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ON SOME FOSSIL FISH REMAINS FROM JAVA

by

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(with Plates I-II)

During his paleontological searches in Java, the late Prof. Eug. Dubois collected a number of fossil fish remains. His searches were instituted mainly in pleistocene deposits, and as far as I am aware these fish remains were the first of their kind to be collected in Java in strata of that age. This, and the fact that Dubois (1907, 1908) referred to these fish in two preliminary papers, gives this collection additional interest.

In the first of his preliminary papers, Dubois (1907, p. 455) mentions the following fish:

Anabas microcephalus,

Clarias magur,

Ophiocephalus,

Carcharias gangeticus.

In the second paper, Dubois (1908, p. 1239) mentions that at least seven species of freshwater fish are represented in his collection, viz.,

Anabas microcephalus,

Clarias magur, and four other Silurids,

several species of Ophiocephalids.

A second collection was made in the Trinil beds by the Selenka Expedition, and the fish remains were described by Hennig (1911). This author identified the remains only to family or genus, and he did not succeed in identifying the species. Therefore, it is considered to be worth while to re-examine the remains collected by Dubois, and to check his identifications. In

several cases it proved that the identifications by Dubois were correct. However, the names used by him prove to be synonyms of names now in use.

Comparisons were made with recent skeletons, as this not only is the easiest way to ascertain the identity of the individual bones, but it enables us too to identify the remains with definite genera, and sometimes even with species. It may be mentioned, however, that the scantiness of the fossil material, and the lack of a sufficient number of recent skeletons for comparison, made the process of identification very difficult. In a number of cases the specimens could not be identified with absolute certainty, while a number of remains could not be identified at all. When, in the fall of 1947, the author resigned from the staff of the Leiden Museum, a number of yet unidentified fish remains were passed for identification to his successor, Dr. M. Boeseman.

From the comparison with recent skeletons it became evident, that the fossil remains are larger in size than the corresponding parts of the recent specimens. This fact has been observed in other groups of Vertebrates too.

The numbers by which the specimens are designated refer to the register of the Dubois Collection in the Rijksmuseum van Natuurlijke Historie, Leiden, of which these fish remains form part. Of the localities mentioned the beds at Trinil and at Kedung Brubus belong to the pleistocene; the age of the deposits at Grobogan and at Blora is unknown to me.

SILUROIDEA

Clarias batrachus (L.) (Pl. I figs. 1-5)

Clarias magur, Dubois, 1907, p. 455 (part.); Dubois, 1908, p. 1239 (part.); De Beaufort, 1931, p. 463 (part.).

Clarias batrachus, Martin, 1919, pp. 106, 120.

Pimelodus, Hennig, 1911, p. 60, pl. XI fig. 11.

Pimelochus, Hennig, 1911, p. 59.

No. 3797, Trinil.

a. 3 occipitalia superiora of which one complete (Pl. I fig. 1) (cf. Hennig, 1911, pl. XI figs. 9a, 9b, 10).

b. 2 left frontalia of which one complete (Pl. I fig. 2).

c. 3 fragments of right postclavicula with cotyle of the pectoral fin (Pl. I fig. 3).

d. 3 fragments of postclavicula, 1 right, 2 left, without the cotyle of the pectoral fin.

No. 11638, Trinil, 7 spines of pectoral fin, 5 right, 2 left (Pl. I figs. 4, 5).

Comparisons were made with reg. no. 3799 consisting of recent bones of the skull and of fin spines, which Prof. Dubois received from the Leiden

Museum and from Prof. Max Weber. Further the fossils were compared to a skeleton of *Clarias batrachus* (L.) from Java (Leiden Museum, cat. a, *Clarias magur* H. B., collected by Kuhl & Van Hasselt, 14 cm).

The fossil bones agree well with those of *Clarias batrachus* (L.), except that the occipital process in the occipitalia superiora is a little shorter. The height of the occipital process is $2\frac{1}{3}$ in base; in *Clarias batrachus* (L.) it is 2, in *Clarias leiocanthus* Blkr. it is 3.

Hennig (1911, pl. XI) figures eleven different bones of *Clarias*. It may be noted that the bone shown in Hennig's pl. XI fig. 11 is not the praeoperculum of *Pimelodus* (on p. 59 called *Pimelochus*!), but it is a postclavicula of *Clarias batrachus* (L.).

With the bones here referred to *Clarias batrachus* (L.) were several other fish bones from Trinil that could not be identified (vide infra, no. 3797e-i, and a right frontal (no. 3797 j) that is referred tentatively to *Clarias leiocanthus* Blkr.

Clarias cf. leiocanthus Blkr.

Clarias magur, Dubois, 1907, p. 455 (part.); Dubois, 1908, p. 1239 (part.); De Beaufort, 1931, p. 463 (part.).

No. 3797j, one right frontal, Trinil.

This fragment is less granular than the frontals of *Clarias batrachus* (L.). It also has a shorter frontanel. Tentatively it is referred to *Clarias leiocanthus* Blkr.

cf. **Macrones nemurus** (C.V.) (Pl. I figs. 6-11)

No. 11639a, 2 right and 7 left pectoral spines of a species similar to *Macrones nemurus* (C.V.), Trinil.

Not identified

No. 11639b, 1 right, 2 left pectoral spines, and 2 fragments of pectoral spines of another species that could not be identified, Trinil.

No. 11639c, 2 fragments of fin spines of still another species, Trinil.

No. 11639d, 1 dorsal spine of a not identified species, Trinil.

No. 11639e, 1 fragment of a radius branchiostegus of a Silurid?

No. 3797e, 1 small fragment of a left postclavicle?

No. 3797f, 1 fragment of a left scapula.

No. 3797g, 4 fragments of bones of the skull.

No. 3797h, 1 fragment of a pectoral spine?

No. 3797i, 1 fragment of a radius branchiostegus?

LABYRINTHICI

Anabas testudineus (Bl.) (Pl. I fig. 12)

Anabas microcephalus, Dubois, 1907, p. 455; Dubois, 1908, p. 1239; Martin, 1919, p. 106; De Beaufort, 1931, p. 464.

Anabas scandens, Hennig, 1911, p. 59.

No. 11641, 2 left opercula and 1 right operculum, Trinil, 1892-1899.

These opercula were compared with those of a recent skeleton from Java (Leiden Museum, cat. a, *Anabas scandens* Daldorff, collected by Kuhl & Van Hasselt, 10 cm). The three fossil opercula belong to *Anabas testudineus* (Bl.) of which *Anabas scandens* and *Anabas microcephalus* are synonyms.

Ophiocephalus spec. (Pl. I figs. 13-14, Pl. II fig. 1)

Ophiocephalus, Dubois, 1907, p. 455; Martin, 1919, p. 106; De Beaufort, 1931, p. 464.
"Ophiocephaliden Arten", Dubois, 1908, p. 1239.

No. 11640a, 2 left interopercula (Pl. I figs. 13-14).

No. 11640b, 1 right operculum.

No. 11640c, 1 right epi- + ceratohyale (Pl. II fig. 1).

No. 11640d, 1 fragment of a basisphenoid.

All specimens are from Trinil.

SELACHII

Carcharodon cf. **megalodon** (Ch.) (Pl. II fig. 2)

No. 11645, one tooth without base, Grobogan, Semarang Residency.

Odontaspis cf. **cuspidata** (Ag.) (Pl. II figs. 3-4)

No. 11644, 2 teeth with bases, Trinil.

Isurus cf. **hastatus** (Ag.) var. **trigonodon** (Ag.) (Pl. II fig. 5)

No. 11643, 4 teeth, of which two with bases, Blora.

Eulamia gangetica (M.H.) (Pl. II figs. 6-9)

Carcharias gangeticus, Dubois, 1907, p. 455; Martin, 1919, p. 104.

No. 11642, 15 teeth from the upper jaw, of which 5 from close to the symphysis, 8 from the left and 2 from the right side, Trinil.

1 tooth from the lower jaw, close to the symphysis, Trinil.

I have compared these teeth with plate 19 of Müller & Henle (1861) and with the jaws of the type of *Carcharias japonicus* T. & Schl. in the Leiden

Museum. They are very similar to the teeth of *Eulamia gangetica* (M. H.) of which name *Carcharias japonicus* T. & Schl. probably is a synonym. *Eulamia gangetica* lives in India, where it enters the rivers. The species probably occurs in the Netherlands East Indies, but is not abundant there. The different species of the genus *Eulamia*, which are common in the Netherlands East Indies have, however, teeth of another shape than the fossil teeth, that certainly do not belong to one of these species. It is very probable that the fossil teeth belong to *Eulamia gangetica* (M. H.), to which Dubois (1907, p. 455) brought them too.

Not identified fish remains

- No. 1473, 3 teeth (of fish?).
 No. 9972, 1 corpus of fish vertebra.
 No. 11646, 10 fish vertebrae, Trinil, 1899.
 No. 11646a, 1 fish vertebra, Kedung Brubus.

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EXPLANATION OF THE PLATES

Plate I

Figs. 1-5. *Clarias batrachus* (L.), Trinil; fig. 1, occipitale superior, no. 3797a; fig. 2, left frontal, no. 3797b; fig. 3, right postclavicula, no. 3797c; fig. 4, right pectoral spine, no. 11638; fig. 5, left pectoral spine, no. 11638. Figs. 1-3, natural size; figs. 4-5, $\times 2\frac{1}{2}$.

Figs. 6-11. Cf. *Macrones nemurus* (C.V.), Trinil, no. 11639; figs. 6-10, left pectoral spines; fig. 11, right pectoral spine. Natural size.

Fig. 12. *Anabas testudineus* (Bl.), Trinil, no. 11641, right operculum. Natural size.

Figs. 13-14. *Ophicephalus* spec., Trinil; no. 11640a, left interopercula. Natural size.

Plate II

Fig. 1. *Ophicephalus* spec., Trinil, no. 11640b, right epi- + ceratohyale. Natural size.

Fig. 2. *Carcharodon* cf. *megalodon* (Ch.), Grobogan, no. 11645, tooth. Natural size.

Figs. 3-4. *Odontaspis* cf. *cuspidata* (Ag.), Trinil, no. 11644, teeth. Natural size.

Fig. 5. *Isurus* cf. *hastatus* (Ag.) var. *trigonodon* (Ag.), Blora, no. 11643, tooth. Natural size.

Figs. 6-9. *Eulamia gangetica* (M. H.), Trinil, no. 11642, teeth; fig. 6, tooth from lower jaw; fig. 7, tooth from upper jaw, close to symphysis; fig. 8, tooth from upper jaw, left side; fig. 9, tooth from upper jaw, right side. $\times 3\frac{1}{2}$.



