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THE FAMILY MONOTAXIDAE (PISCES: PERCIFORMES) OF TAIWAN[1]

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Sin-Che Lee (1982) The family Monotaxidae (Pisces: Perciformes) of Taiwan. *Bull. Inst. Zool., Academia Sinica* **21**(2): 155-160. The present paper reports 5 monotaxid fishes (former pentapodids) in the surrounding waters of Taiwan. They are *Monotaxis grandoculis* (Forskål), *Gnathodentex aurolineatus* (Lacépède), *G. mossambicus* Smith, *Gymnocranius japonicus* Akazaki and *G. griseus* (Temminck and Schlegel). Among them, *Gnathodentex mossambicus* and *Gymnocranius japonicus* are new records from Taiwan. A family diagnosis, key to genera and species and synonyms, materials, diagnosis and figures of each species are given.

The monotaxids (former pentapodids) are marine food fishes, occurring mostly on the rocky bottom of coastal waters. Their distributional ranges are restricted to the tropical and subtropical Indo-Pacific.

Fishes of the genera *Monotaxis*, *Gnathodentex*, *Pentapodus* and *Gymnocranius* were formerly included in subfamily Nemipterinae under family Lutjanidae (Weber and de Beaufort, 1936)[18]. Later in 1941, Smith[14] placed them in the newly established family Pentapodidae. Matsubara (1955)[11] added the genus *Taius* (= *Dentex*) to this family, but moved *Monotaxis* to the family Sparidae. Akazaki (1962)[2] refused the family Pentapodidae; he transferred *Taius* (=*Dentex*) to Sparidae, *Pentapodus* to Nemipteridae and other three genera (*Monotaxis*, *Gnathodentex* and *Gymnocranius*) to subfamily Monotaxinae under family Lethrinidae. Nelson (1976)[13] included *Monotaxis*, *Gnathodentex*, *Gymnocranius* and *Pentapodus* under the family Pentapodidae. In my opinion, *Pentapodus* seems to be more closely related to Nemipteridae than to Pentapodidae, in having fewer anal soft rays and ovoid suborbital shelf, opisthotics and 2 imperfect interneural spines. Therefore, it is more reasonable to transfer *Pentapodus* to family Nemipteridae and the genus was not treated in the present study. Since *Pentapodus* is excluded from the family Pentapodidae, the family name for the rest of species in the previous Pentapodidae, has been replaced by Monotaxidae.

In Taiwan, three monotaxid species: *Monotaxis grandoculis*, *Gnathodentex aurolineatus* (=former *Pentapodus aurolineatus*) and *Gymnocranius griseus* were recorded previously under the family Sparidae (Chen, 1969)[5]. The present author adds two species namely *Gnathodentex mossambicus* and *Gymnocranius japonicus* to make a total of 5 monotaxid species in the Taiwan area.

MATERIALS AND METHODS

Materials studied were collected from Hengchun and Keelung around the rocky coastal areas by long-line fishing. Sizes of specimens were stated under each description of species. All the specimens were deposited in the Museum of the Institute of Zoology, Academia Sinica.

1. Paper No. 232 of the Journal Series of the Institute of Zoology, Academia Sinica.

TABLE 1
Body proportions of monotaxid species

Species	No. fish measured	In standard length			In head length		
		Head length	Body depth	Pectoral length	Snout	Eye diameter	Interor-bital
Monotaxis grandoculis	1	3.04	2.39	3.06	3.72	3.41	2.59
Gnathodentex aurolineatus	7	3.20-3.57 (3.37)	2.77-2.91 (2.83)	3.68-4.04 (3.87)	3.26-3.63 (3.40)	2.63-2.89 (2.77)	2.63-2.86 (2.74)
G. mossambicus	1	2.78	1.92	2.95	3.25	3.33	2.86
Gymnocranius japonicus	1	3.03	2.52	3.61	2.44	3.84	2.44
G. griseus	2	2.95	2.25-2.29	3.44-3.69	3.27-3.36	2.74-2.85	2.65-2.85
G. g. frenatus	1	3.09	2.17	3.64	2.80	3.35	2.55

TABLE 2
Meristic counts of monotaxid species

Species	No. fish counted	Dorsal fin	Anal fin	Pectoral fin	Ll.*	Ltr.**	No. of gill-rakers	No. of vertebrae
Monotaxis grandoculis	1	X, 10	III, 9	15	46	4½	3+5	10+14
Gnathodentex aurolineatus	7	X, 10	III, 9	15	63-70	5½	4-5+5-6	10+14
G. mossambicus	1	X, 10	III, 10	14	44	4½	3+7	10+14
Gymnocranius japonicus	1	X, 10	III, 10	14	49	4½	3+5	10+14
G. griseus	2	X, 10	III, 10	15	48-49	5½	2-3+5-6	10+14
G. g. frenatus	1	X, 10	III, 10	14	47	5½	—	10+14

* No. of pored scales on lateral line.
** No. of scale rows between lateral line and median dorsal spines.

The terminology and methods of measurements of the specimens follow Lee (1980)[8]. Results of measurements and counts are listed in Tables 1-2.

RESULTS

FAMILY MONOTAXIDAE

Diagnosis: Monotaxidae is characterized by having large eye, 24 vertebrae, 10 dorsal spines, fewer (about 3-6+5-7) knob-like gill rakers, enlarged canine-like teeth on the front of jaws, minimal 3 transverse scale rows on cheek, naked dorsal surface of head together with toothless vomer and palatines. The family is closely related to other three allied sparoid families (Sparidae, Lethrinidae and Nemipteridae). They are easily recognized each other by the following key:

1. Dorsal spines XI-XIII .....Sparidae
   Dorsal spines X.....2
2. Cheek completely naked.....Lethrinidae
   Cheek scaled.....3
3. Dorsal soft rays 9; anal soft rays 7 or 8; pectoral rays 16-18; suborbital shelf large, ovoid; length of preorbital bone greater than width; opisthotics present; 2 imperfect interneural spines.....Nemipteridae
   Dorsal soft rays 10; anal soft rays 9-10; pectoral rays 14-15; suborbital shelf small boot-like; length of preorbital bone shorter than width; opisthotics absent; 3 imperfect interneural spines.....Monotaxidae

Key to genera and species of Taiwan Monotaxidae

1. Outer surface of maxilla with longitudinal serrated ridge; dorsal surface of frontal bones smooth.....2
   Outer surface of maxilla without serrated

ridge; dorsal surface of frontal bones with low parallel ridges.....4 (*Gymnocranius*)

2. Teeth on lateral sides of jaws with conspicuously large molars, oval in shape; anal soft rays 9 (*Monotaxis*).....
.....*Monotaxis grandoculis*
Lateral teeth on jaws conical; anal soft rays 9–10.....3 (*Gnathodentex*)

3. Scales between lateral line and median dorsal spines 5½, Ll. 63–70; anal soft rays 9; pectoral rays 15; yellowish lines on body sides and yellowish blotch on dorsal profile of caudal peduncle .....
.....*Gnathodentex aurolineatus*
Scales between lateral line and median dorsal spines 4½, Ll. 44; anal soft rays 10; pectoral rays 14; the above mentioned lines and blotch absent .....
.....*Gnathodentex mossambicus*

4. Teeth on lateral sides of jaws molar; scales between lateral line and median dorsal spines 4½; both lobes of caudal fin with rounded margin.....
.....*Gymnocranius japonicus*
Lateral teeth on jaws molar-like conical; scales between lateral line and median dorsal spines 5½; both lobes of caudal fin sharp.....*Gymnocranius griseus*

Genus *Monotaxis* Bennett, 1830

1. *Monotaxis grandoculis* (Forskål) (Fig. 1)

Sciaena grandoculis Forskål, 1775: 53cf[(2)] (Type locality: Djedda, Red Sea).
Sparus grandoculis; Bloch and Schneider, 1801: 276.
Monotaxis grandoculis; Weber and de Beaufort, 1936: 350; Matsubara, 1955: 657; Akazaki, 1962: 220; Smith, 1965: 250; Munro, 1967: 310; Chen, 1969: 381; Masuda *et al.*, 1975: 232; Kyushin *et al.*, 1977: 168.

Materials: 1 specimen, 197 mm SL, February 1980, Hengchun.

Diagnosis: D. X, 10; A. III, 9; P. 15; Ll. 46; Ltr. 4½ (scales between lateral line and median dorsal spines); GR. 4+4=8; vertebrae (including urostyle) 10+14=24. Dorsal profile of head strongly convex. Villiform tooth bands on anterior inner sides of upper jaw and front of lower jaw; 2 or 3 pairs of canines arranged anteriorly in single outer row on jaws; posterior lateral sides of jaws with single row of conspicuously large and stout molars. Preopercle with 5 transverse scale rows, its lower posterior flange naked. Soft dorsal and anal rounded. Caudal forked with sharp lobes. Ground color of body of live specimens brownish silvery, lips orangish, pectoral reddish except the black axis; other fins dark, bases of soft dorsal and anal fins black.

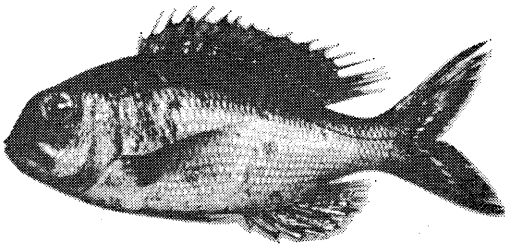

Fig. 1. *Monotaxis grandoculis*, 197 mm standard length.

Genus *Gnathodentex* Bleeker, 1873

2. *Gnathodentex aurolineatus* (Lacépède) (Fig. 2)

Sparus aurolineatus Lacépède, 1803: 132cf[(2)].
Pentapus aurolineatus; Day, 1875: 93.
Pentapodus aurolineatus; Chen, 1969: 380.
Gnathodentex aurolineatus; Weber and de Beaufort, 1936: 348; Matsubara, 1955: 670; Munro, 1967: 311; Masuda *et al.*, 1975: 232; Chang *et al.*, 1980: 60.

Materials: 7 specimens, 136–203 mm SL, April 1982, Hengchun.

Diagnosis: D. X, 10; A. III, 9; P. 15; Ll. 63–70; Ltr. 5½; GR. 4–5+5–6; vertebrae 10+14=24. Outer surface of maxilla with serrated ridge. Single row of small conical teeth on lateral sides of both jaws; 4 moderate canines anteriorly in upper jaw and 6 in lower jaw; the outermost larger than the others. Preopercle with 6 transverse scale rows, its lower posterior flange naked. Opercle with 6 scale rows. Caudal forked with sharp lobes. Color light reddish brown with longitudinal yellowish lines on body sides and a large yellowish blotch on the caudal peduncle im-

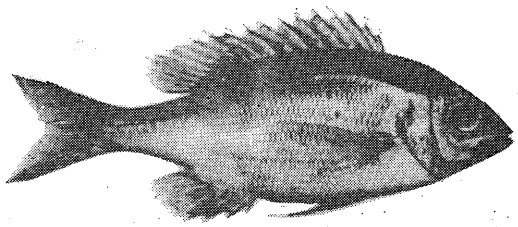

Fig. 2. *Grathodentex aurolineatus*, 175 mm standard length.

mediately behind the soft dorsal. Vertical fins reddish, paired fins pink.

Remarks: The occurrence of this species in Taiwan could also be confirmed according to the photograph taken by Dr. Chang and his associates from Lanyü at the depth of 7 m.

3. *Gnathodentex mossambicus* Smith
(Fig. 3)

Gnathodentex mossambicus Smith, 1957: 122 (Type locality: Mossambique); Akazaki, 1962: 227; Masuda *et al.*, 1975: 232; Kyushin *et al.*, 1977: 128.

Materials: 1 specimen, 166.5 mm SL, February 1980, Hengchun.

Diagnosis: D. X, 10; A. III, 10; P. 14; Ll. 44; Ltr. $4\frac{1}{2}$; GR. 3+7=10; vertebrae 10+14=24. Maxilla with outer serrated ridge. Single row of conical teeth on jaws, the anteriormost 2 pairs enlarged into canines; bands of villiform teeth on anterior inner sides of upper jaw and on front of lower jaw. Preopercle with 7 transverse scale rows, its lower posterior flange naked. Caudal fin forked with rounded lobes. Generally silvery yellow above with few dark markings, and paler below. Vertical fins mostly olive, scattered with white spots. Pectoral fin orangish with distinct dark base.

Genus *Gymnocranius* Klunzinger, 1870

4. *Gymnocranius japonicus* Akazaki
(Fig. 4)

Gymnocranius japonicus Akazaki, 1961: 437 (Type locality: Amami Island, Kagoshima); 1962: 230; Masuda *et al.*, 1975: 233.

Materials: 1 specimen, 360 mm SL, May 1980, Hengchun.

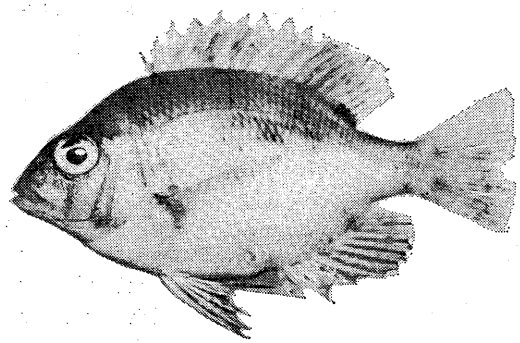

Fig. 3. *Gnathodentex mossambicus*, 166.5 mm standard length.

Diagnosis: Posterior margin of maxilla extends to below the anterior nostril. Patches of villiform teeth on the anterior inner sides of jaws; outer lateral sides of jaws with single series of molars; 4 moderate canines anteriorly on upper jaw and 2 larger ones on lower jaw. Preopercle with 4 transverse scale rows while the opercle with 6 rows. Caudal fin forked with rounded lobes. Color pale greyish brown, each scale on the upper half of body with blackish basal spot. Vertical fins reddish with white margins.

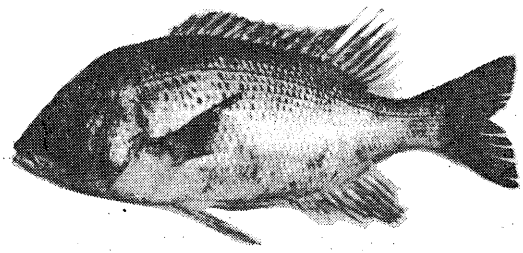

Fig. 4. *Gymnocranius japonicus*, 360 mm standard length.

Remarks: This species differs from the closely related *G. lethrinoides* in having molar teeth on both sides of jaws, and in having red vertical fins with white margins.

5. *Gymnocranius griseus* (Temminck and Schlegel)
(Figs. 5-6)

Dentex griseus Temminck and Schlegel, 1843: 72 (Type locality: SW coast of Japan).

Gymnocranius griseus; Weber and de Beaufort, 1936: 391; Matsubara, 1955: 669; Akazaki, 1962: 235; Smith, 1965: 250; Munro, 1967: 311; Chen, 1969: 381; Lindberg and Krasyukova, 1971: 311; Masuda *et al.*, 1975: 233; Kyushin *et al.*, 1977: 124.

Materials: 2 specimens, 218.0 and 188.5mm SL, February 1980 and February 1981, Hengchun.

Diagnosis: D. X, 10; A. III, 10; P. 15; Ll. 47-49, Ltr. $5\frac{1}{2}$; GR. 2-3+5-6=7-9; vertebrae 10+14=24. Maxilla smooth externally. Lateral sides of jaws with outer single row of stout conical teeth, anteriormost 2 pairs enlarged into canines; bands of villiform teeth on the anterior inner side of upper jaw and front of lower jaw. Preopercle with 4 transverse scale rows, its lower posterior flange naked. Caudal forked with sharp lobes, median caudal ray 0.94-0.98 in eye and 2.16-2.17 in longest caudal ray. Silvery brown scattered with black spots and irregular dark cross bars, the first one running across the orbit. Pectorals yellowish.

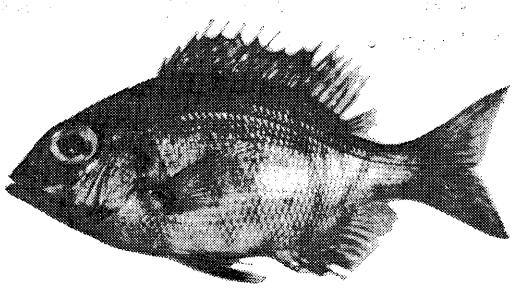

Fig. 5. *Gymnocranius griseus*, 188 mm standard length.

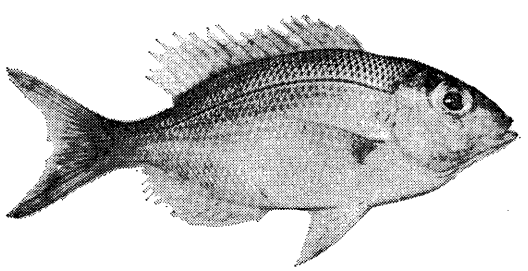

Fig. 6. *Gymnocranius griseus frenatus*, 245.6 mm standard length.

Remarks: A 245.6 mm SL specimen collected in May 1981 from Auti near Keelung resembles the typical *G. griseus* rather than *G. robinsonii*, in having deeper body depth (2.17 *vs* 2.68 in *G. robinsonii*) and larger eye (3.35 *vs* 4.32 in *G. robinsonii*) (Fig. 6). The presence of three blue lines on snout is the only minor difference from the typical *G. griseus*. Nevertheless, this specimen seems to be a variant of *G. griseus* which may be identified as *G. griseus frenatus*.

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臺灣之異黑鯛科 (Monotaxidae) 魚類

李 信 徽

本報告記述棲息於臺灣沿岸之異黑鯛 (*Monotaxis grandoculis*)，金帶鯛 (*Gnathodentex aurolineatus*)，莫桑鼻給鯛 (*G. mossambicus*)，日本白鱲 (*Gymoncranius japonicus*) 及白鱲 (*G. griseus*) 等五種異黑鯛科魚類。其中之莫桑鼻給鯛及日本白鱲爲臺灣新紀錄種。有關該科之特徵，種屬之分類檢索以及每種魚類之異名、材料來源、種之特徵及外形照片均一一載列於本文中。