

Redescription of *Hypoatherina valenciennesi* and its Relationships to Other Species of Atherinidae in the Pacific and Indian Oceans

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Abstract A review of Tirant's collections and examination of types has resulted in the reidentification of *Haplocheilus argyrotaenia* Tirant as *Hypoatherina valenciennesi* (Bleeker) which is found throughout the southwestern Pacific and as far north as Japan. The taxonomic status of *H. valenciennesi* is clarified and Bleeker's emendation of the original specific epithet *valenciennesi* to *valenciennesi* is rejected. The systematic position of this species is difficult to determine since *H. valenciennesi* shows affinities with both *Hypoatherina* and *Atherinomorus*. In the light of the present knowledge, Bleeker's species appears to have greater affinities with *Hypoatherina* and is therefore placed in this genus.

Recent reexamination of the types of *Haplocheilus argyrotaenia* Tirant, 1883, (unaccepted and misspelt emendation of *Haplochilus* Agassiz, 1846, for *Aplocheilus* McClelland, 1839) has prompted us to review the status of *Hypoatherina valenciennesi* (Bleeker, 1853a) which is considered to be the senior synonym of Tirant's species (thought by him to be an aplocheilid). Although the systematic position of the Pacific atherinids is yet to be resolved, work to that end has already begun. The most recent reviews of atherinids of that region are by Schultz (1948, 1953) and Ivantsoff (1978). A study of the status of *Atherinomorus* Fowler, 1903 was published by Whitehead and Ivantsoff in 1983. Schultz in 1948 and in 1953 (in Schultz et al.) listed over 20 species of silversides which were placed into 4 genera, *Pranesus* Whitley, 1930, *Allanetta* Whitley, 1943, *Hypoatherina* Schultz, 1948, and *Stenatherina* Schultz, 1948. *Allanetta*, as defined by Schultz (1948), had become accepted by most workers although Smith (1965) could see no differences between *Hypoatherina* and *Allanetta* in terms of Schultz's definition and diagnoses. In 1964, Taylor pointed out that *Allanetta mugiloides* (McCulloch, 1913), the type species of the genus, was most closely related to the Australian freshwater genus *Craterocephalus* McCulloch, 1913 (also endemic to New Guinea). Ivantsoff (1978) confirmed this finding and reassigned most of Schultz's *Allanetta* species to *Hypoatherina* and some to *Atherinomorus* (the latter being the senior synonym of *Pranesus*, see Whitehead and Ivantsoff,

1983). The genus *Hypoatherina* as defined by Ivantsoff (1978) includes all those species with moderately long dorsal process of premaxilla but not longer than eye diameter, lateral process of premaxilla short and broad, lower jaw coronoid process highly elevated, distinct notch (sensory canal opening) in posterior margin of anterior bony edge of preopercle near its lower corner, body slender and subcylindrical, midlateral band usually ending with scythe-like mark extending upwards and backwards past hypural joint, gill rakers slender, moderately long but never longer than diameter of pupil.

Members of the genus *Hypoatherina* extend throughout the western Pacific Ocean, from Japan in the north, to about 33°40'S near Sydney, Australia and from the east coast of Africa and the Red Sea to the west coast of Australia in the Indian Ocean. One species of the genus, *H. harringtonensis* (Goode, 1877) occurs in the Caribbean as do two other species with Old World affinities, *Atherinomorus stipes* (Müller and Troschel, 1848) and *Alepidomus evermanni* (Eigenmann, 1903), a close relative of *Atherinomorus* but found exclusively in the freshwaters of Cuba.

Methods and materials

The methods used for counts and measurements are fully described by Patten and Ivantsoff (1983) and are based on techniques developed by Munro (1967) with some modifications and additions to

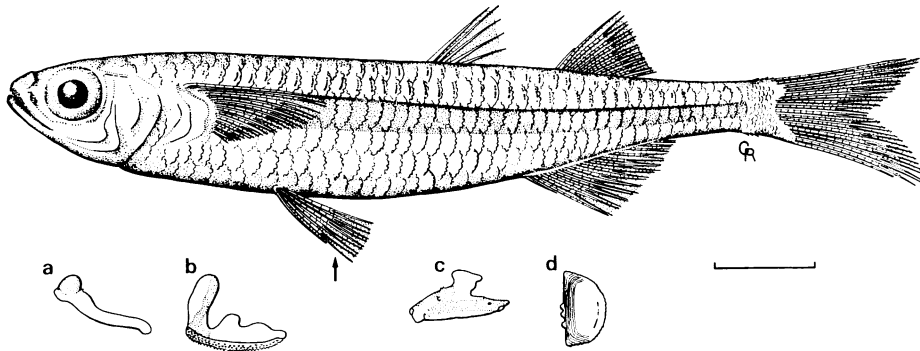


Fig. 1. *Hypoatherina valenciennei* Bleeker, MQU WI 76-12, 77.7 mm SL, Hong Kong. a, maxilla; b, premaxilla; c, dentary; d, scale from midlateral line. Arrow pointing to anus position. Scale bar: 10 mm.

provide more comprehensive meristics and morphometrics wherever possible.

Specimens examined belong to the following institutions: British Museum (Natural History), London (BMNH); California Academy of Sciences, San Francisco (CAS); Musée Guimet d'Histoire Naturelle, Lyon (MGHNL); Muséum National d'Histoire Naturelle, Paris (MNHN); Macquarie University, Sydney (MQU); Rijkmuseum van Natuurlijke Historie, Leiden (RMNH); Zoological Museum, Ann Arbor, Michigan (UMMZ); National Museum of Natural History, Washington (USNM).

RMNH 6377 (17), designated lectotype and paralectotypes of *Atherina valenciennei*, Sumatra and Java. BMNH 1880.4.21: 168–169 (2), Sumatra. MNHN A.4387 (5), Java. BMNH 1851.12.27: 181–184 (6), syntypes of *Atherina bleekeri*, China. CAS-SU 6259, holotype of *Atherina woodwardi*, Okinawa, Ryukyu Is., Japan. CAS-SU 6714 (5), paratypes of *Atherina woodwardi*, same locality as holotype. USNM 49815 (2), paratypes of *Atherina woodwardi*, same locality as holotype. MQU-WI 76-12 (6), Hong Kong. MGHNL 42000043 (4), syntypes of *Haplocheilus argyrotaenia*, Rivière de Hué, Viet Nam. CAS-SU 6782 (20), Nagasaki, Japan. UMMZ 204129 (2), Hakata (Fukuoka) Bay, north of Kyushu, Japan. UMMZ 204133 (1), Sagami Bay, off Manazuru Beach, Japan. UMMZ 204135 (1), Sagami Bay, off Hayakawa, Japan. Size range 46.9–99.7 mm SL. All measurements and counts are based on 64 specimens of *H. valenciennei*. Meristics and morphometrics for 8 specimens of *H. woodwardi* (holotype and paratypes, 49–61.6 mm SL) are also recorded in Table 1.

Specimens of *H. valenciennei* examined but not used in measurements and counts: RMNH 6377 (31), designated paralectotypes of *A. valenciennei*, Sumatra

and Java. MGHNL 42000043 (18), syntypes of *Haplocheilus argyrotaenia*, Rivière de Hué, Viet Nam. CAS-SU 23052 (2), Bombay, India. CAS-SU 44698 (6), Gulf of Thailand.

Other material examined: RMNH 6376, holotype and paratype of *Atherina japonica* Bleeker, Japan.

Hypoatherina valenciennei (Bleeker)

(Fig. 1)

Atherina valenciennei Bleeker, 1853a: 507, type locality: Padang, Sumatra. Herein designated lectotype: RMNH 6377, 77.9 mm SL; paralectotypes also designated: RMNH 6377 (47 specimens, 40–76.5 mm SL), USNM 143716 (4, formerly part of RMNH 6377), all originally labelled as syntypes. (MNHN A.4387 (4) and BMNH 1880.4.21.168-9 (2) are also labelled as syntypes but are unlikely to be so (Dr. M. Boeseman, RMNH, pers. comm.) and are therefore not recognised as typical); Fowler, 1935: 133; 1937: 221.

Atherina valenciennesi: Bleeker, 1859: 203 (emendation); Weber, 1921: 52; Weber and de Beaufort, 1922: 212; Duncker and Mohr, 1926: 135; Seale, 1935: 355; Sirimontaporn, 1984: 15.

Atherina valenciennesii: Günther, 1861: 398; Weber, 1913: 136.

Atherina bleekeri Günther, 1861: 398, type locality: China. Syntypes: BMNH 1851.12.27.181–184 (6).

Haplocheilus argyrotaenia Tirant, 1883: 95, type locality: Rivière de Hué, Viet Nam. Syntypes: MGHNL 42000043 (22), USNM 48006 (formerly part of MGHNL 42000043). (Identified as an aplocheilid, with emendation of generic name); 1885: 130; Chevey, 1937: 249 (reexamination of Tirant's types, *Atherina* sp. juv., possibly *A. valenciennei*); Kottelat, 1986: 17.

Hepsetia valenciennesii: Jordan and Hubbs, 1919:

33.

Aplocheilus argyrotaenia: Chevey, 1934: 32, 130.

Allanetta valenciennesii: Schultz, 1948: 23.

Pranesus valenciennesi: Fowler, 1949: 68.

Allanetta valenciennesi: Schultz, 1953: 298; Munro, 1958: 156.

Allanetta valenciennesi: Munro, 1967: 175.

Description. Morphometrics and meristics: Head 4.0–4.8 (mean=4.4), body depth 4.8–6.5 (5.6), least depth of caudal peduncle 12.1–16.4 (13.7) times in standard length. Eye 2.5–3.0 (2.8), interorbital 2.7–3.3 (2.9) times in head length. Snout 1.3–1.8 (1.5), premaxilla 0.9–1.3 (1.1), height of dorsal process of premaxilla 1.8–2.7 (2.2) times in eye diameter.

Origin of first dorsal from 2 to 5 scales behind vertical through tips of ventrals and from 6 to 10 scales behind vertical through tips of pectorals. Origin of ventrals at or up to 3 scales in front of vertical through pectoral tips. Anus 1 to 4 scales in front of ventral tips, often almost at origin of innermost ventral rays. Gill rakers long and slender about diameter of pupil, 20–26 (22.8) in first lower gill arch. Midlateral scales 40–46 (42.6), transverse scale rows along side of body 5–6, predorsal scales 17–23 (18.6), interdorsal scales 6–8 (7.2). Dorsal fin elements IV–VII (5.3) Ii7–9 (8.2), anal fin Ii9–12 (11.0), pectoral Ii13–15 (14.2). Vertebrae (based on 39 specimens) 38–44 (41.6).

Morphology: Premaxilla long and obliquely directed, extending past vertical through anterior margin of orbit; its free edge slightly concave anteriorly and convex posteriorly. Labial ligament weakly developed. Dorsal process of premaxilla moderately wide and long; its first lateral process short and wide at base. Maxilla completely behind infraorbitals when mouth closed. Upper jaw extremely protractile. Coronoid process of dentary highly elevated but not rounded as in other *Hypoatherina* species (Fig. 1c).

Body robust and less slender than other species of *Hypoatherina*. Dorsal profile straight with slight slope both towards head and tail. Belly slightly rounded. Head small and triangular.

Dentary with very few teeth; premaxillary teeth short but well developed with free edge of premaxilla often heavily covered with minute shagreen teeth. Teeth present on vomer, palatines, ectopterygoids and with strong ridge of teeth on mesopterygoids. Tongue (basihyal) often with teeth

around edge.

Preopercle naked in preserved specimens. Opercle covered with one or two large scales. Body scales large, dorsoventrally elongated (Fig. 1d), with circuli on anterior half, with posterior edge rounded and margins of scales crenulated. Small processes on anterior edge of each scale on sides of body. Sensory pores on head large.

Colour: Preserved specimens usually brown with golden sheen. Scales probably covered with fine melanophores in life. Midlateral band bright gold. Scales above midlateral band edged with black and with darker middorsal band (Weber and de Beaufort, 1922). Fins clear but with small traces of pigment remaining. Head, eye, opercle and preopercle silvery gold. Live specimens blue green above, whitish below, with tip of snout dark (Munro, 1967).

Discussion

The specific epithet of *Hypoatherina* has been the subject of a number of emendations as shown in the synonymy above. Bleeker's, (1859) own emendation appears to be unjustified according to the 1985 edition of the International Code of Zoological Nomenclature (art. 33 (b) (iii)). *valenciennesi* was formed in accordance with art. 31 (a) (i) from the latinized name of Valenciennes (Valenciennes) and does not have to be corrected.

When describing *Atherina bleekeri*, Günther (1861) listed *A. japonica* Bleeker, 1853b as a synonym but since *A. bleekeri* was not explicitly indicated to be a replacement name, its types are the six Chinese specimens collected by J. R. Reeves and listed by Günther (now catalogued BMNH 1851.12.27.181–184). If *A. bleekeri* were explicitly indicated as a replacement name, its types would be those of *A. japonica* Bleeker. *Atherina japonica* Bleeker, 1853b, is a junior primary homonym of *A. japonica* Houttuyn, 1782. The latter name has been suppressed (submitted by Whitehead, 1963) for the purposes of the Law of Priority but not for those of the Law of Homonymy (International Commission on Zoological Nomenclature, 1965). And although the name is not available, Bleeker's *A. japonica* must still be replaced by the next available name. Since Bleeker's *A. japonica* type examined by one of us (W.I.) is distinct and different from the types of *A. valen-*

ciennei (probably indistinct from the types of *A. temminckii* Bleeker, 1853a), its correct taxonomic status, in accordance to the Law of Homonymy, will be considered elsewhere.

Examination of the type material of *A. bleekeri* by one of us (W.I.) leads us to the conclusion that the latter nominal species is unlikely to be distinct from *H. valenciennei* (see Table 1). The present study is based on 5 populations (see Table 1) covering a wide geographic range. Of the 35 meristic, morphometric and morphological characters examined (same attributes as in Whitehead and Ivantsoff, 1983) 23 showed no differences in the present study. The remaining 12 attributes showed minor regional differences but with an overlap of ranges. The dorsal process of the premaxilla in the Hong Kong specimens is the longest although specimens both from Indonesia and Japan include fish with a long dorsal process also. All the scale counts show a progressive increase with higher latitudes suggesting a cline which is probably related to the temperature of the water. The vertebral and the gill raker counts show a similar tendency. The Japanese specimens of *H. valenciennei* are marginally more slender posteriorly than all others (least depth of caudal peduncle, Table 1).

It must be pointed out that the midlateral scale count for the types of *A. bleekeri* is consistently lower (Table 1) when compared with those of Schultz (1953: table 26). Schultz distinguished *A. bleekeri* and *A. valenciennei* by the width of the midlateral band and the midlateral scale count. The present study shows that the width of the midlateral band in the Indonesian specimens fluctuates too widely to be of diagnostic value. Schultz (1953) does not indicate the provenance of his specimens and it is very likely that with further studies, it will be shown that *H. valenciennei* has a much wider range of variability than is presently known.

A comparison of *H. valenciennei* with *H. woodwardi* (Jordan et Starks, 1901) is of some interest since the two species appear to be very closely related despite their habitat preferences and differences in body size (Table 1). The latter can be distinguished by a slightly larger head; the position of fins in *H. woodwardi* specimens is distinct from the populations of *H. valenciennei* although the ranges of Viet Nam and Hong Kong specimens meet the range of variations of *H. woodwardi* at

their extremes. The predorsal scale and the gill raker counts are marginally lower in *H. woodwardi*. The presently examined data suggests that *H. woodwardi* is distinct. However, because of the overlap of ranges in the characters examined, the fact the head of *H. woodwardi* is small and triangular like the head of *H. valenciennei*, the body is robust and more like those of *Atherinomorus* species than *Hypoatherina*, the coronoid process of the dentary is elevated, the anus is placed very far forward and the edge of the tongue bordered by teeth, all indicate a very close affinity between the two nominal species. *H. valenciennei* specimens have crenulated scales which clearly distinguish them from the types of *H. woodwardi* where the scale crenulation is very slight in about half of the specimens in CAS or absent in the other two specimens in USNM. It may be argued that in the light of all other similarities pointed out above, the variation in the degree of crenulation (or even its absence) of body scales may not be useful in diagnosing *H. woodwardi* as distinct. Variation in crenulation is also observed in *Allanetta mugiloides* where a single collection will yield a wide spectrum of scale shape. Recent collection of marine/estuarine species of atherinids of the west coast of Australia, *Craterocephalus pauciradiatus* and *C. capreoli* shows a similar degree of variation in crenulation. There is also a tendency for crenulation to be less distinct or absent in smaller fish.

The degree of variation in morphology of atherinids which inhabit marine and/or estuarine habitats has been the subject of study and controversy for many years. *Atherina boyeri* in the Mediterranean may vary in size, meristics and morphometrics depending on its habitat (Kiener and Spillman, 1969). Bamber and Henderson (1985) go further and synonymise the more marine Atlantic species *Atherina presbyter* with *A. boyeri* stating that the "morphology (of the latter) varies under the influence of conditions of temperature and salinity during embryo development, and the isolation of populations maintains comparative morphological distinctions resulting from local selection and random genetic drift". The North American *Menidia* spp. are equally problematical: Chernoff et al. (1981) in their statistical analysis of meristic and morphometric characters of inland and marine populations, reduce *Menidia beryllina* complex of nominal

species to two. They also cite a number of other studies of the impact of the environmental component on the phenotype. On the other hand, Prince et al. (1982) distinguished a new estuarine atherinid from a more marine sibling species on a small number of minor differences. The recognition of this new species was further supported by electrophoretic studies by Pavlov in 1985.

The status of *H. woodwardi* can probably be resolved by an osteological analysis and possibly by a comparison of enzymes of populations of *H. valenciennei* from Japan with those specifically from the Ryukyus.

The generic placement of *H. valenciennei* needs to be discussed in some detail since it has varied from one author to another. *Atherina* Linnaeus, 1758, has been a catch-all genus until a number of revisions had appeared in the earlier part of the 20th century (Jordan and Hubbs, 1919, for example). *Hepsetia* Bonaparte, 1832–1841, is a genus (or a subgenus, see Kiener and Spillmann, 1969) of distinctive atherinids restricted to Europe and Africa. *Allanetta* is a monotypic genus (Taylor, 1964) of silversides restricted to the northern and western coasts of Australia. It is closely allied to a predominantly freshwater genus, *Craterocephalus*, which is endemic to

Australia and New Guinea. Neither *Allanetta* nor *Craterocephalus* has a distinctive preopercular notch which is characteristic of the species of *Hypoatherina* and *Atherinomorus*. The placement of *H. valenciennei* into *Atherinomorus* (senior synonym of *Pranesus*) has been defended by Patten (1978). Fowler (1949) referred 10 species (including *A. temminckii* Bleeker, 1853a, *A. uisula* Jordan et Seale, 1906, *A. ovalaua* Herre, 1935 and *A. valenciennei*) to *Pranesus* but without any explanation. Whilst all of the above, with the exception of *H. valenciennei*, can only be referred to *Hypoatherina* within the context of the definition given, a more thorough osteological investigation of *H. valenciennei* shows it has distinct affinities both with *Hypoatherina* and *Atherinomorus*. Ivantsoff (1978) referred this species to *Hypoatherina* on the basis of jaw protrusibility, distinct elevation of the coronoid process of the dentary, the shapes of the premaxillary process and the maxilla. Patten (1978), on the other hand, referred this species to *Pranesus* (= *Atherinomorus*) pointing to the fact that the dorsal process of the premaxilla in *H. valenciennei* is primitive and has no diagnostic value. He also stated that *P. valenciennei* was the most primitive representative of the genus, with short jaws, a distinct second postmaxillary process (present in

Table 1. Selected morphometric and meristic data (mean, range in parenthesis, and standard deviation) standard length; HL, head length; PDP, dorsal process of premaxilla; OD₁, origin of the first depth of caudal peduncle; 1st LGR, first lower gill arch. ¹ RMNH 6377 (syntypes, 17); MNHN ² BMNH 1851.12.27.181–184 (syntypes of *Atherina bleekeri*, 6). ⁴ CAS SU-6259 (holotype of *woodwardi*, 2).

Locality	<i>Hypoatherina valenciennei</i>					
	Java, Indonesia ¹		Hue River, Viet Nam ²		Hong Kong	
Number	24		4		6	
Size range	51.9–77.9 mm SL		46.9–57.7		74.6–79.2	
Head in SL	4.4 (4.2–4.6)	0.13	4.3 (4.2–4.3)	0.06	4.6 (4.4–4.8)	0.13
Interorb. in HL	2.8 (2.7–3.0)	0.08	2.9 (2.8–3.0)	0.10	2.6 (2.8–3.1)	0.12
PDP in eye	2.3 (2.0–2.5)	0.12	2.5 (2.5–2.6)	0.04	1.9 (1.8–2.0)	0.05
OD ₁ to TV	B3.9 (B3–B5)	0.60	B2.6 (B2–B3)	0.48	B3.1 (B2–B4)	0.60
OD ₁ to TP	B7.6 (B6–B10)	0.98	B6.5 (B6–B7.5)	0.71	B7.3 (B6.5–B8)	0.55
Midlateral scales	40.7 (40–42)	0.68	41.0 (40–41)	0.58	42.6 (42–45)	0.47
Predorsal scales	18.4 (17–20)	0.86	19.3 (19–20)	0.50	19.3 (19–21)	0.74
Anal fin rays	11.0 (10–12)	0.45	10.3 (10–11)	0.50	11.7 (11–12)	0.47
Vertebrae	39.4 (39–40)	0.40	38.5 (38–39)	0.50	41.6 (41–42)	0.48
H max	5.5 (4.8–5.9)	0.27	5.5 (5.3–5.8)	0.21	5.6 (5.5–5.8)	0.14
H min	12.9 (12.1–14.1)	0.53	13.2 (12.9–13.5)	0.26	13.1 (12.5–14.1)	0.60
Gill rakers in 1st LGR	22.1 (20–25)	1.06	21.5 (21–23)	1.10	22.0 (21–23)	1.10

all *Hypoatherina* spp. but absent in all other *Atherinomorus*, high dentary coronoid process (typical of *Hypoatherina* but not of *Atherinomorus*) and a "neurocranium not very different in overall shape from *Hypoatherina*." Patten also concluded that *Hypoatherina* spp. are more primitive than *Pranesus* because of lack of specialised characters. Patten's argument for not placing *H. valenciennei* into *Hypoatherina* is based on the fact that, in his opinion, only primitive characters are shared. From his work it is possible to conclude that the advanced characters shared between *H. valenciennei* and *Atherinomorus* are possibly a reduced peak on the articular bone and the coronoid process of the dentary ending in a sharp point. However, even these characters exhibit a range of variations which can be placed on a continuum which will bridge the two genera. Since on the basis of overall similarity, Bleeker's species appears to be closer to *Hypoatherina*, in the light of the present knowledge, we refer it to this genus.

Range

Hypoatherina valenciennei has a wide range of distribution in the southwest Pacific and a record from Bombay, India, indicates its presence in the western Indian Ocean. It has been collected in

Java (Bleeker, 1853a), New Britain (Duncker and Mohr, 1926) Thailand, Singapore, Borneo, Sulawesi and adjacent areas (Weber and de Beaufort, 1922), Guadalcanal, Malaita and Vanikoro Islands in the Solomons (Seale, 1935). It is common off the coast of New Guinea as well as off islands such as Normanby, Kairuku, and Maron Island, New Britain (Munro, 1958). Collections, in institutions already listed, indicate that *Allanetta* or *Hypoatherina valenciennei* occurs in Hainan, Hong Kong and from numerous localities in Japan which include Awa Island, about 38°30'N 139°E. Tirant's collection from Viet Nam is now added to the list.

On present evidence it appears that *H. valenciennei* may be divided into a number of geographic races which can be more or less defined by higher scale counts (China and Japan). Likewise, the vertebral counts clearly distinguish the southern populations from those of the north. These differences, however, may become less apparent with examination of larger samples.

Like other species of the genus (*H. barnesi*, *H. ovalaua*, *H. temminckii*), *H. valenciennei* has a very wide distribution in the western Pacific and extends as far as the west coast of India in the Indian Ocean.

of five populations of *Hypoatherina valenciennei* and the type specimens of *Atherina woodwardi*. SL, dorsal fin; TV, tips of pelvic fins; TP, tips of pectoral fins; H max, greatest body depth; H min, least A. 4387 (5); BMNH 1880.4.21.168-9 (2). ² MGHNL 42000043 (syntypes of *Haplocheilus argyrotaenia*, 4). *Atherina woodwardi*); CAS SU-6714 (paratypes of *A. woodwardi*, 5); USNM 49815 (paratypes of *A.*

<i>Hypoatherina valenciennei</i>						<i>H. woodwardi</i>	
China (local. unknown) ³		Nagasaki, Fukuoka, Japan		Combined data		Okinawa, Ryukyu Japan ⁴	
6		24		64		8	
77.8-84.4		62.5-99.7		46.9-99.7		49.0-61.6	
4.5 (4.3-4.6)	0.09	4.3 (4.0-4.7)	0.18	4.4 (4.0-4.8)	0.18	4.1 (3.9-4.5)	0.17
2.8 (2.7-2.9)	0.07	3.0 (2.7-3.3)	0.16	2.9 (2.7-3.3)	0.15	3.0 (2.7-3.2)	0.16
2.0 (1.8-2.2)	0.16	2.3 (1.9-2.7)	0.19	2.2 (1.8-2.7)	0.21	2.2 (2.0-2.6)	0.19
B3.5 (B3-B5)	0.76	B3.1 (B2-B5)	0.13	B3.4 (B2-B5)	0.76	B0.3 (F1.5-B2)	1.1
B7.6 (B7-B8)	0.47	B7.5 (B6-B9)	0.17	B7.5 (B6-B10)	0.88	B5.0 (B3-B6)	0.86
43.5 (43-44)	0.50	44.7 (43-46)	0.76	42.6 (40-46)	2.0	39.9 (39-41)	0.60
20.3 (19-21)	0.74	20.6 (19-23)	0.97	19.6 (17-23)	1.32	16.8 (16-18)	0.69
11		11.0 (9-12)	0.69	11.0 (9-12)	0.60	11.3 (11-12)	0.43
42		43.0 (42-44)	0.60	41.6 (38-44)	1.77	39.6 (39-40)	0.47
5.9 (5.3-6.5)	0.32	5.6 (4.8-6.5)	0.32	5.6 (4.8-6.5)	0.32	5.4 (5.0-6.0)	0.28
13.4 (12.9-14.0)	0.39	14.8 (13.9-16.4)	0.66	13.7 (12.1-16.4)	1.1	13.5 (13.3-13.7)	0.14
23.0 (22-24)	0.89	23.9 (23-26)	1.19	22.8 (20-26)	1.39	21.1 (19-23)	1.25

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トウゴロウイワシの再記載，分布および類縁関係について

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Haplocheilus argyrotaenia Tirant は，模式標本の調査の結果，南西太平洋から北は日本まで広く分布するトウゴロウイワシ *Hypoatherina valenciennei* (Bleeker) に再同定された。トウゴロウイワシの分類学的問題点が明らかにされ，Bleeker の訂正，すなわち原記載の種小名の綴りである *valenciennei* から *valenciennesi* への変更は棄却された。本種は *Hypoatherina* および *Atherinomor* の中間的な特徴をもつため分類学的位置付けは困難である。現時点では本種は *Hypoatherina* により類似しているのでこの属に含めた。