

A SHORT CONTRIBUTION ABOUT THE PYCNODONT FISHES (ACTINOPTERYGII, NEOPTERYGII) FROM LOWER SAXONY (NW-GERMANY) DESCRIBED BY FRICKE (1876)

[Contribución al conocimiento de los peces Pycnodontiformes (Actinopterygii, Neopterygii) del Sajoniense inferior del NO de Alemania descritos por Fricke (1876)]

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RESUMEN: Los peces Pycnodontiformes están principalmente representados por elementos craneales desarticulados, tales como el vómer o los prearticulares. Estos elementos, con su dentición característica, juegan un importante papel para establecer su identidad taxonómica. Durante los últimos 150 años se han descrito varias especies de pycnodontos en el Sajoniense inferior, basándose en la dentición del prearticular y/o vómer. Este artículo describe un prearticular de Hanover que se diferencia de los hasta ahora conocidos en esta región, determinados como *Proscinetes minutus*. Tiene sólo tres dientes muy ovalados en la fila dentaria principal. Por encima de estos tres hay cuatro filas de dientes; cada una de ellas tiene seis a siete dientes pequeños, cuadrangulares o redondos. Hay dientes anteriores a estas filas, sin alineación especial. Son de forma redondeada y tan pequeños como los de las filas alineadas. Dos series de dientes están por debajo de estos dientes irregulares. Esta dentición especial no pertenece al género *Proscinetes*, ya que tiene más de cuatro filas de dientes. Por el número de filas y la forma de los dientes recuerda al género *Eomesodon*. Se propone nombrarlo como cf. *Eomesodon* dado que no es posible asegurarlo con un único elemento dental.

Palabras clave: *Eomesodon*, Pycnodontiformes, Actinopterygii, Neopterygii, Kimmeridgiense, Hanover, niveles de *Pteroceras*, NO de Alemania.

ABSTRACT: Pycnodontiform fishes are mostly represented by disarticulated cranial elements such as the vomer or prearticulars. These elements with their characteristic molariform dentition play an important role in establishing taxonomic identity. During the last 150 years, several species of pycnodonts were described from Lower Saxony based on the dentition of the prearticular and/or vomer. This paper describes a prearticular from Hanover which differs from all known prearticulars of this area and was determined as *Proscinetes minutus*. It has just three large oval teeth in the principal tooth row. Four tooth rows are above these three large teeth, each of them is formed by six to seven small quadrangular or roundish teeth. The teeth anterior to these tooth rows have no special alignment. They have a roundish form and are as small as the row teeth. Two tooth series are beneath these irregular teeth. This special dentition demonstrates that this prearticular does not belong to the genus *Proscinetes* because it has more than four tooth rows. It shows similarities (number of tooth rows and form of the large teeth) with the genus *Eomesodon*, but up to now it is not possible to identify the genus (cf. *Eomesodon*) with certainty based on a single dental element.

Key words: *Eomesodon*, Pycnodontiformes, Actinopterygii, Neopterygii, Kimmeridgian, Hanover, *Pteroceras*-layers, NW Germany.

INTRODUCTION

Pycnodontiformes (Actinopterygii, Neopterygii) is a group of predominantly Mesozoic fishes. Their fossil record comprises ca. 175 million years and ranges from the late Triassic to the Eocene (e. g. TINTORI, 1981; POYATO-ARIZA & WENZ, 2002; KRIWET & SCHMITZ, 2005). During the Mesozoic, they had an almost worldwide distribution, being known from e. g. Solnhofen area in S-Germany, Las Hoyas in Spain, Tepexi de Rodríguez in México, Lebanon, and the Santana Formation of Brazil (e. g. POYATO-ARIZA & WENZ, 2002, 2005; POYATO-ARIZA, 2003; KRIWET & SCHMITZ, 2005).

Their morphological characteristics include a high rounded and laterally flattened body and normally elongated dorsal and anal fins. Furthermore they have characteristic molariform teeth on the unpaired vomer in the roof of the mouth and paired prearticulars, which form most of the lower jaws. The molariform teeth were arranged more or less in rows forming a dense tritorial pattern indicating durophagy in these fishes (HENNIG, 1906; NURSALL, 1996; KRIWET, 2001, 2005; POYATO-ARIZA & WENZ, 2005). Up to now, more than 650 species have been described, most of them are known only by their isolated dentitions or teeth (e. g. POYATO-ARIZA & WENZ, 2002; POYATO-ARIZA, 2003;

KRIWET, 2004; DELSATE & KRIWET, 2004); only 80 species are known from skeletal remains.

Pycnodontiform fishes are mostly represented by isolated elements such as single teeth, dentition, and scales in most Lagerstätten as it is in Lower Saxony. Especially their characteristic molariform dentition plays an important role in establishing their taxonomic identity. This paper discusses a single pycnodont prearticular dentition from Lower Saxony (NW-Germany), which differs from all other prearticulars known from this area.

MATERIAL AND LOCALITY

The focus of this paper provides a single prearticular (GZG.V.11466) of an unknown pycnodont fish, which was figured by FRICKE (1876) and is stored at the Geoscience Centre of the University of Goettingen (GZG). It comes from the locality Toenjesberg near Hanover (north-western Germany) and was recovered from the Pteroceras-layers (Aporrhais-layers), which are Kimmeridgian, Late Jurassic, in age (FRICKE, 1876). The open nomenclature follows BENGSTON (1988).

DESCRIPTION

The dentition of this prearticular is very heterogeneous (Figs. 1 and 2A). A main tooth row is formed by three large teeth. Two large oval teeth occur at the posterior end, followed by a tooth cavity behind these two. Four tooth rows are above these two large teeth, each of them is formed by six to seven small teeth. These teeth are quadrangular, roundish or oval. The teeth anterior of these tooth rows have no special alignment. They have a roundish form and are as small as the row teeth. Two tooth rows are beneath these irregular teeth. The inner flanking row is formed by five teeth and reaches posterior as far as the two large teeth. Three teeth build the outer flanking row which is very short. This prearticular is small (about 2.1 cm) and shows no similarities with other prearticular dentitions from other Fundlagerstätten.

DISCUSSION

FRICKE (1876) monographed the Late Jurassic fishes from Hanover (Lower Saxony, NW-Germany) and recognized three genera of pycnodonts (*Mesodon*, *Microdon*, and *Gyrodon*). In plate 3, he figured several vomer and prearticulars and determined those as belonging to the genus *Microdon* (now *Prosci-netes*). The unique dentition characters of this genus are: Three vomerine tooth rows; one large and two small teeth alternate in the principal vomerine row; four tooth rows in the prearticular (FRICKE, 1876; POYATO-ARIZA & WENZ, 2002). FRICKE reported that this genus is represented by two species, i.

e. *Proscinetes bugii* (Fig. 2B) and *Proscinetes minutus* (Figs. 2C and 2D), from different outcrops in or near Hanover. The prearticular dentition characteristics of *P. minutus* are described by VON MÜNSTER (1846), FRICKE (1876) & WOODWARD (1895; according to FRICKE) as the following: Four tooth rows; maximal ten teeth of the principal row are elliptic and twice as broad as long; the inner flanking tooth row has transversely elongated and relative large teeth; the outer flanking rows have small roundish or slightly elongated teeth.

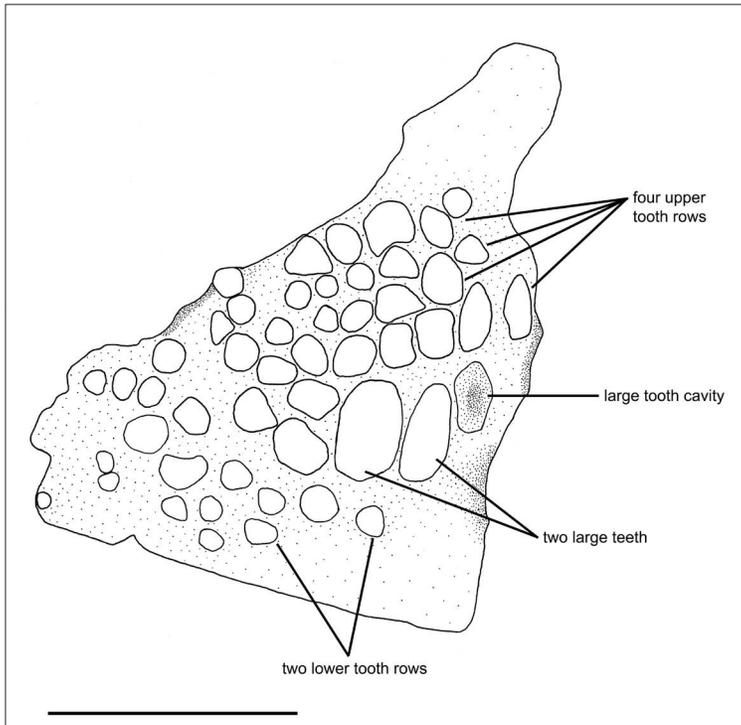


Figure 1. Schematic drawing of a right prearticular of cf. *Eomesodon* sp. (GZG.V. 11466). - Scale: 1 cm.

The original prearticulars of FRICKE (1876) were studied and compared with all other prearticulars in the collections of Hanover (NLMH), Goettingen (GZG), and London (BMNH). One prearticular (FRICKE, 1876: plate 3; Fig. 7) disagrees with all other prearticulars. This prearticular was identified by FRICKE as *P. minutus* and shows only a few similarities with this species. Some teeth of this prearticular are oval or elliptic. The main argument that this prearticular disagrees with the others is that it has more than four tooth rows (Fig. 2A). Four prearticular tooth rows are an autapomorphy for the genus *Proscinetes* (HECKEL, 1856; FRICKE, 1876) (Figs. 2B-2D). The prearticular, however, has six

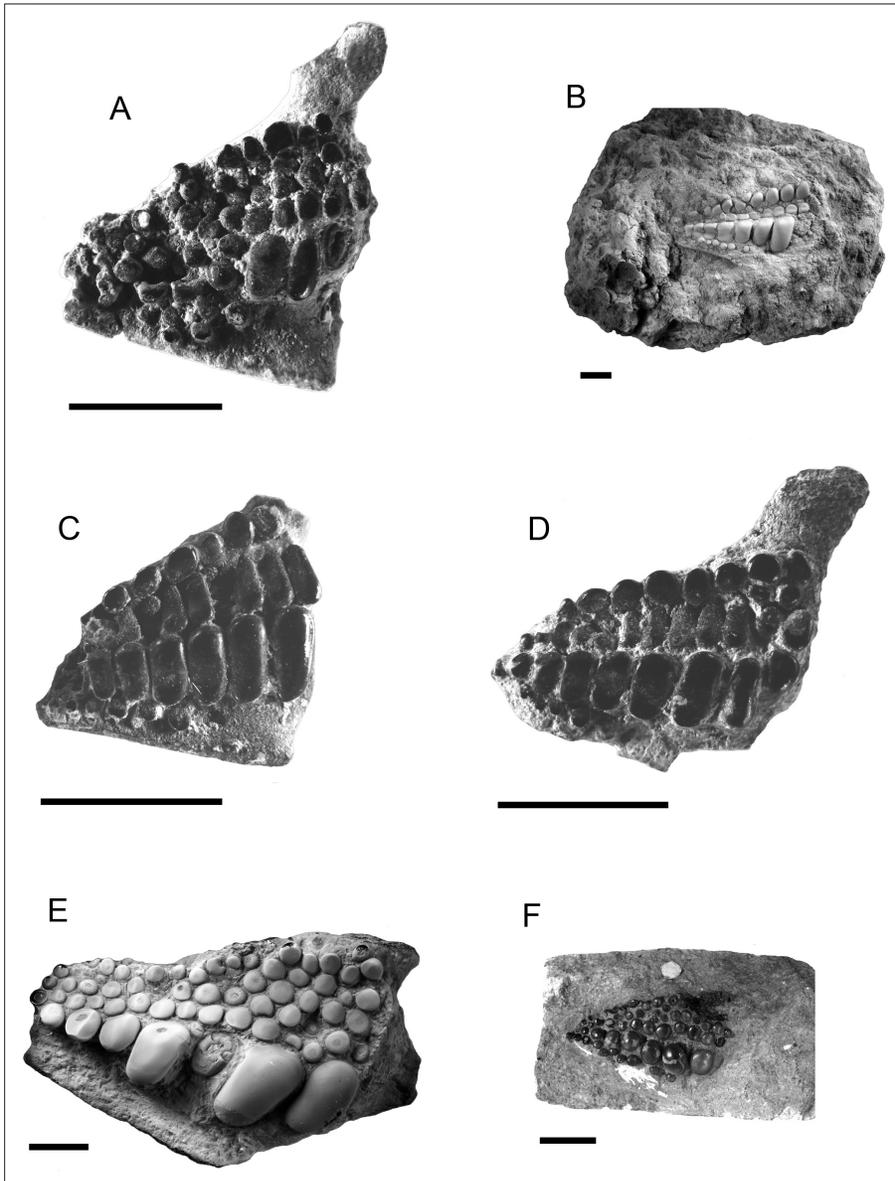


Figure 2. A: Right prearticular of *cf. Eomesodon* sp. (GZG.V. 11466); B: Right prearticular of *Proscinetes hugii* (GZG.V. not labelled); C: Right prearticular of *Proscinetes minutus* (GZG.V. 11484); D: Right prearticular of *Proscinetes minutus* (GZG.V. 11484); E: Right prearticular of *Eomesodon granulatus* (GZG.V. 11004); F: Left prearticular of *Athrodon intermedius* (B.M.(N.H.) Palaeont. Dept. 40314). - Scale: 1 cm.

tooth rows as described above. These tooth rows are short but they can be recognized significant as those. Thus this prearticular certainly does not belong to the genus *Proscinetes* like the other prearticulars illustrated by FRICKE (plate 3; Figs. 5-16).

Eomesodon and *Athrodon* are the only genera with five or more tooth series which are known from this area but all species of *Eomesodon* and *Athrodon* have a principal tooth row with more than five large teeth (Figs. 2E and 2F). However, the prearticular discussed herein has just three large teeth which build the main tooth row. The distinction between the principal row teeth of *Eomesodon* and *Athrodon* is their form. The teeth of *Athrodon* are round and those of *Eomesodon* are oval or elliptic (Figs. 2E and 2F). The large teeth of the here described prearticular resemble those of the genus cf. *Eomesodon*, and the specimen is (provisionally) assigned to that genus. A second Lower Saxonian prearticular resembles that described above. This was figured by FRICKE (1876) (plate 3; fig. 16) and described as *Proscinetes bugii*. This prearticular has six tooth rows and the main tooth row confirms of three large teeth. It also do not belong to the genus *Proscinetes* because of the number of tooth rows.

This short contribution should just give an increment to the knowledge about the pycnodont fauna of NW-Germany from the Late Jurassic. A revision for the several genera is far behind the scope.

CONCLUSIONS

Mesozoic strata around Hanover are well-known for pycnodontid fishes for more than 100 years and fossils were continuously collected from these sites in the past. Several species have also been described from the Upper Jurassic, belonging to the genera *Athrodon*, *Eomesodon*, *Ocloedus*, *Proscinetes* and *Gyrodon* (e. g. LICHT & REICH, 2007). However, one specimen is characterized by a unique prearticular dentition but unfortunately, it is a single specimen. The characteristics of this prearticular are: the principal tooth row is formed by just three large teeth, four upper flanking tooth rows with six to seven teeth, two lower flanking tooth rows with three and five teeth, and irregular arranged teeth anterior to the tooth rows. FRICKE (1876) identified this prearticular as *Proscinetes minutus*, but an autapomorphy for the genus *Proscinetes* is that it has four tooth rows in the prearticular (HECKEL, 1856; FRICKE, 1876). This prearticular has six tooth rows and cannot belong to *Proscinetes*. Up to now, it is not possible to assign it to any of the known genera with certainty, but it is suggested that this prearticular rather belongs to the genus cf. *Eomesodon* than to *Athrodon* based on the number of tooth rows and the form of the large teeth.

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