

# 14. PISCES, REPTILIA AND AVES

BY

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## INTRODUCTION.

In the following list of fishes and reptiles, known to occur as fossils in the Indoaustralian Archipelago, I have chiefly followed SMITH WOODWARD (Bibl. 18) for the taxonomy. The teleosts, however, have been arranged according to BOULENGER (The Cambridge Natural History, Vol. VII, 1904), with some slight alterations. I have not strictly followed the rules of zoological nomenclature and f. i. not changed *Macrurus* into *Coryphaenoides*. Palaeontologists are more conservative in this respect, and probably they are right.

## LIST OF SPECIES.

### PISCES.

#### SELACHII.

##### FAM. CARCHARIDAE.

- Carcharias* (*Prionodon*) *javanus* Martin. — Miocene, Java, Bibl. 13, p. 27; Bibl. 4, p. 3.  
" " *Dyki* Martin. — Miocene, Java, Bibl. 13, p. 28; Bibl. 4, p. 3.  
" " spec. — Pleistocene, Java, Bibl. 9, p. 54.  
" (*Hypoprion*?) spec. indet. — Miocene, Java, Bibl. 13, p. 30.  
*Galeocерdo javanus* Martin. — Miocene, Java, Bibl. 13, p. 24; Bibl. 4.  
" spec.? — Miocene, Java, Bibl. 13, p. 25.  
*Hemipristis serra* Ag. — Miocene, Java, Bibl. 13, p. 26; Bibl. 4, p. 4.<sup>1)</sup>  
" spec. — Upper Cretaceous, Timor, Bibl. 1, p. 66.  
*Sphyrna* spec.?? — Miocene, Java, Bibl. 13, p. 27.

## FAM. LAMNIDAE.

- Lamna appendiculata* (Ag.) — Upper Cretaceous, Timor, Bibl. 1, p. 64.  
*Otodus* (spec.?). — Miocene, Java, Bibl. 13, p. 24. <sup>2)</sup>  
*Oxyrhina crassa* Ag.? — Miocene, Java, Bibl. 4, p. 4.  
 „ *desori* Ag. — Miocene, Java, Bibl. 4, p. 4.  
 „ (mantelli aff.?) — Upper Cretaceous, Timor, Bibl. 1, p. 64.  
*Orthacodus* spec.? — Upper Cretaceous, Timor, Bibl. 1, p. 63.  
*Scapanorhynchus* spec. — Upper Cretaceous, Timor, Bibl. 1, p. 63.  
*Carcharodon megalodon* Ag. — Miocene, Java, Bibl. 13, p. 23. Tertiary  
 Madura, W. Borneo, Boeton, Bibl. 4, p. 4.  
 „ (longidens Pillet?) — Upper Cretaceous, Timor, Bibl. 1, p. 65.  
*Carcharoides* spec.? — Upper Cretaceous, Timor, Bibl. 1, p. 65.  
*Corax* spec.? — Upper Cretaceous, Timor, Bibl. 1, p. 66.

## BATOIDEI.

## FAM. PRISTIDAE.

- Pristis* spec. — Pleistocene, Java, Bibl. 9, p. 55.

## FAM. TRYGONIDAE.

- Trygon vorstmani* deBfrt. — Miocene Celebes, Bibl. 3, p. 119.

## FAM. MYLIOBATIDAE.

- Ptychodus polygyrus* Ag. — Upper Cretaceous, Timor, Bibl. 1, p. 61.  
 „ *rugosus* Dixon. — Upper Cretaceous, Timor, Bibl. 1, p. 62.  
 „ *decurrens* Ag. — Upper Cretaceous, Timor, Bibl. 1, p. 62.

## HOLOCEPHALI.

## FAM. CHIMAERIDAE.

- Chimaera javana* Martin. — Miocene, Java, Bibl. 13, p. 30.  
 Incertae sedis (Ichthyodorulite).  
*Coelorhynchus cretaceus* Dixon. — Upper Cretaceous, Timor, Bibl. 1,  
 p. 67.

## HOLOSTEI.

## FAM. PYCNODONTIDAE.

- Gyrodus* aff. — Upper Cretaceous, Timor, Bibl. 1, p. 68.

## TELEOSTEI.

## MALACOPTERYGII.

## FAM. ELOPSIDAE.

- Brouweria robusta* de Bfrt. — Miocene, Celebes, Bibl. 3, p. 124.  
 „ *striata* de Bfrt. — Miocene, Celebes, Bibl. 3, p. 124.  
 „ spec.? — Miocene, Celebes, Bibl. 3, p. 125.

## FAM. NOTOPTERIDAE.

- Notopterus primaevus* Günther. — Eocene, Sumatra, Bibl. 8, p. 181; Bibl.  
 18, IV, p. 86.

## FAM. OSTEOGLOSSIDAE.

*Dapedoglossus* (?) *polyodon* (Gthr.) — Eocene, Sumatra, Bibl. 8, p. 180. <sup>3)</sup>

## FAM. CLUPEIDAE.

*Clupea* (*Sardinella*) *brouweri* deBfrt. — Miocene, Celebes, Bibl. 3, p. 126; Bibl. 5, p. 162.

*Dussumierina* spec. — Eocene, Sumatra, Bibl. 16, p. 167. <sup>4)</sup>

*Otolithus* (*Clupeidarum*) *dilatus*. — Pliocene, Sumatra, Bibl. 7, p. 21.

” ” *parvulus*. — Pliocene, Sumatra, Bibl. 7, p. 22.

” ” spec. — Upper Eocene, Java, Bibl. 19, p. 15.

” (*Engraulidarum*) *erectus*. — Pliocene, Sumatra, Bibl. 7, p. 21.

## OSTARIOPHYSI.

## FAM. CYPRINIDAE.

*Barbus megacephalus* Gthr. — Eocene, Sumatra, Bibl. 8, p. 179.

” *fossilis* Martin. — Pliocene?, Java, Bibl. 13, p. 20.

*Thynnichthys amblystoma* (v. d. Marck). — Eocene, Sumatra, Bibl. 8, p. 177. <sup>5)</sup>

*Amblypharyngodon* spec. — Eocene, Sumatra, Bibl. 8, p. 180.

*Hexasephus*. — Eocene Sumatra, Bibl. 8, p. 182.

*Brachyspondylus saropterix* v. d. Marck. — Eocene, Sumatra, Bibl. 2, p. 150. <sup>6)</sup>

## FAM. SILURIDAE.

*Clarias batrachus* Bl. — Pleistocene, Java, Bibl. 6, p. 1239; Bibl. 9, p. 58; Bibl. 15, p. 106. <sup>7)</sup>

*Bagarius gigas* Gthr. — Eocene, Sumatra, Bibl. 8, p. 176.

*Pseudotropius verbeeki* Gthr. — Eocene, Sumatra, Bibl. 8, p. 175. <sup>8)</sup>

*Otolithus* (*Arius*) *tenuis*. — Pliocene, Sumatra, Bibl. 7, p. 28.

*Pimelodus*?. — Pleistocene, Java, Bibl. 9, p. 59.

## APODES.

*Mastygocereus vermiformis* deBfrt. — Miocene, Celebes, Bibl. 3, p. 130.

## HAPLOMI.

## FAM. ENCHODONTIDAE.

*Enchodontide*?. — Upper Cretaceous, Timor, Bibl. 1, p. 68.

## FAM. SCOPELIDAE.

*Scopelide*?. — Miocene, Celebes, Bibl. 3, p. 131.

*Otolithus* (*Scopelus*) *papuensis* Schubert. — Plio-pleistocene, New-Guinea, Bibl. 17, p. 327. Pliocene, Sumatra, Bibl. 7, p. 25.

” ” *sulcatus* Prochazka. — Bibl. 7, p. 22. Upper Miocene Java, Bibl. 19, p. 12. <sup>9)</sup>

” ” *pulcher*. — Pliocene, Sumatra, Bibl. 7, p. 23.

” ” *fragilis*. — Pliocene, Sumatra, Bibl. 7, p. 24.

” ” *circularis* Frost. — Pliocene, Sumatra, Bibl. 7, p. 25. Upper Miocene, Java, Bibl. 19, p. 11.

## HETEROMI.

## FAM. AULORHYNCHIDAE.

*Auliscops sumatranus* Gthr. — Eocene, Sumatra, Bibl. 8, p. 173<sup>10</sup>).

## PERCESOCES.

## FAM. SPHYRAENIDAE.

*Sphyraena crassidens* deBfrt. — Miocene, Celebes, Bibl. 3, p. 133.

## ANACANTHINI.

## FAM. MACRURIDAE.

*Otolithus (Macrurus) Trolli* Schubert. — Pliocene, Sumatra, Bibl. 7, p. 9.  
 Upper Miocene, Java, Bibl. 19, p. 13<sup>11</sup>).  
 " " *Toulai*. — Pliocene, Sumatra, Bibl. 7, p. 19.  
 " " *gracilis*. — Pliocene, Sumatra, Bibl. 7, p. 20.  
 " " *aff. praecursor* Koken. — Pliocene, Sumatra, Bibl. 7,  
 p. 20.

## FAM. GADIDAE.

*Gadide?* — Miocene, Celebes, Bibl. 3, p. 134.

## HETEROSOMATA.

## FAM. PLEURONECTIDAE.

*Otolithus (Pleuronectes) elongatus*. — Pliocene, Sumatra, Bibl. 7, j. 27.

## FAM. SOLEIDAE.

*Otolithus (Solea) glaber* Koken. — Pliocene, Sumatra, Bibl. 7, p. 25.  
 " " *angularis*. — Pliocene, Sumatra, Bibl. 7, p. 26.  
 " " *songgoënsis* Vorstman. — Upper Eocene, Java, Bibl. 19,  
 p. 14.  
 " " *balonggensis* Vorstman. — Upper Eocene, Java, Bibl.  
 19, p. 13.

## LABYRINTHICI.

## FAM. ANABANTIDAE.

*Anabas microcephalus* Blkr. — Pleistocene, Java, Bibl. 6, p. 1239.

## FAM. OPHIOCEPHALIDAE.

*Ophiocephalus spec.* — Pleistocene, Java, Bibl. 6, p. 1239; Bibl. 9, p. 59.

## BERYCOMORPHI.

## FAM. BERYCIDAE.

*Holocentrum spec.* — Miocene, Celebes, Bibl. 3, p. 134.

## FAM. MONOCENTRIDAE.

*Otolithus (Monocentris) lemoinei*. — Pliocene, Sumatra, Bibl. 7, p. 13.  
 " " *lemoinei*, var. *angulatus* Frost. — Pliocene, Su-  
 matra, Bibl. 7, p. 13.  
 " (*Berycidarum*) *atjehensis* Frost. — Pliocene, Sumatra, Bibl. 7,  
 p. 12.

## PERCIFORMES.

## FAM. PERCIDAE.

- Otolithus (Percidarum) aff. plebejus Koken. — Pliocene, Sumatra, Bibl. 7, p. 8.  
 " " plebejus Koken. — Pliocene, Sumatra, Bibl. 7, p. 8.

## FAM. SERRANIDAE.

- Ambassis spec. ? — Eocene, Sumatra, Bibl. 8, p. 173, footnote <sup>12</sup>).  
 Lutjanus spec. ? — Miocene, Celebes, Bibl. 5, p. 165.  
 Otolithus (Serranus) noetlingi Koken. — Pliocene, Sumatra, Bibl. 7, p. 9.  
 " (Apogoniarum) boulei Priem. — Pliocene, Sumatra, Bibl. 7, p. 9.  
 Upper Eocene, Upper Miocene, Java, Bibl. 19, p. 4 <sup>13</sup>).

## FAM. CEPOLIDAE.

- Otolithus (Cepola) oriens. — Pliocene, Sumatra, Bibl. 7, p. 26.

## FAM. SCIAENIDAE.

- Otolithus (Umbrina) poeroeënsis Vorstman. — Upper Eocene, Java, Bibl. p. 8.  
 " " plenus. — Pliocene, Sumatra, Bibl. 7, p. 15.  
 " (Sciaenidarum) aff. subgemma. — Pliocene, Sumatra, Bibl. 7, p. 16.  
 " (Micropogon) distinctus. — Pliocene, Sumatra, Bibl. 7, p. 16.  
 " (Sciaenidarum) subeporrectus Vorstman. — Upper Eocene, Java, Bibl. 19, p. 7.  
 " " songgoënsis Vorstman. — Upper Eocene, Java, Bibl. 19, p. 6.

## FAM. SPARIDAE.

- Otolithus (Dentex) aff. sardinensis. — Pliocene, Sumatra, Bibl. 7, p. 12.  
 " " balonggensis Vorstman. — Upper Eocene, Java, Bibl. 7, p. 6.  
 " (Sparidarum) vöslauensis. — Pliocene, Sumatra, Bibl. 7, p. 10.  
 " " gregarius Koken. — Pliocene, Sumatra, Bibl. 7, p. 10. Upper Eocene, Java, Bibl. 19, p. 5 <sup>14</sup>).  
 " " crescens. — Pliocene, Sumatra, Bibl. 7, p. 11.  
 Sparide. — Miocene, Java, Bibl. 4, p. 4; Bibl. 13, p. 21 <sup>15</sup>).  
 " ? — Miocene, Celebes, Bibl. 3, p. 135.

## FAM. CHAETODONTIDAE.

- Chelmo fossilis deBfrt. — Miocene, Celebes, Bibl. 3, p. 136.

## FAM. POMACENTRIDAE.

- Pomacentride ? — Miocene, Celebes, Bibl. 3, p. 137.

## FAM. LABRIDAE.

- Choerops aff. — Miocene, Java, Bibl. 4, p. 5.

## FAM. SCARIDAE.

- Pseudoscarus ? — Miocene, Java, Bibl. 4, p. 5 <sup>16</sup>).  
 Incertae Sedis.  
 Perciform ? — Miocene, Celebes, Bibl. 3, p. 143.

## SCOMBIFORMES.

## FAM. SCOMBRIDAE.

*Cybium intermedium* deBfrt. — Miocene, Celebes, Bibl. 3, p. 141.

## FAM. CARANGIDAE.

*Caranx femeri* deBfrt. — Miocene, Celebes, Bibl. 3, p. 138.

„ *baltruschi* deBfrt. — Miocene, Celebes, Bibl. 3, p. 138.

## GOBIIFORMES.

## FAM. GOBIIDAE.

*Otolithus* (*Gobius*) *vicinalis* Koken. — Pliocene, Sumatra, Bibl. 7, p. 17.

„ „ *aff. vicinalis*. — Pliocene, Sumatra, Bibl. 3, p. 17.

„ *obliquus* Frost. — Pliocene, Sumatra, Bibl. 7, p. 18. Upper Miocene, Lower Miocene, Java, Bibl. 19, p. 10.

„ (*Gobius*) *preangerensis* Vorstman. — Lower Miocene, Java, Bibl. 19, p. 9.

„ „ *tankilensis* Vorstman. — Upper Miocene, Java, Bibl. 19, p. 9.

„ „ *orientalis* Vorstman. — Upper Miocene, Lower Miocene, Java, Bibl. 19, p. 11.

„ (*Gobiidarum*) *talahebensii* Vorstman. — Upper Eocene, Java, Bibl. 19, p. 8.

„ „ *njalindoengensis* Vorstman. — Lower Miocene, Java, Bibl. 19, p. 10.

## JUGULARES.

## FAM. TRACHINIDAE.

*Otolithus* (*Trachinus*) *seelandicus*. — Pliocene, Sumatra, Bibl. 7, p. 14.

## FAM. OPHIDIIDAE.

*Otolithus* (*Ophidium*) *pantanellii*. — Pliocene, Sumatra, Bibl. 7, p. 14.

„ „ *magnus*. — Pliocene, Sumatra, Bibl. 7, p. 15.

## PLECTOGNATHI.

## FAM. TRIACANTHIDAE.

*Marosia huismani* deBfrt. — Miocene, Celebes, Bibl. 3, p. 142.

## FAM. BALISTIDAE.

*Balistes spec. juv.* — Miocene, Celebes, Bibl. 3, p. 142.

## FAM. DIODONTIDAE.

*Diodon sigma* Martin. — Miocene, Java, Bibl. 13, p. 16, Bibl. 4, p. 5.

*Otolithus* (*Incertae sedis*) *circularis* Vorstman. — Upper and Lower Miocene, Java.

**REPTILIA.****CHELONIA.****FAM. TESTUDINIDAE.**

*Hardella isoclina* Dubois. — Pleistocene, Java, Bibl. 6, p. 1269.

*Batagur signatus* Jaekel. — Pleistocene, Java, Bibl. 10, p. 77.

„ *siebenrocki* Jaekel. — Pleistocene, Java, Bibl. 10, p. 78.

**FAM. TRIONYCHIDAE.**

*Trionyx trinilensis* Jaekel. — Pleistocene, Java, Bibl. 10, p. 78.

„ spec. — Pleistocene, Java, Bibl. 6, p. 1239.

*Chitra selenkae* Jaekel. — Pleistocene, Java, Bibl. 10, p. 80.

„ *minor* Jaekel. — Pleistocene, Java, Bibl. 10, p. 80.

**CROCODILIA.****FAM. GAVIALIDAE.**

*Gavialis bengawanicus* Janensch. — Pleistocene, Java, Bibl. 11, p. 61.

**FAM. CROCODILIDAE.**

*Crocodylus ossifragus* Dubois. — Pleistocene, Java, Bibl. 6, p. 1296. Bibl. 11, p. 66.

**ICTHYOSAURIA.**

*Ichthyosaurus ceramensis* Martin. — Cretaceous?. Ceram, Bibl. 4, p. 74.

*Mixosaurus timorensis* Broili. — Trias, Timor, Bibl. 4a, p. 1—10.

**RHYNCHOCEPHALIA.****FAM. MOSASAURIDAE.**

*Mosasaurus* spec. — Upper Cretaceous, Timor, Bibl. 1, p. 69.

**FAM. CHAMPSOSAURIDAE.**

*Champsosaurus* spec. — Upper Cretaceous, Timor, Bibl. 1, p. 69.

**LACERTILIA.****FAM. VARANIDAE.**

*Varanus* spec. — Pleistocene, Java, Bibl. 11, p. 73.

**OPHIDIA.****FAM. COLUBRIDAE.**

Colubride?. — Pleistocene, Java, Bibl. 11, p. 74.

**A V E S.****FAM. PHALACROCORACIDAE.**

*Protoplotus Beauforti* Lambrecht. — Eocene, W. Sumatra, Bibl. 12a, p. 15—24.

## ANNOTATIONS TO THE LIST OF SPECIES.

1. SMITH WOODWARD (Bibl. 18, I) seems to doubt the correctness of the determination of MARTIN. He cites at least MARTIN with a query under the synonyms of *H. serra*. On what ground he does not mention.
2. *Otodus* is a synonym of *Lamna*.
3. GÜNTHER described part of the jaw with teeth as *Chirocentrus polyodon*, from the same deposit (Bibl. 8, p. 180). In a large collection, from the same locality (Sepang, Padang, Highlands), which the „Dienst v. d. Mijnbouw in Ned. Indië” sent me for identification. I found some fossils of an Osteoglossid fish, without doubt belonging to *Ch. polyodon* of GÜNTHER. Previously I had the opportunity of describing a scale of an Osteoglossid fish, also from the same locality (Bibl. 2). Provisionally I range this fish in the genus *Dapedoglossus*, but most probably it belongs to a new genus. I will not go into details here, as Miss M. SANDERS will soon report on this collection.
4. Considered by GÜNTHER (Bibl. 8, p. 173 „to be fry, and, at present, indeterminable”.
5. Described as *Sardinooides amblystoma* by VON DER MARCK (Bibl. 12).
6. GÜNTHER (Bibl. 8, p. 183) and SMITH WOODWARD (Bibl. 18, IV, p. 323) consider this fossil to be a *Cyprinoid*, with which opinion I agree.
7. HENNIG (Bibl. 9, p. 58) and DUBOIS (Bibl. 6, p. 1239) record this species as *Clarias magur*, a synonym of *Clarias batrachus*.
8. The fish described by v. d. MARCK (Bibl. 12) from the same deposits as *Brachyspondylus indicus*, is probably this species.
9. Miss VORSTMAN (Bibl. 19, p. 12) being of opinion that it is improbable that this European species occurred in Sumatra, has changed the name into *O. (Scopelus) Frosti*. As long as no differences can be found, I think it better to keep the name, given by FROST.
10. *Protosyngnathus sumatrensis* v. d. MARCK (Bibl. 12, p. 141) and *Aulorhynchus sumatrensis* SM. WOODWARD (Bibl. 18, IV, p. 373), are synonyms of this species.
11. Miss VORSTMAN (Bibl. 19, p. 13) is of opinion, that FROST was wrong and that the otolith belongs to a pleuronectid fish, which she calls *O. (Pleuronectes) boerlensis*.
12. GÜNTHER supposes (Bibl. 8, p. 173, footnote), that the fish described by RÜTTMEYER (Bibl. 16, p. 159) as *Smerdis sp. macroua aff.*, is an *Ambassis*. I agree with this supposition.
13. See 9. Miss VORSTMANN calls this fish *O. (Apogonarum) Frosti*.
14. See 9. Miss VORSTMANN calls this fish *O. (Sparidarum) Frosti*.
15. The teeth, which MARTIN (Bibl. 13, p. 21) thought to belong to a fish near *Triacanthus*, are, according to me (Bibl. 4, p. 4) from a Sparid fish.



16. As I had more material than MARTIN (Bibl. 13, p. 22), who compared the teeth with those of *Monacanthus* or *Balistes*, I could prove that they belong to a Scarid fish (Bibl. 4, p. 5).

### STRATIGRAPHICAL REMARKS.

It is very difficult to ascertain the age of fossil fishfaunas in the Indoaustralian Archipelago, especially the tertiary ones. The fossil marine fishfauna of the tertiary of Europe, f. i. the well known fauna of Monte Bolca, shows so much resemblance to the recent marine fishfauna of the Indoaustralian Archipelago, that we must come to the conclusion that the tertiary fishfauna of Europe has survived here. However, how much has it changed in the mean time? This is difficult to say. The best known tertiary marine fishfauna in the Indoaustralian Archipelago is, for the moment, that of Maros, S. Celebes. I suggested, that it was of miocene age, considering that most of the genera are still in existence, but that all the species are different. As we don't know, how quickly species change, it remains a guess.

It is the same with the freshwater fishfauna of the Padang Highlands. I have called it Eocene in this paper, but I am well aware, that this opinion is open to critic.

The fishteeth described by MARTIN from Ngembak, Java (Bibl. 13) contain several forms, which have been found again in Kleripan (Bibl. 4.) Ngembak is considered to be Upper-Miocene, Kleripan Lower-Miocene, but as such fossils as *Diodan sigma* and a very characteristic tooth of a Sparid fish are common in both, it is very probable that the deposits of Ngembak and Kleripan are part of the same facies. Here the fishfossils can be useful for the geologist and in the case of the deepsea deposits of Timor, the occurrence of teeth of *Ptychodus* and others made it certain, that they are of Upper Cretaceous age.

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