Morphology and Systematics of Fossil Vertebrates

Edited by Dariusz Nowakowski

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Late Triassic lungfishes from Krasiejów near Opole

Piotr Skrzycki

Abstract

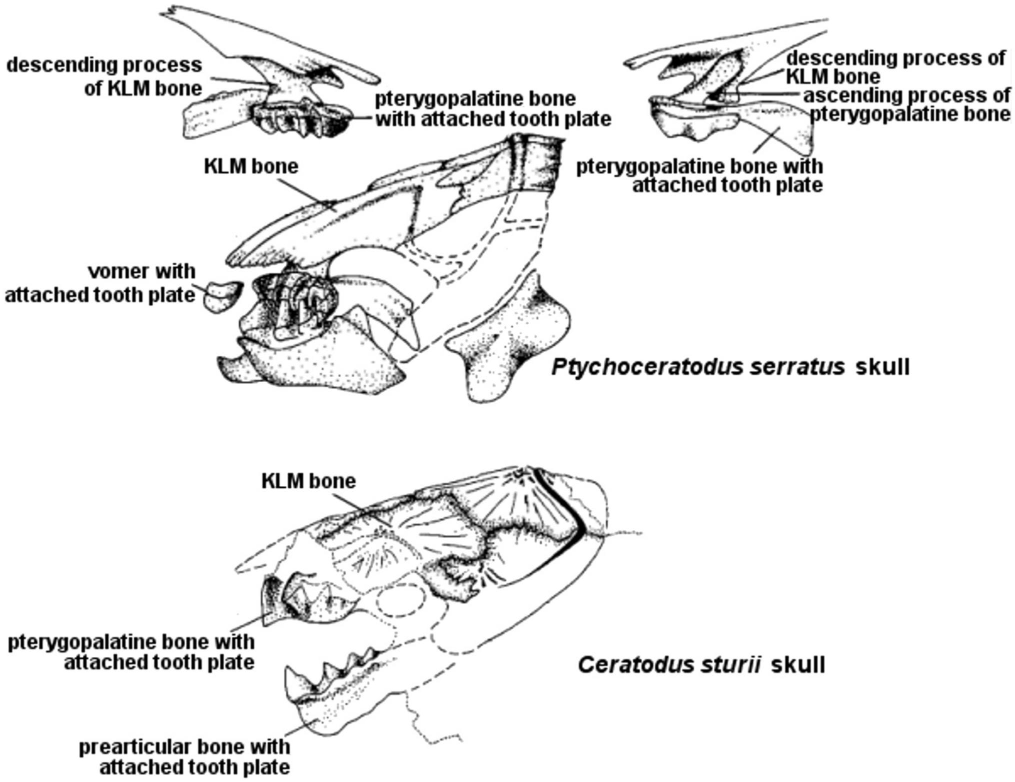
Krasiejów is a village in the Opole province, which is situated ca 20 kilometers east of Opole. Since 1993, the Institute of Paleobiology Polish Academy of Science and Opole University carry on excavations in an old clay mine. Fossils of lungfishes (Dipnoi) from the Ptychoceratodontidae family occur there in river and lake deposits of Late Triassic (late Carnian) age. They probably belong to the genus *Ceratodus* which is known from the Lower Triassic to Upper Cretaceous almost all over the world. It is closely related to barramunda (*Neoceratodus*), which is a lungfish living today in Australia. *Ceratodus* was a durofag, because (like barramunda) was fitted with four tooth plates which were used to crush shells of clams and other molluscs. Its fossils were found abundantly in Argentina, Australia, China, England, France, Kyrgyzstan, Madagascar, Marocco, Germany, RSA, USA and Thailand, as well as on Polish territory in several localities. In Krasiejów *Ceratodus* is represented by tooth plates and scales, which are very rare in other localities. In addition, clam shells are found with bite marks, which correspond to the morphology of the lungfish tooth plates. The tooth plates have the different number of ridges-lower four and upper five. The ridges of adult speciments are worn but those of the juvenile ones are sharp-edged. Comparison Krasiejów tooth plates with plates belonging to other members of this genus might help to classification of the findings.

Key words: tooth plates, durofag, Carnian, morphometry

Lungfishes (Dipnoi) appear in the early Devonian (Janvier 1996), widely spread in the late Devonian and Carboniferous, and then there was a stagnation in their differentiation, until the early Mesozoic when they reach large numbers again, but today only three genera survived. Mesozoic lungfishes has been found on the Polish territory for a long time. In 1870, Roemer examining the layers of 'lisowska' breccia in Lisów near Lubliniec, found the fossils of lungfish, which he described as *Ceratodus silesiacus* Roemer, 1870. However, later research has shown, that this is probably a juvenile *Ceratodus philippsi* or *Ceratodus concinnus* (Martin *et al*. 1981). Next Triassic findings are known from Gogolin (Anisian, *Ceratodus madelungi* Volz, 1896) and Lisowice (Rhaetic, undescribed material), as well as Krasiejów. In local Late Triassic (late Carnian) river-lake sediments (Dzik & Sulej 2007) have been found the fossils of lungfishes from Ptychoceratodontidae family. They belong to the type of *Ceratodus,* perhaps to one of the above-mentioned species.

Materials

A characteristic feature of lungfishes is lack of maxilla and premaxilla and presence of four massive tooth plates (Fig.1) (Janvier 1996, Kemp 1998). Leading durofagical lifestyle lungfishes use these plates to crush shells of clams and other molluscs. Tooth plates are attached to the prearticular bone (lower plate) and pterygopalatine bone (upper plate), which are connected to the other bones of the skull making a functional jaw apparatus (Fig. 1 and 2). The researched material is seven tooth plates-five of the lower jaw



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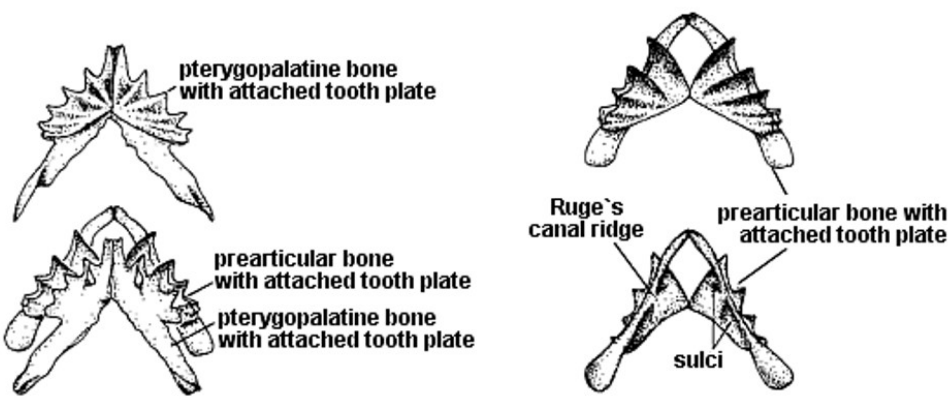

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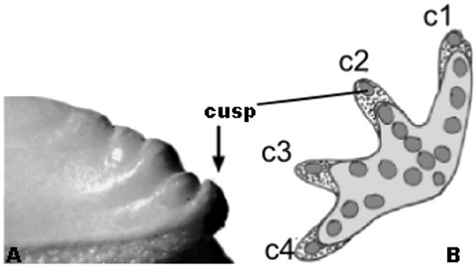

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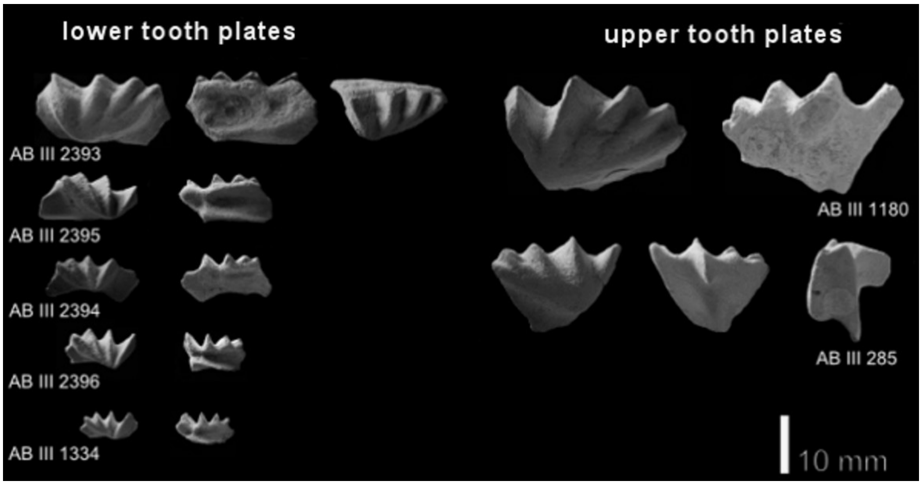

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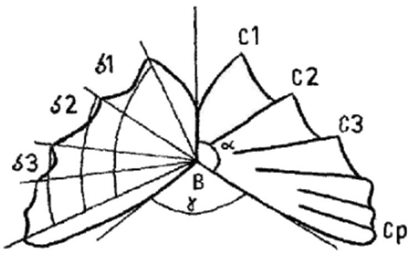

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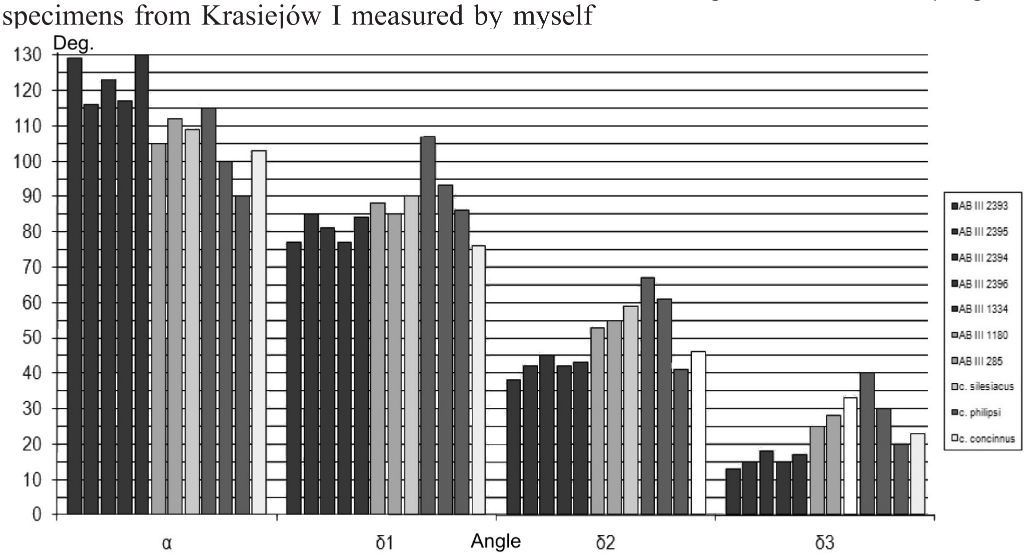

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Streszczenie

Późnotriasowe ryby dwudyszne z Krasiejowa koło Opola

W późnotriasowych rzeczno-jeziornych osadach ze starej kopalni iłów w Krasiejowie znaleziono siedem płyt zębowych (pięć dolnych, dwie górne) ryb dwudysznych z rodzaju *Ceratodus* (Fig. 3). Reprezentują one różne stadia ontogenetyczne, gdyż na małych płytach widać tzw. guzki (Fig. 4), które ścierają się w miarę używania i są niewidoczne u osobników dorosłych. Płyty zębowe były przyrośnięte do kości przedstawowej (dolne płyty) i skzydłowo-podniebiennej (górne płyty) tworzyły sprawny aparat szczękowy (Fig.1 i 2) służący do miażdżenia skorup mięczaków. W pracy dokonano porównań znalezionych płyt zębowych z płytami *C. philippsi*, *C. concinnus* i *C. silesiacus* aby określić, czy należą one do któregoś z tych gatunków. Porównano ogólną morfologię płyt, a także przeprowadzono badania morfometryczne na podstawie pracy Vorobjevy i Minikha z 1968 roku. Wykorzystując diagram z tej pracy (Fig. 5) pomierzono odpowiednie kąty między grzebieniami płyt i wyniki zestawiono w Tab. I oraz na wykresie (Fig. 6). Wnioski płynące z porównań są takie, że wszystkie płyty znalezione w Krasiejowie należą do jednego gatunku.Ponadto, mimo podobieństw, nie jest to żaden w wymienionych wyżej gatunków, choć mogą istnieć między nimi powiązania.

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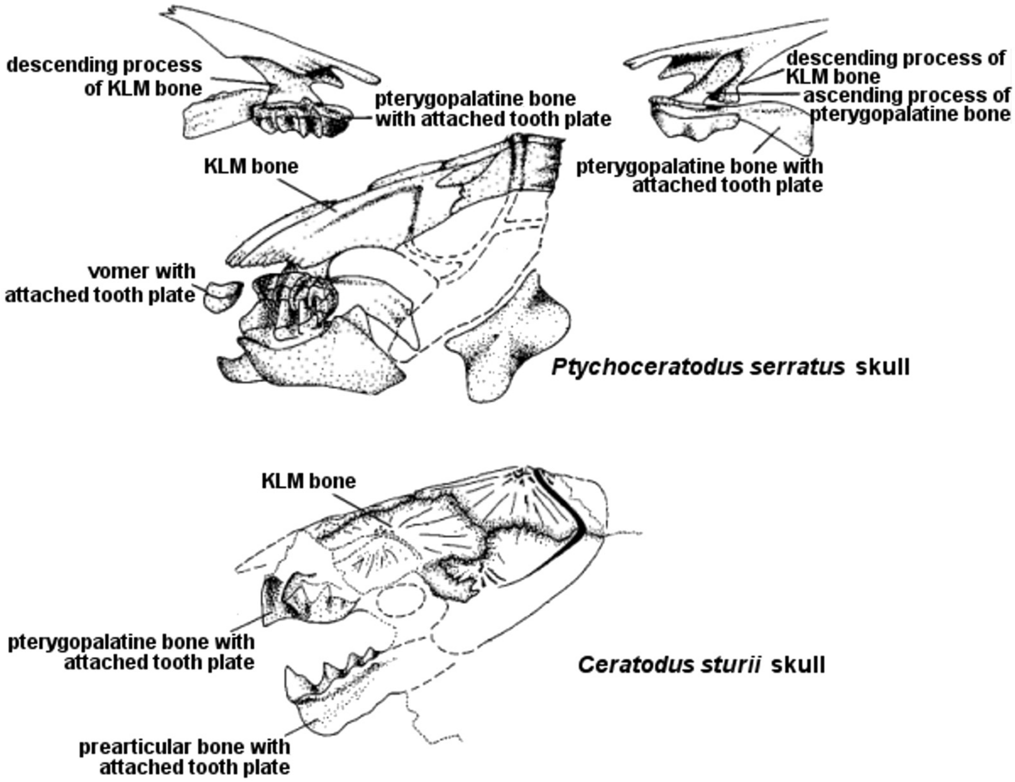

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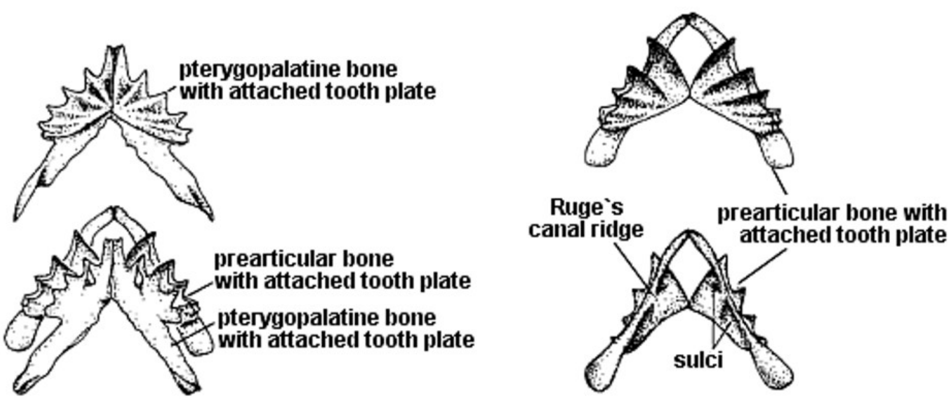

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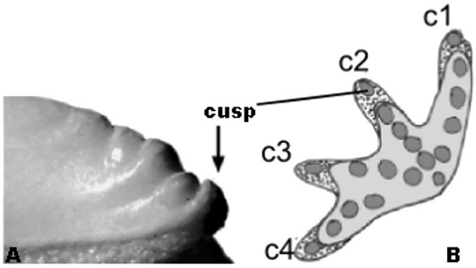

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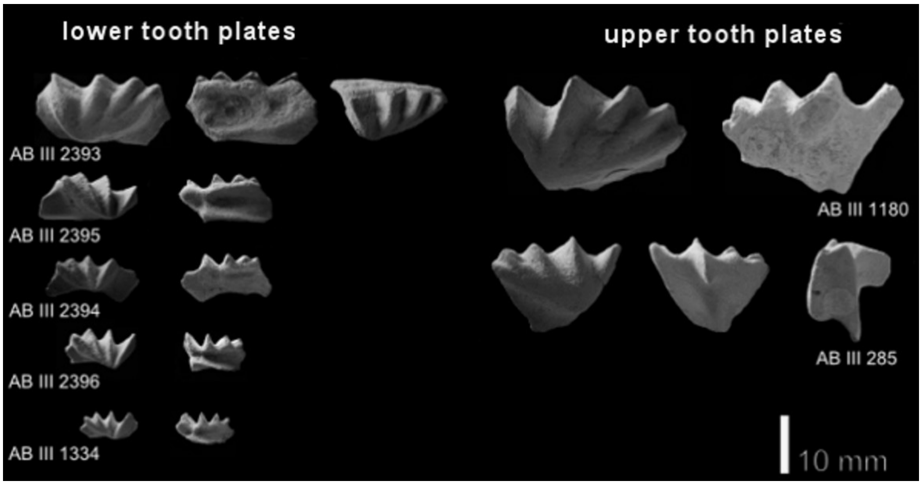

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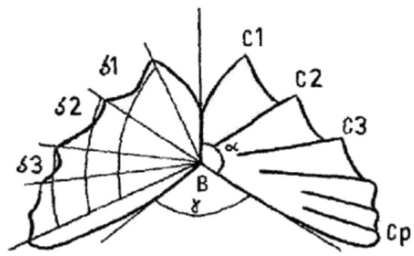

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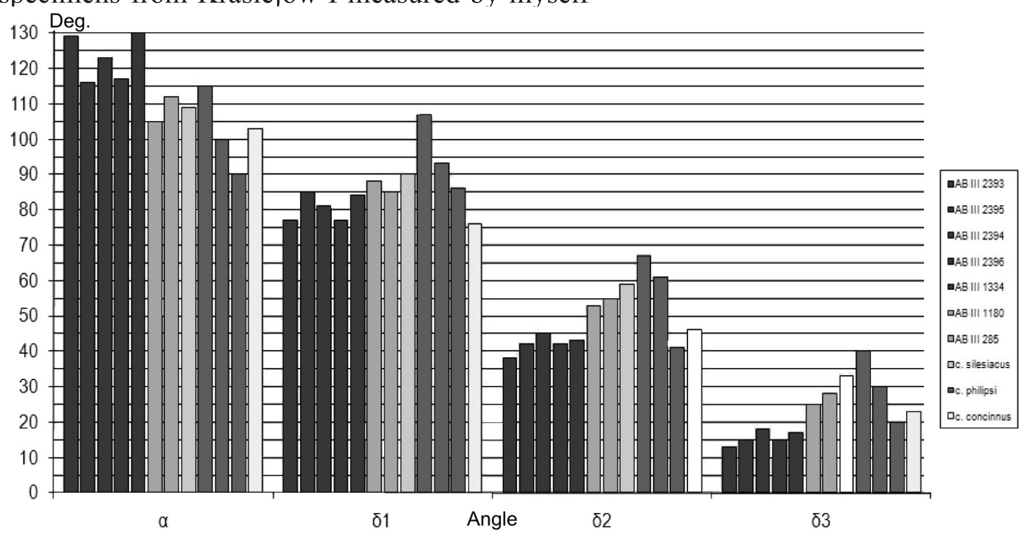

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Streszczenie

Późnotriasowe ryby dwudyszne z Krasiejowa koło Opola

W późnotriasowych rzeczno-jeziornych osadach ze starej kopalni iłów w Krasiejowie znaleziono siedem płyt zębowych (pięć dolnych, dwie górne) ryb dwudysznych z rodzaju *Ceratodus* (Fig. 3). Reprezentują one różne stadia ontogenetyczne, gdyż na małych płytach widać tzw. guzki (Fig. 4), które ścierają się w miarę używania i są niewidoczne u osobników dorosłych. Płyty zębowe były przyrośnięte do kości przedstawowej (dolne płyty) i skrzydłowo-podniebiennej (górne płyty) tworzyły sprawny aparat szczękowy (Fig.1 i 2) służący do miażdżenia skorup mięczaków. W pracy dokonano porównań znalezionych płyt zębowych z płytami *C. philippsi*, *C. concinnus* i *C. silesiacus* aby określić, czy należą one do któregoś z tych gatunków. Porównano ogólną morfologię płyt, a także przeprowadzono badania morfometryczne na podstawie pracy Vorobjevy i Minikha z 1968 roku. Wykorzystując diagram z tej pracy (Fig. 5) pomierzono odpowiednie kąty między grzebieniami płyt i wyniki zestawiono w Tab. I oraz na wykresie (Fig. 6). Wnioski płynące z porównań są takie, że wszystkie płyty znalezione w Krasiejowie należą do jednego gatunku.Ponadto, mimo podobieństw, nie jest to żaden w wymienionych wyżej gatunków, choć mogą istnieć między nimi powiązania.