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Annotated Checklist for a Collection of Fishes from Tapi River Basin, south Thailand

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ABSTRACT.–A collection of fishes was taken from the Tapi River Basin floodplain, small tributaries and mainstream of the river in the middle and lower reaches of the basin in 1996. In this study, 49 species in 37 genera belonging to 20 families were collected, identified and deposited in the Prince of Songkla University Zoological Collection. Notes on occurrence, ecology and taxonomy are given. An additional 3 species: *Lepidocephalichthys tomaculum* Kottelat and Lim, 1992, *Pseudeutropius* cf. *moolenburghae* Weber and Beaufort, 1913 and *Dermogenys sumatrana* (Bleeker, 1853) are newly recorded species for Thailand. An additional 15 species are new recordings for the Tapi River Basin: *Clupeichthys perakensis* (Herre, 1936), *Sundasalanx praecox* Roberts, 1981, *Esomus metallicus* Ahl, 1924, *Oxygaster pointoni* (Fowler, 1934) *Rasbora daniconius* (Hamilton, 1822), *Trigonostigma heteromorpha* (Dunker, 1904), *Mystus castanaeus* Ng, 2002, *Kryptopterus* cf. *bicirrhis* (Valenciennes, 1839), *Micronema* cf. *apogon* (Bleeker, 1851), *Phenacostethus* cf. *smithi* Myers, 1928, *Aplocheilus panchax* (Hamilton, 1822), *Indostomus crocodilus* Britz and Kottelat, 1999, *Nandus nebulosus* (Gray, 1835) *Brachygobius sebanus* Inger, 1958 and *Helostoma temmincki* Cuvier, 1829.

KEY WORDS: Freshwater fishes; Tapi River Basin; Surat Thani.

INTRODUCTION

The freshwater ichthyofauna of southern river basin in Thailand has not been examined as thoroughly as the central, northern and northeastern river basins, probably due to relatively short drainage and small catchment areas. More comprehensive works carried out covering all or part of Thailand or southern Thai Peninsular included those of Fowler (1934-1939, *cited in* Smith, 1945), Smith (1945) and Kottelat (1989). The Tapi River Basin is the largest river basin in south Thailand. The freshwater ichthyofauna of Tapi River Basin has been preliminary studied and reported by Storer (1978), from meadowland around Nong Thung Thong in the middle reach. Afterwards, Tarnchalanukit (1980), Chukajorn et al. (1988), Duangsawasdi and Krachangdara (1994) reported their works, which were restricted to the Klong Sang sub-basin and Rajjaprabha Reservoir of the Tapi River Basin respectively.

Specimens used in the present study were mostly collected while the author participated in Wetland Inventory program for south Thailand.

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The freshwater fishes obtained in this study are not numerous, yet this study has produced some interesting information regarding range extension of some species, which it seems warranted to publish, particularly in order to extend our understanding on the biogeographical distribution for several species.

MATERIALS AND METHODS

Study Area

The Tapi River Basin covers an area of 12,225 km^2, consisting of the Phumduang River and the Tapi River. The Phumduang River basin originates from the eastern sector of Phuket Mountain Range and covers an area of

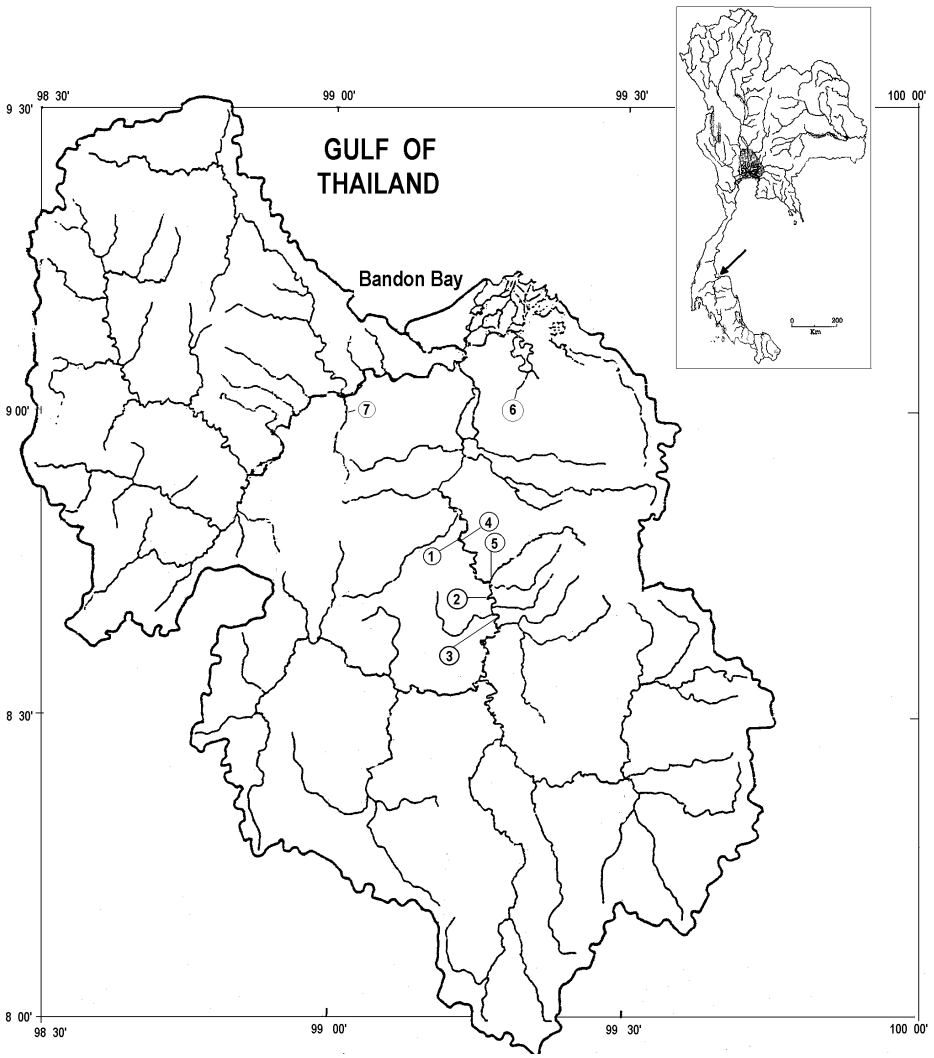

FIGURE 1. The Tapi River Basin in south Thailand. Sampling stations indicated by number in circles, 1: Fish pond in Nong Thung Thong Non Hunting Area, Kian Sa District, 2: Oxbow Lake at Ban Haan Dum, Kian Sa District; 3: Floodplain at Ban Mo Ket, Ban Na San District; 4: main Tapi River at Ban Wang Hin, Kian Sa District; 5: Main Tapi River at Ban Mae Khaek, Kian Sa District; 6: Klong Ban Mai, Bung Khun Thale, Muang District and 7: Klong Krut at Ban Krut, Phun Pin District, Surat Thani.

6,125 km^2. The Tapi River Basin originates from western sector of Nakhon Sri Thammarath Mountain Range covering about 5,460 km^2. These two rivers join about 15 km west of Surat Thani, forming an extended delta as they discharge into the Gulf of Thailand (Fig. 1).

The climate of the Tapi River Basin, based on meteorological data between 1997-1998, is intermediate between equatorial and tropical monsoon types and is characterized by constant high temperature and high rainfall without extremes of heat. Mean relative humidity is 81% (range from 61-95%). Mean monthly temperature ranges from 26 °C, usually in the wettest month, to 32 °C, usually in April. The wet season starts in May and lasts until December; during this season monthly rainfall ranges from 77 mm to 412 mm. The highest amount of rainfall was in August. Lower rainfall and a higher evaporation rate characterizes the dry season, from January to April.

The Tapi River Basin is predominantly an agricultural land for rubber plantations, oil palms and orchards in the middle and lower reaches, while urban areas are centered in lower reach district. The middle and especially lower reaches of the Tapi River Basin are fairly industrialized. There are several large and medium scale industrial units besides the large number of urbanization along the river.

Sampling Sites

Specimens examined in this study were obtained during a visit to Nong Thung Thong Non-Hunting Area, Bung Khun Thale and others wetland in the Tapi River Basin. Three habitats were sampled during the month of March and December 1996, namely floodplains, the mainstream river and small tributaries.

River floodplains

Nong Thung Thong Non-Hunting Area is a 2,960 ha reserve within a 6,450 ha complex of swamps and wet meadows on the Tapi River floodplain in Kian Sa and Phra Sang Districts, Surat Thani Province. It is located at 8° 44′ N to 8° 54′ N and 99° 12′ E to 99° 16′ E, with elevation ranged from 30-40 m MSL. The area was first declared by the Royal Forestry Department of Thailand in 1975, and was also included in Scott's (1989) Directory of Asian Wetlands. In the wet season, these areas are entirely flooded to 1-4 m depth by flows from the Tapi River, while in dry season the major area is dry except for Oxbow lakes along the river, permanent swamps and natural fish ponds (Storer, 1978). Fish specimens were taken from two sample sites within the non-hunting area. First, a natural fish pond approximately 20 m in width, on the left bank of Tapi River floodplain (Station 1), is a temporary fresh water habitat with seasonal dry out situated near the Non-Hunting Area Headquarters Office at Ban Nong Thung Thong, Kian Sa District, on March 11th, 1996. The second site, an Oxbow lake at Ban Haan Dum (Station 2), is a permanent freshwater habitat on the left bank of the floodplain on March 12th, 1996. This Oxbow lake is surrounded by freshwater scrub and swamp trees, with a substratum of mud, twigs, logs and branches and decomposing plant materials, with maximum width ca. 30 m and maximum length ca. 200 m.

An another supplement sample outside Nong Thung Thong Non-Hunting Area was collected from fishermen in the Tapi River Floodplain, at Ban Mo Ket (Station 3), Ban Na San District, Surat Thani on 25 May 2001.

Mainstream River Habitat

Samples from the mainstream of the Tapi River were obtained at Ban Wang Hin, Kian Sa District and Ban Mae Khaek, Phunphin District on March 12th, 1996 (Stations 4 and 5 respectively). These are in the middle reaches of the basin with a maximum width of about 30 m and a maximum depth of 2.5 m, relatively slow current, moderate turbidity, sandy-mud substratum and sparse emergent and submerged vascular plants along the banks.

Tributary

Tributary samples were taken from location nearby Bung Khun Thale, Muang District and Klong Krut at Ban Krut, Phunpin District, Surat

Thani. Bung Khun Thale originated from freshwater swamp and floodplain nearby Nikom Sang Ton Eng Khun Thale and drain in to Bung Khun Thale, before discharging to the lower reach of the Tapi River. Bung Khun Thale sample were taken on the March, 14th 1996 at Klong Ban Mai (Station 6), a small tributary creek about 10 m in width and 2.5 m in depth. Klong Krut is a small creek empty to the mainstream of the Tapi River (Sample 7), maximum width app. 10 m and 2 m in depth, samples were taken during the early stage of flooding period on the December, 9th 1996

Collecting Methods

Specimens were obtained mainly from a small beach seine net (10 m x 1.5 m, 5-mm stretched mesh) and a hand net with diameter 30 cm and 5-mm stretched mesh, while specimens from Klong Krut were obtained from local fishermen using lift nets. Capture specimens were preserved in 10% neutral formalin and returned to laboratory for identification.

All measurements are in millimeters. The standard length is measured from the tip of the snout to the base of the caudal peduncle. Identification and nomenclature details here follow Roberts (1989), Kottelat et al. (1993), Rainboth (1996) and Kottelat (2001). All voucher specimens examined in this study are deposited and registered in Prince of Songkla University Zoological Collection (PSUZC), Prince of Songkla University, Songkhla, Thailand.

RESULTS AND DISCUSSION

Taxonomic Account

The checklist below gives the zoological collection specimen numbers, the total number of specimens of the species caught at each certain locality, range of size (given as standard length, SL) and given locality name. The families of fishes are arranged following Nelson (1994) and amendment given in Eschmeyer et al. (1998) and Eschmeyer (2003). The standard ichthyological nonation is used for fin ray counts, with stiff spines represented by Roman numerals and soft rays by Arabic numbers.

CLUPEIDAE

***Clupeichthys perakensis* (Herre, 1936)**

Materials – PSUZC-19960312-02.10, 3 (18.5-23.0 mm SL), Main Tapi River, Ban Wang Hin.

Remarks – This is one of the small freshwater pellonulines in Southeast Asia, with abdominal scutes 12-14. Herre (1936) described this species from Perak River in Peninsula Malaysia. Recently, Vidthayanon (2002) reported this species from tributary canals of peat swamp at Phru Tao Dang, Narathiwat. This is the first record of this species in the Tapi River Basin and it extends the known distribution of *Clupeichthys perakensis* northwards to the Tapi River Basin, which is probably the northernmost of the distribution range for this species.

SUNDASALANGIDAE

***Sundasalanx praecox* Roberts, 1981**

Materials – PSUZC-19960312-03.04; 1 (17 mm SL), main Tapi River at Ban Mae Khaek.

Remarks – Specimen in the present study was caught in the middle reach of the main Tapi River in a zone of medium current (ca. 0.1 m/s), shallow (less than 1 m depth), turbid water along a muddy, vegetated bank of *Phragmites australis*. However, only one specimen was obtained because the mesh size of hand nets was too large. Previously, the species had been recorded from its type locality in the Songkhla Lake basin at Pak Payoon, Pattalung Province (Roberts, 1981), from the Maeklong-Petchaburi Basin (Vidthayanon et al., 1997) and the Mekong River Basin (Rainboth, 1996). Specimen was examined under a stereomicroscope showing 13 branched anal fin rays, no midvental row of round pigment spots on abdomen and postpelvic. The present report is likely to indicate that the species occurs continuously elsewhere on the peninsula and probably further north toward the Maeklong-Petchaburi Basin.

CYPRINIDAE

***Chela laubuca* (Hamilton, 1822)**

Materials – PSUZC-19960311-01.19, 7 (29.0-50.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.12, 17 (43.0-53.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-03.11, 1 (52.0 mm SL), Main Tapi River, Ban Mae Khaek; PSUZC-19961209-04.08, 11 (45.0-54.5 mm SL), Klong Krut, Ban Krut.

Remarks – Body has a conspicuous black striped on the posterior half of the body. The present species were obtained from stagnant freshwater habitat like temporary pond in the floodplain and relatively fast-flowing waters in the main river.

***Cyclocheilichthys apogon* (Valenciennes, 1842)**

Materials – PSUZC-19960314-01.07, 1 (53.0 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.22, 57 (20.5-63.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.11, 61 (19.0-61.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-02.07, 5 (47.0-59.0 mm SL), Main Tapi River, Ban Wang Hin; PSUZC-19960312-03.10, 4 (52.5-67.0 mm SL), Main Tapi River, Ban Mae Khaek; PSUZC-19961209-04.05, 1 (45.5 mm SL), Klong Krut.

Remarks – This is one of the most common cyprinids distributed in most freshwater habitats in Thailand. This species can be distinguished from other co-generic species in the area by the absence of barbels. All specimens collected in the present study were juveniles which differ in coloration significantly from the adult, especially lacking the bright red fins and eyes as well as a less pronounced longitudinal black stripe on the body.

***Esomus metallicus* Ahl, 1923**

Materials – PSUZC-19960311-01.20, 11 (34.0-47.5 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.13, 1 (47.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19961209-04.03, 1 (44.0 mm SL), Klong Krut

Remarks – Two pairs of prominent, large barbels, with the anterior (rostral) barbels extending to the posterior margin of the eye. The present species were mostly obtained from stagnant habitats, such as temporary pond in the floodplain and slow-moving water habitat. This species showed a unique swimming pattern at the surface in highly turbid and murky conditions by continuous opening and closing of their mouths. This species has not been previously recorded in the basin.

***Labiobarbus leptocheila* (Valenciennes, 1842)**

Materials – PSUZC-19960311-01.24, 2 (30.0-36.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-02.09, 6 (59.5-65.5 mm SL), Main Tapi River, Ban Wang Hin; PSUZC-19960312-03.09, 1 (136.5 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks. – This near bottom dwelling cyprinid was found in the main river and floodplains. Roberts (1993) made a revision of the genus in Southeast Asia. *Labiobarbus burmanicus* (Day, 1877), which have been used by Duangsawasdi and Krachangdara (1994) might be a synonym of *L. leptocheila*.

***Mystacoleucus marginatus* (Valenciennes, 1842)**

Materials – PSUZC-19960312-03.12, 3 (18.0-78.0 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks – Black edge at anterior and distal margins of dorsal fin and distal margin of the caudal fin as well as a black crescent-shaped mark on the base of most flank scales are distinguishing characteristics of this species. Associated with clear and moving water of rivers and streams with medium to coarse sand substratum.

***Osteocheilus hasselti* (Valenciennes, 1842)**

Materials – PSUZC-19960311-01.23, 3 (20.0-30.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong;

PSUZC-19960312-01.23, 12 (20.0-49.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19961209-04.06, 1 (42.5 mm SL), Klong Krut, Ban Krut.

Remarks – Body with 6-9 rows of red spot along scale rows, when alive, and a large round black blotch on the caudal peduncle, no black midlateral striped. This is one of the most common cyprinids distributed in most freshwater habitats in Thailand. This fish prefers large slow-moving stream with muddy or very fine sand substratum.

***Osteochilus* cf. *waandersii* (Bleeker, 1852)**

Materials – PSUZC-19960312-01.22, 17 (15.0-22.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – Identification of this lot is tentative, due to the small size of specimens. Counting of branched dorsal fin rays of these juveniles were 12-13 which is in the range of *Osteochilus waandersii* (Bleeker, 1852).

***Oxygaster pointoni* (Fowler, 1934)**

Materials – PSUZC-19960311-01.18, 188 (26.5-77.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.20, 38 (29.5-75.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – This is one of the most common cyprinids distributed in slow flowing part of rivers with vegetation in Thailand. The present specimens were obtained from stagnant habitats, they were possibly trapped in floodplain during inundation time. This species has not been previously recorded in the basin.

***Parachela maculicauda* (Smith, 1934)**

Materials – PSUZC-19960314-01.01, 2 (37.5-41.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.13, 34 (23.0-31.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.18, 83 (21.0-38.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19961209-04.07, 2 (39.0-42.0 mm SL), Klong Krut, Ban Krut.

Remarks – This is one of the small common cyprinid distributed in slow flowing parts of the river with vegetation and swamp in Thailand. In this collection all specimens were obtained from both slow flowing and stagnant habitats. A prominent dark spot at each sub-terminal lobe of the caudal fin is very unique for this species.

***Parachela oxygastroides* (Bleeker, 1852)**

Materials – PSUZC-19960311-01.14, 18 (57.0-70.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.19, 1 (45.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-02.06, 1 (25.5 mm SL), Main Tapi River, Ban Wang Hin.

Remarks – Relatively large pectoral fin with dark distal margin, extending beyond tip of pelvic fin and dark outline on the first few lateral canals of the lateral line are distinguishing characters. It is found in medium to large-sized rivers and is a common resident of seasonally flooded habitats.

***Parachela siamensis* (Gunther, 1868)**

Materials – PSUZC-19960314-01.02, 8 (47.0-56.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale.

Remarks – Relatively short pectoral fin, not extending beyond tip of the pelvic fin. This species has not been previously recorded in the basin.

***Puntius binotatus* (Valenciennes, 1842)**

Materials – PSUZC-19960314-01.09, 1 (22.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale.

Remark – This is one of the most common cyprinid distributed in small freshwater tributaries. There was no collected material in the main stream of the river.

***Puntius brevis* (Bleeker, 1850)**

Materials – PSUZC-19960312-01.24, 24 (24.0-50.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – Barbs with a pair of maxillary barbels, last simple dorsal ray without serration along its posterior margin and a black blotch at caudal peduncle are diagnostic characters of this species. This is one of the most common cyprinids distributed in river floodplain, sluggish streams and relatively slow-moving freshwater habitats in Thailand.

***Puntius partipentazona* (Fowler, 1934)**

Materials – PSUZC-19960314-01.08, 30 (16.5-34.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.12, 15 (13.0-25.5 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.21, 12 (13.0-19.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19961209-04.04, 1 (26.0 mm SL), Klong Krut, Ban Krut.

Remarks – *P. partipentazona* is one of the most common barbs associated in slow flowing waters, such as rivers and swamps with vegetation, including forest streams, natural ponds and reservoirs in Thailand. *P. partipentazona* can be distinguished from closely related species by its red dorsal fin tip and the third bar on the body is unconnected with the dark bar extending from the dorsal fin.

***Rasbora daniconius* (Hamilton, 1822)**

Materials – PSUZC-19960312-01.16, 12 (27.5-37.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-03.07, 1 (33.0 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks – A black stripe runs from eye to caudal fin; nearly complete lateral line, with only the last few scales lacking pores are diagnostic characteristics of this species. It occurs in a variety of habitats such as ditches, ponds, canals, streams, rivers and floodplains. This species has not been previously recorded in the basin.

***Rasbora dusonensis* (Bleeker, 1851)**

Materials – PSUZC-19960314-01.04, 6 (33.5-56.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.16, 10 (38.5-49.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.17, 2 (34.0-38.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-02.08, 3 (44.0-60.0 mm SL), Main Tapi River, Ban Wang Hin; PSUZC-19960312-03.08, 28 (45.0-59.0 mm SL), Main Tapi River, Ban Mae Khaek; PSUZC-19961209-04.02, 1 (64.0 mm SL), Klong Krut.

Remarks – This is one of the most commonly distributed *Rasbora* in south Thailand. A dark grey midlateral stripe, more intense posteriorly, and a black posterior margin of the caudal fin is the most distinguishing characters. It occurs in a variety of habitats, but seems to prefer large clear water rivers with slow current and streams. This species was previously recorded as *R. myersi* Brittan, 1954.

***Rasbora paviei* (Tirant, 1885)**

Materials – PSUZC-19960314-01.05, 15 (41.5-60.0 mm SL), Bung Khun Thale, Ban Nikom Khun ThaleI; PSUZC-19960311-01.15, 14 (18.5-51.5. mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.14, 20 (27.0-76.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19961209-04.01, 12 (36.5-62.0 mm SL), Klong Krut, Ban Krut.

Remarks – this conspicuous, narrow, black longitudinal stripe along the sides, which widens into a diamond-shaped blotch on the caudal peduncle, a unique characteristic for *Rasbora paviei*. This is one of the most commonly distributed cyprinids in freshwater habitats in Thailand.

***Rasbora trilineata* Steindachner, 1870**

Materials – PSUZC-19960314-01.06, 31 (12.5-38.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.17, 32 (11.5-25.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.15, 40 (14.0-27.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – This is one of the most commonly distributed cyprinids, found in lakes, swamps, slow flowing areas of rivers in Thailand.

***Thynnichthys thynnoides* (Bleeker, 1852)**

Materials – PSUZC-19960311-01.21, 1 (56.5 mm SL), Natural fishpond, Tapi River floodplain, BanNong Thung Thong.

Remarks – Body covered with small silvery scales. It is usually found in large rivers, canal and floodplains

***Trigonostigma heteromorpha* (Dunker, 1904)**

Materials – PSUZC-19960314-01.03, 2 (21.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale.

Remarks – The generic placement of this species follows that of Kottelat and Witte (1999). The flank has a conspicuous black stripe from below the dorsal-fin origin to the middle caudal-fin base and usually broadens anteriorly. Vidthayanon (2002) reported this species to be only found in Phru Tao Dang, Narathiwat. This species has not been previously recorded in the basin.

COBITIDAE

***Acanthopsis dialuzona* van Hasselt, 1823**

Materials – PSUZC-19960312-03.03, 7 (70.0-90.5 mm SL), Main Tapi River, Ban Mae Khaek; PSUZC-19961209-04.09, 1 (78.5 mm SL), Klong Krut, Ban Krut.

Remarks – Inhabits rivers and streams with sand substratum.

***Botia morleti* Tirant, 1885**

Materials – PSUZC-19960312-01.09, 5 (19.5-28.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – Body has four prominent short, narrow transverse bars, but these are sometimes not very distinct. There is a two-pointed spine, below each eye, that can be erected and locked into position. It occurs along the edge of oxbow lake on the floodplains and is associated with dead twigs, branches and wood chips. This species was

TABLE 1. Selected meristic characters and morphometric measurement of *Lepidocephalichthys tomaculum* Kottelat and Lim, 1992 from Tapi River Basin, south Thailand.

Characters	Counts and Measurement (n = 11)
Dorsal fin rays	iii 6
Pectoral fin rays	i 7
Total ventral fin rays	i 6
Total anal fin rays	iii 5
Principal caudal fin rays	8 + 8
Standard length (mm)	11.6 – 22.8
Snout length (mm)	0.8 – 1.5
Head length (mm)	3.1 – 5.5
Eye diameter (mm)	0.6 – 1.0
Snout to dorsal fin length (mm)	6.8 – 12.0
Snout to pectoral fin length (mm)	3.6 – 5.8
Snout to pelvic fin length (mm)	6.7 – 12.5

previously recorded under the name *Botia horae* (Bleeker, 1853) in Tarnchalanukit (1980).

***Lepidocephalichthys tomaculum* Kottelat and Lim, 1992**

Materials – PSUZC-19960311-01.09, 13 (13.5-21.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.10, 3 (13.5-23.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – Kottelat and Lim (1992) discovered this species in flowing streams and peat swamps in Peninsula Malaysia. This is the first record of this species in Thailand and it extends the known distribution of *L. tomaculum* northwards to the Tapi River Basin (previous northernmost thought to be Terengganu drainage, Malaysia). In life, *L. tomaculum* is reddish brown in color, with a series of 5-6 predorsal and 4-5 postdorsal narrow black transverse bars on back. Caudal fin is rounded. Meristic characters and morphometric measurements for *L. tomaculum* (Table 1) conformed to the published descriptions given in Kottelat and Lim (1992). This species has not been previously recorded in the basin.

BAGRIDAE

***Mystus castaneus* Ng, 2002**

Materials – PSUZC-19960311-01.06, 1 (34.0 mm SL), Natural fishpond, Tapi River floodplain, Ban Nong Thung Thong.

Remarks – There is a small dark triangular blotch on the base of the caudal peduncle. This species was believed to be recorded as *Mystus micracanthus* (Bleeker, 1846) in Thailand by Smith (1945) and Vidthayanon et al. (1997). Ng (2002) stated that *M. micracanthus* (Bleeker, 1846) is a synonym of *Mystus nigriceps* (Valenciennes, 1840), which was distributed in large, slow flowing rivers with turbid water and muddy substratum in Java and southern Sumatra.

***Mystus singaringan* (Bleeker, 1846)**

Materials – PSUZC-19960312-02.04, 5 (61.0-80.0 mm SL), Main Tapi River, Ban Wang Hin; PSUZC-19960312-03.02, 1 (115.0 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks – Catfish with long adipose dorsal fin, much longer than the anal fin, and contiguous with the dorsal fin; maxillary barbels very long reaching to or beyond the caudal-fin base. It inhabits slow-flowing, turbid waters with soft bottoms. Roberts (1994) suggested this species in Thailand was previously misidentified as *Mystus cavasius* (Hamilton, 1822).

SILURIDAE

***Kryptopterus* cf. *bicirrhis* (Valenciennes, 1840)**

Materials – PSUZC-19960312-01.25, 36 (27.0-53.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – Identification for this species was done tentatively. It is a plain color, but not clearly transparent in life as normal *Kryptopterus bicirrhis* (Valenciennes, 1840). Gill rakers 14-18, branchiostegal rays 8-9, pectoral-fin rays 9-11, pelvic 5-6 and anal 51-67, which are intermediate between *K. bicirrhis* (Valenciennes, 1840) and *K. macrocephalus* (Bleeker, 1858) as given in Roberts (1989) and Krudphan (2001). In preserved specimens, the swim bladder is visible through the large thin walled tympanic membrane. *K. bicirrhis* inhabits in large river and is regularly associated with floodplains. This species has not been previously recorded in the basin.

***Kryptopterus cryptopterus* (Bleeker, 1851)**

Materials – PSUZC-20010525-03.04, 2 (118.6-124.5 mm SL), Tapi River Floodplain, Ban Mo Ket.

Remarks – This *Kryptopterus* has a unique character, the pectoral fin spine is as long as the pectoral fin length. Maxillary barbels reach to the pectoral fin base. Anal fin rays 68-71, branchiostegal rays 10, which is closed to the description given in Weber and de Beaufort (1913). Tarnchalanukit (1980) reported the occurrence of this species in Klong Sang prior to Rajjaprabha Reservoir construction, its absence after construction (Chukajorn et al.,

1988 and Duangsawasdi and Krachangdara, 1994) suggests that reservoir may have detrimental effects on the distribution of this species.

***Kryptopterus palembangensis* (Bleeker, 1852)**

Materials – PSUZC-20010525-03.02, 1 (94.7 mm SL), Tapi River Floodplain, Ban Mo Ket.

Remarks – Only one specimen obtained, branchiostegal rays 9 and anal fin ray 63. This species closely resemble *Kryptopterus bicirrhis* (Valenciennes, 1840) but the anal fin base is not connected to caudal base. Krudphan (2001) also recorded this species from Tapi River Basin.

***Micronema* cf. *apogon* (Bleeker, 1851)**

Materials – PSUZC-20010525-03.03, 1 (153.0 mm SL), Tapi River Floodplain, Ban Mo Ket

Remarks – Identification of this species is only tentative, due to the fact that this species shows a prominent blackish color under head which lacking from the present specimen. The present specimen lacking dorsal fin with 15 pectoral fin rays, 9 pelvic fin rays, 13 branchiostegal rays, 78 anal fin rays and vomer with an angular teeth band. Maxillary barbels reaching to the posterior border of the eyes. *Micronema apogon* has not been previously recorded in the basin. Krudphan (2001) reported this species only from the Mekong, Chao Phraya and Maeklong River basins in Thailand.

***Ompok siluroides* Lacepede, 1803**

Materials – PSUZC-19960311-01.07, 1 (104.5 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.01, 1 (90.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19961209-04.10, 1 (100.0 mm SL), Klong Krut, Ban Krut.

Remarks – Krudphan (2001) found that most studies in Thailand recorded the present species as *O. bimaculatus*. This species is distributed throughout freshwater habitats in Thailand. Total number of anal fin rays of present specimens were 54-56 (compared to 62-75 of *O. bimaculatus*).

SCHILBEIDAE

***Pseudeutropius* cf *moolenburghae* Weber and de Beaufort, 1913**

Materials – PSUZC-19960311-01.08, 21 (34.0-45.5 mm SL), Natural fishpond, Tapi River floodplain, Ban Nong Thung Thong. from its type locality in the Batang Hari River, Sumatra (Weber and de Beaufort, 1913) and from Borneo and Sulawesi (Roberts, 1989; Kottelat et al., 1993). The Tapi River specimens conform closely to the description and drawing in Weber and de Beaufort (1913) and to diagnostic characters and the photograph in Roberts (1989) and Kottelat et al. (1993).

The diagnostic features of *P. moolenburghae* are: head 4.1-4.7 of standard length; barbels long, extending posteriorly to behind anterior fourth of anal fin base; anal fin rays 39-42; branchiostegal membranes 9-10, separate from isthmus; swim bladder with bilaterally expanded, anterior chamber visible through large circle thin-walled tympanic membrane; dorsal fin small with serrated posterior margin spine and six branched rays, adipose fin small and hyaline; pectoral fin with a thin, stiff spine with serration on posterior margin and eight branched rays; anal fin long not confluent with caudal, 39-42 branched rays; caudal fin deeply forked with pointed lobes and a total of 17 principal rays. Color pearly white, often with 2-3 longitudinal dark stripes, with a small black dot at the origin of the dorsal fin and another at the mid-base of the caudal fin. Meristic characters and morphometric measurements (Table 2) conformed to the published descriptions except that anal fin-ray counts were 39-42, lower than the range of 42-49 given by Roberts (1989).

Recently, Vidthayanon (2002) reported *Pseudeutropius* sp., from tributary canals of peat swamp at Phru Tao Dang, and Kolok River Narathiwat. As these are relatively small fish, when compared with other genera in the Schilbeidae (< 100 mm total length: Roberts, 1989; Kottelat et al., 1993), they are easily overlooked in conventional sampling.

TABLE 2. Selected meristic characters and morphometric measurement of *Pseudeutropius* cf. *moolenburghe* Weber and de Beaufort, 1913 from Tapi River Basin, south Thailand.

Characters	Counts and Measurement (n=15)
Dorsal fin rays	ii, 6
Pectoral fin rays	i, 8
Total ventral fin rays	i, 6
Total anal fin rays	i, 39 - i, 42
Branchiostegal rays	9 - 10
Principal caudal fin rays	17
Standard length (mm)	35.0 - 46.7
Head length (mm)	8.1 - 10.1
Head width (mm)	3.5- 5.0
Eye diameter (mm)	2.2 - 3.0
Width of mouth (mm)	2.0 - 3.0
Predorsal length (mm)	12.0 - 14.5
Body depth at dorsal fin origin (mm)	5.5 - 7.0
Caudal peduncle length (mm)	3.0 - 4.4
Caudal peduncle depth (mm)	3.0 - 4.4
Anal fin length (mm)	16.5 - 22.8
Adipose fin length (mm)	1.4 - 1.7

HETEROPNEUSTIDAE

***Heteropneustes kemratensis* (Fowler, 1937)**

Materials – PSUZC-20010525-03.01, 2 (120.0-122.0 mm SL), Tapi River Floodplain, Ban Mo Ket

Remarks – Storer (1978) reported this species as *Heteropneustes fossilis* (Bloch, 1794), which is in fact restricted from Myanmar to south Asia (Kottelat, 2001). Specimens obtained from the Tapi River Basin had 72-76 anal fin rays, which was higher than *H. fossilis*, A 60-70.

PHALLOSTETHIDAE

***Phenacostethus* cf. *smithi* Myers, 1928**

Materials – PSUZC-19960312-03.05, 2 (17.0 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks – Only two specimens, 1M and 1F, were obtained probably due to large mesh size of hand nets. They were associated with emerged and submerged aquatic vegetation along the banks. There are two *Phenacostethus* recorded from Thailand, namely *P. smithi* Myers, 1928, type locality from Bangkok, and

P. posthon Roberts, 1971, type locality from Satun and Phangnga on the Andaman coast of Peninsular Thailand. Specimens from Tapi River Basin with D_2 ii, 4 and A ii, 11 are differ from both *P. smithi* and *P. posthon* in toxactinium. The toxactinium of *P. posthon* arises on left side of the head and curves very strongly towards the right side of body, while toxactinium of *P. smithi* arises on the right side of head and curves towards the left side of body. Toxactinium from Tapi River specimens arises on the left side and bends towards the right side of body as found in *P. posthon,* but is more gently curved like *P. smithi*. Distal end of seminal papilla are smooth. This genus has not been previously recorded in the basin.

HEMIRAMPHIDAE

***Dermogenys sumatrana* (Bleeker, 1853)**

Materials – PSUZC-19960314-01.11, 11 (31.0-40.0 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.25, 1 (31.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.06, 5 (23.0-30.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – In the present collection, the distal end of the second anal ray of male has an enlarged tip and a basal pair of spinous process, corresponding well with the figure and description given in Brembach (1991). Some meristic characters and morphometric measurements for *D. sumatrana* are also given in Table 3. This species has not been previously recorded in Thailand.

BELONIDAE

***Xenentodon cancila* (Hamilton, 1822)**

Materials – PSUZC-19960311-01.10, 3 (76.5-107.0 mm SL), Natural fish pond, Tapi

TABLE 3. Selected meristic characters and morphometric measurement of *Dermogenys sumatrana* (Bleeker, 1853) from Tapi River Basin, south Thailand.

Characters	Counts and Measurement	
	Female(n=8)	Male (n=3)
Dorsal fin rays	9	9
Pectoral fin rays	i 9	i 9
Total ventral fin rays	i 5	i 5
Total anal fin rays	15	4+11
Principal caudal fin rays	12-13	13
Standard length (mm)	28.0-34.5	24.3-28.1
Snout length* (mm)	3.0-3.7	2.8-3.6
Head length (mm)	7.2-8.7	6.5-8.1
Eye diameter (mm)	1.7-2.3	1.4-1.8
Upper jaw length (mm)	2.8-3.4	2.6-3.2
Lower jaw length (mm)	7.9-10.0	7.4-8.2
Snout to pectoral fin length (mm)	9.0-11.0	8.6-10.0
Snout to pelvic fin length (mm)	17.7-22.5	15.3-17.8

* Anteriormost point of in the present measurement is the upper lip

River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.05, 3 (110.0-133.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-02.02, 4 (95.0-161.0 mm SL), Main Tapi River, Ban Wang Hin; PSUZC-19960312-03.01, 1 (109.5 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks – A freshwater garfish that occurs primarily in rivers with slow flowing pools, also in ponds, canals and inundated fields. A solitary fish usually swims and floats its body against the current, and is capable of quick bursts of speed, especially when in pursuit of its prey or escape from enemy.

APLOCHEILIDAE

***Aplocheilus panchax* (Hamilton, 1822)**

Materials – PSUZC-19960314-01.10, 1 (24.0 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.11, 16 (10.0-11.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong.

Remarks – One of the most common species found in forest and rural streams, ponds, reservoirs and mangrove creeks, ranging from freshwater, brackish water and seawater. A silvery-white spot on top of the head is the unique characteristic of this surface dwelling species. This species has not been previously recorded in the basin.

INDOSTOMIDAE

***Indostomus crocodilus* Britz and Kottelat, 1999**

Materials – PSUZC-19960311-01.05, 1 (20.5 mm SL), Natural fish pond, Tapi River Flood Plain, Ban Nong Thung Thong; PSUZC-19960312-01.08, 1 (26.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – *Indostomus crocodilus* Britz and Kottelat, 1999 was recently described from specimens collected in a backwater stream, among submerged vegetation at Phru Tao Dang, Kolok River Basin, Narathiwat Province. In the present collections, both specimens were caught from stagnant habitats in the floodplain, which different from type locality. This species has not been previously recorded in the Tapi River Basin, which extends the known distribution of *I. crocodilus* northwards to the Tapi River Basin, probably to be the northernmost of the distribution range.

AMBASSIDAE

***Parambassis siamensis* (Fowler, 1937)**

Materials – PSUZC-19960312-02.01, 6 (26.0-36.0 mm SL), Main Tapi River, Ban Wang Hin; PSUZC-19960312-03.06, 1 (35.5 mm SL), Main Tapi River, Ban Mae Khaek.

Remarks – This is a unique transparent fish, found in slow flowing water with vegetation such as rivers and swamps, including forest streams, natural ponds and reservoirs in Thailand.

NANDIDAE

***Nandus nebulosus* (Gray, 1835)**

Materials – PSUZC-19960314-01.12, 1 (47.0 mm SL), Bung Khun Thale, Ban Nikom Khun Thale.

Remarks – It is a solitary species, carnivorous and inhabites clear water. This fish mimics a floating piece of dead leaf both in appearance and behavior. This species has not been previously recorded in the basin.

***Pristolepis fasciatus* (Bleeker, 1851)**

Materials – PSUZC-19960314-01.13, 1 (54.0 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960312-02.05, 2 (45.5-46.5 mm SL), Main Tapi River, Ban Wang Hin.

Remarks – Inhabites slow or stagnant water of rivers, floodplains, ponds and swamps among shore vegetation.

GOBIIDAE

***Brachygobius sabanus* Inger, 1958**

Materials – PSUZC-19960314-01.15, 9 (11.0-18.0 mm SL), Bung Khun Thale, Ban Nikom Khun Thale.

Remarks – This goby inhabites in clear, slow or stagnant water. This species has not been previously recorded in the basin.

ANABANTIDAE

***Anabas testudineus* (Bloch, 1792)**

Materials – PSUZC-19960312-01.02, 2 (87.0-91.5 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – A small common and widely distributed fish, this species is solitary and predatory and found in freshwater swamps, natural ponds, paddy fields and reservoirs in Thailand.

OSPHRONEMIDAE

***Trichogaster pectoralis* Regan, 1910**

Materials – PSUZC-19960311-01.02, 4 (91.5-99.0 mm SL), Natural fishpond, Tapi River floodplain, Ban Nong Thung Thong.

Remarks – *Trichogaster pectoralis* is native to Thailand, except for the southern river basin. Occurrence of this species in the area probably resulted from human introduction for aquaculture in the south and in Malaysia in the 1930s. Found in shallow sluggish or standing-water and floodplain habitats with a lot of aquatic vegetation. Storer (1978) also reported this *T. pectoralis* from Ban Nong Thung Thong.

***Trichogaster trichopterus* (Pallas, 1770)**

Materials – PSUZC-19960311-01.03, 14 (41.0-70.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.03, 10 (39.0-64.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum; PSUZC-19960312-02.03, 1 (48.5 mm SL), Main Tapi River, Ban Wang Hin.

Remarks – One of the small, most common and widely distributed in Thailand, it is found in natural ponds, paddy fields and reservoirs in Thailand.

***Trichopsis vittata* (Cuvier, 1831)**

Materials – PSUZC-19960314-01.14, 9 (21.0-40.5 mm SL), Bung Khun Thale, Ban Nikom Khun Thale; PSUZC-19960311-01.04, 40 (10.0-31.0 mm SL), Natural fish pond, Tapi River floodplain, Ban Nong Thung Thong; PSUZC-19960312-01.04, 7 (17.5-26.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – A small, common and carnivorous species, its behavior is peaceful and solitary. It is found in forest streams, natural ponds, paddy fields and reservoirs in Thailand.

HELOSTOMATIDAE

***Helostoma temmincki* Cuvier, 1829**

Materials – PSUZC-19960311-01.01, 3 (91.0-95.5 mm SL), Natural fishpond, Tapi River floodplain, Ban Nong Thung Thong.

Remarks – Associated with isolated pond in the floodplain, also recorded in slow-flowing pools with dense submerged vegetation. This species has not been previously recorded in the basin.

CHANNIDAE

***Channa striata* (Bloch, 1793)**

Materials – PSUZC-19960312-01.07, 1 (162.0 mm SL), Oxbow Lake, Tapi River floodplain, Ban Haan Dum.

Remarks – This is one of the most common and widely distributed snakehead fish in Thailand, found in forest streams, drainage areas, ponds and reservoirs

There is very little prior information about floodplain ichthyofauna in the Tapi River Basin. This survey produced 49 species, 37 genera in 20 families, mostly belonging to the Cyprinidae. All, excepting the snakeskin gouramy *Trichogaster pectoralis* are not native to the basin, but are widespread in Thailand and peninsular Malaysia. Species richness was higher in the natural fishponds and oxbow lake of the floodplain than the two river reaches and tributary streams. Storer (1978) surveyed the fish in the same region as the present study (Nong Thung Thong Non-Hunting Area) and reported only 13 species. Data given here show 41 more known species have been added to the ichthyofauna in the middle reach of the Tapi River Basin. However, with greater sampling effort, more time spent sampling, greater habitat heterogeneity sampling and more efficient fishing gear produced more substantial samples, it is expected to yield rare species and a higher number of species and enumerates the

true faunal richness of the Tapi River Basin. Middle and lower reaches of the Tapi River Basin, especially floodplains and deeper habitats, have not yet been as intensively studied when compared to the upper watershed (Tarnchalanukit, 1980; Chukajorn et al., 1988; Duangsawasdi and Krachangdara, 1994). In further studies, attention needs to be extended to these reaches.

The highlights of this study are three new recorded species: *Lepidocephalichthys tomaculum* Kottelat and Lim, 1992, *Pseudeutropius* cf. *moolenburghae* Weber and de Beaufort, 1913 and *Dermogenys sumatrana* (Bleeker, 1853). Many range extensions in to the Tapi River Basin were noted, *Clupeichthys perakensis* (Herre, 1936), *Sundasalanx praecox* Roberts, 1981, *Esomus metallicus* Ahl, 1924, *Oxygaster pointoni* (Fowler, 1934), *Rasbora daniconius* (Hamilton, 1822), *Trigonostigma heteromorpha* (Dunker, 1904), *Mystus castanaeus* Ng, 2002, *Kryptopterus* cf. *bicirrhis* (Valenciennes, 1839), *Micronema* cf. *apogon* (Bleeker, 1851), *Phenacostethus* cf. *smithi* Myers, 1928, *Aplocheilus panchax* (Hamilton, 1822), *Indostomus crocodilus* Britz and Kottelat, 1999, *Nandus nebulosus* (Gray, 1835), *Brachygobius sebanus* Inger, 1958 and *Helostoma temmincki* Cuvier, 1829.

Local people who have lived and fished in Nong Thung Thong Non-Hunting Area for more than 10 years claimed that fish catches have declined over this period. This may reflect increased fishing pressure, habitat alteration such as burning meadows in the dry season for expansion of rubber plantations, terrapin hunting, firewood harvesting, siltation and pollution by agricultural wastes. Recent reports from large European rivers show chemical water quality has improved markedly, but the recovery of the fish fauna is not proceeding accordingly due to the loss of habitats in the main river channels and floodplains, and the diminished hydrological connectivity between them (Aarts et al., 2004) This implies that local fish fauna of the Tapi River Basin is therefore by no means secure, and the presence of rare species suggests that habitat conservation efforts need to be intensified and that the status of the fauna should be monitored for the foreseeable future.

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