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On *Pristipomoides multidens* and *P. typus* (Family Lutjanidae)

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Abstract *Pristipomoides multidens* (Day), usually considered a synonym of *P. typus* Bleeker, is shown to be a valid species of lutjanid fish. Existence of yellow bands on snout and cheek, transverse vermiculations on interorbital region, wider suborbital width, stronger canines, and thicker 1st hemal spine characterize *P. multidens* from *P. typus*.

In the current literature, only one species of the genus *Pristipomoides* with about 50 lateral line scales is known from the Indo-Pacific region. Although this fish is called *Pristipomoides* (= *Aprion*) *typus* Bleeker by some scientists (Weber and Beaufort, 1936; Smith, 1954; Kami, 1973), others (Fowler, 1931; Shinohara, 1966) consider *P. argyrogrammicus* (Valenciennes) as the correct nomenclature and *P. typus* as one of its synonyms.

Two distinct forms of *Pristipomoides* species with about 50 lateral line scales were observed in the South China Sea and Andaman Sea, and have been temporarily assigned as rosy form and yellow form, in accordance with their color differences when fresh. Their occurrence are almost equally frequent and abundant in the catches of experimental trawl, long line and vertical line operations conducted by the research vessel Changi of the Research Department of the Southeast Asian Fisheries Development Center.

A detail comparative study of both forms over a wide range of body length, and an examination of literature have revealed that they represent two distinct species, the rosy form corresponding to *P. typus* Bleeker and the yellow form to *P. multidens* (Day). The latter is usually considered a synonym of the former.

Specimens used

Most of the specimens used were collected from the catch of RV Changi either in the South China Sea or the Andaman Sea. A few specimens were purchased at Jurong Fish Market, Singapore, from a commercial boat. Table 1 summarize the collection data.

Differences between *P. typus* and *P. multidens*

Key to the Indo-Pacific *Pristipomoides* species with about 50 lateral line scales.*

a[1] Pored scales on lateral line 48 to 52, no teeth on tongue.

b[1] No golden band on snout and cheek, longitudinal vermiculations in interorbital region. Suborbital narrow; 8.4 in head at 15 cm in standard length, 7.3 at 25 cm, 5.8 at 40 cm. The 1st hemal spine gradually decreases in the transverse width toward the tip, hemal arch of 11th vertebra elongate triangular.....*P. typus* Bleeker

b[2] Two golden bands edged with dark blue on snout and cheek, transverse vermiculations in interorbital region. Suborbital wide; 7.0 in head at 15 cm in standard length, 5.5 at 25 cm, 4.0 at 40 cm. The 1st hemal spine suddenly decreases in transverse width at 3/5 of its length from the base, hemal arch of 11th vertebra oval ....*P. multidens* (Day)

External characters. Both species resemble each other externally, especially in preserved specimens (Fig. 1). There is no difference in meristic characters, both having: D. X, 11; A. III, 8; P. 16; lateral line scales 48～50+(1～2); transverse series of scales 6～7/13～15; 7 rows on cheek; 13 predorsal; 6～8+11～15 gill rakers, rudiments inclusive (although the avreage number is higher in *P. typus*). Both species

* For other species, see the key either by Shinohara (1966) or Kami (1973).

Table 1. Date, locality and other data of specimens treated. Numbers in parentheses are numbers of specimens utilized for skeleton study.

Date	Locality		Depth of the sea	Fishing gear	*P. typus*			*P. multidens*		
					Catalogue number*	Number of specimens	Standard length mm	Catalogue number*	Number of specimens	Standard length mm
22.6.72	7°–42′N	102°–30′E	73～75 m	Bottom longline				RD7206073	1	490
24.9.72	3–20	110–20	70～74	—do—	RD7209079	1	405			
25.9.72	2–50	110–15	65	—do—	RD7209080	1	205			
16.8.73	3–00	104–30	64	Trawl	RD7308001	1	173			
29～30.9.73.	3–00	104–48	63～66	Trawl	RD7309026 RD7309034	1 1	287 144	RD7309025 RD7309045	1 1	287 145
18.2.74	6–50	98–40	85	Trawl	RD7402014～21	4+(4)	204～269	RD7402022～27	2+(4)	227～320
21～22.2.74.	11–30	97–20	105～130	Vertical line	RD.S.7405～6	(2)	416,c.530	RD.S.7403～4	(2)	580,c.700
1.8.74.	Malaysia, purchased at Jurong Fish Market.		?	Trawl	RD7407001	1	512	RD7407003,04	2	445, 553

* RD: Marine Fisheries Research Department, SEAFDEC.

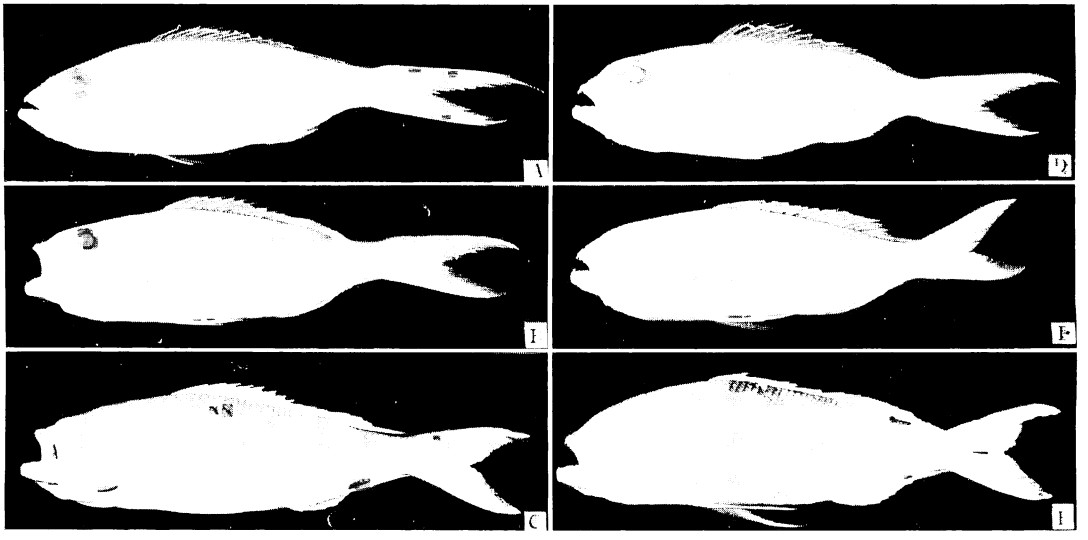

Fig. 1. *Pristipomoides typus* Bleeker (A～C) and *P. multidens* (Day) (D～F). A, RD 7309034, 144 mm; B, RD 7309026, 287 mm; C, RD 7407001, 512 mm; D, RD 7309045, 145 mm; E, RD 7309025, 287 mm; F, RD 7407003, 553 mm in standard length.

Table 2. Character trend from relative measurements of the external body parts by species and by age. The characters in Gothic type showed a marked difference between the species.

	Comparison between specimens of equal size		
	P. typus > *P. multidens*	*P. typus* ≒ *P. multidens*, or variable	*P. typus* < *P. multidens*
Larger in younger specimens	**Caudal fin**	Eye	Head
Constant or individually variable	Depth of caudal peduncle	Body depth, Pectoral length	Ventral fin length, **Canines**
Larger in older specimens		Snout, Interorbital	**Suborbital width**, Orbit to preopercle, Maxillary length

have vomerine teeth in a triangular villiform patch.

Fig. 2 compares the relative measurements of body parts, which increase or decrease with age, as summarized in Table 2. Among the external characters, length of the upper lobe of caudal fin, suborbital width and size of canines are most useful for differentiating the two species.

In specimens of about 15 cm in standard length the upper lobe of the caudal fin is filamentous in both species (Figs. 1A and D). This filamentous elongation is still remarkable in *P. typus* of about 25 cm, but is no longer obvious in *P. multidens* of this size. The ratio of the length of upper lobe over that of lower lobe, both measured from the posterior end of urostyle, at 20～30 cm is 1.4～1.5 for *P. typus* and about 1.1 for *P. multidens*.

Although the suborbital increases markedly in width with age, it is always considerably smaller in *P. typus* than in *P. multidens* of the same size. In head suborbital width for *P. typus*/*P. multidens* is 8.4/7.0 at 15 cm in standard length, 7.3/5.5 at 25 cm, and 5.8/4.0 at 40 cm. In small specimens, 15 cm or so, suborbital width is much smaller than eye, being 2.5 (*P. typus*) and 2.0 (*P. multidens*) in eye. As the relative growth of suborbital is opposite to that of eye as shown in Fig. 2E and Su, the difference between their sizes becomes smaller with age. At

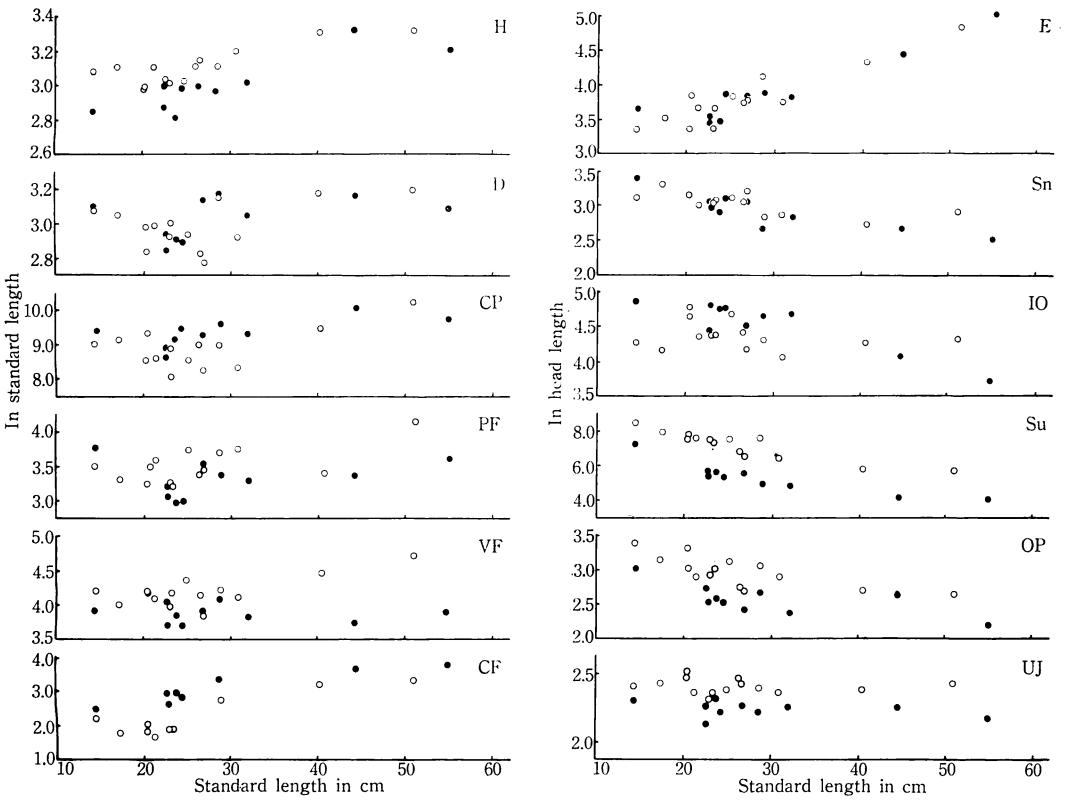

Fig. 2. Relative measurements of body parts of *P. typus* (open circles) and *P. multidens* (solid dots) over a range of sizes.
In standard length: H, head; D, depth of body; CP, depth of caudal peduncle; PF, length of pectoral fin; VF, length of ventral fin; CF, length of upper lobe of caudal fin. In head: E, eye; Sn, snout length; IO, interorbital width; Su, suborbital width; OP, distance from orbit to angle of preopercle; UJ, length of upper jaw.

about 45 cm or more in standard length, suborbital width exceeds diameter of eye in *P. multidens*, while this is not the case in *P. typus*.

There is a pair of canines well apart from each other situated near the anterior end of both the upper and lower jaws. These canines are considerably bigger in *P. multidens* as shown in Fig. 3. Diameter of canines was measured at the proximal end of the exposed part of the tooth, and the length from the tip of the tooth to the base, both under microscope. Relative measurements of the canines in both jaws were almost constant over a wide range of standard length. *P. typus* had the canine of 3.0～3.5×8.2～11.7 (diameter×length, both in per mill of standard length) in upper jaw and 1.7～2.7×5.2～7.6 in lower jaw, while *P. multidens* had the canines of 4.1～5.2×11.7～18.0 in upper jaw and 3.7～4.0×10.4～11.4 in lower jaw.

In large specimens of about 40 cm or more in standard length, the lower jaw of *P. typus* projects beyond the upper jaw, while jaws of *P. multidens* are subequal.

Color. When fresh the two species can be easily distinguished by color differences. *P. typus* is rosy in ground color, deeper on top of head. On the other hand, *P. multidens* is more yellowish than rosy with about six longitudinal yellow bands along the body, and a golden band from the anterior inferior angle of the eye to the snout, with another just below it. These golden bands in snout and cheek have blue margins, which remain as dark bands for a considerably long time in formalin (Fig. 1 D～F).

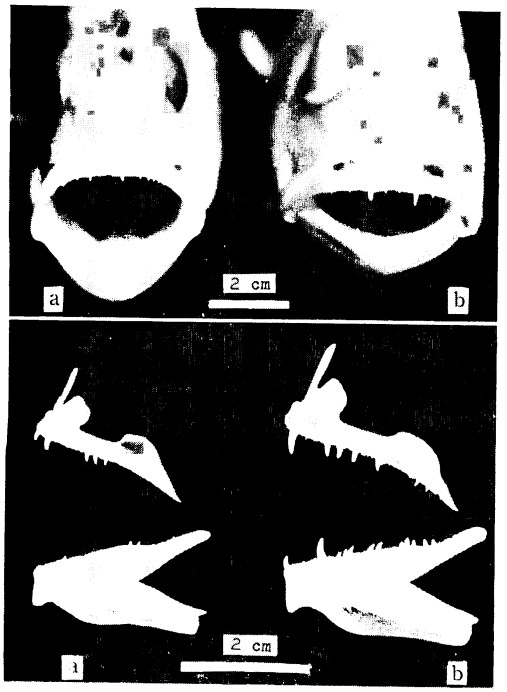

Fig. 3. Front view of mouth (top) and lateral view of premaxillary and dentary (bottom) of *P. typus* (a) and *P. multidens* (b). Specimens shown are 287 mm (both of top), 265 mm (bottom, a) and 269 mm (bottom, b) in standard length.

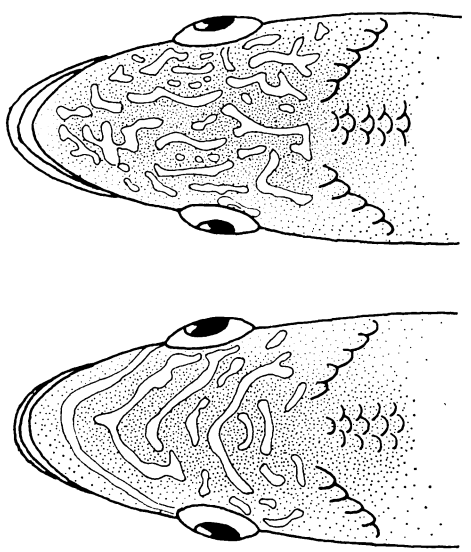

Fig. 4. Schematic representation of vermiculations in top of head in *P. typus* (top) and *P. multidens* (bottom).

Another characteristic distinction is in the brownish yellow vermiculations with a dark rose background on the front and top of the head. In *P. typus* the vermiculations basically run longitudinally, although they tend to bend in various directions. Those of *P. multidens* run transversely, often traversing between the eyes (Fig. 4). The density and thickness of the vermiculations are subject to individual variation in both species. They trend to become obscure shortly after death, and no trace remains in preserved specimens.

Internal characters. Although the two species agree in numbers of pyloric caeca (5) and vertebrae (10+14), the skeletal structure shows some considerable differences. In the following description the size of bone is expressed in per cent of the length of cranium as measured from the anterior margin of vomer to the posterior margin of basioccipital.

The maximum height of cranium, as measured between the top of supraoccipital and the postero-inferior margin of basioccipital, and the maximum width of cranium, as measured between postero-external margins of both pterotics, are almost the same for the two species, the former being 49.6～52.4 and the latter 53.1～56.0. The shelves forming the roof of the brain case narrow down in width anteriorly. This reduction in width is more pronounced in *P. multidens*; the distances between the external margins of the shelves for *P. multidens*/*P. typus* are 31.1～33.0/32.2～32.3 at the posterior end of epiotic, 24.9～25.2/28.2～28.6 at the boundary between epiotic and parietal, and 12.5～15.9/17.4～22.3 at the anterior end of the shelves. In older specimens, with cranium length of about 80 mm or more, or 40 cm in standard length, the anterior view of interorbital is slightly convex in *P. typus*, but almost straight or slightly concave in *P. multidens*.

Many of the visceral skeletons are relatively smaller in *P. typus* e.g. the length of the premaxillary ramus is 45.7～47.5 for *P. typus* and 48.4～50.5 for *P. multidens* (Fig. 3B).

A marked difference in shape of the posterior trunk vertebrae and anterior caudal vertebra is seen between the two species, although the first hemal arch is on the 8th vertebra of both species. In *P. typus* the lateral margins of parapophyses on the 9th and 10th vertebrae spread outward

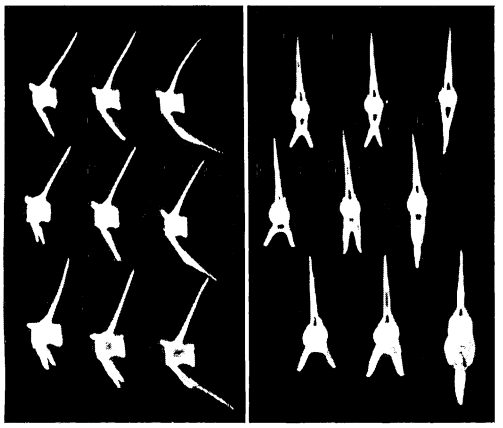

Fig. 5. Lateral and posterior views of the 9～11th vertebrae of three species of *Pristipomoides*. Top, *P. typus*, 265 mm; middle, *P. multidens*, 269 mm; bottom, *P. filamentosus*, 318 mm in standard length.

after passing the middle point along the length of parapophysis; the 1st hemal spine which is on the 11th vertebra gradually and evenly decreases in transverse width from the base toward the tip; the hemal arch of the 11th vertebra is elongated and triangular with rounded corners, the height of the triangle being about 2.5 times of the base (Fig. 5, top). On the other hand, in *P. multidens* the lateral margins of the corresponding parapophyses spread outward evenly from the base to the tip (9th vertebra) or run parallel to each other (10th vertebra); the 1st hemal spine scarcely reduces its transverse width for about 3/5 of its basal portion but suddenly decreases in width distally; the hemal arch of the 11th vertebra is oval, with the longer vertical axis being about 1.7 times of the shorter horizontal axis (Fig. 5, middle). The transverse expansion of the hemal spine of 11th vertebra is much more conspicuous in another species, *P. filamentosus* (Valenciennes) (Fig. 5, bottom).

Remarks on nomenclature

The two type specimens of Bleeker's (1852) *Pristipomoides typus*, 275 and 293 mm in total length, were collected in Sibogha of western Sumatra. As Bleeker (1869, 1873, 1876～1877) described the fish under various names based on the types of *P. typus*, supplementary informations to the original paper can be obtained from these papers.

Among the characteristics described for the types the following are worth citing. Scales on lateral line 50; eye almost 3.5 in head, suborbital width twice smaller than eye (from these it is calculated that suborbital width is about 7 in head); upper lobe of caudal fin much longer than lower, about 3 1/4 in total body length (2 1/4 in standard length); color of body and fin rose (nothing is mentioned about the golden bands on snout and cheek). As to the relative size of suborbital width, Bleeker (1876～1877) gave a much different value; viz. eye almost 3 1/4 in head, suborbital width less than three times smaller than eye, thus suborbital width is about 9 in head.

The characteristics given for *Mesoprion multidens* by Day (1870) are in striking contrast to those for the preceding species. The type, of which the length is not given and which came from the Andaman Islands, had the following characteristics. Scales on lateral line 52; eye nearly 1/3 of head, suborbital width 2/3 of orbit (suborbital width less than 4.5 in head); length of caudal fin 1/4 of the total length (3 in standard length; nothing is mentioned if the upper lobe is produced); color of body rosy, with about six longitudinal yellow bands, a golden band from the anterior inferior angle of the eye to the snout, and another across the forehead.

On synonymizing Day's *Mesoprion multidens* with his *Aprion pristipoma*, Bleeker (1876～1877) considered that the difference in freshness of their specimens was the cause of the difference in their colors, viz. with or without the yellow bands on snout and cheek. Although later Day (1889) himself also accepted Bleeker's view of the synonymy of both the species, from the description and discussion given so far it may be clear that they are two distinct species. It seems reasonable to identify the rosy form as *Pristipomoides typus* Bleeker, and the yellow form as *P. multidens* (Day).

Schlegel (1842) reported *Diacope sparus* from Japan. The original description, based on a dried specimen of 21 inches (525 mm) in total length is not sufficient for definite identification. The color is described as uniform brownish yellow, but is seemed to have been red when alive. As Smith (1954) reported that the type had 50 scales on lateral line, it is probable that

either *P. typus* or *M. multidens* is a synonym of this species.

According to Dr. M. Boeseman at Rijksmuseum in Leiden (personal communication), the type of *D. sparus*, 470 mm in standard length, had the head length of 154.5 mm and suborbital width of 22.5 mm, giving the relative measurement of suborbital width as 6.9 in head. Although this value suggests the possibility of the synonymy of *P. typus* with *D. sparus* (see Fig. 2 Su), this cannot be conclusive, because in a stuffed specimen measurements are never fully accurate. On the other hand, all those specimens recently described by the name of *Pristipomoides argyrogrammicus*, from Japanese waters, the type locality of *D. sparus*, have yellow bands on snout and cheek, and comparatively wide preorbital (Akazaki, 1965; Shinohara, 1966) characteristic of *P. multidens*. A final decision on the synonymy of *D. sparus* is reserved at the moment.

Jordan and Evermann (1903) described *Platyinius sparus* (Schlegel) for a specimen of 6.25 inches (c. 157 mm) in total length, from Formosa. The suborbital width was 6.25 in head, and the length of the upper lobe of caudal fin is measured from the text figure as about 3.1 in standard length, although it might be possible that the distal portion of the lobe was broken. These suggest that their specimen may be *P. multidens* rather than *P. typus*, although the color of their specimen was shortly described as "apparently bright red, now faded to silvery; cheeks bright silvery." The same description and figure reappeared for *Pristipomoides sparus* in Jordan and Thompson (1911) and in Jordan, Tanaka and Snyder (1913).

Recent Japanese taxonomists usually adopt *P. argyrogrammicus* (Valenciennes) as the scientific name for the *Pristipomoides* species which has 48～52 lateral line scales (Matsubara, 1955; Akazaki, 1965; Shinohara, 1966).

The original description (Valenciennes, 1831) of the type, 9 pouces (244 mm) in total length, from Mauritius Island is brief, and the number of scales on lateral line is not given. Sauvage (1891) gave a more detail description and an illustration of *Etelis argyrogrammicus* based on a specimen of 240 mm in total length. According to him, this specimen had 58 lateral line scales*. Although nothing is mentioned in Sauvage's book about the origin of his specimen, Fowler (1931) was of the opinion that Sauvage had redescribed the type. Dr. Charles Roux at Muséum National d'Histoire Naturelle in Paris found that the lateral line scales of the type is 61+4 (personal communication). He also considers that Sauvage's description was most probably based on the type.

Thus, there is no possibility that either *P. typus* Bleeker or *P. multidens* (Day) is conspecific with *S. argyrogrammicus*.

Summarising the above discussion on nomenclature, the synonymy for *P. typus* and *P. multidens* is shown below:

Pristipomoides typus Bleeker
(new Japanese name, Barahimedai)

Pristipomoides typus Bleeker, 1852: 575, type locality Sibogha, Sumatra.
Dentex pristipoma Bleeker, 1854: 246.
Mesoprion dentex Bleeker, 1859: 19.
Lutjanus dentex; Bleeker, 1865: 278.
Chaetopterus pristipoma; Bleeker, 1869: 83～85.
Aprion pristipoma; Bleeker, 1873: 96～98; Bleeker, 1876～1877: 79, tab. 336, fig. 3.
Pristipomoides typus; Fowler, 1928: 192; Fowler, 1929: 634; Munro, 1955: 134, pl. 24, fig. 378.
Aprion typus; Fowler, 1904: 527; Weber and Beaufort, 1936: 313～315.
Doubtful synonyms.
Pristipomoides argyrogrammicus (part, non Valenciennes); Fowler, 1931: 189～190.
Negative synonyms.
Serranus argyrogrammicus Valenciennes, 1831: 472～474.
Etelis argyrogrammicus; Sauvage, 1891: 107～108, pl. 10, fig. 3.
Mesoprion multidens Day, 1870: 680.

Pristipomoides multidens (Day, 1870)
(Japanese name, Nagasaki-fuedai)

Mesoprion multidens Day, 1870: 680, type locality Andaman Islands.
Aprion multidens; Day, 1875: 27 with addenda on p. 746, pl. 7, fig. 4.
Aprion pristipoma (non Bleeker); Day, 1889: 533～534, fig. 161.
Centropristis pristipoma; Klunzinger, 1884: 16.

* From his illustration, about 52 scales are counted on the body and about 6 on the base of caudal fin.

Pristipomoides typus (non Bleeker); Smith, 1954: 486~488, pl. 10, fig. A; Smith and Smith, 1969: 29, pl. 24, fig. E; Kyushin, Amaoka, Nakatani and Ida, 1973: 89, fig. 73.

Pristipomoides argyrogrammicus (non Valenciennes); Akazaki, 1965: 304, fig. 624; Shinohara, 1966: 228~230, fig. 20.

Doubtful synonyms

Diacope sparus Temminck and Schlegel, 1842: 14; Boeseman, 1947: 31~32.

Mesoprion sparus; Günther, 1859: 188.

Platyinius sparus; Jordan and Evermann, 1903: 344~345, fig. 16.

Pristipomoides sparus; Jordan and Thompson, 1911: 460~461, fig. 5; Jordan, Tanaka and Snyder, 1913: 166, fig. 123.

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ナガサキフエダイ *Pristipomoides multidens* とバラヒメダイ *P. typus* (新称)

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インド・太平洋海区からは5種のヒメダイ属が知られており，そのうち側線鱗数が 50 前後のものは *Pristipomoides typus* Bleeker 1 種のみとされていた．しかるに，南支那海およびアンダマン海のヒメダイ属魚類のうち側線鱗数 48～52 の魚には別種と見做すべき2型があり，そのひとつは *P. typus* であり，他は Bleeker (1876～1877) 以来その異名同種とされてきた Day (1870) の *Mesoprion multidens* に該当することが判った．後者を前者より区別する主要点は，吻および頬部に黄色線がある，頭頂部の虫食い状斑紋が横に走る (前者では縦)，眼下骨幅が大きい，上下両顎の犬歯が大きい，尾鰭上葉の延長がより若いうちにみられなくなる，第一血管棘の横幅は基部より約 3/5 の点で急に狭くなる (前者では基部から尖端に向かって一様に横幅を減ずる)，第一尾椎骨の血道弓門は卵形である (前者では細長い三角形)，などである．日本人研究者 (赤崎，1965；篠原，1966；久新・他，1973) によりナガサキフエダイの和名で記載されている魚は *P. multidens* であり，新たに *P. typus* の和名としてバラヒメダイを提唱する．日本では屢々ナガサキフエダイの学名として *P. argyrogrammicus* (Valenciennes) が採用されているが，後者の模式標本の側線鱗数は，58 (Sauvage, 1891) もしくは 61 (パリ国立科学博物館 Dr. Roux による) であり，両者が同種である可能性はない．Schlegel (1842) が日本より報告した *Diacope sparus* が表記両種のいずれを指すかは明らかでない．

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