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ABOUT THE FIRST OCCURRENCE OF PSEUDOSUCHIAN BODY REMAINS (ARCHOSAURIA: RAUISUCHIDAE) FROM THE LOWER TO MIDDLE TRIASSIC CHIROTHERIAN-SANDSTONE OF THURINGIA (SE GERMANY)

[Sobre el primer hallazgo de restos de pseudosúquidos (Archosauria: Rauisuchidae) en las Areniscas con Quiroterios (Triásico Inferior a Medio) de Turingia (SE de Alemania)]

Hans-Volker KARL (*)

Gottfried TICHY (*)

(*): Department of Geography, Geology and Mineralogy: Division: Palaeontology. University of Salzburg. Hellbrunner Straße 34. A-5020 Salzburg, Austria. Correo-e: hvkarl@web.de or Gottfried.Tichy@sbq.ac.at

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RESUMEN: Se describen moldes de osteodermos de un reptil pseudosúquido, procedentes de las Areniscas con Quiroterios del Triásico Inferior o Medio inferior, Turingiense, de Turingia (SE de Alemania), y son comparadas con el reptil *Ticinosuchus*, del Anisiense. Una de las huellas presenta claras afinidades con este género de rauisúquido.

Palabras clave: *Rauisuchia*, gen. et spec. indet., icnofósil, Turingiense, Areniscas con Quiroterios, Sollingiense, Triásico Inferior-Medio, Turingia, Alemania.

ABSTRACT: Moulds of osteoderms from a pseudosuchian reptile are described from the Lower to Lower Middle Triassic Thuringian Chirotherian Sandstone of

Thuringia (SE Germany) and compared with the Anisian reptile Ticinosuchus. One of the imprints shows clear affinities to this rauisuchid genus.

Key words: *Rauisuchia*, gen. et spec. indet., ichnofossil, Thuringian Chirotherian Sandstone, Sollingian, Lower-Middle Triassic, Thuringia, Germany.

INTRODUCTION

In the woods of Paulinzella (Thuringia, SE Germany), a block with several molds of osteoderms has been found which most probably belongs to sauromorphs. Hitherto from the Lower Triassic to Lower Anisian Buntsandstein only tracks from vertebrates are known and no other saurian remains have ever been found in association with them. Therefore this find is of a great importance because this is the first evidece of imprints derivable from pseudosuchian dermal plates.

LOCALITY AND STRATIGRAPHICAL POSITION

Locality: Sand-pit in the southern part of the Paulinzella woods between Rottenbach, Militz and Storchsdorf: TK 1: 25 000- M_32_47_C_d (Rottenbach); above the railway-bridge.

Stratigraphical position: Chirotherian-Sandstone, Sollingian (Middle to Upper Buntsandstein).

Discoverer: Dr. Hans-Volker Karl (6.20.02)

Storage: University of Salzburg: Department of Geography, Geology and Mineralogy: Division of Paleontolgy, Inv. N.º: 652.

MATERIAL AND DESCRIPTION OF THE ICHNOFOSSILS

A compact rock with 40/30/15 cm in size shows imprints of osteodermal plates of a sauromorph reptile (figure 1B) which have a brownish colour. Besides round disc-like, and rhomboidal-prismatic moulds of diverse size, there is one mark of a typical size and structure (figure 1C) which enables a comparison with the dorsal plate of the rauisuchid genus *Ticinosuchus* (figure 1A).

INTERPRETATION

According to KREBS (1976) the dermal ossifications along the dorsal line are kown from all pseudosuchians exept from *Scleromochlus*. Both, the osteodermal plates of phythosaurians, as it can be shown by WESTPHAL (1970), and those of the crocodyles correspond to an other type as those described in this paper.

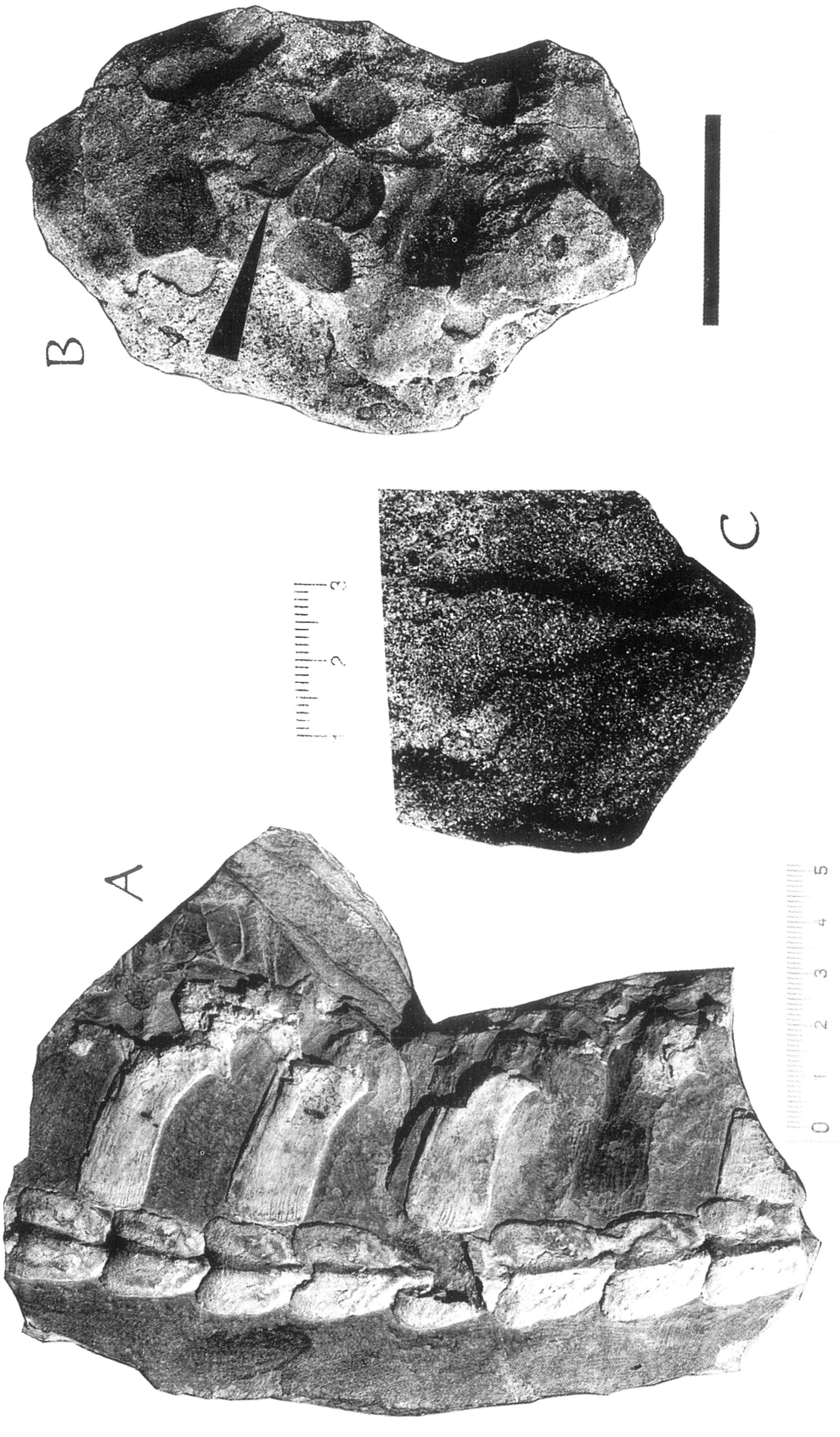

Figure 1. **A:** Ticinosuchus ferox *Krebs, 1965, Paratype T 2471, photo: Institute and Museum of Paleontology in Zurich.* **B:** *Rauisuchidae gen. et spec. indet., photo: Dirk Urban, Erfurt.* **C:** *Rauisuchidae, gen. et spec. indet., detail with an imprint of a typical dorsale plate in comparison with figure 1A, photo: Dirk Urban, Erfurt.*

Subclass: Archosauria Cope, 1869

Order: Thecodontia Owen, 1859

Suborder: Pseudosuchia Zittel, 1887-1890

Family: Rauisuchidae v. Huene, 1942

Gen. et spec. indet.

The genuses of the rauisuchids have mainly been found in South-America, South-East Asia and Africa, but there are also some reports from Europe. The only European genus of the family Rauisuchidae is *Ticinosuchus* Krebs, 1965, with the type specimen *Ticinosuchus ferox* Krebs, 1965. This species has been found in the lower layers of the "Grenzbitumenhorizont" (Uppermost Anisian) of the Monte San Giorgio in Tessin (Switzerland).

Because this is the only representative of a terrestrial pseudosuchian reptile in Europe which has been found together with a welth of marine fossils, such as ammonoids and bivalves, *Ticinosuchus* has a great importance to the correlation between both, the continental and marine alpine Trias. The type location of *Ticinosuchus* is also a part of the type section of the marine Middle Triassic (RIEBER, 1973a and b). The type-horizon of *Ticinosuchus ferox* Krebs, 1965 is the *polymorphus*-Zone, which lies between the *trinodosus*- and the *reitzi*- Zone and therefore represents the uppermost part of the Anisian (RIEBER, 1973a). Since KREBS (1965) noticed a correlation between the skeleton of the foot of *Ticinosuchus* and the *Chiotherium*-tracks of the "large manus group" (*Chirotherium barthi* Kaup, 1835) of the German Buntsandstein (HAUBOLD, 1971), this find obtains a special meaning.

Because of the corresponding reptile tracks in the Bunter with faunas of the Anisian (KREBS, 1969: 712) makes the conclusion, that also the upper Middle-Buntsandstein and the Upper Buntsandstein from Germany, belongs to the Anisian stage.

Recently tracks from *Chirotherium, Rotodactylus, Sphingopus, Parachirotherium, Atreipus,* and *Grallator* from the Trias of Turingia and Franconia are of importance in respect to the evolution of the early archosaurians towards dinosaurians (HAUBOLD & KLEIN, 2002). Saurian tracks of the Triassic period in Germany are listed in KUHN (1971: 23 and 1974: 15-18) and figured in SCHMIDT (1928, 1938).

Whereas the presented imprint undoubtedly belongs to a dorsal plate, the interpretation to the surrounding and irregular shaped marks is difficult, since such forms are not known till now. Rather there is a relation to armourplates of the crocodyl's neck (WERMUTH & FUCHS, 1978). But these structures have not been described from pseudosuchians, therefore we only can speculate. The same ist true with the relationship between the moulds and the genus *Ticinosuchus*. Therefore this question will be unsolved as long as more relevant matrerial will be available.

It seems quiet clear to us, that the presented imprints belong to a raurisuchid reptile, wheras one of the plates shows a striking similarity to that of *Ticinosuchus*.

BIBLIOGRAPHY

HAUBOLD, H. (1971): Ichnia Amphibiorum et Reptiliorum fossilium. *In*: *Handbuch der Paläoherpetolgie* (edit. KUHN, O.). Fischer, Jena, **18**: 123 S., 65 Abb.

HAUBOLD, H. & KLEIN, H. (2002): Chirotherien und Grallatoriden aus der Unteren bis Oberen Trias Mitteleuropas und die Entstehung der Dinosauria. *Hallesches Jahrb. Geowiss*, **24:** 1-22, 12 Abb. Halle/Saale.

KREBS, B. (1965): *Ticinosuchus ferox* nov. gen. nov. sp. Ein Pseudosuchier aus der Trias des Monte San Giorgio. *Schweiz. Pal. Abh.*, **8**: 1-140. Basel.

KREBS, B. (1969): *Ctenosauriscus koeneni* (v. Huene), die Pseudosuchia und die Buntsandstein-Reptilien. *Eclogae Geol. Helvetiae*, **62**: 697-714, 2 Abb., 2 Taf. Basel.

KREBS, B. (1976): Pseudosuchia. *In*: *Thecodontia* (CHARIG, A. J.; KREBS, B.; SUES, H. D. & WESTPHAL, F.): *In*: *Handbuch der Paläoherpetologie* (edit. KUHN, O.). Fischer Verlag, Stuttgart, New York, **13**: 137 S., 63 Abb.

KUHN, O. (1971): *Die Saurier der deutschen Trias*. Verlag Gebr. Geiselberger, Altötting, 105 S., 52 Abb.

KUHN, O. (1974): *Die deutschen Saurier*. **Nachtrag I**: 64 S., 27 Abb. Verlag Gebr. Geiselberger, Altötting.

RIEBER, H. (1973a): Cephalopoden aus der Grenzbitumenzone (Mittlere Trias) des Monte San Giorgio (Kanton Tessin, Schweiz). *Schweiz. Paläont. Abh.*, **93**: 1-96, 22 Abb., 13 Tab., Taf. 1-17. Birkhäuser, Basel.

RIEBER, H. (1973b): Ergebnisse paläontologisch-stratigraphischer Untersuchungen in der Grenzbitumenzone (Mittlere Trias) des Monte San Giorgio (Kanton Tessin, Schweiz). *Eclogae Geol. Helvetiae*, **66 (3)**: 667-685, 8 Figs., 4 Tabs. Basel.

SCHMIDT, M. (1928): *Die Lebewelt unserer Trias*. Hohenlohesche Buchhandlung Ferdinand Rau, Oehringen, 461 S., 1220 Abb.

SCHMIDT, M. (1938): *Die Lebewelt unserer Trias*. Hohenlohesche Buchhandlung Ferdinand Rau, Oehringen, **1938**: 143 S., zahlr. Abb.

WERMUTH, H. & FUCHS, K. (1978): *Bestimmen von Krokodilen und ihrer Häute*. Fischer, Stuttgart-New York, 99 S., 34 Abb.

WESTPHAL, F. (1970): Phytosaurier-Hautplatten aus der Trias von Madagaskar- ein Beitrag zur Gondwana-Paläogeographie. *N. Jb. Geol. Paläont. Mh.*, **1970**: H. 10, 632-638, 1 Abb., Stuttgart.

