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PLECTORHINCHUS MACROSPILUS, A NEW SPECIES OF THICKLIP (PERCIFORMES: HAEMULIDAE) FROM THE ANDAMAN SEA OFF SOUTHWESTERN THAILAND

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ABSTRACT

Plectorhinchus macrospilus is described as a new species of haemulid fish from the adult holotype and a subadult paratype collected at the Similan Islands in the Andaman Sea off the coast of southwestern Thailand. It is characterized as follows: dorsal-fin rays XII, 21; anal-fin rays III, 8; pored lateral-line scales 58; a low gill-raker count 4–6 + 14–15, total 18–21; scales above the lateral line 14, below 19–21; chin with 6 pores, no median pit; adults with many large black spots on body, nape, and soft portions of median fins, and smaller black spots on head; juveniles with 4 (or probably 5 when smaller) dark stripes more than half orbit diameter in width that gradually break up into spots with growth.

INTRODUCTION

The subfamily Plectorhinchinae of the grunt family Haemulidae consists of the genera *Diagramma* and *Plectorhinchus*, but many authors also include *Parapristipoma* in the subfamily. These fishes are known as sweetlips in Australia and rubberlips or grunters in South Africa. The current preferred common name is thicklips. The fishes of this subfamily are remarkable for the striking changes in color pattern with growth, and it is not surprising that many of the species were described more than once. Smith (1962) reviewed the species of *Plectorhinchus* of the western Indian Ocean; he correctly linked the different-colored juveniles and subadults with the adults for several species. He recognized 19 species of *Plectorhinchus* (as the genus *Gaterin*, a synonym). McKay (1983) reduced this number for the same region to 16 as a result of discovering more synonyms. Nevertheless, taxonomic problems remain, and the subfamily is in need of revision.

While surveying reef fishes at the Similan Islands in the Andaman Sea off the southwest coast of Thailand in February 1979, the second author collected and photographed a specimen of *Plectorhinchus*, 285 mm in SL (when fresh), that had numerous, large, close-set, black spots on the body and soft portion of the median fins and smaller dark spots on the head. The photograph was made available to McKay who published it in color in his 1983 review and labeled it *P. fangi* Whitley, 1951; however, in his text for *Plectorhinchus pictus* (Tortonese, 1936), he placed *Plectorhynchus fangi* Whitley, 1951 in synonymy, along with *Gaterin cincta* Munro, 1955. McKay's black and white illustration of *P. pictus* on the text page is a copy of the figure from Day (1875: pl. 20, fig. 1) who illustrated a specimen from Sind (Pakistan). McKay gave the range of *P. pictus* as Persian Gulf to Sri Lanka on his distribution map, but added, "Elsewhere, eastward extending to China." His description of the color of the young of *pictus* was taken from Munro (1955) who described a specimen (as *Gaterin cincta*) from the Gulf of Mannar as "Slaty grey with three longitudinal brownish bands which may be broken into blotches. Numerous dark spots between two uppermost bands."

Plectorhinchus fangi Whitley, 1951 was an unnecessary replacement name for *Plectorhinchus cinctus punctatus* Fang, 1942, described from Foochow, Fukien, China. The name was presumed by Whitley to be preoccupied by *Diagramma punctatum* Cuvier in Cuvier and Valenciennes (1830) in the belief that *Diagramma* is a synonym of *Plectorhinchus*.

McKay was in error to regard *P. pictus* (Tortonese, 1936) as occurring east to China. *Plectorhinchus pictus* (as *Hapalogenys pictus*) was described from the Strait of Hormuz. Day (1885: 81) identified his specimen from Sind as *Diagramma cinctum* Temminck and Schlegel, 1843 (=*Plectorhinchus cinctus*), but he noted the lack of dark bands on the body as shown on Plate 26 of the specimen from Japan in Temminck and Schlegel. Randall (1995: 210) concluded that *P. pictus* is a valid species similar to *P. cinctus* from China and Japan; he illustrated an adult of *pictus* of about 40 cm total length from an underwater photograph taken in the Persian Gulf.

McKay's extension of the distribution of *Plectorhinchus pictus* to Sri Lanka seems to be based on his acceptance of the record of Munro (as *Gaterin cinctus*) from the Gulf of Mannar. However, Munro's description of the color of his specimen and his listing of the longitudinal series of scales above the lateral-line as 90–95 indicate that he did not have *P. pictus*. Nor did he have the species collected by the second author at the Similan Islands off Thailand which has 64–65 scales in longitudinal series; it also has 21 dorsal soft rays, compared to 15 given by Munro for his Gulf of Mannar fish.

The Similan Islands specimen remained as *Plectorhinchus* sp. in the fish collection of the Bishop Museum in Honolulu until interest was renewed when the first author sent underwater photographs of the species to the second author and obtained a 145-mm specimen of *Plectorhinchus* from the Similan Islands. It has four irregular dark brown stripes on body, but each partly broken into large spots. We confirmed, from the distinctive meristic data, that the 145-mm specimen is the young of the Bishop Museum specimen, now 278 mm SL in preservative, and we have determined that they represent a new species.

MATERIALS AND METHODS

Type specimens of the new species have been deposited in the Bernice P. Bishop Museum, Honolulu (BPBM) and the Reference Collection of Phuket Marine Biological Center, Phuket (PMBC).

Lengths recorded for specimens are standard length (SL), the straight-line distance from the tip of the snout in the median plane to the base of the caudal fin (end of hypural plate). Body depth is the greatest depth; body width is the greatest width just posterior to the head. Head length is measured from the front of the upper lip in the median plane to the most posterior point of the opercular membrane; snout length is taken from the same anterior point to the fleshy edge of the orbit. Orbit diameter is the greatest fleshy diameter of the orbit; interorbital width is the least bony width; preorbital width is the distance between anterior edge of preorbital bone to anterior edge of orbit. Caudal-peduncle depth is the least depth, and caudal-peduncle length is the horizontal distance between verticals at the rear base of the anal fin and the base of the caudal fin; lengths of spines and rays of fins are measured from their extreme bases in a straight line to their tips. Pectoral-fin length is the length of the longest ray; pelvic-fin length is measured from the base of the spine to the tip of the longest ray.

Counts of pectoral rays include the rudimentary uppermost ray. Counts of lateral-line scales are made to the base of the caudal fin. Counts of transverse scales above the lateral line were made to the middle of the spinous portion of the dorsal fin following a slightly oblique scale row to the top of the basal scaly sheath. The transverse scales below the lateral line were made to the origin of the anal fin along a near-vertical row. The lateral-line scale was not included in either count. Gill-raker counts include all rudiments; the count of lower-limb rakers contains the raker at the angle. Vertebral counts and other osteological information were obtained by X-ray radiographs. Supraneural (predorsal) formula follows the format of Ahlstrom *et al.* (1976).

Meristic and morphometric data given in parentheses refer to paratype. Table 1 provides measurements of type specimens as percentages

of the standard length. Proportional measurements in the text are rounded to the nearest 0.05.

***Plectorhinchus macrospilus*, new species**
(English common name: Largespotted thicklip)
Figs. 1–5; Table 1

Plectorhinchus pictus (non Tortonese); McKay, 1983: pl. I, illustration only, labeled as *P. fangi* (Similan Island, Thailand).
Plectorhinchus sp.; Kuiter and Debelius, 1994: 154 (Andaman Sea).
Plectorhinchus fangi (non Whitley); Mohsin and Ambak, 1996: 353, fig. 542, col. fig. 260 (no locality stated).

Holotype: BPBM 22847, female, 278 mm SL, Andaman Sea, SW Thailand, Similan Islands, Miang Island (8°34′ N, 97°38′ E), west side of bay, rotenone and spear, J.E. Randall and G.R. Allen, 11–14 February 1979.
Paratype: PMBC 17226, 145 mm SL, Andaman Sea, SW Thailand, Similan Islands, from aquarium-fish trader in Phuket, U. Satapoomin, 3 December 1997.

Diagnosis: A species of *Plectorhinchus* with the following combination of characters: dorsal-fin rays XII, 21; anal-fin rays III, 8; pored lateral line scales 58; longitudinal scale series 64–65; gill rakers 4–6 + 14–15 = 18–21; scales above lateral line 14, below 19–21; chin with 6 pores, no median pit; body depth 2.5–2.7 in SL; pectoral fins 1.2 in head length; body of adult whitish with large irregularly rounded black spots (much larger than pupil to nearly equal to orbit) on body and soft part of median fins; head with smaller close-set dark spots and short bands; young with 4 (or probably 5 when smaller) wide longitudinal black stripes (wider than half of orbit) which gradually break up into blotches and then spots with growth.

Description: Dorsal-fin rays XII, 21; anal-fin rays III, 8; pectoral-fin rays 17; pelvic-fin rays I, 5; principal caudal-fin rays (upper + lower) 9 + 8, the uppermost and lowermost unbranched; procurrent caudal-fin rays (upper + lower) 9 + 7 (counts possible only for holotype); lateral-line scales 58 plus 10 (9) pored scales on caudal-fin base; longitudinal scale series 65 (64); scales above lateral line to middle of spinous portion of dorsal fin 14; scales below lateral line to origin of anal fin 21 (19); circumpeduncular scales 15 + 2 + 16; gill rakers 6 + 15 (4 + 14); pseudobranchial filaments 31 (21); branchiostegal rays 7; vertebrae 11 + 16; supraneural bones 3, formula 0/0 + 0/2 + 1/1/; caudal skeleton including five hypurals, one parhypural, three epurals, two uroneurals, and two autogenous haemal spines.

Body oblong, the depth 2.5 (2.7) in SL, and compressed, the width 2.6 (2.55) in depth; head length 3.6 in SL; dorsal profile of head strongly convex; snout length 2.3 (2.5) in head; orbit diameter 3.7 (2.8) in head; interorbital width 3.4 (3.15) in head; preorbital width 3.4 (3.6) in head; caudal-peduncle depth 2.4 (2.5) in head; caudal-peduncle length 1.3 (1.35) in head.

Mouth small, lips moderately thick, the maxilla reaching just anterior to vertical at rear edge of orbit, the upper-jaw length 3.5 (3.3) in head; teeth conical, in a band in each jaw, the outer series enlarged, but none as canines; front of upper jaw with about 7 (5) rows of teeth, narrowing to 2–3 rows posteriorly; front of lower jaw with about 9 (5) rows of teeth, becoming uniserial on side of the jaw; palatine toothless; gill rakers short, the one below angle on the lower limb longest, 5.25 (5.4) in orbit diameter.

Anterior nostril in front of and a little below center of eye by a distance equal to 2.2 (2.9) in orbit diameter, with slightly raised membranous rim, the posterior part of which is developed as spatulate-like dermal flap as long as the nostril diameter; posterior nostril rounded, slightly smaller than the anterior nostril, with an anterior dermal flap about half length of the nostril diameter; posterior nostril dorsoposterior to anterior nostril, the internarial distance about half width of anterior nostril.

Opercle without distinct spine; posterior edge of preopercle finely serrate, the rounded corner and superior margin smooth; margin of subopercle and interopercle smooth.

Lateral line continuous, paralleling contour of back and becoming straight at peduncular portion; ctenoid scales covering body, head, cheek, and

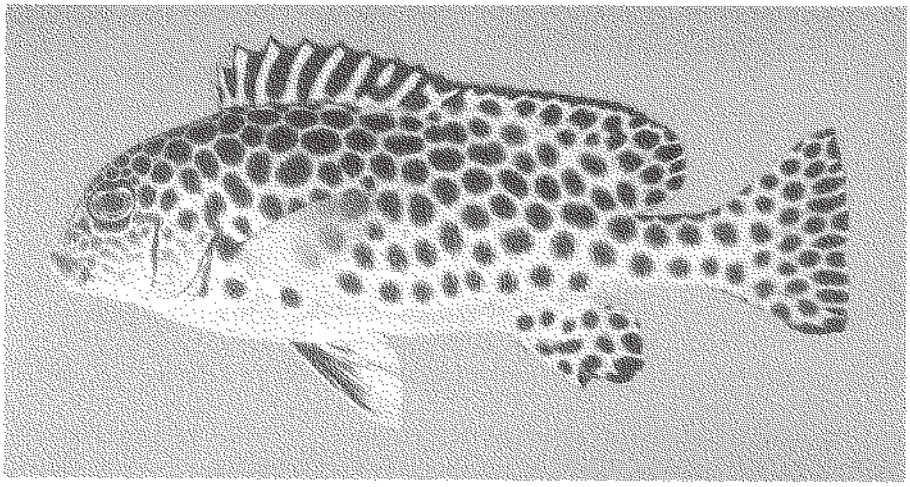

Figure 1 Holotype of *Plectorhinchus macrospilus*, BPBM 22847, 278 mm SL, Miang Island, Similan Islands, SW Thailand (J.E. Randall).

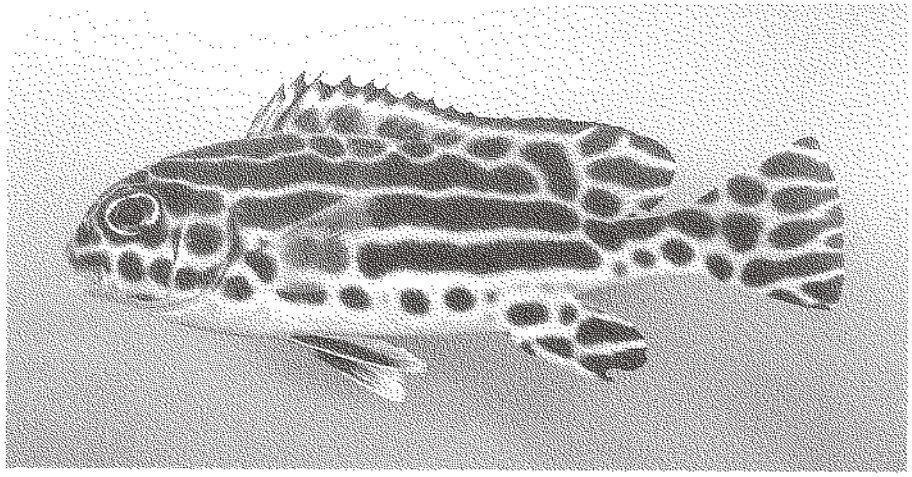

Figure 2 Paratype of *Plectorhinchus macrospilus*, PMBC 17226, 145 mm SL, Similan Islands, SW Thailand (U. Satapoomin).

opercular bones; scales on cheek small, extending anteriorly onto suborbital and hind part of preorbital region; scales on head small and extending forward to anterior nostrils; front of snout, lips and chin naked; basal sheath of scales present on dorsal and anal fins; spinous and soft portions of dorsal fin with 1.5–2 and 3–10 (3–12) scale rows, respectively; spinous and soft portions of anal fin with 1.5–3 and 6–8 (6–9) scale rows, respectively; small scales on soft rays of median fins, reaching nearly to fin margins; scales on pectoral-fin base extending onto basal part of rays, about one-fourth length of rays; inner base of pectoral fins scaleless; small scales on medial surface of pelvic fins, reaching nearly to fin margins; scaly processes, as superimposed scales, present on upper angle of pectoral and pelvic fins.

Dorsal fin little notched, its origin above edge of opercle, the predorsal length 3.9 (3.7) in SL; base of soft fin portion of dorsal fin 1.1 in that of

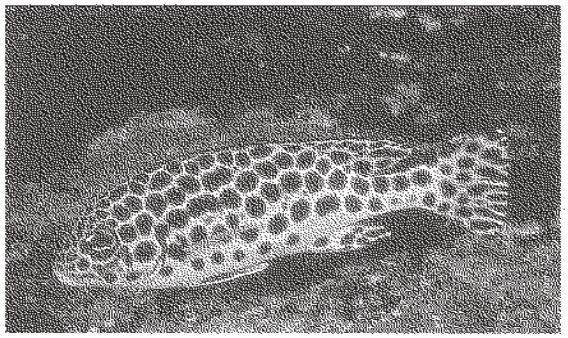

Figure 3 Underwater photograph of *Plectorhinchus macrospilus*, about 20 cm TL, Phuket Island, SW Thailand (J.E. Randall).

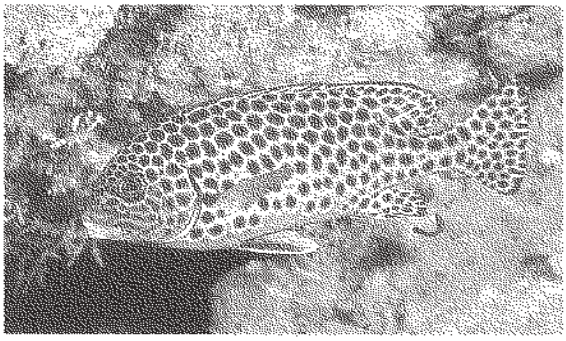

Figure 4 Underwater photograph of *Plectorhinchus macrospilus*, about 30 cm TL, Similan Islands, SW Thailand (M. Strickland).

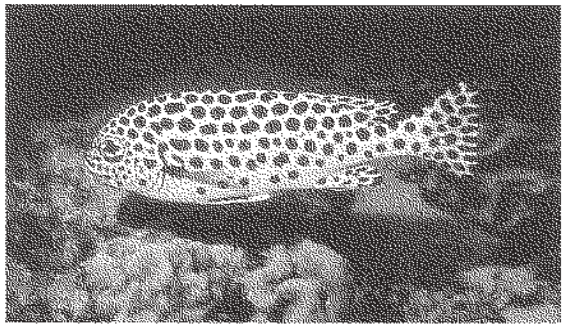

Figure 5 Underwater photograph of *Plectorhinchus macrospilus*, about 40 cm TL, Rok Nai Island, Krabi Province, SW Thailand (V. Haycharoensri).

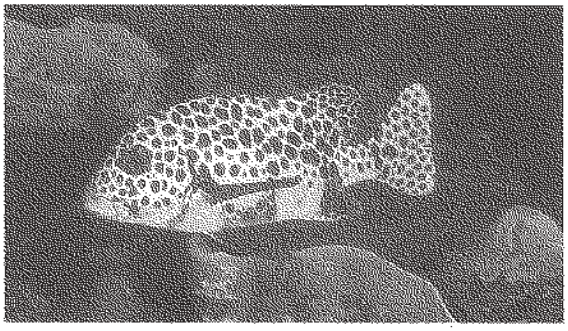

Figure 6 Underwater photograph of *Plectorhinchus chaetodonoides*, about 21 cm TL, Flores, Indonesia (J.E. Randall).

spinous part; spines of dorsal fin rather strong; first dorsal spine 4.5 (3.7) in head; fourth dorsal spine longest, 2.1 (1.9) in head; eleventh or twelfth soft dorsal rays longest, 1.8 (1.5) in head and 2.2 (1.7) in length of soft dorsal-fin base; origin of anal fin below base of 7th to 8th dorsal soft rays; the preanal length 1.6 (1.7) in SL; first anal spine 6.0 (4.0) in head; second spine robust and longest, 1.75 (1.3) in head; second anal-fin ray longest, slightly longer than second spine, 1.5 (1.3) in head; base of anal fin 1.5 (1.6) in its height; caudal fin truncate (slightly convex in paratype), 1.5 (1.2) in head; pectoral fin asymmetrical, the fourth ray longest, 1.2 in head; origin of pelvic fins behind lower base of pectoral fins, the prepelvic length 2.8 in SL; pelvic fins nearly reaching anus, the second (first in paratype) ray longest, 1.3 (1.2) in head.

Color of holotype in alcohol: ground color brownish, the edges of scales darker than centers; many large, close-set, irregularly rounded, dark brown spots covering most part of body, nape, caudal and anal fins, and soft portion of dorsal fin; spots distinctly larger than pupil or nearly equal to orbit diameter (2.3–1.1 in orbit diameter); except those on frontal part of head which markedly smaller than pupil (2.4–7.0 in orbit diameter and 1.1–1.3 in pupil diameter); the spots dorsolaterally on body closer together than the rest of body, some hexagonal, the pale background forming a reticular pattern; dark small spots on cheek and lower half of opercle very close-set, some joined to form short

irregular bands; ventral part of thorax and abdomen free of spots; pectoral fins light brown, without spots; pelvic fins light brown with a dark brown streak anteriorly from base through nearly whole length of first two soft rays, about half length of the third, and about one-third of the fourth; dorsal fin light brown, with dark brown streaks, each more than half width of interspinous membrane, in front of each of the second to tenth spines, followed by series of dark brown spots (the first spot in between the tenth and eleventh spines), with a maximum of 3 rows of spots on highest portion of the fin; margin of anterior half of soft dorsal fin dark brown; upper lip dark brown on upper half, the lower half at the front paler; lower lip pale brown.

Table 1 Proportional measurements of type specimens of *Plectorhinchus macrospilus* expressed as percentages of the standard length.

	Holotype BPBM 22847	Paratype PMBC 17226
Standard length (mm)	278	145
Greatest body depth	39.75	37.5
Body width	15.1	14.7
Head length	27.7	27.4
Snout length	12.05	11.0
Orbit diameter	7.55	9.65
Pupil diameter	3.3	4.7
Interorbital width	8.1	8.7
Suborbital depth	6.8	6.1
Preorbital width	8.1	7.5
Caudal peduncle depth	11.5	10.8
Caudal peduncle length	20.9	20.3
Predorsal length	25.6	27.2
Preanal length	61.15	60.3
Prepelvic length	35.9	35.5
Upper jaw length	7.9	8.3
First dorsal fin spine length	6.1	7.4
Longest dorsal fin spine length (4th)	12.9	14.5
Longest dorsal fin ray length (11th or 12th)	15.3	18.6
Spinous dorsal-fin base length	30.9	29.0
Soft dorsal-fin base length	33.8	31.7
First anal fin spine length	4.6	6.9
Second anal fin spine length	15.8	20.5
Third anal fin spine length	13.7	17.6
Longest anal fin ray length (2nd)	18.2	20.7
Aanal fin base length	12.1	12.7
Caudal fin length	18.7	23.0
Longest pectoral fin ray length (4th)	23.9	22.3
Pelvic fin spine length	12.2	12.3
Pelvic fin length	22.8	23.2

Color of holotype when fresh (Fig. 1): ground color whitish on body, greyish on belly, and yellowish on soft portions of median fins, the dark brown markings described for the preserved specimen black on body and fins and dark grey on head; lips blackish brown; skin in groove behind upper jaw reddish; iris a mixture of brown and yellow.

Color of subadult paratype in alcohol: four irregular dark brown longitudinal stripes on each side of body, each stripe partly broken up into large spots or blotches, in particular those on head, back, caudal peduncle, and behind pectoral fins; width of stripes 1.5–1.75 in orbit diameter; pale spaces between stripes narrow dorsally, progressively wider ventrally, the lateral interspace nearly half width of dark stripes; a row of dark spots from corner of mouth across cheek and abdomen to anal-fin base, which may have been a fifth dark stripe when the fish was younger; a few small dark hexagonal spots on interorbital, separated by narrow pale reticular interspace; dorsal fin with distinct dark margin on spinous part and anterior half of soft portion, becoming blotches on the posterior half; a row of large dark spots or blotches present on rear base of fin (the first spot on fifth spine); pectoral fins creamy white with a few faint blotches.

Color of subadult paratype when fresh (Fig. 2): ground color whitish on body, greyish on belly, and yellowish on soft portions of median fins, the dark or dark brown markings described for the preserved specimen deep dark-brown to black.

The life color of young adult from underwater photograph (Fig. 3) represents certain stage of the fish which has recently completed its transition from the lined to spotted patterns. The life color of two adults (Figs. 4 and 5) is similar to that of the holotype. However, the one from Rok Nai Island (Fig. 5), presumably a larger fish, has the spots

on the body arranged horizontally in irregular rows (maximum about 6 rows in central part of body), each lateral row with up to 15 or 16 spots; the spots are relatively smaller (but most larger than pupil), and the pale interspaces broader; the small spots on the snout, cheek, and around eye are more clearly defined than on holotype.

Remarks: This species of *Plectorhinchus* is named *macrospilus* from the Greek in reference to the distinct large black spots on the body and fins. It is presently known only from islands in the Andaman Sea off the southwest coast of Thailand.

Plectorhinchus macrospilus is one of six species of the genus that have numerous dark spots as adults; the others are *P. chaetodonoides* Lacepède, 1800; *P. cinctus* (Temminck and Schlegel, 1843); *P. gaterinus* (Forsskål, 1775); *P. picus* (Cuvier in Cuvier and Valenciennes, 1830); and *P. pictus* (Tortonese, 1936). The spots of the new species are larger at any given size than those of these five species, and they cover more of the head and body. It also has a higher number of dorsal soft rays (21, compared to 15–20 for the other species), and a lower number of gill rakers (18–21, compared to 22–44 for the others).

In addition to *P. macrospilus*, there are four species of the Plectorhinchinae that occur along the Andaman Sea coast of Thailand: *Diagramma pictum* (Thunberg, 1792), *Plectorhinchus chaetodonoides* Lacepède, 1800, *P. gibbosus* (Lacepède, 1802) and *P. vittatus* (Linnaeus, 1758) [the species has been widely known as *P. orientalis* (Bloch, 1793), for which Randall and Johnson (2000) have recently resurrected *P. vittatus* (Linnaeus) as an older name]. Of these, only *P. chaetodonoides* might be confused with *P. macrospilus*. It has a similar spotted pattern at a total length of about 20 to 30 cm to adults of *P. macrospilus*. Figure 6 of an individual estimated as 21 cm TL shows this resemblance, but it still has some vestige of juvenile coloration ventrally on the body. Better illustrations to show the similarity may be found in Shen (1984: pl. 65, fig. 327–4 C) and Kuiter and Debelius (1994: 151, middle right fig.). Apart from meristic differences, *P. chaetodonoides* differs in having the spinous dorsal and paired fins spotted, a higher and more deeply notched dorsal fin, and a slightly forked caudal fin.

Plectorhinchus pictus (Tortonese, 1936) as a juvenile also bears some resemblance to *P. macrospilus*, as shown by the illustration in Blegvad (1944: pl. 6, fig. 1 of a 178-mm specimen); however, the spots are more variable in size, and there are none on the head, nape, chest, and abdomen. This species is recorded from the Persian Gulf and the Gulf of Oman.

Two other recently described haemulid fishes also appear to be endemic to the Andaman Sea, *Pomadasys andamanensis* McKay and Satapoomin, 1994, and *Hapalogenys merguiensis* Iwatsuki, Satapoomin and Amaoka, 2000, the latter known from 80–180 m. Randall and Satapoomin (1999) listed 10 other fishes that are found only in the Andaman Sea or adjacent Sumatra. They suggested that isolation of the Andaman Sea basin following the sea level lowering during the last Ice Age or earlier Ice Ages may be the basis for the speciation of these fishes.

Comparative materials examined: *Diagramma pictum*: PMBC 5884, 193 mm SL, Phuket Trawling Harbor, Phuket, Thailand; PMBC 13956, 298 mm SL, Lipe Island, Satul, Thailand; PMBC 14425, 154 mm SL, Kura Buri, Phangnga, Thailand. *Plectorhinchus chaetodonoides*: BPBM 9480, 185 mm SL, Palau; BPBM 33698, 139 mm SL, Coral Sea, Australia; PMBC 6322, 112 mm SL, Phanwa Cape, Phuket, Thailand. *Plectorhinchus cinctus*: MUFS 7153, 18232 (2 specimens), 200–216 mm SL, Nobeoka, Miyazaki, Japan; NSMT-P21060, 132 mm SL, Chiba Prefecture, off Choshi, Honshu, Japan. *Plectorhinchus gaterinus*: BPBM 17589 (2), 131–140 mm SL, Mafia Island, Tanzania. *Plectorhinchus gibbosus*: PMBC 6743, 297 mm SL, Northern Andaman Sea, Myanmar, otter trawl, 60–70 m; PMBC 14423, 183 mm SL, Kura Buri, Phangnga, Thailand. *Plectorhinchus picus*: BPBM 14844, 224 mm SL, Lord Howe Island, Australia; BPBM 33699, 115 mm SL, Coral Sea, Australia. *Plectorhinchus pictus*: BPBM 29475 (2), 140–155 mm SL, Bahrain. *Plectorhinchus vittatus*: BPBM 17624, 176 mm SL, Mafia Island, Tanzania; BPBM 29336, 177 mm SL, Bali, Indonesia; PMBC 5897, 213 mm SL, Phuket Fish Market, Phuket, Thailand; PMBC 6741, 316 mm SL, Northern Andaman Sea, Myanmar, otter trawl, 60–70 m.

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REFERENCES

Ahlstrom, E.H., J.L. Butler, and B.Y. Sumida. 1976. Pelagic stromateoid fishes (Pisces, Perciformes) of the eastern Pacific: kindes, distributions, and early life histories and observations on five of these from the northwest Atlantic. Bull. Mar. Sci. **26**(3): 285–402.

Blegvad, H. 1944. Fishes of the Iranian Gulf. Einar Munksgaad, Copenhagen. 247 pp.

Day, F. 1875–1888. The Fishes of India. William Dawson and Sons, London. xx + 778 pp.

Iwatsuki, Y., U. Satapoomin, and K. Amaoka. 2000. New species: *Hapalogenys merguiensis* (Teleostei; Perciformes), from Andaman Sea. Copeia **2000**(1): 129–139.

Kuiter, R.H. and H. Debelius. 1994. Southeast Asia Tropical Fish Guide. IKAN-Unterwasserarchiv, Frankfurt. 321 pp.

McKay, R.J. 1983. Haemulidae: pp. 1–11, pls. I–II, "HAEM Diag 1" to "HAEM Pomad 16." **In**: W. Fisher and G. Bianchi (eds.), FAO Species Identification Sheets for Fisheries Purposes; Western Indian Ocean (Fishing Area 51). Vol. 2. FAO, Rome, Italy.

McKay, R.J. and U. Satapoomin. 1994. *Pomadasys andamanensis*, a new species of haemulid fish from Thailand. Phuket mar. biol. Cent. Res. Bull. **59**: 1–4.

Mohsin, A.K.M. and M.Z. Ambak. 1996. Marine Fishes and Fisheries of Malaysia and Neighboring Countries. Universiti Pertanian Malaysia Press, Serdang. xxxvi + 744 pp.

Munro, I.S.R. 1955. The Marine and Fresh Water Fishes of Ceylon. Department of External Affairs, Canberra. xvi + 351 pp.

Randall, J.E. 1995. Coastal Fishes of Oman. Crawford House Publishing, Bathurst, Australia. xvi + 439 pp.

Randall, J.E. and J.W. Johnson. 2000. *Perca lineata* and *P. vittata* established as valid species of *Plectorhinchus* (Perciformes: Haemulidae). Mem. Qld. Mus. **45**(2): 477–482.

Randall, J.E. and U. Satapoomin. 1999. *Archamia ataenia*, a new species of cardinalfish (Apogonidae: Perciformes) from the Andaman Sea and Mentawai Islands. Phuket mar. biol. Cent. Res. Bull. **62**: 1–8.

Shen, S.-C. 1984. Coastal Fishes of Taiwan, Dept. of Zoology, National Taiwan University, Taipei, 190 pp.

Temminck, C.J. and H. Schlegel. 1842–1850. Pisces in P.F. von Seibold's Fauna Japonica. Lugduni Batavorum, Leiden. 323 pp.

Tortonese, E. 1936. Un nouvo percoide dell'Oceano Indiano (*Hapalogenys pictus*, n. sp.). Bull. Musei Zool. Anat. Comp. Torino, Ser. 3. **45**: 281–284.

Smith, J.L.B. 1962. Fishes of the family Gaterinidae of the western Indian Ocean and the Red Sea, with a résumé of all known Indo-Pacific species. Ichthyol. Bull. Rhodes Univ. **25**: 469–502, pls. 69–72, 22 figs.

Whitley, G.P. 1951. New fish names and records. Proc. Roy. Zool. Soc. N. S. W., 1949–50: 61–68.

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