

THE INLAND FISHES OF PULAU TIOMAN, PENINSULAR MALAYSIA

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ABSTRACT. - Forty-eight species of fishes are presently known from the inland drainages of Pulau Tioman, of which only six are primary freshwater species. Ten species are recorded for the first time, viz., *Megalops cyprinoides* (Megalopidae), *Apogon hyalosoma* (Apogonidae), *Butis gymnopomus*, *Eleotris melanosoma*, *Giuris margaritacea*, *Lophogobius bleekeri*, *Exyrias puntang*, *Pseudogobius javanicus*, *Stiphodon atropurpureus* (Gobiidae) and *Parioglossus raoi* (Microdesmidae). The presence of *Monopterus albus* (Synbranchidae) on the island is now confirmed after a hiatus of 70 years.

KEY WORDS. - Checklist, inland fishes, new records, Pulau Tioman.

INTRODUCTION

Pulau Tioman is located about 45 km off the south-eastern coast of the Malay Peninsula in the South China Sea. The rugged island is drained by many streams, the largest of which is about 15 m wide. The streams, generally under forest canopy, are swift-flowing and follow a boulder strewn course with many small cascades. In the flat coastal areas, the typical stream course changes to a meander (Bullock & Medway, 1966). The waters are generally neutral to medium-hard (pH 6.6-8.0). The inland fish fauna of Tioman consists largely of anadromous, secondary division freshwater forms and these appear to be concentrated mainly in the lower reaches and estuaries (Alfred, 1966; Lim, 1993). Only six species of primary freshwater fish are found on the island. They are *Puntius lateristriga*, *Sundoreonectes tiomanensis*, *Clarias batu*, *C. teijsmanni*, *Trichogaster trichopterus* and *Macrognathus maculatus*.

Although annotated checklists of the inland fishes of Pulau Tioman have been compiled by Alfred (1966) and Lim (1993), these were based on collections in only a few localities on the island. Thirty-six species were last recorded (Lim, 1993). The present report incorporates collections and observations made during several outings to Tioman between 1996 and 1997 by various teams, when most of the major drainages on the island were surveyed. However,

this checklist is still incomplete. Due to the shortage of time, not all the drainages have been thoroughly sampled, most notably the upper stretch of Sungai Mentawak on the south-eastern section. Not all records are supported by material, although voucher specimens were collected whenever possible.

In the course of this study, 10 species of fishes are recorded for the first time from inland drainages on Pulau Tioman. These are *Megalops cyprinoides*, *Apogon hyalosoma*, *Butis gymnopomus*, *Eleotris melanosoma*, *Giuris margaritacea*, *Lophogobius bleekeri*, *Exyrias puntang*, *Pseudogobius javanicus*, *Stiphodon atropurpureus* and *Parioglossus raoi*. The record of *Monopterus albus*, last collected in 1926, is now substantiated by new material.

MATERIAL AND METHODS

The fishes were collected by electrofishing, hook-and-line, cast nets, scoop nets and 40 X 60 cm rectangular tray nets with diagonal mesh size of 3 mm. The method of using the tray nets is outlined in Cramphorn et al. (1993). The fishes were immediately killed and preserved in 10% formalin solution. After two weeks, they were transferred to 70% alcohol for long-term storage.

Voucher specimens are deposited in the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, Department of Biological Sciences, National University of Singapore and the Malaysian Department of Wildlife and National Parks in Kuala Lumpur (MDW).

All sizes of the fishes are given as standard length, unless otherwise stated. Abbreviations used include: Sg. (Sungai = river), Kg. (Kampung = village), SL (standard length) and TL (total length).

ANNOTATED CHECKLIST

ORDER ELOPIFORMES

FAMILY MEGALOPIDAE

Megalops cyprinoides (Broussonet)

(Fig. 1)

Material examined. - Remnant stream ca. 50 m south of Sg. Keliling (ZRC 40437, 3 ex., 75.1-91.6 mm SL, 27 Jun 1996).

A new Tioman record. Three young specimens (ZRC 40437) were obtained from a small waterhole in a dried up tributary at the mouth of Sg. Keliling. In addition, one example of about 20 mm TL was sighted upstream in a deep, rocky pool at Sg. Paya.

ORDER CYPRINIFORMES

FAMILY CYPRINIDAE

Puntius lateristriga (Valenciennes in Cuvier & Valenciennes)

Puntius lateristriga - Tweedie, 1961: 178; Alfred, 1966: 97-98, Fig. 6; Lim, 1993: 7; Anon., 1995: 58-59.

Material examined. - Sg. Ayer Besar near Kg. Tekek (ZRC 581, 6 ex., 33.6-98.0 mm SL, May 1927; ZRC 3654, 63 ex., 44.2-97.5 mm SL, 29 May, 1958); Sg. Ayer Rajah, Kg. Genting (ZRC 39223, 42 ex., 23.4-92.8 mm SL, 15 Sep 1995); Sg. Durian Kallang upstream, near base of Bukit Paya (ZRC 39226, 15 ex., 34.7-105.3 mm SL, 17 Sep 1995); Sg. Pasal upstream (ZRC 39227, 4 ex., 15.3-23.6 mm SL, 17 Sep, 1995); Sg. Keliling (ZRC 40443, 44 ex., 16.2-104.3 mm SL, 28 Jun 1996; ZRC 41442, 2 ex., 81.1-79.1 mm SL, 26 Jun 1997); unnamed stream along Mentawak-Keliling trail (ZRC 40446, 40 ex., 11.8-109.7 mm SL, 27 Jun 1996); Sg. Baharu on Tekek-Juara trail (towards Juara) (ZRC 40447, 5 ex., 17.9-61.0 mm SL, 28 Jun 1996; ZRC 40448, 34 ex., 11.5-71.5 mm SL, 25 Jun 1996); Sg. Ayer Dalam, approx. 200 m behind Kg. Juara (ZRC 40449, 27 ex., 12.0-92.5 mm SL, 28 Jun 1996); Sg. Raya (ZRC 40453, 38 ex., 18.3-106.2 mm SL, 28 Jun 1996); Sg. Asah (ZRC 40455, 4 ex., 23.6-32.3 mm SL, 26 Jun 1996; ZRC 41408, 1 ex., 126.4 mm SL, 24 Jun 1997); and Sg. Paya (ZRC 40456, 30 ex., 14.9-85.8 mm SL, 25 Jun 1996; ZRC 41445, 1 ex., 84.4 mm SL, 25 Jun 1997).

This appears to be the most common primary freshwater fish encountered in the drainages of Pulau Tioman. Throughout its geographic range, *Puntius lateristriga* is known to exhibit variation in its colour pattern. Tweedie (1961) recognised six distinct forms of colour pattern in *P. lateristriga* from Peninsular Malaysia and originally categorised those from Pulau Tioman as belonging to the Johor form. Alfred (1966) studied additional specimens and described them as being intermediate between the Johor and Muar forms.

FAMILY BALITORIDAE

Sundoreonectes tiomanensis Kottelat

Noemacheilus sp. nov. - Day & Mowbray, 1990: 41-42.

Sundoreonectes tiomanensis Kottelat, 1990: 52-55, Pl. 1 (Fig. 2), Figs. 3, 4; Lim, 1993: 8.

Material examined. - None.

This blind, greyish-pink loach was reported by Day & Mowbray (1990) from a cave near the summit of Gunung Kajang. This species is of particular interest as the genus *Sundoreonectes* is not known from the Malay Peninsula. Two non-cave-dwelling congeners, however, occur in Borneo. Only four specimens of this unique fish have been collected to date. The type specimens are at the Natural History Museum of London, while the remaining two are said to be deposited at the Universiti Kebangsaan Malaysia.

The fish were discovered in a granite cave system reported to be at 980 metres above sea level. The shallow pool in which they were obtained was no more than 20 cm deep with a slight through-flow but no exit, the cave roof no more than one metre in height. The substrate of the pool was fine granitic sand. The cave roof showed remains of swiftlet nests. Besides the approximately 15 *Sundoreonectes tiomanensis* observed at the bottom of the pools, *Leptobranchium* sp. tadpoles were also found (after Day & Mowbray, 1990).

This species is listed as rare in the 1994 IUCN Red List of Threatened Animals (Groomridge, 1993). No specimens were recently obtained.

ORDER SILURIFORMES

FAMILY CLARIIDAE

Clarias batu Lim & Ng

Clarias nieuhofi - Alfred, 1966:98.

Clarias aff. *nieuhofii* - Lim, 1993: 9, Fig. 2a.

Prophagorus nieuhofii - Anon., 1995: 58-59.

Clarias batu Lim & Ng, 1999.

Material examined. - See Ng & Lim (1999).

Clarias batu has been collected from Sg. Paya, Sg. Nipah, Sg. Asah, Teluk Dungun, Sg. Baharu, Sg. Ayer Besar; and Kg. Genting. It differs from its congener, *C. teijsmanni* in having a more slender body (body depth at anus 9.0-11.4 %SL vs. 14.8-15.9) and a longer distance between the tip of the occipital process to the origin of the dorsal fin (9.9-11.8 %SL vs. 8.2-9.4). This species has not been found syntopically with *C. teijsmanni*. The two species seem to prefer different habitats: *C. batu* in fast-flowing streams with large boulders (under which they hide), *C. teijsmanni* in slower-flowing streams which are heavily vegetated. See Lim & Ng (1999) (in this volume) for a detailed account of the taxonomy and ecology of *C. batu*.

Clarias teijsmanni Bleeker

Clarias teijsmanni - Lim, 1993: 9, Fig. 2b.

Material examined. - Remnant stream about 50 m south of Sg. Keliling (ZRC 40094, 5 ex., 218-250 mm SL, 27 Jun 1996; ZRC 40439, 2 ex., 146.1-153.2 mm SL, 27 Jun 1996); Sg. Keliling (ZRC 40095, 1 ex., 253 mm SL, 27-28 Jun 1996; ZRC 40442, 1 ex., 73.7 mm SL, 27-28 Jun 1996; ZRC 41443, 2 ex., 160-225 mm SL, 26 Jun 1997); lower reaches of Sg. Baharu (ZRC 24438-24440, 3 ex., 190-240 mm SL, 9 Aug 1992).

The habitat preference of *Clarias teijsmanni* may explain why this species is only found on the eastern half of the island. Slower-flowing, heavily-vegetated streams are found only on the gentler slopes on the eastern part of Tioman, while due to the steeper terrain, most drainages in the western half are fast-flowing with large boulders.

ORDER SYNBRANCHIFORMES

FAMILY SYNBRANCHIDAE

Monopterus albus Zuiew

Fluta alba - Alfred, 1966: 99.

Monopterus albus - Lim, 1993: 9.

Material examined. - Northeast of Pulau Tioman (ZRC 1677, 1 ex., 280 mm TL, 24 Jun 1926); Sg. Keliling (ZRC 40444, 6 ex., 28.2-285 mm TL, 28 Jun 1996).

The specimens obtained from Sg. Keliling are the first record in 70 years, thus confirming the presence of *Monopterus albus* on Pulau Tioman. Young specimens (ca. 30-40 mm TL) were caught from among leaf litter in more stagnant sections of the stream, while larger specimens above 200 mm TL were caught from submerged bank vegetation.

ORDER CYPRINODONTIFORMES

FAMILY APLOCHEILIDAE

Aplocheilus panchax (Hamilton)

Aplocheilus panchax - Alfred, 1966: 99; Lim, 1993: 9.

Material examined. - Sandy streams behind Kg. Salang (ZRC 41430, 15 ex., 21.9-38.9 mm SL, 25 Jun 1997).

ORDER BELONIFORMES

FAMILY HEMIRAMPHIDAE

Dermogenys pusilla van Hasselt

Dermogenys pusillus - Alfred, 1966: 99.

Dermogenys cf. *pusilla* - Lim, 1993: 9.

Hemirhamphodon pogonognathus (non Bleeker) - Anon. 1995: 58-59.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1655, 16 ex., 20.1-49.4 mm SL, 27 May 1958); stream behind Kg. Genting (ZRC 40434, 20 ex., 19.1-49.6 mm SL, 29 Apr 1995); Sg. Paya (ZRC 40464, 15 ex., 22.5-44.8 mm SL, 25 Jun 1996); Monkey's Bay, mangrove area (ZRC 41428, 20 ex., 19.4-41.6 mm SL, 25 Jun 1997); sandy streams behind Kg. Salang (ZRC 41429, 22 ex., 24.9-54.0 mm SL, 25 Jun 1997).

The record of *Hemirhamphodon pogonognathus* by Anon. (1995) is most probably this species. The modified anal fin ray of a male example from Tioman is illustrated on Fig. 13.

Zenarchopterus gilli (Smith)

Zenarchopterus beauforti - Alfred, 1966: 99; Lim, 1993: 9.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1656, 1 ex., 83.8 mm SL, 3 Jun 1958); Sg. Paya (ZRC 40457, 1 ex., 129.5 mm SL, 25 Jun 1996).

The species previously identified as *Zenarchopterus beauforti* by Alfred (1966) and Lim (1993) has been reidentified by B. B. Collette as *Z. gilli*. A male specimen with distinctly thickened anal fin rays extending beyond the caudal base was caught from Sg. Paya. This specimen was part of a small group observed in brackish water at the lower reaches of Sg. Paya.

ORDER ATHERINIFORMES

FAMILY ATHERINIDAE

Atherinomorus lacunosus (Forster)

Pranesus pinguis - Alfred, 1966: 99.

Atherinomorus lacunosus - Lim, 1993: 10.

Material examined. - Sg. Baharu at Kg. Juara (ZRC 1674, 6 ex., 85-92 mm SL and ZRC 1675, 8 ex., 49.1-91.7 mm SL, 3 Jun 1958).

ORDER PERCIFORMES

FAMILY MUGILIDAE

Moolgarda seheli (Forsskål)

Mugil seheli - Alfred, 1966: 99.

Valamugil seheli - Lim, 1993: 10.

Material examined. - Sg. Baharu at Kg. Juara (ZRC 1657, 4 ex., 18.3-69.3 mm SL, 30 May 1958).

Valamugil is a junior synonym of *Moolgarda* (see Randall & Anderson, 1993). A school of grey mullets with long pectoral fins observed in Sg. Paya may belong to this species.

FAMILY APOGONIDAE

Apogon amboinensis Bleeker

Apogon amboinensis - Alfred, 1966: 99; Lim, 1993: 10.

Material examined. - Sg. Paya (ZRC 40456, 1 ex., 58.6 mm SL, 25 Jun 1996); Sg. Mentawak (ZRC 41415, 1 ex., 26.7 mm SL, 24 Jun 1997); Sg. Keliling (ZRC 41441, 3 ex., 54.7-62.3 mm SL, 26 Jun 1997); Kg. Salang.

Apogon hyalosoma Bleeker
(Fig. 2)

Material examined. - Sg. Mentawak tributary (ZRC 41414, 1 ex., 57.2 mm SL, 24 Jun 1997).

A new record for Pulau Tioman, the present specimen was obtained by cast net during low tide. This species is common in estuaries throughout the Malay Peninsula.

FAMILY AMBASSIDAE

***Ambassis interrupta* Bleeker**

Ambassis interrupta (in part) - Alfred, 1966: 100.

Ambassis interrupta - Lim, 1993: 10.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1660, 7 ex., 34.6-58.7 mm SL, 27 May 1958; ZRC 1661, 46 ex., 34.3-57.4 mm SL, 3 Jun 1958).

***Ambassis urotaenia* Bleeker**

Ambassis interrupta (in part) - Alfred, 1966: 100.

Ambassis urotaenia - Lim, 1993: 10.

Material examined. - Sg. Baharu at Kg. Juara (ZRC 1659, 4 ex., 47.9-68.2 mm SL, 30 May 1958).

Part of the material identified by Alfred as *A. interrupta* had been re-identified as *A. urotaenia* by Lim (1993). They are distinguished from *A. interrupta* in being more slender (body depth 32.7 %SL vs. 38.5), having one (vs. two) row of cheek scales, and an entire (vs. denticulated) interopercle (Lim, 1993).

FAMILY TERAPONTIDAE

***Terapon jarbua* (Forsskål)**

Terapon jarbua - Alfred, 1966: 100; Lim, 1993: 10.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1662, 5 ex., 10.8-68.2 mm SL, 3 Jun 1958).

FAMILY MONODACTYLIDAE

***Monodactylus argenteus* (Linnaeus)**

Monodactylus argenteus - Lim, 1993: 10.

Material examined. - Sg. Mentawak mouth (ZRC 41421, 5 ex., 14.8-19.1 mm SL, 24 Jun 1997); Kg. Salang.

This species was observed together with *Apogon amboinensis* at Kg. Salang by Lim (1993). Adults and juveniles were also observed in the mouth of Sg. Mentawak. While adults were observed in open areas, juveniles apparently tend to hide among bank vegetation.

FAMILY TOXOTIDAE

***Toxotes jaculatrix* (Pallas)**

Toxotes jaculatrix - Lim, 1993: 11.

Material examined. - None.

Examples of this surface dwelling species were sighted by Lim (1993) at the mouth of Sg. Mentawak.

FAMILY SILLAGINIDAE

***Sillago sihama* (Forsskal)**

Sillago sihama - Lim, 1993: 11.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1663, 1 ex., 122.5 mm SL, 3 Jun 1958).

FAMILY CARANGIDAE

***Atule mate* (Cuvier)**

Selar mate - Alfred, 1966: 100.

Atule mate - Lim, 1993: 11.

Material examined. - Sg. Baharu at Kg. Juara (ZRC 1664, 8 ex., 71.2-81.5 mm SL, 30 May 1958).

***Caranx sexfasciatus* Quoy & Gaimard**

Caranx sexfasciatus - Alfred, 1966: 100; Lim, 1993: 11.

Material examined. - Sg. Baharu at Kg. Juara (ZRC 1665, 1 ex., 92.2 mm SL, 30 May 1958); Sg. Mentawak (ZRC 41411, 1 ex., 118.0 mm SL, 24 Jun 1997).

The specimen from Sg. Mentawak was obtained by cast net during low tide.

FAMILY GERREIDAE

***Gerres filamentosus* Cuvier**

Gerres filamentosus - Lim, 1993: 11.

Material examined. - Juara bay, freshwater stream (ZRC 2700, 1 ex., 119.6 mm SL, 26 Apr 1927).

FAMILY LUTJANIDAE

Lutjanus argentimaculatus (Forsskål)

Lutjanus argentimaculatus - Lim, 1993: 11.

Material examined. - Sg. Mentawak (ZRC 41410, 9 ex., 75.9-175 mm SL, 24 Jun 1997); Teluk Dungun, ca. 50 m upstream from mangrove area (ZRC 41432, 3 ex., 111.5-128.4 mm SL, 25 Jun 1997); Sg. Keliling (ZRC 41440, 2 ex., 92.5-106.8 mm SL, 26 Jun 1997); Sg. Raya; Kg. Juara; Kg. Salang; Sg. Paya; Sg. Ayer Dalam.

Juveniles and subadults of this species were sighted at Sg. Mentawak, Sg. Raya, Kg. Juara and Kg. Salang by Lim (1993). They were seen together with a true freshwater species, *Puntius lateristriga* (see Lim, 1993; pers. obs.). Present specimens were obtained by cast nets.

FAMILY HAEMULIDAE

Plectorhinchus gibbosus (Lacepède)

Plectorhinchus gibbosus - Lim, 1993: 11.

Material examined. - Sg. Mentawak (no material examined).

This species has been sighted by Lim (1993) at the mouth of Sg. Mentawak.

FAMILY POMACENTRIDAE

Pomacentrus taeniometopon Bleeker

Pomacentrus melanopterus - Alfred, 1966: 100.

Pomacentrus taeniometopon - Lim, 1993: 11.

Material examined. - Freshwater stream at Juara bay (ZRC 2081, 1 ex., 80.5 mm SL, 26 Apr 1927); Sg. Mentawak (ZRC 41413, 3 ex, 53.3-62.0 mm SL, 24 Jun 1997).

The present specimens were obtained by cast net near the mouth of Sg. Mentawak during high tide. Identification confirmed by G. R. Allen.

Abudefduf sordidus (Forsskål)

Abudefduf sordidus - Lim, 1993: 12.

Material examined. - None.

This species has been sighted by Lim (1993) at the mouth of Sg. Mentawak.

FAMILY BLENNIIDAE

Istiblennius edentulus (Bloch)

Salarias edentulus - Alfred, 1966: 100.

Istiblennius edentulus - Lim, 1993: 12.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1678, 2 ex., 58.6-59.2 mm SL, 6 Jun 1958).

FAMILY GOBIIDAE

Butis gymnopus (Bleeker)

(Fig. 3)

Material examined. - Sg. Mentawak tributary (ZRC 41416, 1 ex., 60.1 mm SL, 24 Jun 1997).

Recorded for the first time from Pulau Tioman, the present specimen was obtained by push net along the stream bank during low tide.

Eleotris melanosoma Bleeker

(Fig. 4)

Material examined. - Remnant stream about 50 m south of Sg. Keliling (ZRC 40436, 8 ex., 29.6-108.4 mm SL, 27 Jun 1996); Sg. Keliling (ZRC 40441, 10 ex., 22.2-83.7 mm SL, 27-28 Jun 1996; ZRC 41436, 8 ex., 44.7-127.3 mm SL, 26 Jun 1997); Sg. Ayer Dalam, approx. 200 m behind Kg. Juara (ZRC 40450, 1 ex., 64.1 mm SL, 28 Jun 1996); Sg. Mentawak (ZRC 41418, 3 ex., 52.8-85.3 mm SL, 24 Jun 1997).

Recorded for the first time from Pulau Tioman, the specimens were caught from among submerged bank vegetation of freshwater streams. The cephalic papillae pattern of a Tioman example is illustrated on Fig. 14.

Eleotris oxycephala Temminck & Schlegel

Eleotris insulindica - Alfred, 1966: 102.

Eleotris oxycephala - Lim, 1993: 12, Fig. 4.

Material examined. - Sg. Baharu at Kg. Juara (ZRC 1671, 2 ex., 75.0-81.9 mm SL, 31 May 1958).

Not collected recently, these specimens differ from *Eleotris melanosoma* in having short spine-covered pedestal-like (vs. Longer, rod-like) gill rakers, female genital papilla bearing fringes (vs. no fringe) on the posterior margin, and two (vs. three) dark stripes radiating backwards from the eye (see Akihito, 1967). The cephalic papillae pattern of a Tioman example is illustrated on Fig. 15.

Exyrias puntang (Bleeker)

(Fig. 5)

Material examined. - Sg. Paya (ZRC 40460, 1 ex., 90.7 mm SL, 25 Jun 1995); Sg. Mentawak (ZRC 41412, 4 ex., 34.7-86.4 mm SL, 24 Jun 1997).

A new record for Pulau Tioman. Specimens were caught from among submerged bank vegetation in brackish water.

***Giuris margaritacea* (Valenciennes)**

(Fig. 6)

Material examined. - Sg. Keliling (ZRC 41435, 1 ex., 166 mm SL, 26 Jun 1997).

A new record for Pulau Tioman. The present example was obtained from among submerged bank vegetation.

***Glossogobius aureus* Akihito & Meguro**

Glossogobius giurus - Alfred, 1966: 101.

Glossogobius aureus - Lim, 1993: 13.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1669, 1 ex., 163 mm SL, 3 Jun 1958); remnant stream about 50 m south of Sg. Keliling (ZRC 40438, 3 ex., 106.4-126.1 mm SL, 27 Jun 1996).

The specimen previously identified as *G. giuris* by Alfred (1966) has been re-identified as *G. aureus* by Lim (1993). Three specimens (ZRC 40438) were caught together with *Megalops cyprinoides* from the same waterhole.

***Glossogobius biocellatus* (Valenciennes)**

Glossogobius biocellatus - Alfred, 1966: 101; Lim, 1993: 13.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1667, 1 ex., 52.1 mm SL, 3 Jun 1958); Sg. Paya (ZRC 40462, 1 ex., 33.9 mm SL, 25 Jun 1996); Sg. Nipah (ZRC 40468, 1 ex., 22.9 mm SL, 28 Jun 1996); Sg. Mentawak (ZRC 41419, 4 ex., 24.8-32.2 mm SL, 24 Jun 1997).

Recent specimens were caught from among submerged bank vegetation in deep, rocky freshwater pools.

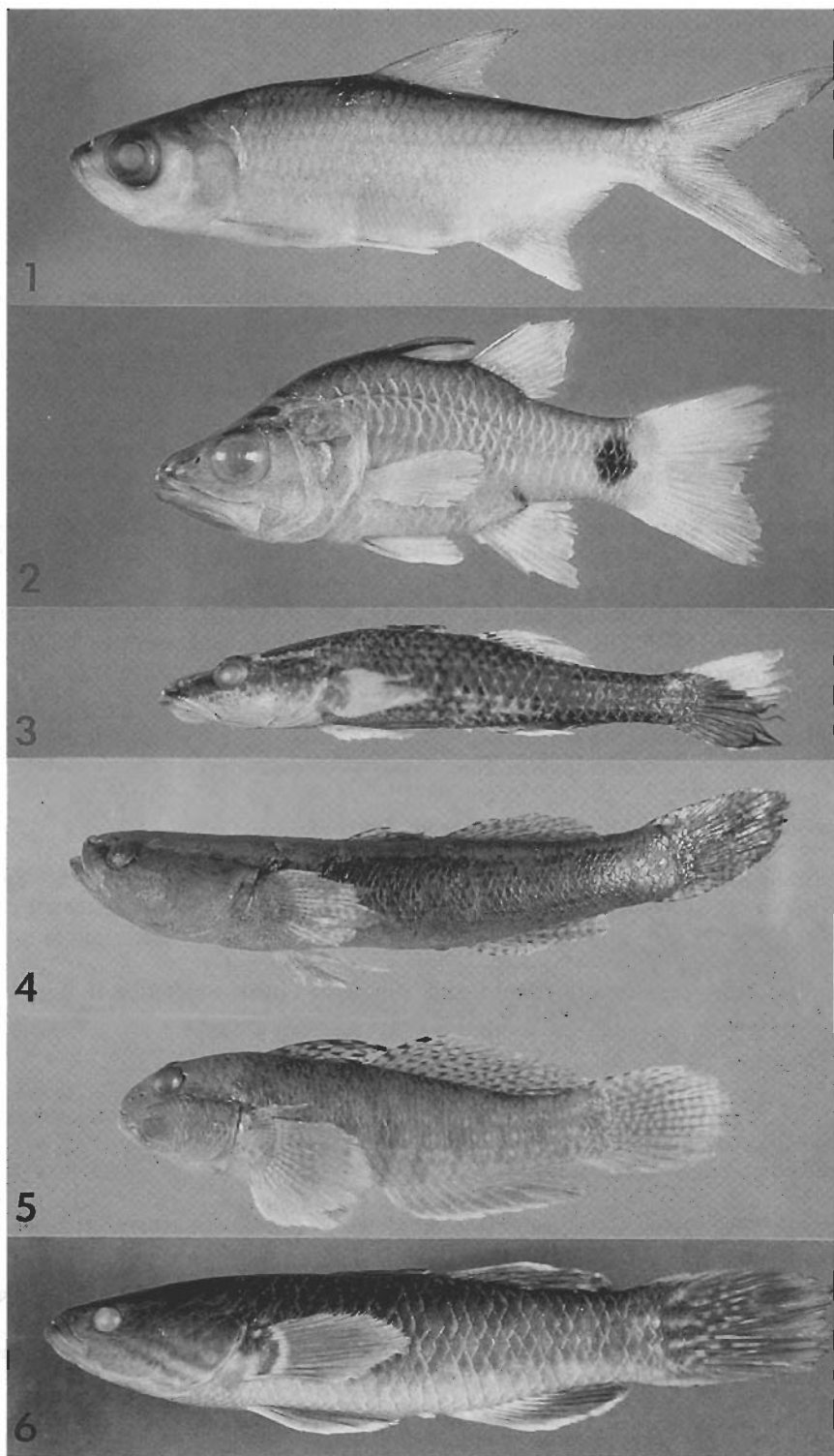
***Glossogobius cf. celebius* (Valenciennes)**

Glossogobius celebius - Alfred, 1966: 101; Anon., 1995: 58-59.

Glossogobius cf. celebius - Lim, 1993: 13.

Material examined. - Sg. Tekek at Kg. Tekek (from riverine pre-cascade zone) (ZRC 1668, 2 ex., 48.8-58.8 mm SL, 3 Jun 1958); Sg. Keliling (ZRC 40440, 8 ex., 26.5-86.5 mm SL, 27-28 Jun 1996; ZRC 41437, 10 ex., 44.7-127.3 mm SL, 26 Jun 1997); Sg. Ayer Dalam, about 200 m behind Kg. Juara (ZRC 40451, 1 ex., 84.0 mm SL, 28 Jun 1996); Sg. Raya (ZRC 40454, 5 ex., 51.4-97.4 mm SL, 28 Jun 1996; ZRC 41424, 4 ex., 69.8-103.4 mm SL, 24 Jun 1997); Sg. Paya (ZRC 40461, 5 ex., 30.1-106.8 mm SL, 25 Jun 1996; ZRC 41446, 6 ex., 86.0-111.8 mm SL, 25 Jun 1997); Sg. Mentawak (ZRC 41420, 2 ex., 56.1-61.9 mm SL, 24 Jun 1997).

All the specimens of *Glossogobius cf. celebius* obtained recently were caught among large rocks in fast-flowing freshwater streams, either by hook-and-line baited with earthworm or by electrofishing. It appears that the specimens from Tioman are not conspecific with *G. celebius* from Sulawesi (D. Hoese. pers. comm.).



Figs. 1-6. (1) *Megalops cyprinoides*. ZRC 40437, 92.7 mm SL, Sg. Keliling. (2) *Apogon hyalosoma*. ZRC 41414, 57.2 mm SL, Sg. Mentawak. (3) *Butis gymnopomus*. ZRC 41416, 60.1 mm SL, Sg. Mentawak. (4) *Eleotris melanosoma*. ZRC 40441, 83.7 mm SL, Sg. Keliling. (5) *Exyrias puntang*. ZRC 40460, 90.7 mm SL, Sg. Paya. (6) *Giuris margaritacea*. ZRC 41435, 166 mm SL, Sg. Keliling.

***Istigobius ornatus* (Rüppell)**

Acentrogobius ornatus - Alfred, 1966: 101.

Istigobius ornatus - Lim, 1993: 13.

Material examined. - Kg. Ayer Batang (ZRC 1679, 4 ex., 15.0-42.3 mm SL, 1936).

***Lophogobius bleekeri* Popta**

(Fig. 7)

Material examined. - Sg. Mentawak (ZRC 41423, 1 ex., 29.2 mm SL, 24 Jun 1997).

The present specimen, kindly identified by H. K. Larson, was found dead and drifting near the mouth of Sg. Mentawak during high tide. The fish is uniformly bluish-black with a broad white distal margin on its soft dorsal fin. Its cephalic papillae pattern is illustrated on fig. 16. This is a new record for Pulau Tioman.

***Ophiocara porocephala* (Valenciennes)**

Ophiocara porocephala - Alfred, 1966: 102; Lim, 1993: 13.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1627, 2 ex., 51.4-92.1 mm SL, 27 May 1958; ZRC 1673, 2 ex., 97.7-128.1 mm SL, 3 Jun 1958); remnant stream about 50 m south of Sg. Keliling (ZRC 40435, 7 ex., 121.3-160 mm SL, 27 Jun 1996); Sg. Keliling (ZRC 41434, 7 ex., 70.1-170 mm SL, 26 Jun 1997); Sg. Paya (ZRC 40459, 2 ex., 66.7-132.9 mm SL, 25 Jun 1996); Sg. Raya.

Most of the specimens caught during the honours 96-97 trip were from the same waterhole in which *Megalops cyprinoides* was caught (see above). They were hiding amongst the submerged leaf litter along the bank. Some individuals were sighted in a brackish mangrove stream (Sg. Raya); the remaining specimens were caught near a log at the bottom of the stream.

***Periophthalmus argentilineatus* Cuvier**

Periophthalmus argentilineatus - Alfred, 1966: 101; Lim, 1993: 14.

Material examined. - Kg. Ayer Batang (ZRC 239, 3 ex., 43.5-49.9 mm SL, May 1927; ZRC 240, 4 ex., 38.4-45.1 mm SL, 1927); Sg. Tekek at Kg. Tekek (ZRC 1670, 1 ex., 41.8 mm SL, 3 Jun 1958); Sg. Mentawak (ZRC 41417, 3 ex., 14.6-66.7 mm SL, 24 Jun 1997); Sg. Keliling (ZRC 41438, 1 ex., 65.4 mm SL, 26 Jun 1997); Juara stream.

This mudskipper has been observed in a rocky freshwater stream in Juara (Lim, 1993), in freshwater at Sg. Keliling and in brackish water at Sg. Mentawak.

***Pseudogobius javanicus* (Bleeker)**

(Fig. 8)

Material examined. - Sg. Nipah (ZRC 40466, 5 ex., 18.1-25.2 mm SL, 28 Jun 1996); mangrove area at Monkey's Bay (ZRC 41427, 6 ex., 17.6-27.9 mm SL, 25 Jun 1997).

Common in estuarine areas throughout the Malay Peninsula, this species is recorded for the first time from Pulau Tioman. Specimens from Sg. Nipah were caught from among submerged roots in a rocky freshwater pool, while those from Monkey's Bay were obtained from a mangrove stream.

***Redigobius balteatus* (Herre)**

Acentrogobius balteata - Alfred, 1966: 101.

Redigobius balteatus - Lim, 1993: 13.

Material examined. - Sg. Tekek at Kg. Tekek (ZRC 1666, 4 ex., 23.5-27.1 mm SL, 3 Jun 1958).

***Redigobius bikolanus* (Herre)**

(Fig. 9)

Redigobius bikolanus - Lim, 1993: 13.

Material examined. - Rocky freshwater stream at Kg. Juara (ZRC 24422-24435, 14 ex., 12.5-25.5 mm SL, Aug 1992); Sg. Baharu at Kg. Juara (ZRC 26062-26083, 22 ex., 12-22 mm SL, 31 May 1958); Sg. Keliling (ZRC 40445, 10 ex., 10.4-25.4 mm SL, 27-28 Jun 1997; ZRC 41439, 15 ex., 13.0-25.3 mm SL, 26 Jun 1997); Sg. Ayer Dalam, approx. 200 m behind Kg. Juara (40452, 3 ex., 15.4-18.7 mm SL, 28 Jun 1996); Sg. Paya (ZRC 40463, 48 ex., 11.7-27.5 mm SL, 25 Jun 1996); Sg. Nipah (ZRC 40467, 4 ex., 14.7-22.3 mm SL, 28 Jun 1996); stream behind Kg. Genting (ZRC 40469, 3 ex., 19.8-20.4 mm SL, 29 Apr 1995); Sg. Asah (ZRC 41409, 10 ex., 16.9-24.5 mm SL, 24 Jun 1997); Sg. Mentawak (ZRC 41422, 14 ex., 13.3-25.0 mm SL, 24 Jun 1997); Sg. Raya at Kg. Mukut (ZRC 41425, 6 ex., 22.3-32.3 mm SL, 26 Jun 1997); Teluk Dungun (ZRC 41433, 6 ex., 11.9-28.1 mm SL, 25 Jun 1997).

Recent material were obtained from among submerged bank vegetation and from under rocks near the banks of fast-flowing freshwater streams.

***Stiphodon atropurpureus* (Herre)**

(Fig. 10)

Material examined. - Sg. Keliling (ZRC 41444, 1 ex., 43.4 mm SL, 26 Jun 1997).

Identified by L. R. Parenti, the present specimen is a male with a iridescent greenish-blue longitudinal band from the snout to the upper caudal base. Its first dorsal spine does not extend into a filament. Recorded previously from Leyte in the Philippines by Watson & Kottelat (1995), it represents a new record for Malaysia.

***Yongeichthys nebulosus* (Forsskal)**

Yongeichthys nebulosus - Lim, 1993: 14.

Material examined. - None.

This species has been observed by Lim (1993) at the mouth of Sg. Mentawak.

FAMILY MICRODESMIDAE

***Parioglossus raoi* (Herre)**
(Fig. 11)

Material examined. - Sg. Paya (ZRC 40465, 4 ex., 10.9-15.9 mm SL, 25 Jun 1996).

This slender fish has a distinct black stripe from eye to anal fin base. Two longitudinal black stripes on the caudal fin, the upper one much less conspicuous, while the lower one is an extension from the anal base. A black blotch at the base of the first dorsal fin. Identification based on Rennis & Hoese (1985). A school of about 10 individuals were observed hovering in midwater near mangrove roots in Sg. Paya. The water was approximately 50 cm deep and brackish. This is a new record for Pulau Tioman.

FAMILY SIGANIDAE

***Siganus guttatus* (Bloch)**

Siganus guttatus - Lim, 1993: 14.

Material examined. - None.

A school of about 10 (ca. 20 cm TL) was sighted by Lim (1993) at the mouth of Sg. Mentawak.

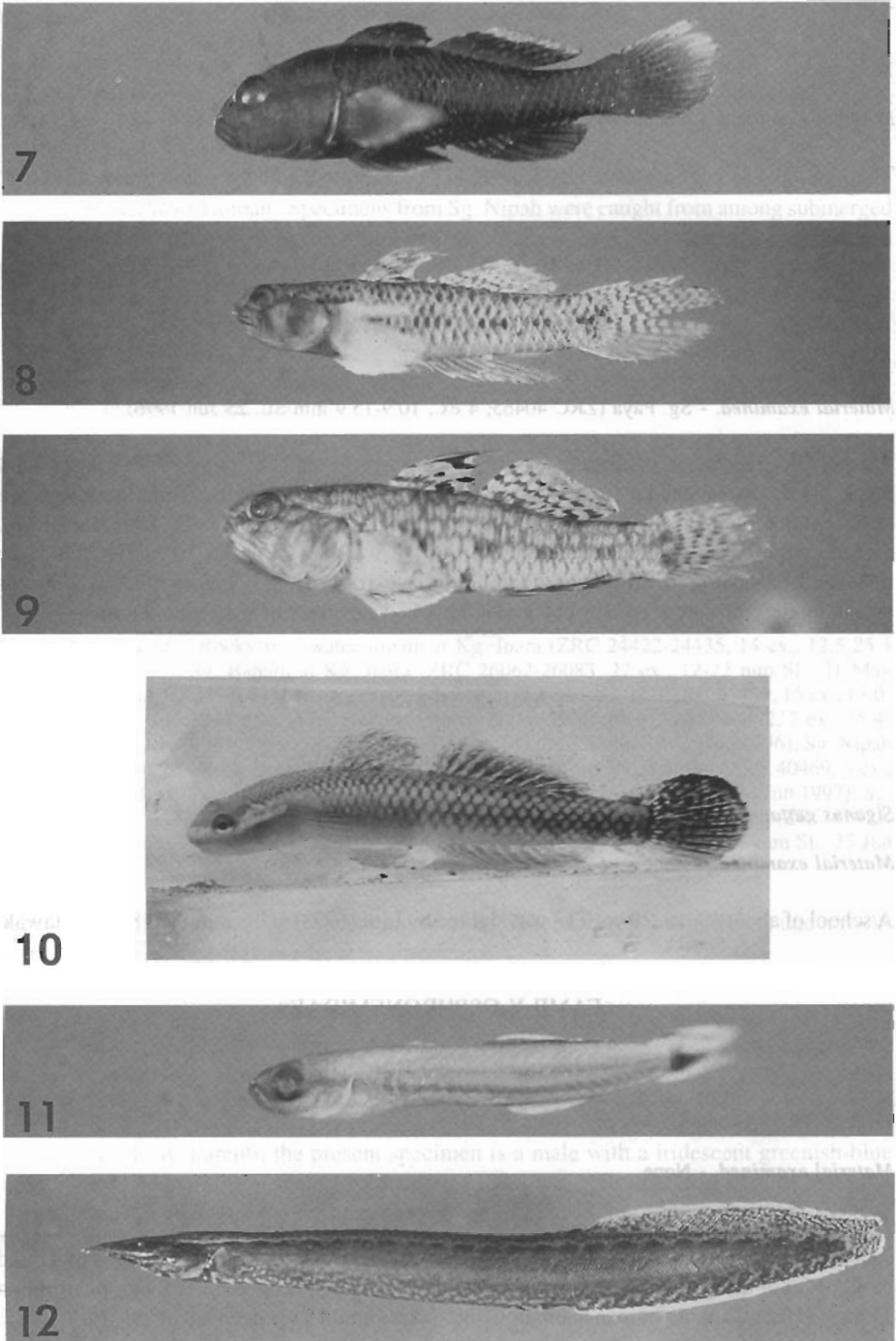
FAMILY OSPHRONEMIDAE

***Trichogaster trichopterus* (Pallas)**

Trichogaster trichopterus - Anon., 1995: 58-59.

Material examined. - None.

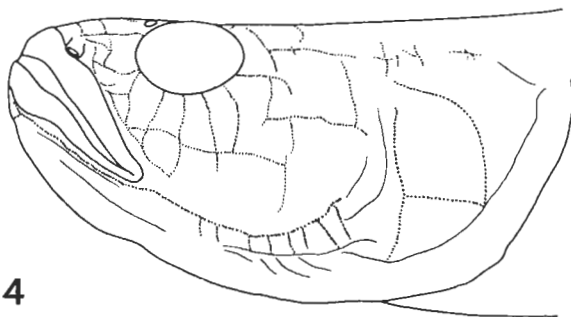
Trichogaster trichopterus was recorded from streams near Mukut by Anon. (1995). The specimens obtained are deposited in the MDW. KKPL also observed this species in a pond in Kg. Mukut in June 1997. It was not possible to obtain specimens. As the population on Tioman is found among human habitation, the species could have been artificially introduced.



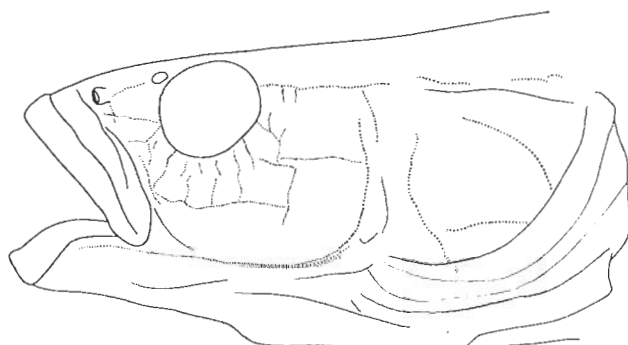
Figs. 7-12. (7) *Lophogobius bleekeri*. ZRC 41423, 29.2 mm SL, Sg. Mentawak. (8) *Pseudogobius javanicus*. ZRC 41427, 27.9 mm SL, Monkey's Bay. (9) *Redigobius bikolanus*. ZRC 41425, 29.5 mm SL, Sg. Raya. (10) *Stiphodon atropurpureus*. ZRC 41444, 43.4 mm SL, Sg. Keliling. (11) *Parioglossus raoi*. ZRC 40465, 15.9 mm SL, Sg. Paya. (12) *Macrognathus maculatus*. ZRC 41407, 166 mm SL, Sg. Asah.



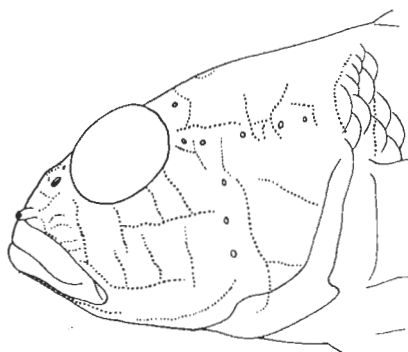
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Figs. 13-16. (7) Modified anal fin ray of male *Dermogenys pusilla*. (ZRC 1655, ca. 38 mm SL). (14) Schematised lateral view of head of *Eleotris melanosoma* (ZRC 40441, 55.3 mm SL) showing papillae pattern. (15) Schematised lateral view of head of *Eleotris oxycephala* (ZRC 1671, 75.0 mm SL) showing papillae pattern. (16) Schematised lateral view of head of *Lophogobius bleekeri* (ZRC 41423, 29.2 mm SL) showing papillae pattern.

FAMILY MASTACEMBELIDAE

***Macrognathus maculatus* Cuvier**
(Fig. 12)

Mastacembelus maculatus - Anon., 1995: 58-59.

Material examined. - Sg. Asah (ZRC 41407, 1 ex., 166.0 mm SL, 24 Jun 1997).

This spiny eel was first recorded from Pulau Tioman by Anon. (1995) from a specimen obtained from Sg. Asah. The present specimen was obtained from the same drainage in a rocky area with clear, fast flowing water.

ACKNOWLEDGEMENTS

We are grateful to Peter K. L. Ng for his support and advice, and Mrs. C. M Yang for the loan of specimens and use of laboratory facilities at the ZRC. Thanks also to Oliver K. S. Chia, T. M. Leong, Michael P. C. Chia, S. P. Ngoh, L. H. Liow and Ganymede Y. Lim, P. M. Foo, K. N. Hong, H. L. Oon, S. H. Tan, Adelene H. B. Tay, Francis W. M. Tay and H. B. Tay, Abdul Latiff bin Zainal, S. H. Tan, Tommy H. T. Tan and Darren C. J. Yeo for their help and companionship in the field. Helen K. Larson, Lynne R. Parenti, Douglas Hoese, Gerald R. Allen and Bruce B. Collette helped with the identification of some fishes. This work has been supported by research grant RP960314 from the NUS to Peter K. L. Ng. This is contribution number 96/21 from the Systematics and Ecology Laboratory, Department of Biological Sciences at the NUS.

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