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FISHES OF THE FAMILY LUTJANIDAE OF TAIWAN[1]

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Sin-Che Lee (1987) Fishes of the family Lutjanidae of Taiwan. *Bull. Inst. Zoology, Academia Sinica* **26** (4): 279-303. Up to date, a total of 44 lutjanid species are confirmed to occur around the waters of Taiwan. They include 4 subfamilies and 10 genera: Paradicichthyinae (*Symphorus*, 1 species); Lutjaninae (*Lutjanus*, 23 species; *Macolor*, 1 species; *Pinjalo*, 2 species): Apsilinae (*Paracaesio*, 3 species); Etelinae (*Aprion*, 1 species; *Aphareus*, 2 species; *Etelis*, 3 species; *Pristipomoides*, 6 species; *Tropidinius*, 2 species). Among 44 species, *Lutjanus ehrenbergii* and *Pristipomoides typus* are not yet available and are provisionally excluded from this report. The remaining 42 species are provided with their distinctive characters with color photos as well as the keys for specific identification. The following 12 species namely *Aphareus furcatus, A. rutilans, Etelis carbunculus E. radiosus, Lutjanus bengalensis, L. carponotatus, L. doedecanthoides, Pristipomoides auricilla, P. multidens, Tropidinius amoenus, T. zonatus,* are first records from Taiwan, and *Pinjalo microphthalmus* is the new species.

Fishes of Lutjanidae or snappers have the dorsal fin continuous or with a shallow notch, with 10-12 spines and 10-17 soft rays; anal fin with 3 spines and 7-11 soft rays; mouth mostly with enlarged canine teeth on jaws, and small teeth on palatines and usually on vomer; vertebrae 24. Lutjanidae are important food fishes which are mostly marine and occurring in tropical and subtropical seas of Atlantic, Indian and Pacific Oceans with an estimation of about 185 species in 17 genera (Nelson, 1984). The arrangements of systematic orders in the family were based on Johnson (1980).

As the number of lutjanid species of Taiwan concerned, the earliest record was made by Jordan and Evermann (1902) who noted 5 species including *Lutjanus fulviflamma, L. annularis* (=*L. erythropterus*), *L. argentimaculatus, L. vitta,* and *Platyinius sparus* (=*Pristipomoides typus*). Later in 1909, Jordan and Richardson added 5 species namely *Lutjanus fuscescens* (=*L. russelli*), *L. quinquelineatus* (*L. spilurus* is the synonym of it), *L. kasmira, L. lineolatus* (=*L. lutjanus*), and *L. rivulatus.* Several years after the end of second world war, Liang (1951) furtherly added 5 species: *Lutjanus sebae, L. monostigma, L. nematophorus* (=*Symphorus nematophorus*), *Aprion virescens* and *Pristipomoides sieboldii.* In 1954, Chen added another 4 species: *Lutjanus ehrenbergii, L. vaigiensis* (=*L. fulvus*), *L. malabaricus* and *Pristipomoides argyrogrammicus* (=*P. filamentosus*). The occurrence of *L. ehrenbergii* in Taiwan mentioned by Chen (1954) and Allen and Talbolt (1985) was primarily based on Weber and de Beaufort (1936) but the specimen was not actually obtained in Taiwan. In 1969, Chen added further 6 species including *Lutjanus decussata, L. bohar, L. gibbus, Macolor niger, Etelis carbunculus* (=*E. coruscans*) and *Paracaesio xanthurus.* In 1982, Lee reported 2

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more *Paracaesio* species: *P. caeruleus* and *P. kusakurii*. Two years later, Shen (1984 a, b) added 5 species: *Lutjanus johnii*, *L. caeruleovittatus* (=*L. boutton*), *L. stellatus*, *Pinjalo pinjalo* and *Pristipomoides flavipinnis*. The other newly recorded *L. rufolineatus* is the misidentification of *L. boutton*. Although *Lutjanus semicinctus* and *L. janthinuropterus* appeared in Chen and Yu (1987) were thought to be new records, however, *L. semicinctus* is the juvenile *L. decussata* (Burgess and Axelrod, 1974) and the latter being synonymous with *L. fulvus*. From the above revision on earlier literatures, 32 species were noticed. Nevertheless, resulting from the present work, the following 12 species are furtherly increased: *Aphareus furcatus*, *A. rutilans*, *Etelis carbunculus*, *E. radiosus*, *Pristipomoides auricilla*, *P. multidens*, *Lutjanus bengalensis*, *L. carponotatus*, *L. dodecanthoides*, *Pinjalo microphthalmus*, *Tropidinius amoenus* and *T. zonatus*. This brings a total of 44 lutjanid species occurring in Taiwan. Among the above list, *Lutjanus ehrenbergii* and *Pristipomoides typus* are not yet available and are provisionaly excluded from this report.

MATERIALS AND METHODS

Specimens used were mostly collected by long-liners, hand-liners and trawlers from the vicinities of Keelung, Kaohsiung, Tungkang and Hengchun. They were photographed when fresh and preserved in 10% formalin thereafter. Methods of morphometric measurements and meristic counts followed those in the previous paper (Lee, 1980). Specimens were mostly deposited in the Museum of the Institute of Zoology, Academia Sisica (ASIZP) and partly deposited in the Museum of the Department of Zoology, National Taiwan University (NTUM).

RESULTS AND REMARKS

Systematic account

Key to genera of the family Lutjanidae

1. Soft dorsal and anal fin membranes covered by scales, or with a low scaly sheath at bases; D. X-XII, 11-17.....2
   Soft dorsal and anal fin membranes scaleless, without scaly sheath; D. X, 10..5
2. Vomer toothless (Paradicichthyinae).... .....*Symphorus*
   Vomerine teeth present (Lutjaninae)...3
3. Gill-rakers on lower limb of first gill arch more than 50.....*Macolor*
   Gill-rakers less than 50.....4
4. Mouth small, jaw teeth small ....*Pinjalo*
   Mouth large, jaw teeth well developed, some of them in canine-like...*Lutjanus*
5. Last dorsal and anal fin rays shorter than their preceeding ones; interorbital space distinctly convex; D. X, 10 (Apsilinae) .....*Paracaesio*
   Last dorsal and anal fin rays longer than their penultimates; interorbital space flattened; D. X, 11 (Etelinae).....6
6. Dorsal fin deeply notched between spinuous and soft portions; maxilla scaled ..... *Etelis*
   Dorsal fin not deeply notched; maxilla scaleless.....7
7. Pectoral fin much shorter than head length (about snout length), a deep groove below nostril.....*Aprion*
   Pectoral fin about equal to head length, no groove below nostril 8
8. Vomer and palatines toothless...*Aphareus*
   Vomer and palatines toothed.....9
9. Body less deeper, 3 or more times in standard length.....*Pristipomoides*
   Body deeper, 2.7-3 times in standard length .....*Tropidinius*

SUBFAMILY PARADICICHTHYINAE

Genus *Symphorus*

1. *Symphorus nematophorus* (Bleeker, 1860)
曳絲笛鯛
Plate 1, Fig. 1

Mesoprion nematophorus Bleeker, 1860: 56 (Celebes). (not seen).

Lutjanus nematophorus, Weber and de Beaufort, 1936: 240; Liang, 1951: 23.

Symphorus nematophorus, Munro, 1967: 293.

Materials: ASIZP 055636, one specimen, 355 mm SL, Nov. 1980, Hengchun.

Diagnosis: D. X, 15; A. III, 9; P. 17; GR. 5+13; Ll. 52. Head 3.10, body depth 2.89, pectoral 3.90 in standard length. Maxilla 2.49, eye 6.03, preorbital depth 3.23 in head length. Nostril-orbital distance between hind margin of postnostril and anterior margin of orbit 7.89% of eye. A narrow groove from below nostril to anterior edge of orbit. Vomer toothless, palatine stoothed. Fourth to sixth soft dorsal rays filamentous. Color when fresh red with 7 longitudinal blue lines on body sides.

Remarks: Young of this species resembles *Symphorichthys spilurus* by the filamentous dorsal rays and blue lines on body side. They can be distinguished by greater number of soft dorsal rays and the black saddle on the caudal peduncle of the latter species.

SUBFAMILY LUTJANINAE

Genus *Macolor*

2. *Macolor niger* (Forskal, 1775)

黑背笛鯛

Plate 1, Fig. 2

Sciaena nigra Forskal, 1775: 47 (Arabia).
Lutjanus niger, Weber and de Beaufort, 1936: 289.
Macolor niger, Chen, 1969: 391.

Materials: NTUM 04481, one specimen 109.5 mm SL, June 1984, Hengchun.

Diagnosis: D. X, 13; A. III, 10; P. 17; GR. 38+65; Ll. 52. Head 2.90, body depth 2.34, pectoral 2.74 in standard length. Maxilla 2.33, eye 3.29, preorbital depth 6.10 in head length. Nostril-orbital distance 30.43% of eye. Preopercle with a deep notch. Vomer and palatines toothed. Ventral fins much longer, reaching to base of third soft dorsal ray. Soft parts of dorsal and anal fins pointed, much higher than the spinuous part. Color when fresh black on upper half with white spots while whitish with a longitudinal stripe on lower half. Head with a wide band across the orbit. Fins almost uniformly black.

Remarks: The black longitudinal stripes in juveniles become uniformly black in adults.

Genus *Pinjalo*

Key to species of *Pinjalo*

1. Eye equal to or slightly larger than snout; ventral fin exceeding the middle way between its origin and anus; body deeper ..... *P. pinjalo*
   Eye much smaller than snout; ventral fin reaching the middle way between its origin and anus; body less deeper.. ..... *P. microphthalmus*

3. *Pinjalo pinjalo* (Bleeker, 1850)

斜鱗笛鯛

Plate 1, Fig. 3

Caesio pinjalo Bleeker, 1850: 10 (Maenaden).
Pinjalo pinjalo, Weber and de Beaufort, 1936: 293; Shen, 1984b: 61.

Materials: ASIZP 055634, one specimen, 111 mm SL, Jan. 1974, Kaohsiung; ASIZP 056097, one specimen, 201 mm SL, Sept. 1979, Wanli.

Diagnosis: D. XI, 14; A. III, 10; P. 19; GR. 7-9+16-17; Ll. 51-52. Head 3.13-3.28, body depth 2.12-2.37, pectoral 3.28-3.35 in standard length. Maxilla 3.01-3.29, eye 3.55-4.14 in head length. Eye 114-125% of snout length. Body deeper, ovoid in shape. All scale rows on body side running obliquely. Mouth small, maxilla extends to the anterior margin of orbit. Vomer and palatines toothed, the former in triangular; tongue toothless. Ventral fin shorter, exceeding the middle point between its origin and vent. Caudal fin deeply lunated. Color when fresh yellowish red, paler below, all vertical fins with black edges.

4. *Pinjalo microphthalmus* sp. nov.

細眼斜鱗笛鯛

Plate 1, Fig. 4

Pinjalo sp. Masuda *et al.*, 1984: 168.

Materials: Holotype, ASIZP 056180, one specimen, 570 mm SL, May 16, 1986, Shiao-

liu-chu, Pingtung.

Diagnosis: D. XI, 14; A. III, 10; P. 19; GR. 7+17; Ll. 56. Head 3.58, body depth 2.48, pectoral 4.01 in standard length. Maxilla 3.46, eye 4.68 in head length. Eye very small, only 73.91% of snout length. Body more or less elongated, the occipt steeply arched. Mouth small, the maxilla reaching to the anterior margin of orbit. Vomer and palatines toothed; tongue toothless. Ventral fin very short, not reaching the middle point between its origin and vent. Caudal fin lunated, slightly protruded in the middle. Dorsal and anal fins scaled. All scale rows ascending obliquely. Color when fresh bright red, vertical fins with black distal edges.

Remarks: This is a large-sized *Pinjalo* species inhabiting the coral reefs on southern-more seas. It differs from *P. pinjalo* by its smaller eyes, shorter ventral fin and more elongated body shape.

Ethymology: *Pinjalo microphthalmus* is named after its rather small-sized eyes.

Genus *Lutjanus*

Key to species of *Lutjanus*

1. Body slenderer, about 3 in standard length; preorbital depth very short, about 9 or more in head length; soft dorsal rays usually 12 or less..... ..... *L. lutjanus*
   Body deeper, mostly less than 3 in standard length; preorbital deeper, less than 9 in head length; soft dorsal rays usually over 13.....2
2. Body side with bluish longitudinal stripes in life 3
   Body uniformly coloured or with longitudinal stripes of yellowish or other colors.....5
3. Dorsal spines XI .....*L. bengalensis*
   Dorsal spines X.....4
4. Five or 6 stripes on body side, belly without slender lines, upper pectoral rays paler.....*L. quinquelineatus*
   Four stripes on body side, belly with slender lines, upper pectoral rays dusky ..... *L. kasmira*
5. Longitudinal scale rows above lateral line running entirely horizontally or rising obliquely on posterior half of body.....6
   Longitudinal scale rows above lateral line running entirely obliquely 7
6. Scale rows above lateral line paralleling to lateral line profile anteriorly and rising obliquely below posterior dorsal spines; no black blotch on back..... ..... *L. argentimaculatus*
   Scale rows above lateral line entirely paralleling to lateral-line profile; black blotch on back.....*L. johnii*
7. Vomerine tooth patch triangular or diamond shape, with a medial posterior extension.....8
   Vomerine tooth patch triangular or cresenic, without posterior extension...11
8. Axial of pectoral fin with a black spot, body side with about 7 yellowish longitudinal stripes; soft dorsal rays mostly 9..... *L. carponotatus*
   Axial of pectoral fin without black spot, body side with or without stripes; soft dorsal rays usually 13–14; anal rays 8 9
9. Large black blotch on back, lateral stripes of equal size 10
   The black blotch absent, lateral stripes on the midlateral part wider..... ..... *L. lutjanus*
10. Soft dorsal rays 14; temporal scale band of each side interrupted by a wider gap of more than 2 scale wide on forehead; stripes in juveniles are broader and fewer in number, those in adults are slenderer and more numerous..... ..... *L. russelli*
    Soft dorsal rays 13; the gap between the two sides of temporal scale bands much narrower of about one scale wide; stripes in youngs as broad as the *L. russelli* .....*L. fulviflamma*

11. Total gill-rakers 23-31 (lower limb 16-21) ..... *L. gibbus*
Total gill-rakers 23 or less (lower limb 6-16) 12
12. Soft anal rays 10, soft dorsal rays mostly 16 (rarely 15); scale rows below lateral line rising obliquely; body side with three dark brown (red) transverse bands (indistinct in adults) ... *L. sebae*
Soft anal rays 8-9; soft dorsal rays 12-16; scale rows below lateral line running horizontally with few exception of obliquely positioned; body side without such transverse bands mentioned above 13
13. Preopercular notch distinct (well or moderately developed) 14
Preopercular notch indistinct, shallower or absent 17
14. Body deeper, 2.17-2.25 in standard length; soft dorsal rays 15; head with numerous bluish wavy lines ..... *L. rivulatus*
Body less deeper, 2.31-2.58 in standard length; soft dorsal rays 13-14; head without numerous wavy lines as stated above 15
15. Distal third of dorsal fin and entire caudal fin black or dark brown with whitish edge ..... *L. fulvus*
Distal third of dorsal fin and entire caudal fin with same color as the remaining part of the fins 16
16. Preorbital depth wider, 4.08 in head length; lower limb of first gill arch 10; body uniformly dark brown with a whitish spot on back ..... *L. stellatus*
Preorbital depth shorter, 5.4-6.1 in head length; lower limb of first gill arch 13-15; body with about 10 yellowish longitudinal stripes ..... *L. boutton*
17. Caudal base with a black blotch, the uppermost three longitudinal stripes crossed by several transverse bands forming check board like patterns .... *L. decussatus*
Color patterns not as mentioned above 18
18. Nostril set in the preorbital groove; two whitish spots on back, outer parts of ventral fin and anal fin and upper part of pectoral fin dark ..... *L. bohar*
Nostril never set in the grove; color patterns not as above 19
19. Black blotch on back, body without yellowish stripes ..... *L. monostigma*
Black blotch on back absent 20
20. D. XII; 5-6 yellowish stripes on body side ..... *L. dodecanthoides*
D. X-XI; yellowish stripes absent 21
21. Maxilla length less than the distance between bases of last dorsal and anal rays; all the scale rows below lateral line rising obliquely ... *L. erythropterus*
Maxilla length subequal to the distance between base of last dorsal and anal rays; most of the longitudinal scale rows below lateral line running horizontally except some scale rows on the anterior part of body ... *L. malabaricus*

Genus *Lutjanus*

5. *Lutjanus argentimaculatus* (Forskal, 1775)
銀紋笛鯛
Plate 1, Fig. 5

Sciaena argentimaculata Forskal, 1775: 47.
Alphestes gembra Schneider in Bloch and Schneider, 1801: 236 (Tranquebar).
Lutjanus argentimaculatus, Jordan and Evermann, 1902: 344.

Materials: ASIZP 055442, one specimen, 265 mm SL, Oct. 1979; ASIZP 055454 and 055455, two specimens, 103-159 mm SL, Dec. 1979, all from Tungkang; ASIZP 055629, one specimen, 181 mm SL, Sept. 1980 and six uncatalogued specimens, Mar. 1986, all from Kaohsiung.

Diagnosis: D. X, 13; A. III, 8; P. 16; GR. 5-7+9-13 (well developed 0-6+7); LI. 44-45. Head 2.42-2.69, body depth 2.51-2.84, pectoral 3.29-3.47 in standard length. Maxilla 2.35-2.70, eye 4.78-5.63, preorbital depth 4.80-6.54 in head length. Nostril-orbital distance 16.85-34.29% of eye. Scale rows above lateral

line parallelling to lateral line profile anteriorly and ascending posteriorly. Vomerine tooth patch cresenic without medial posterior extension; tongue with a patch of finely granulated teeth. Preopercular notch and interopercular knob indistinct. Caudal fin truncated. Color when fresh generally brownish, darker dorsally and paler ventrally.

Remarks: Body side of the young has 7-8 silvery narrow cross bands.

6. *Lutjanus bengalensis* (Bloch, 1790)

孟加拉笛鯛

Plate 1, Fig. 6

Holocentrus bengalensis Bloch, 1790: 102 (Bengal).
Lutjanus bengalensis, Allen and Talbot, 1985: 21.

Materials: ASIZP 055897, four specimens, 128.5-134.0 mm SL, June 1986; ASIZP 056100, one specimen, 94.5 mm SL, July 1977, all from Hengchun.

Diagnosis: D. XI, 13-14; A. III, 8; P. 16; GR. 6-8+16-18 (2-4+10); Ll. 47-48. Head 2.61-2.87, body depth 2.66-2.93, pectoral 3.19-3.75 in standard length. Maxilla 2.63-2.81, eye 3.40-3.85, preorbital depth 6.24-7.56 in head length. Nostril-orbital distance 17.69 24.63% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic; tongue smooth. Preopercular notch and interopercular knob much prominent. Color when fresh bright yellowish with 4 bluish longitudinal stripes.

Remarks: It resembles *L. kasmira*, but differs from the latter by having 11 dorsal spines instead of 10, and by the lack of brownish lines on belly.

7. *Lutjanus bohar* (Forskal, 1775)

雙斑笛鯛

Plate 1, Fig. 7

Sciaena bohar Forskal, 1775: 46 (Arabia).
Lutjanus bohar, Chen, 1969: 390.

Materials: ASIZP 055638, one specimen, 181 mm SL and ASIZP 055898, one specimen, 222 mm SL, Nov. 1980 and June 1986 respectively, all from Hengchun.

Diagnosis: D. X, 14; A. III, 8; P. 17; GR. 7+16=23; Ll. 48-49. Head 2.48-2.63, body depth 2.45-2.61, pectoral 3.23-3.27 in standard length. Maxilla 2.25-2.33, eye 4.38-4.56, preorbital depth 5.56-6.46 in head length. Nostril-orbital distance 32.50-36.27% of eye. Scale rows above lateral line running obliquely while those below it horizontally. Vomerine tooth patch triangular; palatines toothed; tongue with patch of granular teeth. Preopercular notch and interopercular knob moderately distinct. A groove below nostril extending forwardly from eye. Caudal fin emarginated. Color when fresh reddish brown, much deepened on back where two whitish spots along dorsal flank. Median fins and ventral fins with black distal edges. Pectoral with black upper edge.

Remarks: Two whitish blotches is the characteristic pattern of this species.

8. *Lutjanus boutton* (Lacépède, 1802)

藍帶笛鯛

Plate 1, Fig. 8

Holocentrus boutton Lacépède, 1802: 367 (Moluccas).
Lutjanus boutton, Allen and Talbot, 1985: 26.
Lutjanus caeruleovittatus, Masuda *et al.*, 1984: 170; Shen, 1984b: 59.
Lutjanus lineatus, Shen, 1984a: 268.
Diacope rufolineatus Cuvier in Cuvier and Valenciennes, 1830: 531.
Lutjanus rufolineatus, Chen, and Yu, 1987: 540.

Materials: ASIZP 055457, two specimens, 182-201 mm SL, Dec. 1979, Tungkang; ASIZP 055618, one specimen, 163 mm SL, Sept. 1980, Hengchun.

Diagnosis: D. XI, 13; A. III, 8; P. 16; GR. 7-8+13-15 (3-5+9-10); Ll. 45-46. Head 2.53-2.69, body depth 2.31-2.58, pectoral 2.58-3.02 in standard length. Maxilla 2.39-2.62, eye 3.71-4.00, preorbital depth 5.40-6.10 in head length. Nostril-orbital distance 20.00-24.54% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic;

palatines toothed; tongue smooth. Preopercular notch and interopercular knob much prominent. Caudal fin emarginated. Color when fresh generally reddish, whitish below, with about 10 yellowish stripes on side and a black blotch on back. All fins yellowish except the soft part of dorsal with black distal margin.

Remarks: *Lutjans caeruleovittatus* of several authors (Shen, 1984b; Masuda *et al.*, 1984 and Chen and Yu, 1986, are synonyms of it). This species resembles *L. doedecanthoides* but the lateral yellowish lines running horizontally in this species while those in the latter species obliquely.

9. *Lutjanus carponotatus* (Richardson, 1842)
胸斑笛鯛
Plate 2, Fig. 9

Mesoprion carponotatus Richardson, 1842: 28 (Port Essington, Australia).
Lutjanus carponotatus, Allen and Talbot, 1985: 28.

Materials: One uncatalogued specimen, 186.2 mm SL, Dec. 1979, Hengchun.

Diagnosis: D. X, 14; A. III, 9; P. 15. Head 2.55, body depth 2.47, pectoral 3.16 in standard length. Eye 3.81, preorbital depth 4.75 in head length. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch triangular with a posterior extension. Color when fresh pale brown with 8 yellowish longitudinal stripes. All fins bright yellowish; pectoral base with a black blotch.

Remarks: Taiwan is the northernmost limit of the distribution of this species.

10. *Lutjanus decussatus* (Cuvier, 1828)
交叉笛鯛
Plate 2, Fig. 10

Mesoprion decussatus Cuvier in Cuvier and Valenciennes, 1828: 487 (Java).
Lutjanus decussatus, Chen, 1969: 390.
Lutjanus semicinctus (juv.), Burgess and Axelrod, 1974: 1281.

Materials: ASIZP 055903, two specimens, 210-246 mm SL, July 1986, Hengchun.

Diagnosis: D. X, 13-14; A. III, 8-9; GR. 6-7+6-8 (1+6-7). Head 2.51-2.61, body depth 2.72-2.82, pectoral 3.11-3.43 in standard length. Maxilla 2.43-2.58, eye 4.55-5.50, preorbital depth 4.58-5.88 in head length. Nostril-orbital distance 17.05-27.98% of eye. Scale rows above lateral line rising obliquely while those below lateral line horizontally. Vomerine tooth patch cresenic; palatine toothed; tongue with a patch of granular teeth. Preopercular notch shallower, interopercular knob indistinct. Caudal fin slightly emarginated. Color when fresh generally whitish with 5 longitudinal stripes of dark brownish, the uppermost three crossed by transverse bands, a black blotch at caudal base.

Remarks: Color patterns of juvenile *L. decussatus* resemble that of *L. semicinctus*, however, they are distinguishable that the vertical bands are crossed by 5 longitudinal stripes in the present species. Thus the occurrence of *L. semicinctus* from Pescadores Islands stated by Chen and Yu (1986) is infact referable to the juvenile *L. decussatus* (Burgess and Axelrod, 1974).

11. *Lutjanus dodecanthoides* (Bleeker, 1854)
斜帶笛鯛
Plate 2, Fig. 11

Mesoprion dodecanchoides Bleeker, 1854: 489 (Amboina)
Lutjanus dodecanthoides, Allen, and Talbot, 1985: 31.
Lutjanus rufolineatus, Masuda *et al.*, 1984: 170.

Materials: One uncatalogued specimen of Tungkang Fisheries Branch Station, 130 mm SL, Dec. 1985, Tungkang.

Diagnosis: D. XII, 13; A. III, 8; P. 17. Head 3.65, body depth 2.56 in standard length. Eye 4.28, preorbital depth 3.62 in head length. Scale rows above lateral line rising obliquely while those below it horizontally. Preopercular notch shallower, interopercular knob indistinct. Vomerine tooth patch cresenic; tongue smooth. Color when fresh pink above and silvery below with 6 obliquely running yellowish stripes on body side; all fins yellowish to brownish.

Remarks: The oblique running of yellowish lines on body side is the characteristic color pattern of this species. *Lutjanus rufolineatus* of Masuda *et al.* (1984) is the mistake of this species.

12. *Lutjanus erythropterus* Bloch, 1790

赤鰭笛鯛

Plate 2, Fig. 12

Lutjanus erythropterus Bloch, 1790: 115 (Japan).
Lutjanus annularis, Jordan and Evermann, 1902: 343.
Lutjanus erythropterus, Allen and Talbot, 1985: 36.
Pinjalo pinjalo, Shen, 1984b: 61.

Materials: ASIZP 055430, one specimen, 151.2 mm SL, Nov. 1979, Kaohsiung; ASIZP 055447, one specimen, 73.8 mm SL, Dec. 1979, Tungkang; ASIZP 056107, one specimen, 316 mm SL, May 1977, Tungao.

Diagnosis: D. XI, 13; A. III, 8; P. 16; GR. 6+13 (2+9-11); Ll. 48-49. Head 2.45-2.50, body depth 2.16-2.18, pectoral 3.29-3.48 in standard length. Maxilla 2.54-2.66, eye 3.35-4.87, preorbital depth 4.68-6.56 in head length. Head profile slightly covex. Temporal scale band on forehead interrupted by a very wide (about eye diameter) gap; all the scale rows on body sides rising obliquely. Maxilla to anterior margin of orbit with its length shorter than the distance between the bases of last dorsal and anal rays. Vomerine tooth patch cresenic without posterior extension; tongue smooth. Preopercular notch and interopercular knob indistinct. Two nostrils close set, the distance between the two nostrils about the length of the posterior nostril. Color when fresh pink or reddish, a wide dark band from origin of dorsal to the upper jaw; a broad black cross band on caudal peduncle, the caudal band disappeared in adult.

Remarks: This species is similar to *L. malabaricus*, their discriminating characters are discussed in detail by Allen and Talbot (1985).

13. *Lutjanus fulviflamma* (Forskal, 1775)

火斑笛鯛

Plate 2, Fig. 13

Sciaena fulviflamma Forskal, 1775: 45 (Arabia).
Lutjanus fulviflamma, Jordan and Evermann, 1902: 343.
? *Lutjanus rufolineatus*, Shen, 1984b: 59 (Fig. 323-6).

Materials: ASIZP 055684, two specimens, 179-209 mm SL, Feb. 1981, Hengchun.

Diagnosis: D. X, 13; A. III, 8; P. 15; GR. 6-7+9-10 (1+7); Ll. 47-48. Head 2.71-2.75, body depth 2.87-3.01, pectoral 3.30-3.54 in standard length. Temporal scale band across the forehead interrupted by a narrow gap of about a scale width, the band also remains the same width with the remaining part of predorsal region. Scale rows above lateral line rising obliquely while those below lateral line horizontally. Vomerine tooth patch diamond-shaped with a posterior extension; tongue with a patch of granular teeth. Preopercular notch and interopercular knob indistinct. Color when fresh light brown, paler below, body side with 5 longitudinal yellowish stripes and a black blotch of mainly below lateral line. All fins yellowish.

Remarks: Easily confused with allied *Lutjanus ehrenbergii* and *L. russelli*. *Lutjanus ehrenbergii* is distinguishable from the other two species by the horizontal running scale rows above lateral line compared to the oblique running in the latter twos. *L. fulviflamma* is furtherly separated from *L. russelli* by the narrow (at most one scale width) gap between temporal scale rows against the wider gap in *L. russelli*.

14. *Lutjanus fulvus* (Schneider, 1801)

黃足笛鯛

Plate 2, Fig. 14

Holocentrus fulvus Schneider in Bloch and Schneider, 1801: 318 (Tahiti).
Diacope vaigiensis Quoy and Gaimard, 1824: 307.
Lutjanus vaigiensis, Weber and de Beaufort, 1936: 275; Chen, 1954: 74.

Diacope flavipes Valencience in Cuvier and Valenciennes, 1830: 534.
Lutjanus janithuropterus, Burgess and Axelrod, 1974: 1283; Chen and Yu, 1986: 539.

Materials: ASIZP 056104, one specimen, 123.2 mm SL, June 1975; ASIZP 055686, one specimen, 242 mm SL, Feb. 1981, all from Hengchun; ASIZP 056103, one specimen, 79.8 mm SL, Aug. 1978 and ASIZP 056102, two specimens, 106.3–120.7 mm SL, June 1979, all from Hengchun.

Diagnosis: D. X, 14; A. III, 8; P. 16; GR. 6-7+10-13 (1-2+6-7); Ll. 48-49. Head 2.45–2.59, body depth 2.40–2.51, pectoral 3.02–3.28 in standard length. Maxilla 2.41–2.75, eye 3.68–4.35, preorbital depth 5.43–6.26 in head length. Nostril-orbital distance 23.53–29.17% of eye. The gap between temporal scale band and predorsal scaled area very narrow with about one-scale width; scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic without posterior extension; tongue smooth. Preopercular notch and interopercular knob much distinct. Color when fresh generally brownish above and whitish below, the lower half of body with several yellowish lines; blue line below eye. Dorsal brown with black distal margin; caudal black or dark brown with whitish distal margin, other fins yellowish.

Remarks: It is very closely related to *L. lunulatus* but distinguishable by the well developed preopercular notch and distinct interopercular knob, and horizontal yellowish stripes on body side. The caudal fin of this species is uniformly black while it is in lunulated pattern in *L. lunulatus*.

15. *Lutjanus gibbus* (Forskal, 1775)
隆背笛鯛
Plate 2, Fig. 15

Sciaena gibba Forskal, 1775: 46 (Arabia).
Lutjaus gibbus, Chen, 1969: 391.

Materials: ASIZP 055685, one specimen, 168 mm SL, Feb. 1981 and ASIZP 055899, two specimens, 177–187 mm SL, June 1986, all from Hengchun.

Diagnosis: D. X, 14; A. III, 8; P. 17; GR. 7-10+16-21 (6-10+16=16-19); Ll. 47-50. Head 2.58–2.76, body depth 2.40–2.49, pectoral 2.90–3.03 in standard length. Maxilla 2.67–2.79, eye 3.85–4.13, preorbital depth 4.09–4.58 in head length. Nostril-orbital distance 15.43–16.59% of eye. All scale rows on body side rising obliquely. Vomerine tooth patch cresenic; tongue smooth. Preopercular notch and interopercular knob prominent. Caudal fin deeply forked with rounded lobes. Color when fresh generally reddish, much darker on back and distal edges of median fins and ventral fin.

Remarks: Juvenile usually has a large black blotch at caudal base. The occipt region of adult is much deeper than that in juvenile.

16. *Lutjanus johnii* (Bloch, 1792)
黑斑笛鯛
Plate 2, Fig. 16

Anthias johnii Bloch, 1792: 113 (Suratta, India).
Lutjanus johnii, Shen 1984a: 267.
Coius catus Hamilton, 1822: 90 (Larger Gange estuary).

Materials: ASIZP 056098, one specimen, 111 mm SL, Jan. 1986, Kaohsiung.

Diagnosis: D. X, 14; A. III, 8; P. 17; GR. 6+10; Ll. 48. Head 2.61, body depth 2.61, pectoral 3.83 in standard length. Maxilla 2.53, eye 4.13, preorbital depth 6.54 in head length. Nostril-orbital distance 18.45% of eye. Top of head naked; both dorsal and anal fins with scaly sheath at bases; the scale rows on back parelleling to lateral line profile. Vomerine tooth patch cresenic; palatines toothed; tongue with a patch of granular teeth. Preopercular notch and interopercular knob indistinct. Caudal fin slightly emarginated. Color when fresh generally yellowish, darker above, each scale with a black dot.

Remarks: This species is characterized by all the scale rows on back paralleling to lateral line profile, and the uniformly

yellowish body color, when compared to the most closely-related *L. ehrenbergii*.

17. *Lutjanus kasmira* (Forskal, 1775)
四線笛鯛
Plate 3, Fig. 17

Sciaena kasmira Forskal, 1775: 46 (Arabia).
Lutjanus kasmira, Jordan and Richardson, 1909: 184.

Materials: ASIZP 056156, two specimens, 222–250 mm SL, May 1987, Hengchun.

Diagnosis: D. X, 15; A. III, 8; P. 16; GR. 5-7+13-14 (2+10); Ll. 48-49. Head 2.52–2.64, body depth 2.62–2.69, pectoral 2.62–3.08 in standard length. Maxilla 2.55–2.66, eye 4.16–4.97, preorbital depth 5.25–5.28 in head length. Nostril-orbital distance 35.64–45% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic; tongue smooth. Preopercular notch and interopercular knob much distinct. Color when fresh bright yellow on upper two-thirds of body, with 4 bluish stripes and an indistinct black blotch on back; belly red with yellowish slender lines. Upper edge of pectoral dark.

Remarks: Color patterns of this species similar to that of closely-related *L. bengalensis*, but differs from the latter by having dark upper edge on pectoral fin, and yellowish longitudinal stripes on belly.

18. *Lutjanus lutjanus* Bloch, 1790
正笛鯛
Plate 3, Fig. 18

Lutjanus lutjanus Bloch, 1790: 107 (Japan).
Lutjanus lineolatus, Jordan and Richardson, 1909: 184; Masuda *et al.*, 1984: 170.

Materials: ASIZP 055446, two specimens, 148–162 mm SL, Dec. 1979, Hengchun.

Diagnosis: D. XI-XII, 11; A. III, 8; P. 16; GR. 7-8+17-19 (2-3+17); Ll. 48-49. Head 2.77–2.89, body depth 3.01–3.12, pectoral 3.56–3.86 in standard length. Maxilla 2.44–2.54, eye 3.74–3.94, preorbital depth 9.37–10.67 in head length. Nostril-orbital distance 11.11–18.94% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch triangular with a median posterior extension; tongue with a patch of granular teeth. Preopercular notch shallow, interopercular knob weak. Caudal fin slightly emarginated. Color when fresh whitish with oblique yellowish lines above lateral line and horizontal lines below it, the uppermost horizontal line the broadest.

Remarks: It resembles the closely related *L. vitta* in color patterns, they can be separated by having only 10 dorsal spines in the latter (XI–XII in *L. lutjanus*).

19. *Lutjanus malabaricus* (Schneider, 1801)
摩拉吧笛鯛
Plate 3, Fig. 19

Sparus malabaricus Schneider in Bloch and Schneider, 1801: 278 (Coromandel, India).
Lutjanus malabaricus, Chen, 1954: 74; Allen and Talbot, 1985: 56.

Materials: ASIZP, 054630, one specimen, 325 mm SL, Oct. 1973; ASIZP 056139, one specimen, 330 mm SL, Apr. 1987, all from Kaohsiung.

Diagnosis: D. XI, 13; A. III, 8-9; P. 17; GR. 8+12-13 (4-5+12-13); Ll. 45-46. Head 2.68–2.93, body depth 2.42–2.70, pectoral 3.19–3.37 in standard length. Maxilla 2.22–2.45, eye 5.05–6.00, preorbital depth 3.79–4.39 in head length. Nostril-orbital distance 63.64–65.85% of eye. Top of head before occipt with almost straight profile. Scale rows above lateral line rising obliquely while those below it horizontally except few oblique rows anteriorly. Width of posterior nostril subequal to the distance of the two nostrils. Mouth large, length of maxilla subequal to the distance between last rays of dorsal and anal fins. Vomerine tooth patch cresenic; tongue smooth. Preopercular notch shallow, interopercular knob absent. Color when fresh generally reddish, paler below, dark reddish lines along scale rows.

Remarks: Very closely related to *L.*

erythropterus but differs from the latter by smaller eye and longer maxilla which is subequal to the distance between last rays of dorsal and anal fins. Forehead profile of adult *L. malabaricus* straight or slightly concave while that of *L. erythropterus* convex.

20. *Lutjanus monostigma* (Cuvier, 1828)

單斑笛鯛

Plate 3, Fig. 20

Mesoprion monostigma Cuvier in Cuvier and Valenciennes, 1828: 446 (Seychelles).

Lutjanus monostigma, Liang, 1951: 23; Allen and Talbot, 1985: 61.

Materials: ASIZP 054661, three specimens, 104.3–131.0 mm SL, Jan. 1975, Maopitou; one uncatalogued specimen, 105 mm SL, May 1978, Chengkong.

Diagnosis: D. X, 13–14; A. III, 8; P. 17; GR. 7+11 (1+6–8); Ll. 48–50. Head 2.43–2.57, body depth 2.51–2.82, pectoral 3.36–3.74 in standard length. Maxilla 2.35–2.55, eye 3.12–4.25, preorbital depth 5.93–7.17 in head length. Nostril-orbital distance 15.93–18.95% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic without posterior extension. Preopercular notch shallow, interopercular knob very weak. Color when fresh light brown with a black blotch on back. Body sides without yellowish stripes throughout the life cycle. All fins yellowish.

Remarks: This species resembles *L. fulviflamma* and *L. russelli* bull differs by the lack of posterior extension on vomer, and yellowish stripes on body side throughout the entire life span.

21. *Lutjanus quinquelineatus* (Bloch, 1790)

五線笛鯛

Plate 3, Fig. 21

Holocentrus quinquelineatus Bloch, 1790: 84 (Japan).

Lutjanus quinquelineatus, Jordan and Richardson, 1909: 184.

Diacope spilura Bennett, 1832: 182 (Ceylon).

Lutjanus spilurus, Shen 1984a: 268; Masuda *et al.*, 1984: 170.

Materials: ASIZP 055449, two specimens, 156–169 mm SL, Dec. 1979, Hengchun.

Diagnosis: D. X, 14; A. III, 8; P. 16; GR. 6–7+13–14 (5–6+8–10); Ll. 47–48. Head 2.58–2.64, body depth 2.44–2.45, pectoral 2.79–2.94 in standard length. Maxilla 2.54–2.67, eye 3.40–3.52, preorbital depth 5.50–5.71 in head length. Nostril-orbital distance 20.32% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic; palatines toothed; tongue smooth. Preopercular notch distinct, interopercular knob much prominent. Caudal fin slightly emarginated. Color when fresh generally bright yellowish with 6 bluish lines and a black blotch on back of mainly above lateral line.

Remarks: It is distinguished from the closely related *L. bengalensis* and *L. kasmira* in having 6 bluish lines instead of 4 in the latter two species.

22. *Lutjanus rivulatus* (Cuvier, 1828)

海鷄母笛鯛

Plate 3, Fig. 22

Diacope rivulata Cuvier in Cuvier and Valenciennes, 1828: 414 (Coromandel).

Lutjanus rivulatus, Jordan and Richardson, 1909: 184.

Materials: ASIZP 055496, one specimen, 311 mm SL, Feb. 1980 and ASIZP 055755, two specimens, 194–197 mm SL, Mar. 1982, all from Hengchun.

Diagnosis: D. X, 15; A. III, 8; P. 17; GR. 5–6+11–12 (1+7–8); Ll. 48–49. Head 2.43–2.59, body depth 2.17–2.25, pectoral 2.88–2.94 in standard length Maxilla 2.42–2.50, eye 5.05–5.41, preorbital depth 3.51–4.38 in head length. Nostril-orbital distance 34.81–58.56% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic; palatines toothed; tongue smooth. Preopercular notch and interopercular knob moderately distinct. Caudal fin slightly emarginated. Color when fresh generally brown with whitish dots on each scale, a white blotch

on the posterior third of lateral line; sides of head with numerous undulating bluish lines. All fins yellowish with black distal edges.

Remarks: Very closely related to *L. stellatus* but differs from the latter in having bluish dots on each scales and several bluish lines on each side of snout.

23. *Lutjanus russelli* (Bleeker, 1849)
黑星笛鯛
Plate 3, Fig. 23

Mesoprion russelli Bleeker, 1849: 41 (Malaya-Molucca).
Lutianus fuscescens, Jordan and Richardson, 1909: 184.
Lutjanus russelli, Shen 1984b: 59; Allen and Talbot, 1985: 67.

Materials: ASIZP 055458, two specimens, 108.2–112.0 mm SL, Dec. 1979, Tungkang; ASIZP 055655, one specimen, 135 mm SL, Jan. 1981 and ASIZP 056105, one specimen, 113 mm SL, Jan. 1986, all from Kaohsiung; ASIZP 055759, one specimen, 192 mm SL, Mar. 1982, Hengchun.

Diagnosis: D. X, 14; A. III, 8–9; P. 16; GR. 6–7+9–11 (1+6–7); Ll. 47–49. Head 2.46–2.69, body depth 2.46–2.72, pectoral 3.57–3.96 in standard length. Maxilla 2.42–2.70, eye 4.17–4.53, preorbital depth 5.63–7.03 in head length. Nostril-orbital distance 12.04–16.30% of eye. The gap between temporal scale band and predorsal scaled area wider with about 2–3 scale width. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic with a posterior extension; tongue with a patch of granular teeth. Preopercular notch shallower, interopercular knob weak. Color when fresh generally pink, silvery ventrally with three brownish stripes in juveniles; a black blotch of mainly above lateral line on the back. Dorsal and caudal fins brownish, other fins yellowish.

Remarks: The differences between the present species and *L. fulviflamma* are mentioned in the remark section under *L. fulviflamma* (Allen and Talbot, 1985).

24. *Lutjanus sebae* (Cuvier, 1828)
川紋笛鯛
Plate 3, Fig. 24

Diacope sebae Cuvier in Cuvier and Valenciennes, 1828: 411 (Waigiu).
Lutjanus sebae, Liang, 1951: 22.

Materials: ASIZP 054629, one specimen, 162 mm SL, Sept. 1980, Hengchun.

Diagnosis: D. XI, 16; A. III, 10; P. 17; GR. 6+12; Ll. 50. Head 2.51, body depth 2.22, pectoral 3.13 in standard length. Maxilla 2.77, eye 5.47, preorbital depth 4.03 in head length. Nostril-orbital distance 44.07% of eye. Maxilla hardly reaching the anterior margin of orbit. Vomerine tooth patch cresenic; tongue smooth, Preopercular notch distinct, interopercular knob small. All scale rows on body side rising obliquely. Caudal slightly emarginated. Color when fresh pink with three oblique dark bands on body side, extending partly to the soft parts of dorsal and anal fins.

Remarks: This species is characterized by having three oblique bands on body side, which is more distinct in juvenile than that of large adult. In addition, soft dorsal rays of this species (16) are more numerous than the remaining *Lutjanus* species.

25. *Lutjanus stellatus* Akazaki, 1983
白星笛鯛
Plate 4, Fig. 25

Lutjanus stellatus Akazaki, 1983: 367 (Miyazaki); Shen, 1984b: 60.

Materials: ASIZP 055900, one specimen, 251 mm SL, Jan. 1986, Hengchun.

Diagnosis: D. X, 14; A. III, 8; P. 17; GR. 6+10 (2+7); Ll. 47. Head 2.56, body depth 2.39, pectoral 2.99 in standard length. Maxilla 2.51, eye 5.16, preorbital depth 4.08 in head length. Nostril-orbital distance 42.11% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch cresenic; tongue smooth. Preopercular notch and interopercular knob distinct. Caudal fin slightly emarginated. Color when fresh generally purplish

brown with a whitish blotch of half the size of pupil on back; an oblique bluish stripe on snout.

Remarks: The distinctive characters from the most closely-related *L. rivulatus* are discussed in detail by Akazaki (1983).

26. *Lutjanus vitta* (Quoy and Gaimard, 1824)
縱帶笛鯛
Plate 4, Fig. 26

Serranus vitta Quoy and Gaimard, 1824: 315 (Waigiou).
Lutianus vitta, Jordan and Evermann, 1902: 344.
Lutjanus vitta, Shen, 1984a: 269; Allen and Talbot, 1985: 96.

Materials: ASIZP 055866, two specimens, 229–235 mm SL, Jan. 1986 and ASIZP 055894, one specimen, 241 mm SL, May 1986; eight uncatalogued specimens, 220–255 mm SL, all from Kaohsiung.

Diagnosis: D. X, 13; A. III, 8; P. 16; GR. 6+10–12 (1–2+8). Head 2.66–2.79, body depth 2.68–2.83, pectoral 3.40–3.65 in standard length. Maxilla 2.36–260, eye 4.60–4.71, preorbital depth 5.12–5.45 in head length. Nostril-orbital distance 13.3–17.02% of eye. Scale rows above lateral line rising obliquely while those below it horizontally. Vomerine tooth patch triangular with a median posterior extension; tongue with a patch of granular teeth. Preopercular notch shallow, interopercular knob moderately developed. Caudal fin truncate or slightly emarginate. Color when fresh generally reddish with dark-brownish oblique lines above lateral line and horizontal lines below it, the uppermost horizontal stripe the broadest which may appear with a black ovoid spot in the middle.

Remarks: The individuals with slender median lateral strip is easily confused with *L. lutjanus*, however, they can be distincted by different number of dorsal spines.

SUBFAMILY APSILINAE

Genus *Paracaesio*

Key to species of *Paracaesio*

1. Scales larger, 50 or less on lateral line..... 2
   Scales smaller, 70 or more on lateral line..... *P. xanthurus*
2. Maxilla scaled; pyloric caeca 5; light bluish grey with 4 dark cross bands on back..... *P. kusakarii*
   Maxilla naked; pyloric caeca 7; generally light silvery blue..... *P. caeruleus*

27. *Paracaesio caeruleus* (Katayama, 1934)
藍色擬烏尾冬
Plate 4, Fig. 27

Vegetichthys caeruleus Katayama 1934: 436 (Hatizyo Island, Japan).
Paracaesio caeruleus, Lee, 1982: 128.

Materials: ASIZP 055487 and ASIZP 055632, two specimens, 169.2–267.0 mm SL, Jan. and Sept. 1980; ASIZP 055725, one specimen, 276.5 mm SL, Oct. 1981, all from Hengchun; ASIZP 055699, one specimen, 218 mm SL, Feb. 1981, Auti, Keelung; five uncatalogued specimens, 225–350 mm SL, July 1986, Hengchun.

Remarks: The description of this species refers to Lee (1982).

28. *Paracaesio kusakarii* Abe, 1960
橫帶擬烏尾冬
Plate 4, Fig. 28

Paracaesio kusakarii Abe, 1960: 56 (Hachijo Island, Japan); Lee, 1982: 128.

Materials: ASIZP 055497, one specimen, 284 mm SL, Feb. 1980, Hengchun.

Remarks: The description of this species refers to Lee (1982).

29. *Paracaesio xanthurus* (Bleeker, 1869)
黃背擬烏尾冬
Plate 4, Fig. 29

Caesio xanthurus Bleeker, 1869: 78 (Madagascar).
Paracaesio xanthurus, Lee, 1982: 128.

Materials: ASIZP 055486, one specimen, 259.5 mm SL, Jan. 1980, Hengchun.

Remarks: The description of this species refers to Lee (1982).

SUBFAMILY ETELINAE

Genus *Etelis*

Key to species of *Etelis*

1. Total gill-rakers on first gill arch 4+9=13; upper caudal lobe shorter, about 25% of standard length..*E carbunculus*
   Total gill-rakers on first gill arch 22 or more; upper caudal lobe longer, over 30% of standard length.....2
2. Total gill rakers on first gill arch 31.....*E. radiosus*
   Total gill rakers on first gill arch 22.....*E. coruscans*

30. *Etelis carbunculus* Cuvier, 1828

浜鯛

Plate 4, Fig, 30

Etelis carbunculus Cuvier in Cuvier and Valenciennes, 1828: 127 (Mahe, Seychelles); Masuda *et al.*, 1984: 167.

Etelis marshi, Kyushin *et al.*, 1982: 77.

Materials: ASIZP 055893, one specimen, 335 mm SL, May 1986, Kaohsiung.

Diagnosis: D. X, 11; A. III, 8; P. 17; GR. 4+9=13; Ll. 47. Head 3.16, body depth 3.35, pectoral 3.68 in standard length. Maxilla 2.08, eye 3.84, preorbital depth 7.47 in head length. Upper lobe of caudal fin 24.48% of standard length; nostrial-orbital distance 19.57% of eye. Maxilla scaled posteriorly; conical teeth on both jaws larger, the anteriormost 4 pairs of enlarged canines on upper jaw and 2 pairs on lower jaw; vomer and palatines with conical teeth. A notch between soft and spinuous parts of dorsal fin. Color when fresh generally raddish, paler below.

Remarks: This species is characterized by its shorter caudal fin lobe.

31. *Etelis coruscans* Valenciennes, 1862

長尾浜鯛

Plate 4, Fig. 31

Etelis coruscans Valenciennes, 1862: 1166 (Bourbon); Masuda *et al.*, 1984: 167.

Etelis carbunculus, Chen, 1969: 391; Kyushin *et al.*, 1982: 76.

Materials: ASIZP 055485, one specimen, 206 mm SL, Jan. 1980, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 7+15=22; Ll. 52. Head 2.94, body depth 3.18, pectoral 3.32 in standard length. Maxilla 2.26, eye 3.27, preorbital depth 9.33 in head length. Upper caudal fin lobe 32.77% of standard length. Nostril-orbital distance 25.70% of eye. Maxilla scaled; teeth on both jaws very small, the anteriormost 2 pairs on upper jaw in enlarged canine-like; vomer and palatines with small conical teeth. Color when fresh generally deep red above and paler below.

Remarks: It is easily confused with the closely related *E. radiosus* but differs in the number of gill-rakers, and the shape of caudal fin lobe.

32. *Etelis raradiosus* Anderson, 1981

大口浜鯛

Plate 4, Fig. 32

Etelis radiosus Anderson, 1981: 821 (Galle, Ceylon); Masuda *et al.*, 1984: 167.

Materials: ASIZP 055891, one specimen, 310 mm SL, Mar. 1986, Tungkang.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 10+21=31; Ll. 50. Head 3.12, body depth 3.32, pectoral 3.79 in standard length. Maxilla 2.04, eye 3.90, preorbital depth 10.15 in head length. Upper caudal fin lobe 30.65% of standard length. Nostril-orbital distance 22.75% of eye. Maxilla scaled; small conical teeth on both jaws, the anteriormost 2 pairs on upper jaw canine-like which are only slightly larger than those on sides; vomer and palatines with small conical teeth. Color when fresh generally purplish-red.

Remarks: This species is characterized by having more numerous gill-rakers than other *Etelis* species.

Genus *Ayrion*

33. *Aprion virescens* Valenciennes, 1830

藍笛鯛

Plate 5, Fig. 33

Aprion virescens Valenciennes in Cuvier and Valenciennes, 1830: 544 (Seychelles); Liang, 1951: 23; Masuda *et al.*, 1984: 167.

Materials: ASIZP 055902, one specimen, 364 mm SL, July 1986, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 18; GR. 4+13; Ll. 47. Head 3.05, body depth 3.82, pectoral 7.0 in standard length. Maxilla 2.53, eye 5.31, preorbital depth 4.82 in head length. Body elongated, dorsal and anal fins without scales. A distinct horizontal groove below nostril. Five and 4 pairs of enlarged canine-teeth on upper and lower jaws respectively; vomer and palatines with conical teeth. Pectoral fin much shorter than ventral fin. Body when fresh generally dark blue.

Remarks: It is easily separated from related species by the horizontal grove in front of eye and the much shorter pectoral fin.

Genus *Aphareus*

Key to species of *Aphareus*

1. Gill-rakers on the first gill arch 6+16=22; body deeper, 3.16 in standard length ..... *A. furcatus*
   Gill-rakers on the first gill arch 17+35=52; body less deep, 3.75 in standard length..... *A. rutilans*

34. *Aphareus furcatus* (Lacépède, 1802)
欖色細齒笛鯛
Plate 5, Fig. 34

Labrus furcatus Lacépède, 1802: 429 and 447 (Mauritius).

Aphareus furcatus, Weber and de Beaufort, 1936: 318; Masuda *et al.*, 1984: 167.

Materials: ASIZP 056095, one specimen, 206 mm SL, Nov. 1985; ASIZP 056175, one specimen, 272 mm SL, Jun. 1987, all from Hengchun.

Diagnosis: D. X, 11; A. III, 8; GR. 6+15-16; Ll. 72-73. Head 3.20-3.22, body depth 3.09-3.16, pectoral 3.60-5.78 in standard length. Maxilla 1.84-1.92, eye 4.20-4.23, preorbital depth 6.93-8.35 in head length. Nostril-orbital distance 28.85-34.64% of eye. Teeth on both jaws small villiform; vomer and palatines toothless; upper jaw extends almost to the posterior margin of orbit. Last dorsal and anal soft rays much elongated, nearly three times the lengths of their proceeding ones. Color when fresh generally light purplish tinged with yellowish except the yellowish ventral and anal fins.

Remarks: The wider mouth cleft and the presence of small villiform teeth on jaws are the easily recognizable characters of this species.

35. *Aphareus rutilans* Cuvier, 1830
銹色細齒笛鯛
Plate 5, Fig. 35

Aphareus rutilans Cuvier in Cuvier and Valenciennes, 1830: 490 (Red Sea); Klunzinger, 1884: 45; Fowler, 1928: 195; 1931: 198; Masuda *et al.*, 1984: 167.

Materials: ASIZP 056094, one specimen, 450 mm SL, Apr. 1986, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 17+35=52; Ll. 73. Head 3.69, body depth 3.75, pectoral 3.91 in standard length. Maxilla 1.91, eye 4.82, preorbital depth 9.53 in head length. Nostril-orbital distance 47.44% of eye. Upper jaw nearly to the posterior margin of orbit; tooth patterns of this species resemble those in the former. Color when fresh generally pink, dorsal fins similar to body coloration. Hind margin of upper jaw black.

Remarks: Closely related to *A. furcatus*, but differs from the latter in having more elongated body shape.

Genus *Pristipomoides*

Key to species of *Pristipomoides*

1. Pored lateral line scales over 70; gill-rakers 28-30.....2
   Pored lateral line scales less than 70; gill-rakers less than 27.....3

2. Vomerine tooth patch diamond-shape with posterior protrudence; canines near symphysis not enlarged; body uniformly pink or light purplish red..... ..... *P. sieboldii*
   Vomerine tooth patch triangular without posterior extension, canines near symphysis enlarged; body dark purplish mottled with yellowish.....*P. auricilla*
3. Pored lateral line scales 47–48; gill-rakers 17–18; broken transverse narrow lines; nostril-orbital distance 23–26% of eye diameter; snout and cheek with two bluish-marginated yellowish stripes ..... *P. multidens*
   Pored lateral line scales 59–61; gill-rakers 22–24; nostril-orbital distance 33–43% of eye diameter; abscence of yellowish stripes on snout and cheek 4
4. Canine teeth near symphysis of each jaw greatly enlarged .....*P. flavipinnis*
   Canine teeth near symphysis of jaws not greatly enlarged, which are only slightly larger than those on sides ....*P. filamentosus*

36. *Pristipomoides auricilla* (Jordan, Evermann and Tanaka, 1927)

黃尾姬鯛

Plate 5, Fig. 36

Arnillo auricilla Jordan, Evermann and Tanaka, 1927: 668 (Hawaii).

Pristipomoides auricilla, Kami, 1973: 103; Masuda *et al.*, 1984: 167.

Materials: ASIZP 056176, two specimens, 261–274 mm SL, Jun. 1987, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 10+18–19=28–29; Ll. 71. Head 2.97–3.01, body depth 2.95–3.17, pectoral 3.35–3.48 in standard length. Upper jaw 2.73–2.84, eye 3.67–3.71, preorbital depth 6.50–7.33 in head length. Nostril-orbital distance 33.88–34.69% of eye. Jaws with much enlarged canines near symphysis; vomerine tooth patch broad triangular without posterior projection; palatines with villiform tooth band; tongue smooth. Color when fresh dark purplish with numerous narrow, broken, transverse yellowish bands; one or both caudal lobes bright yellowish.

Remarks: It is easily distinguished from other *Pristipomoides* species by its characteristic color pattern appearing with numerous narrow, transverse yellowish bands on body side and yellowish coloration on caudal lobes.

37. *Pristipomoides filamentosus* (Cuvier and Valenciennes, 1830)

絲鰭姬鯛

Plate 5, Fig. 37

Serranus filamentosus Cuvier and Valenciennes, 1830: 382 (Bourbon).

Pristipomoides filamentosus roseus, Abe and Takashima, 1956: 15.

Pristipomoides filamentosus, Kami, 1973: 106; Shen, 1984b: 61.

Pristipomoides microdon, Chen and Yu, 1986: 541.

Materials: ASIZP 055887, one specimen, 270 mm SL, Apr. 1986, Keelung; ASIZP 055484, one specimen, 295 mm SL, Jan. 1980, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 7+16=23; Ll. 60. Head 3.17–3.22, body depth 3.27–3.37, pectoral 3.30–3.41 in standard length. Maxilla 2.52–2.62, preorbital depth 7.16–7.34, eye 3.92–4.23 in head length. Nostril-orbital distance 31.52–32.83% of eye. Teeth on both jaws very small, the outermost row in well spaced conical or canine-like, those near symphysis not greatly enlarged, but only slightly larger than those on sides; vomerine tooth patch triangular. Color when fresh pale purplish-red with bluish dots on each scales; top of head with yellowish vermiculations and densely distributed bluish dots.

Remarks: *Chaetopterus microlepis* Bleeker, 1869, *Aprion microdon* Steindachner, 1876, *Aprion kanekonis* Tanaka, 1935, and *Pristipomoides argyrogrammiscus*, Chen (1954), are all synonymous with the present species. The so-called *Pristipomoides microdon* appeared in Chen and Yu (1986) is also found to be *Pristipomoides filamentosus*.

38. *Pristipomoides flavipinnis* Shinohara, 1963

黃鰭姬鯛

Plate 5, Fig. 38

Pristipomoides flavipinnis Shinohara, 1963: 49 (Okinawa); Shen, 1984b: 61.

Materials: ASIZP 055889, four specimens, 282-332 mm SL, May 1986, Keelung.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 6-9+15-16=22-24; LI. 59-61. Head 3.20-3.26, body depth 3.13-3.30, pectoral 3.15-3.57 in standard length. Maxilla 2.54-2.82, eye 4.40-4.54 in head length. Nostril-orbital distance 35.65-42.79% of eye. The canine teeth near symphysis much larger than those on sides; vomerine tooth patch broad triangular. Body color when fresh reddish yellow with 6 longitudinal series of yellowish dots on dorsolateral side; top of head purplish green with yellowish vermiculations.

Remarks: *Pristipomoides flavipinnis* and *P. filamentosus* resemble each other in having similar body shape and lateral line scale numbers. However, they are different in color pattern on top of head. *P. flavipinnis* has yellowish vermiculations arranged in reticulation on the dark back ground which lacks dark flecks, while *P. filamentosus* has irrigulated yellowish vermiculations and numerous dark flecks.

39. *Pristipomoides multidens* (Day, 1870)

黃吻姬鯛

Plate 5, Fig. 39

Mesoprion multidens Day, 1870: 68 (Andamans Islands).

Anthias multidens, Day, 1875: 27.

Pristipomoides multidens, Masuda *et al.*, 1984: 166.

Materials: ASIZP 055888, three specimens, 325-342 mm SL, Mar. 1986, Kaohsiung.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 6+11-12=17-18; LI. 47-48. Head 3.01-3.32, body depth 2.95-3.06, pectoral 3.17-3.35 in standard length. Maxilla 2.23-2.47, eye 4.74-4.98 in head length. Nostril-orbital distance 23.11-25.82% of eye. Both jaws with much enlarged, widely spaced canine-like teeth around symphysis larger than those on sides; vomerine tooth patch broad triangular. Body color when fresh purplish red with two bluish-edged golden bands on snout and cheek; top of head dark brown with transversely arranged yellowish vermiculations.

Remarks: It resembles *P. typus* but differs from the latter in having nine transversely arranged vermiculations on the top of head and two golden bands on snout and cheek, and much enlarged canines on jaws. The detail comparisons between the two species was made by Senta and Tan (1975).

40. *Pristipomoides sieboldii* (Bleeker, 1857)

姬鯛

Plate 5, Fig. 40

Chaetopterus sieboldii Bleeker, 1857: 20 (Japan).

Pristipomoides sieboldii, Liang, 1951: 23; Kami, 1973: 99.

Materials: ASIZP 056093, four specimens, 225-342 mm SL, and ASIZP 055890, one specimen, 335 mm SL, Apr. 1986 and May 1986 respectively, all from Keelung; ASIZP 055905, two specimens, 226-237 mm SL, July 1986, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 9-10+20=29-30; LI. 70. Head 3.17-3.34, body depth 3.34-3.72, pectoral 3.24-3.26 in standard length. Maxilla 2.83-3.41, eye 3.90-3.94 in head length. Nostril-orbital distance 38.45-45.00% of eye. Both jaws with minute conical teeth of similar size; vomerine tooth patch diamond shape. Body color when fresh light purplishred, top of head dark purplish-green with yellowish vermiculations of almost in dense reticulations.

Remarks: This is the only *Pristipomoides* species with posterior projection behind vomerine tooth patch.

Plate 1

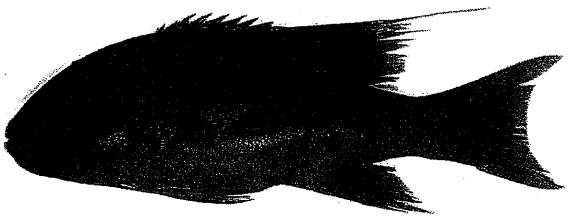

Fig. 1. *Symphorus nematophorus*, 355 mm SL.

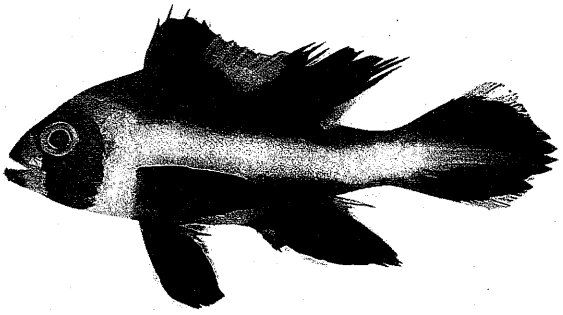

Fig. 2. *Macolor niger*, 109.5 mm SL.

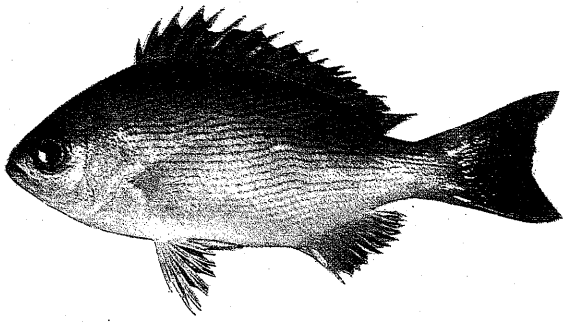

Fig. 3. *Pinjalo pinjalo*, 201 mm SL.

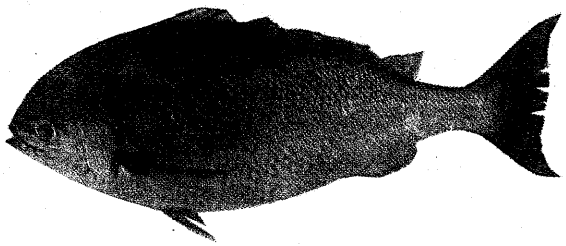

Fig. 4. *Pinjalo microphthalmus*, 570 mm SL.

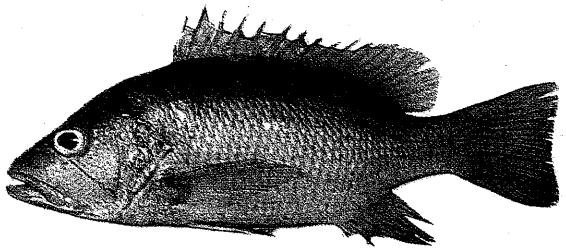

Fig. 5. *Lutjanus argentimaculatus*, 186 mm SL.

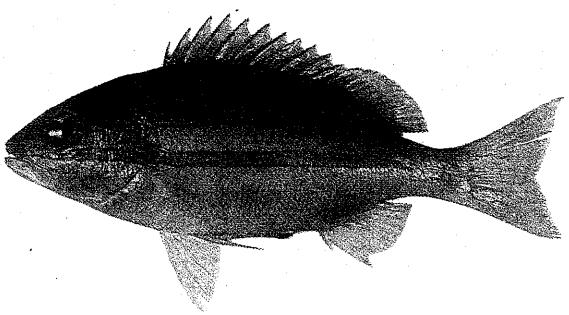

Fig. 6. *Lutjanus bengalensis*, 134 mm SL.

Fig. 7. *Lutjanus bohar*, 222 mm SL.

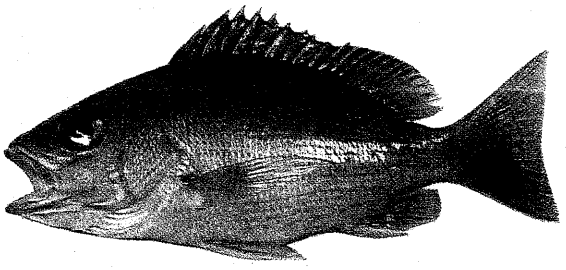

Fig. 8. *Lutjanus boutton*, 201 mm SL.

Plate 2

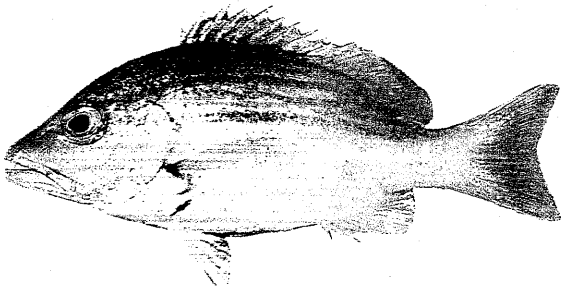

Fig. 9. *Lutjanus carponotatus*, 178 mm SL.

Fig. 10. *Lutjanus decussatus*, 210 mm SL.

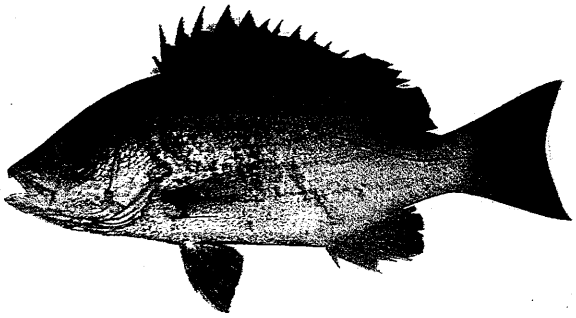

Fig. 11. *Lutjanus dodecanthoides*, 130 mm SL.

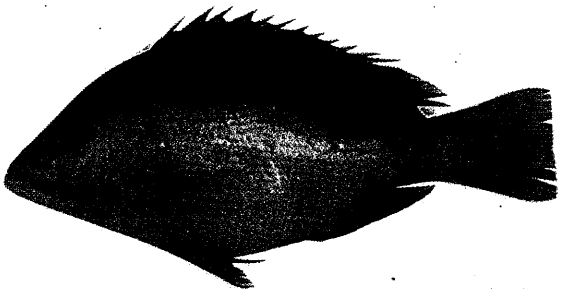

Fig. 12. *Lutjanus erythropterus*, 151.2 mm SL.

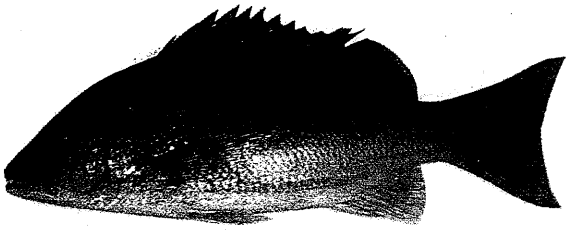

Fig. 13. *Lutjanus fulviflamma*, 179 mm SL.

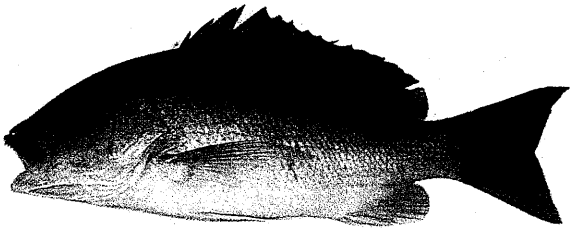

Fig. 14. *Lutjanus fulvus*, 242 mm SL.

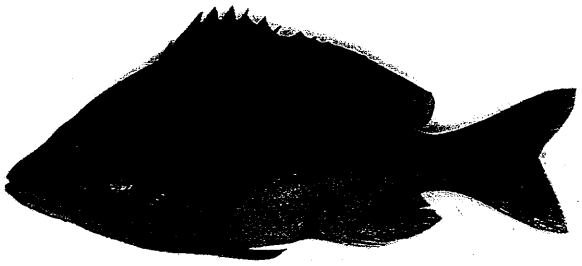

Fig. 15. *Lutjanus gibbus*, 168 mm SL.

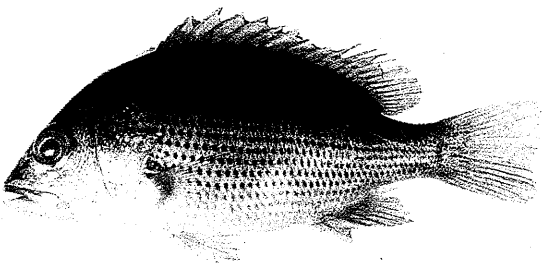

Fig. 16. *Lutjanus johnii*, 111 mm SL.

Plate 3

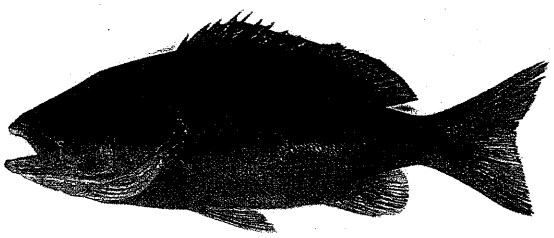

Fig. 17. *Lutjanus kasmira*, 222 mm SL.

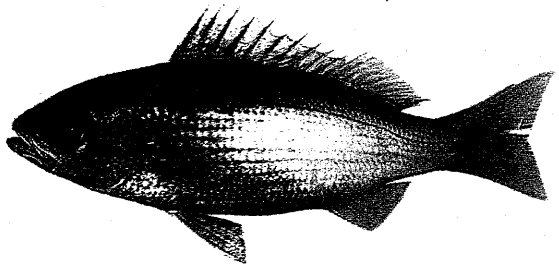

Fig. 18. *Lutjanus lutjanus*, 148 mm SL.

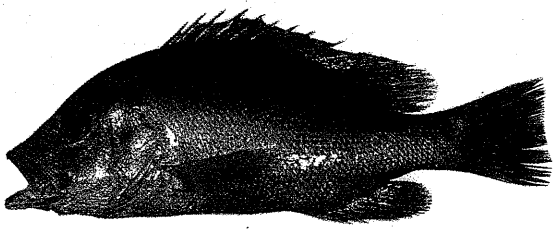

Fig. 19. *Lutjanus malabaricus*, 330 mm SL.

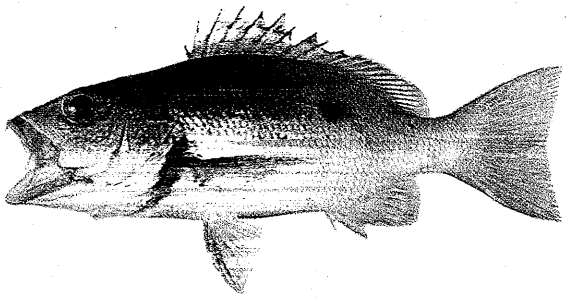

Fig. 20. *Lutjanus monostigma*, 105 mm SL.

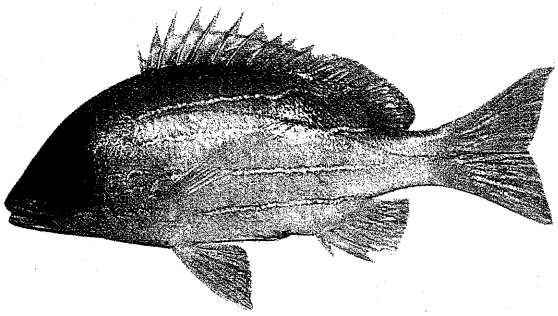

Fig. 21. *Lutjanus quinquelineatus*, 169 mm SL.

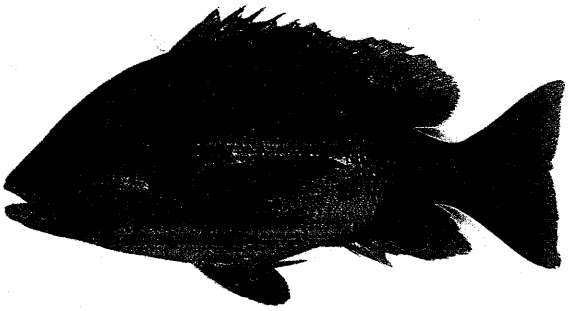

Fig. 22. *Lutjanus rivulatus*, 311 mm SL.

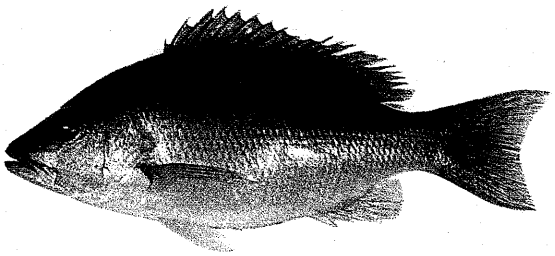

Fig. 23. *Lutjanus russelli*, 192 mm SL.

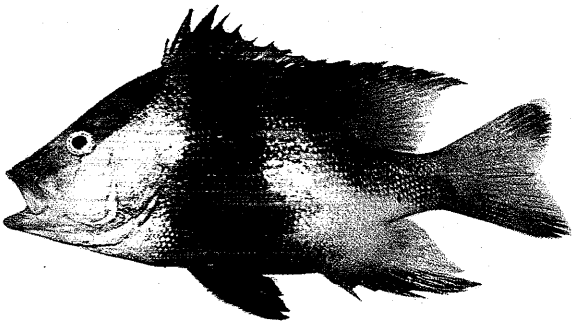

Fig. 24. *Lutjanus sebae*, 162 mm SL.

Plate 4

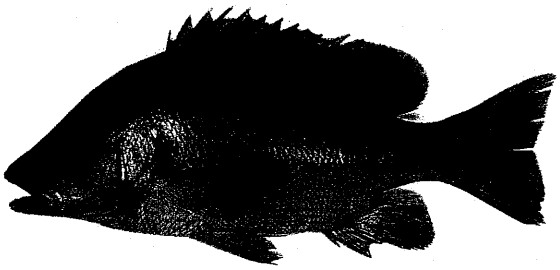

Fig. 25. *Lutjanus stellatus*, 251 mm SL.

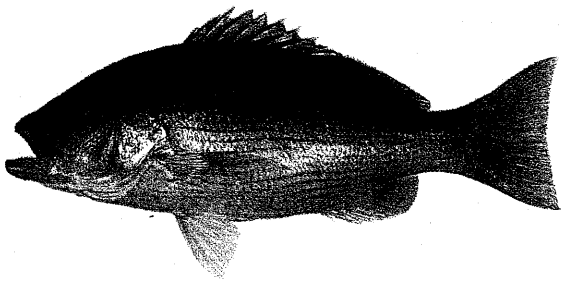

Fig. 26. *Lutjanus vitta*, 229 mm SL.

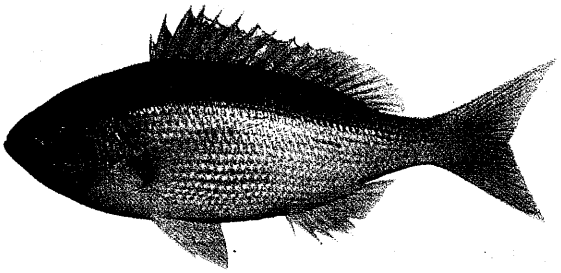

Fig. 27. *Paracaesio caeruleus*, 174 mm SL.

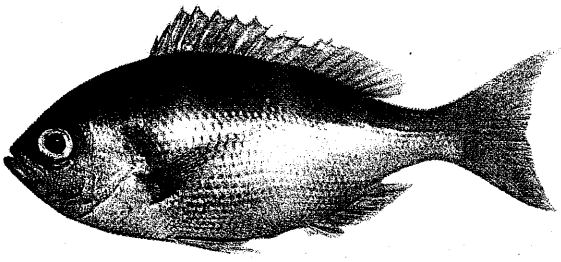

Fig. 28. *Paracaesio kusakarii*, 275 mm SL.

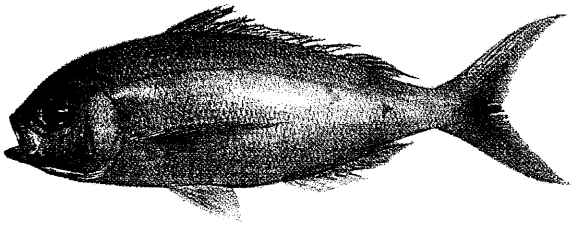

Fig. 29. *Paracaesio xanthurus*, 257 mm SL.

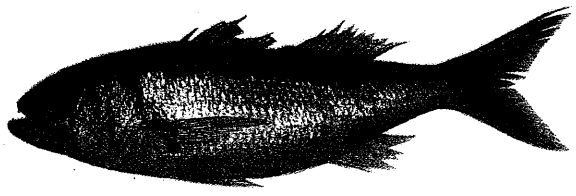

Fig. 30. *Etelis carbunculus*, 335 mm SL.

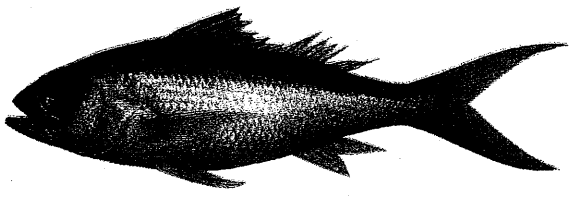

Fig. 31. *Etelis coruscans*, 206 mm SL.

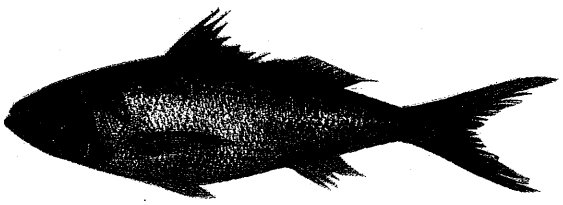

Fig. 32. *Etelis radiosus*, 310 mm SL.

Plate 5

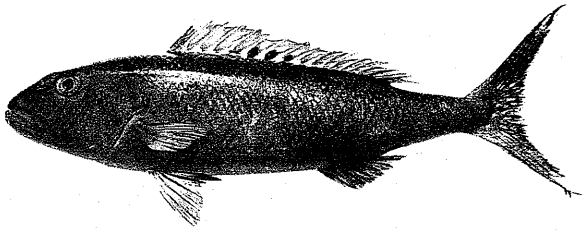

Fig. 33. *Aprion virescens*, 364 mm SL.

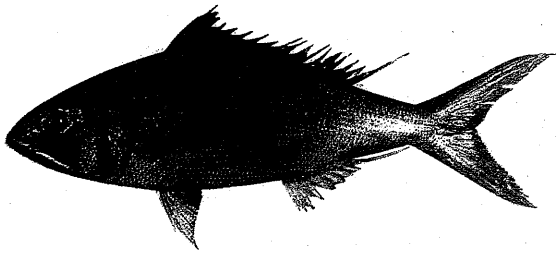

Fig. 34. *Aphareus furcatus*, 206 mm SL.

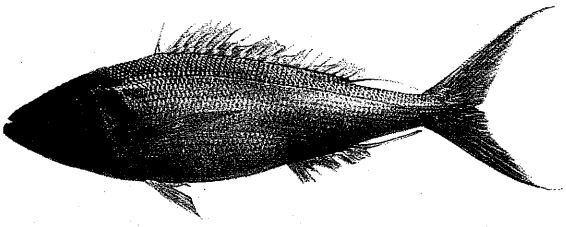

Fig. 35. *Aphareus rutilans*, 450 mm SL.

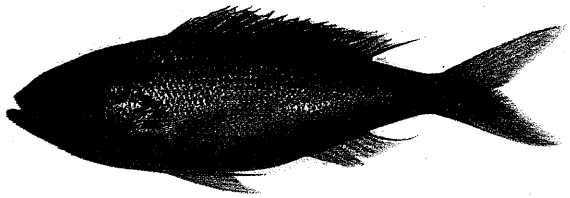

Fig. 36. *Pristipomoides auricilla*, 274 mm SL.

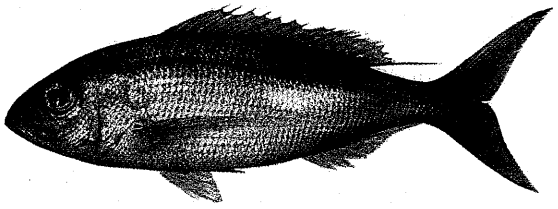

Fig. 37. *Pristipomoides filamentosus*, 295 mm SL.

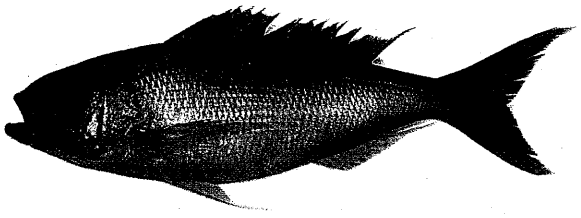

Fig. 38. *Pristipomoides flavipinnis*, 322 mm SL.

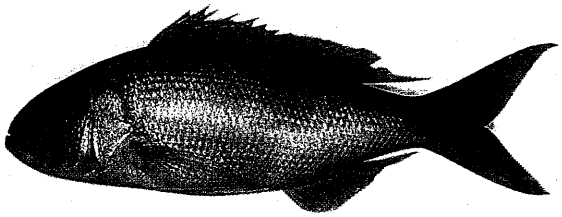

Fig. 39. *Pristipomoides multidens*, 335 mm SL.

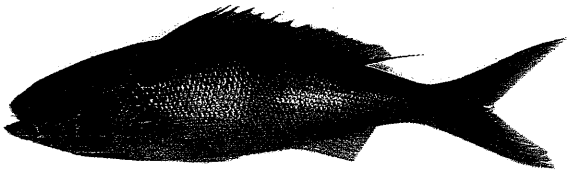

Fig. 40. *Pristipomoides sieboldii*, 230 mm SL.

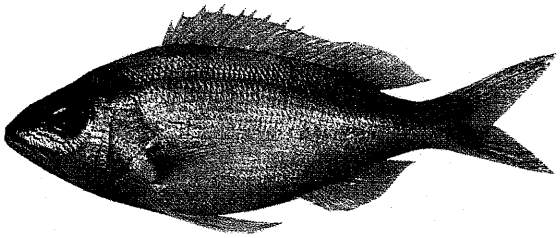

Fig. 41. *Tropidinius amoenus*, 218 mm SL.

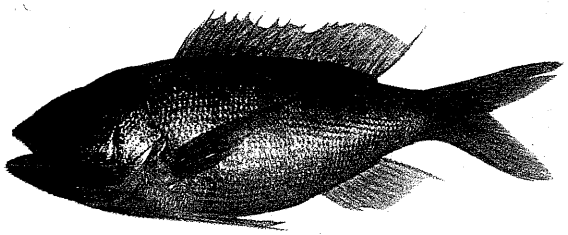

Fig. 42. *Tropidinius zonatus*, 291 mm SL.

Genus *Tropidinius*

Key to species of *Tropidinius*

1a. Body with bluish specks and vermiculations; transverse golden bands on back absent..... *T. amoenus*

1b. Bluish specks and vermiculations absent; body with vertical golden bands ....*T. zonatus*

41. *Tropidinius amoenus* (Snyder, 1911)
花笛鯛

Plate 5, Fig. 41

Platyinius amoenus Snyder, 1911: 530 (Naha, Okinawa).

Tropidinius amoenus, Masuda *et al.*, 1984: 167.

Materials: ASIZP 055483, one specimen, 218 mm SL and ASIZP 055506, one specimen, 191 mm SL, Jan. 1980, and Feb. 1980, respectively, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 4-7+13-15=19-21 (2+10-11=12-13); Ll. 58-59. Head 2.73-2.77, body depth 2.66-2.84, pectoral 3.06-3.18 in standard length. Maxilla 2.30-2.49, eye 3.63-3.81, preorbital depth 9.20-10.00 in head length. Nostril-orbitital distance 33.33-34.21% of eye. Length of last dorsal ray 1.19-1.35 times of the proceeding ones. Maxilla to below the middle of orbit, a row of well spaced canine teeth on both jaws, the anteriormost 2 pairs larger than those on sides; vomer and palatines toothed. The last soft rays of dorsal and anal fins only slightly longer than their proceeding ones. Color when fresh generally pink tinged with bright yellowish on back and paler below, body side with bluish specks and vermiculations; three large yellowish patches and three bluish patches along the dorsal flank of body. Dorsal and caudal yellowish, other fins pink.

Remarks: The fishes of *Tropidinius* are distinguished from the closely-related *Pristipomoides* by their more ovoid, compressed body shape. This species was caught by long-liners from the rocky bttom of the southern Taiwan at the depth of about 60-100 m.

42. *Tropidinius zonatus* (Valenciennes, 1830)
橫帶花笛鯛

Plate 5, Fig. 42

Serranus zonatus Velenciennes in Cuvier and Valenciennes, 1830: 509 (Mauritius).

Tropidinius zonatus, Fowler, 1931: 183; Masuda *et al.*, 1984: 167.

Materials: ASIZP 055773, one specimen, 291 mm SL, Apr. 1983, Hengchun.

Diagnosis: D. X, 11; A. III, 8; P. 16; GR. 6+11=17 (2+9=11); Ll. 65. Head 2.72, body depth 2.72, pectoral 2.92 in standard length. Maxilla 2.49, eye 4.08, preorbital 6.69 in head length. Nostril-orbital distance 38.87% of eye. Last dorsal ray 1.13 times the length of the proceding one. Maxilla to front edge of pupil. Outermost part of jaws with well spaced canine teeth, the anteriomost two pairs larger than those on sides; vomer and palatines toothed. Color when fresh bright red with five vertical bands of bright yellowish. Most part of fins evenly reddish with the exception of yellowish on dorsal fin and lower caudal lobe.

Remarks: It is easily recognizable by having vertical golden bands on body side.

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臺灣之笛鯛科魚類

李　信　徽

到目前爲止臺灣產笛鯛已有44種，分別隸屬於4亞科及10屬：曳絲笛鯛亞科 (Paradicichthyinae) 有 *Symphorus* (1種)；笛鯛亞科 (Lutjaninae) 有 *Macolor* (1種)，*Pinjalo* (2種) 及 *Lutjanus* (23種)；擬烏尾冬亞科 (Apsilinae) 有 *Paracaesio* (3種)；濱鯛亞科 (Etelinae) 有 *Aprion* (1種)，*Aphareus* (2種)，*Etelis* (3種)，*Pristipomoides* (6種) 及 *Tropidinius* (2種)。44種中除愛倫氏笛鯛 (*Lutjanus ehrenbergii*) 及長崎笛鯛 (*Pristipomoides typus*) 標本尚未獲取暫不列入外，其餘之42種均分別描述其種別特徵並附彩照及檢索表以利查對。其中下列十種：欖色細齒笛鯛 (*Aphareus furcatus*)、銹色細齒笛鯛 (*A. rutilans*)、濱鯛 (*Etelis carbunculus*)、大口濱鯛 (*E. radiosus*)、孟加拉笛鯛 (*Lutjanus bengalensis*)、胸斑笛鯛 (*L. carponotatus*) 斜帶笛鯛 (*L. doedecanthoides*) 黃尾姬鯛 (*Pristipomoides auricilla*)、黃吻姬鯛 (*P. multidens*)、花笛鯛 (*Tropidinius amoenus*)、橫帶花笛鯛 (*T. zonatus*) 等爲臺灣新記錄，及細眼斜鱗笛鯛 (*Pinjalo microphthalmus*) 爲新種。