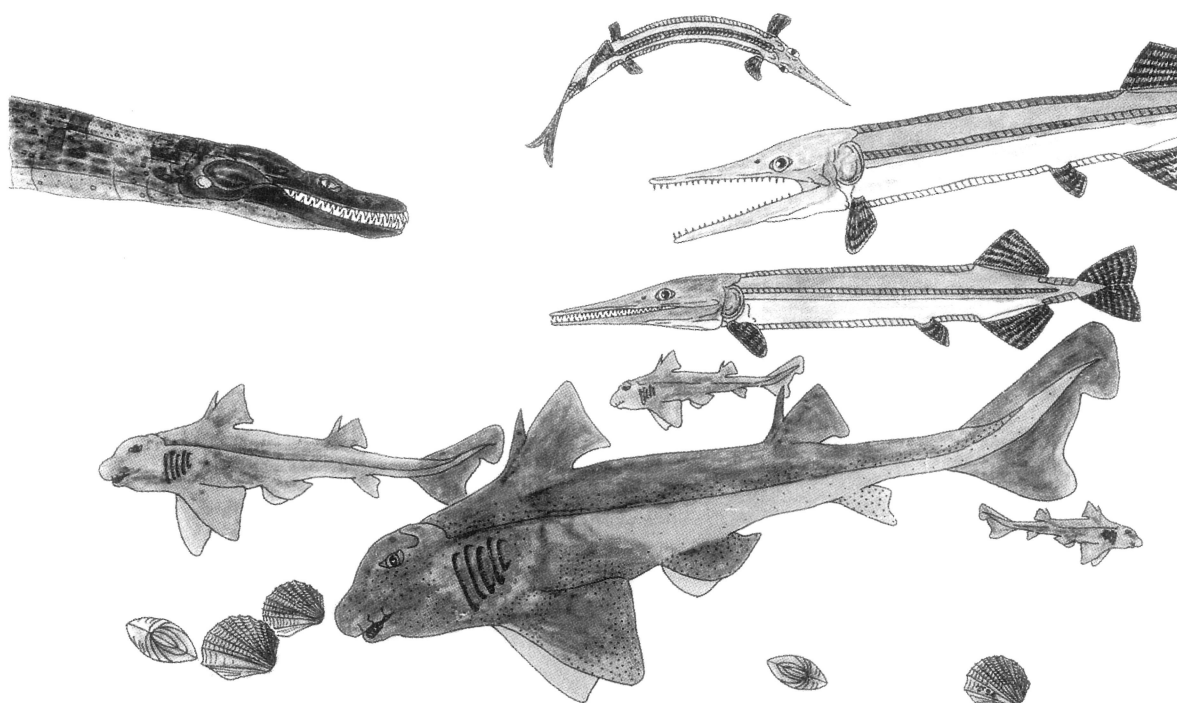


Figure 3. Reconstruction of the facies of the Grenzdolomit from the Drosselberg area / Erfurt. Below *Myophoria goldfussi*, above *Heterodontus spec.*, on top *Saurichthys spec.*, coming from the left: *Nothosaurus spec.* (H.-V. Karl).

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BIBLIOGRAPHY

- ALBERS, P. C. H. (2005): A new specimen of *Nothosaurus marchicus* with features that relate the taxon to *Nothosaurus winterswijkensis*: *www. PalArch. nl, Vertebrate Paleontology*, **3 (1)**: 7 pp.
- ALBERS, P. C. H. & RIEPPEL, O. (2005): A new species of the sauropterygian genus *Nothosaurus* from the Lower Muschelkalk of Winterswijk, the Netherlands. *J. Paleontology*, **77 (4)**: 738-744.
- DOCKTER, J.; LANGBEIN, R. & KLAUA, D. (1974): Keuper. In: *Geologie von Thüringen* (edits. HOPPE, W. & SEIDEL, G.). Haack, Gotha & Leipzig, S. 633-682, photo 85-87, tabs. 73-82.
- EDINGER, T. (1922): Über *Nothosaurus*. III. Ein Schädel Fund im Keuper. *Senckenbergiana*, **4. 12. 1922 (IV)**: 37-42, 1 fig. Frankfurt/Main.
- HUENE, F. R. v. (1956): *Paläontologie und Phylogenie der Niederen Tetrapoden*. Fischer, Jena, 716 pp., 690 figs.
- RIEPEL, O. (2000): Sauropterygia I. In: *Encyclopedia of Paleoberpetology. Part 12A* (edit. WELLNHOFER, P.). Dr. Pfeil, Munich, 134 pp., 80 figs.
- RIEPEL, O. (2001): A new species of *Nothosaurus* (Reptilia: Sauropterygia) from the Upper Muschelkalk (Lower Ladinian) of southwestern Germany. *Palaeontographica, Abt. A*, **263**: 137-161. Stuttgart.
- RIEPEL, O. & WILD, R. (1994): *Nothosaurus edingeriae* Schultze, 1970: Diagnosis of the species and comments on its stratigraphical occurrence. *Stuttg. Beitr. Naturk., Ser. B*, **204**: 1-13, 5 figs. Stuttgart.
- RIEPEL, O. & WILD, R. (1996): A revision of the genus *Nothosaurus* (Reptilia: Sauropterygia) from the Germanic Triassic, with comments on the status of *Conchiosaurus clavatus*.- *Fieldiana Geology, New Series*, **34**: 1-82, 66 figs., 1 tab. Chicago.
- SCHWEIZER, R. (1961): Über die Zähne von *Heterodontus semirugosus* (Plieninger) aus dem Brenztaloolith von Schnaitheim und dem Diceraskalk von Kelheim (Malm). *N. Jb. Geol. Paläont. Abh.*, **113 (1)**: 95-109, 1 fig., pl. 10-12. Stuttgart.
- SEIDEL, G. (1972): *Das Thüringer Becken. Geologische Exkursionen*. Haack, Gotha, 96 pp., 13 figs., 5 tabs., 1 fold-map.