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Notes on a Cyamodontoid maxillary from the Middle Triassic site Lugaşu de Sus (W. Romania)

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Abstract. Armored and non-armored placodont remains have been reported from the Middle Triassic of Lugaşu de Sus and Pestis, Western Romania. "*Placodus gracilis*" has been formerly described based on a lower jaw and a right maxillary fragment. The described specimens are not diagnostic for the genus *Placodus* or for the Placodontoidea. The placodont remains of the Romanian localities belong to the armored placodonts, the Cyamodontoidea.

Keywords: Placodontia, Cyamodontoidea, Middle Triassic, Western Romania

History of the researches

Middle Triassic sites Lugaş and Pestis, near Alesd, north-western Romania, has produced hundreds of marine vertebrate bones over the last 40 years. The first occurrence of Triassic vertebrate remains was reported by geologist Dumitru Istocescu (Diaconu et al., 1965), during some geological mapping works started in 1963. A detailed lithological description of the Middle Triassic of the southern realm of Rez Mountains, respectively Loranta, Gepisului and Pestis Valley – near-

by Alesd, is given by Istocescu et al (1968), identifying the Anisian for the calcareous unit and Ladinian for the overlying dolomites and crystallized limestone's.

Paleontologist Tiberiu Jurcsak from Tarii Crisurilor Museum, Oradea has started his field research in October 1969 on Lion Valley, situated north of Pestis, nearby Alesd. He collected samples of limestones, marly limestones and lumachelles with invertebrate and vertebrate remains. In his first paper on the Triassic of Alesd, Jurcsak (1973) has reported an elongated placodont tooth, he identified it as a tooth of *Paraplaceodus*. Among the remains of sauropterygian reptiles he described a Nothosaurid skull, as *Nothosaurus* cf. *procerus*.

Later, Tiberiu Jurcsak and Elisabeta Popa, have extended field research to other two Triassic deposits: first to Gruia Pietrii, from Lugasu de Sus and later to Fruntii Valley, the same locality situated North East to Alesd. Jurcsak described a new species of *Tanystropheus*, *Tanystropheus biharicus* JURCSAK 1975, based on a cervical vertebra (MTCO 8988), considering that the Gruia Pietrii deposit – Lugasu de Sus is Lower Anisian in age.

T. Jurcsak has continued his series of papers on the Triassic marine reptiles. The number of specimens from the two fossil localities has risen considerably, Jurcsak (1976) described a faunal association consisted of nothosaurids, placodonts, ichthyosaurids, as well as a proganocheilid among reptiles. Jurcsak (1976) identified 2 fish genera, a selachian *Hybodus reticulatus* AGASSIZ and *Hybodus* sp. and the actinopterygian *Colobodus* sp. In the same paper Jurcsak has described a new species of Nothosaurid, namely *Nothosaurus transsylvanicus* JURCSAK 1976, based on a skull fragment, formerly mentioned as *Nothosaurus* cf. *procerus*. According to Rieppel et al. (1999) the skull fragment represents a small species, very close to, if not identical, with *N. marchicus*, as indicated by Jurcsak's (1973) original identification of the specimen as *Nothosaurus* cf. *procerus* (*Nothosaurus procerus* SCHROEDER, 1914 is a subjective junior synonym of *N. marchicus* KOKEN, 1983). The only difference between *N. transsylvanicus* and the latter species relates to the proportions of the external nares. *Nothosaurus marchicus* is characterized by a relatively broad and rounded external naris, the holotype of *N. transsylvanicus* the external naris is distinctly more elongated, according to the ratio of the longitudinal diameter of the external naris to its transverse diameter (Rieppel et al, 1999).

T. Jurcsak continued his research of the Triassic fauna until 1978 (Jurcsak 1977, 1978), when a new fossil site has been reported in the Lower Cretaceous bauxite from Cornet – Lens 204.

The history of research was summarized by Popa et al (1996), after a Romanian-French joint research project in 1995, when Dr. Jean-Michel Mazin came

to a field campaign to Lugasu de Sus. That was the first time when a lithological sequence has been drawn for the Middle Triassic of Lugasu de Sus (Locus Huza).

Abbreviation: MTCO – Tarii Crisurilor Museum, Oradea.

Notes on Placodontia

Among Placodontia, Jurcsak (1976, 1977, 1978, 1982, 1987) has described specimens as belonging to non-armored placodonts (Placodontoidea), namely the genera *Placodus* and *Paraplacodus*, as well as armored placodonts (Cyamodontoidea), mentioning the genera *Psephoderma*, *Placochelys* and *Psephosaurus*. The cyamodontoids were described based on fragmentary, isolated osteoderms.

Pinna (1990) has questioned the stratigraphic range of the two Romanian Triassic deposits and stated the incorrect classification of the findings. According to Pinna (1990) Jurcsak's association of placodonts groups together different species that, in localities with a well established stratigraphy, are found in different temporal levels.

For the Placodontoidea, Jurcsak described a right lower jaw fragment from Pestis (MTCO 7339), which he referred to the genus *Placodus*. Jurcsak gave a detailed description of the teeth, considering the horizontally disposed first 2, chisel-shaped anterior teeth, with evident worn facets, as characteristic for *Placodus*. He also described the next 3 teeth, as having elliptical base and broken tips, with a more vertical position, decreasing in size distally. Jurcsak discussed whether it represented a juvenile individual or belonged to a small but new species "*Placodus gracilis*"? Jurcsak, 1976, referring the specimen in the figure caption as "*Placodus gracilis*" n.sp. Later Jurcsak (1978) considered *Placodus gracilis* as a close form to *Paraplacodus broilii* PEYER. Rieppel (1995) discussed the figured lower jaw of *Placodus gracilis* and considered that the specimen does not represent *Placodus* or, indeed, a placodont. According to Rieppel's description "the mandibular symphysis is narrow, and there are five slender anterior teeth with a narrow cylindrical base and broken tips; three anterior teeth are strongly procumbent. *Placodus* shows an elongated symphysis and two chisel-shaped anterior teeth, separated from posterior crushing teeth by a wide diastema. An elongated symphysis, and a wide diastema separating two conical and procumbent anterior teeth from the posterior crushing teeth, are also characteristic of *Paraplacodus* (Peyer, 1935)." Therefore, Rieppel (1995) considered that *Placodus gracilis* is a **nomen dubium**,

pending a revision of the original material. In their cladistic analyses of the inter-relationships of Placodontia, Rieppel & Zanon (1997) put *Paraplacodus* as the sister taxon of *Placodus* within the Placodontoidea and considered that the specimen identified as *Paraplacodus* or "*Placodus gracilis*", from the Anisian deposit of Alesd in Transsylvania, was not a placodont. Rieppel and Dalla Vecchia (2001) stated again that the genus *Placodus* reported from the Anisian of Transsylvania, respectively "*Placodus gracilis*" Jurcsak 1976 was based on a material which was not diagnostic for the genus *Placodus*.

Jurcsak has figured a maxillary fragment from Lugasu de Sus (in Huza et al., 1987), (only the cast of this maxillary is hosted in the Tarii Crisurilor Museum, MTCO 15.272a, fig. 1). The original specimen is hosted in the National Geological Museum Bucharest and it is displayed in the permanent exhibition. In the original description of the maxillary (Huza et al., 1987), Jurcsak mentioned three alveoli for premaxillary teeth, two alveoli for the maxillary teeth and a palatine tooth, referring the specimen in the text to "*Placodus gracilis*" or to a close form to *Paraplacodus broilii* Meyer. The specimen is figured in the paper as "*Placodus gracilis*", (Huza et al., 1987).

A reexamination of the specimen has revealed that there is only one intact alveolus for the premaxillary tooth, the tip of the premaxillary bone being broken. There is no diastema separating premaxillary and maxillary teeth. The presence of the diastema is a character for Placodontoidea stated by Rieppel and Zanon (1997) in their cladistic analyse of the Placodontia. The absence of a distema separating the premaxillary and maxillary teeth indicates a cyamodontoid feature.

For the maxillary teeth there are two elongated alveoli. Among the species of the genus *Cyamodus*, the number of maxillary teeth varies between two or three in adult specimens, *Placochelys* shows three maxillary teeth, *Psephoderma* shows two maxillary teeth (Rieppel, 2001). Maxillary tooth count for the genera *Placodus* is typically four or more (Rieppel & Zanon, 1995, Rieppel, 2001).

Only a single palatal tooth plate is preserved on this specimen, the posterior one, and it's rather small and rounded. A transverse elongation of the palatal teeth is a characteristic feature for the Placodontoidea, which is not the case in this specimen. The palatal tooth of this specimen, although is not fully preserved, shows that originally it was longer than wide. According to Rieppel (2001) the proportion of the posterior palatal tooth plates vary among cyamodontoid taxa, *Cyamodus* from the Germanic Triassic (i.e. *C. rostratus*, *C. kuhnschwyder*), as well as *Placochelys placodonta* and *Protenodontosaurus italicus* have posterior palatine tooth plates that are between 1.2 and 1.3 times as long as they are wide. The same au-



Fig. 1. *Cyamodontoid* right maxillary (MTCO 15.272a), cast. Scale indicates 1 cm.

thor stated that the Alpine species *Cyamodus hildegardis* shows somewhat more elongated palatine tooth plates (1.3 to 1.4 times as long as they are wide) and this character is present in *Psephoderma alpinum*, which in adult specimens shows posterior palatine tooth plates that are 1.4 to 1.5 times as long as they are wide.

The palatine bone is broken, so the number of the palatal tooth plates cannot be estimated precisely, but most probably, giving the general shape of the maxillary, there were two palatine tooth plates.

Unfortunately, the author couldn't have access to the original specimen at

the National Geological Museum Bucharest, which would allow a better interpretation of the anatomy of this maxillary. All the above mentioned characters indicate that this specimen was not *Placodus* or an other non-armored placodont, it can be referred to the armored placodonts, Cyamodontoidea. Further study of the original specimen will permit generic identification.

Concluding remarks

All remains of placodontian reptiles from Romania belong to the armored placodonts (Cyamodontoidea). The formerly described "*Placodus gracilis*" based on a jaw and a right maxillary fragment is not diagnostic for the genus *Placodus* or for the Placodontoidea.

The formerly described cyamodontids were based on fragmentary isolated osteoderms. The validity of these genera is depending on the question whether isolated osteoderms or carapace fragments can be used as a diagnostic character at the generic level (Westphal, 1975). Recently, Rieppel (2002) described in detail the morphology of the dermal armor of Cyamodontoid placodonts and their systematic value, which will help for the further evaluation of the Romanian cyamodontoid osteoderms and carapace fragments.

The revision of the invertebrate fauna, especially the crinoid remains, which is in progress, will bring new information on the stratigraphic range of the Lugasu de Sus and Pestis Middle Triassic sites.

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