

Reprinted from
Japanese Journal of Ichthyology

Vol. 34, No. 4 : 409-420, figs. 1-7.

February 25, 1988

Two New Species of Goby of the Genus *Astrabe* from Japan

Prince Akihito and Katsusuke Meguro

Two New Species of Goby of the Genus *Astrabe* from Japan

Prince Akihito and Katsusuke Meguro

(Received March 17, 1986)

Abstract Two species of goby belonging to the genus *Astrabe* are described from Japan as new species, *A. flavimaculata* and *A. fasciata*. *A. flavimaculata* is distinguishable from *A. lactisella*, the type species and hitherto the only known species of the genus, in that it has no protrusion on the upper posterior part of the dermal fold along the upper margin of the eye, fewer scales in a longitudinal row, predorsal scales, scales on the belly, a narrower white transverse band across the base of the pectoral fins, and in life yellow markings on a dark brown ground colour except for the white transverse band across the base of the pectoral fins. *A. fasciata* is distinguishable from *A. lactisella* in that it has fewer scales in a transverse row, a narrower scaled area on the lateral side of the body, a narrower white transverse band across the base of the pectoral fins, and a white transverse band across the anterior part of the 1st dorsal fin extending to the ventral side of the body.

A species of goby was illustrated as *Astrabe* sp. with the Japanese name "Kimadarahaze" by Prince Akihito (1984) in the Fishes of the Japanese Archipelago. In connection with the further study of this species and *A. lactisella*, the type species and hitherto the only known species of the genus, another species of this genus was found, and the examination of the specimen recorded as *A. lactisella* from Tanegashima by Snyder (1912) and of the specimen recorded also as *A. lactisella* from Tassha, Sadogashima by Honma and Tamura (1972) revealed that these specimens do not belong to *A. lactisella*, but belong to two hitherto scientifically unnamed species. Here these two species are described as new, and *A. lactisella* is also re-described in comparison with the two new species. According to the results of this study, some corrections are also made to the previous explanations of *A. lactisella* and *A. sp.* by Prince Akihito (1984).

With respect to counting, scales in a longitudinal row are counted from the scale closest to the posterior end of the upper part of the gill membrane to the crease at the base of the caudal fin when the caudal fin is bent, and scales in a transverse row are counted obliquely backwards towards the base of the anal fin from the scale closest to the lateral side of the origin of the 2nd dorsal fin.

The relation between the pterygiophores of the dorsal fins and vertebrae is expressed as 6/IIIOO/

12·13 in the tables. "6" shows that 6 vertebrae are inserted before the pterygiophore of the 1st spine of the 1st dorsal fin. Each "1" shows that a pterygiophore of the 1st dorsal fin is inserted between the neural spines. "12·13" shows that 2 pterygiophores of the spine of the 2nd dorsal fin are inserted between the neural spines of the 12th and 13th vertebrae. If "12" is written instead of "12·13", "12" shows that 2 pterygiophores of the spine of the 2nd dorsal fin are mounted over the 12th vertebra.

Astrabe Jordan et Snyder

(Japanese name: Shirokurahaze-zoku)

Astrabe Jordan and Snyder, 1901: 119. Type by monotypy, *Astrabe lactisella* Jordan and Snyder, 1901.

Characteristics common to the species of the genus *Astrabe* are as follows.

Head with dermal folds. Tips of anterior and posterior nostrils protruding. No sensory canals. Tip of genital papilla of male narrow; that of female widely open. Shape of fins not different between sexes. Pectoral fin with unbranched rays in upper and lower parts; most unbranched rays free; minute projections scattered over free rays. Pelvic fin rays I, 5, united by crenated frenum and by connecting membrane between whole length of 5th soft rays; frenum at part of spines protruding. Scales absent on head and

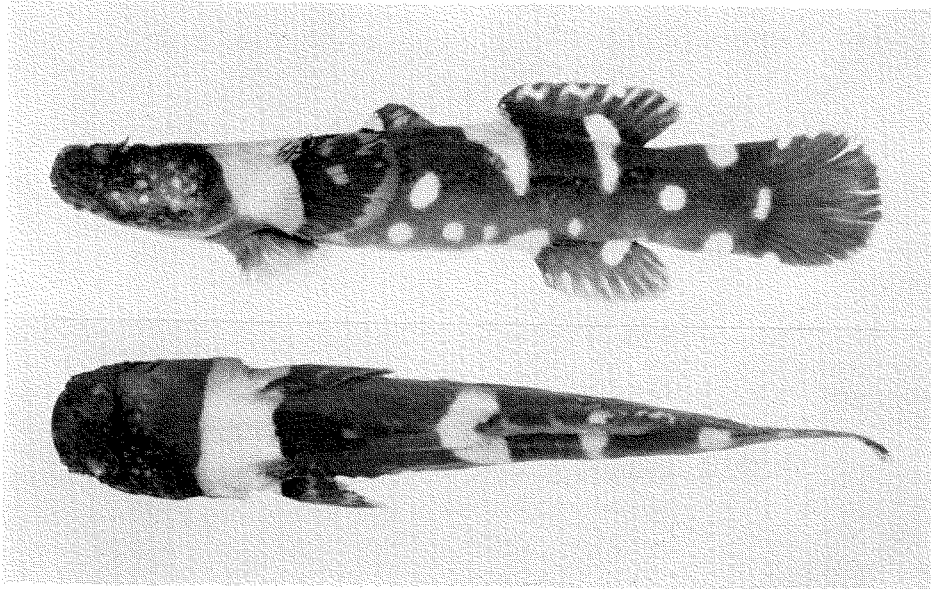


Fig. 1. *Astrabe lactisella*, LICPP 1982164, female, 38.6 mm SL from Izu Oceanic Park, Shizuoka Pref., Japan.

before pelvic fins; body covered with cycloid scales, but scales on lateral side not extending forwards to posterior margin of gill membrane. Found in the sea in Japan.

Astrabe lactisella Jordan et Snyder

(Japanese name: Shirokurahaze)

(Fig. 1)

Astrabe lactisella Jordan and Snyder, 1901: 119, fig. 26.

Material. Holotype: CAS (California Academy of Sciences) (SU) 06460, 28.2 mm in standard length (SL), female, collected at the rock pools near Misaki, Miura, Kanagawa Pref., August, 1900.

Other specimens: USNM (United States National Museum) 071533-1, 39.2 mm SL, male, Misaki, Miura, Kanagawa Pref., 1906, collected by Snyder and Sindo. USNM 071533-2, 37.2 mm SL, male, same data as USNM 071533-1. USNM 071533-3, 28.8 mm SL, same data as USNM 071533-1. USNM 071533-4, 24.1 mm SL, same data as USNM 071533-1. ZUMT (Department of Zoology, University Museum, University of Tokyo) 28675, 42.7 mm SL, female, Misaki, Miura, Kanagawa Pref., May 2, 1912. ZUMT 29243, 37.2 mm SL, male, same locality as ZUMT 28675, date unknown. ZUMT 35951, 33.9 mm SL, female, Uchiura, Amatsukominato, Awa-gun, Chiba Pref., date unknown. ZUMT 35952, 19.8 mm SL, same data as ZUMT 35951. ZUMT 35953, 21.4 mm SL, same data as ZUMT 35951. LICPP (Labora-

tory of Ichthyology, the Crown Prince's Palace, Tokyo) 1982164, 38.6 mm SL, female, at 5 m depth, Izu Oceanic Park, Futo, Ito, Shizuoka Pref., November 25, 1982, collected by Masuda. No catalogue number, kept in Mie Prefectural Museum, 25.4 mm SL, Oshima, Wagu, Shima, Shima-gun, Mie Pref., date unknown.

Diagnosis. A protrusion on upper posterior part of dermal fold along upper margin of eye; 55 to 60 (mean 58.1) scales in a longitudinal row; 19 to 22 (mean 20.9) scales in a transverse row; no predorsal scales; belly without scales; distribution of scales individually different, from extending to near posterior end of base of 1st dorsal fin and posterior part of base of 2nd dorsal and anal fins to not extending to these fins; width of scaled area 80.3 to 88.5% (mean 84.7%) of body depth at origin of anal fin; a wide white transverse band across base of pectoral fins whose width at median dorsal side is 11.1 to 16.7% (mean 13.6%) of standard length; no white transverse band across anterior part of 1st dorsal fin extending to ventral side of body; in life white markings on a dark brown ground colour.

Description. Counts and measurements of the material are shown in Table 1.

The arrangement of the dermal folds and sensory papillae on the head is shown in Fig. 2. Large dermal fold along upper margin of eye with a protrusion on upper posterior part. Several

Table 1. Counts and measurements of *Astrabe lactisella*.

	Holotype CAS (SU) 06460	USNM 071533				LICPP 1982164	No cat. no.
		1	2	3	4		
Sex	♀	♂	♂	?	?	♀	?
Total length (mm)	35.2	47.8	45.5	34.6	29.8	45.4	31.0
Standard length (mm)	28.2	39.2	37.2	28.8	24.1	38.6	25.4
Dorsal fin rays	III-I, 10	II-I, 9	III-I, 9	III-I, 9	III-I, 9	III-I, 10	III-I, 10
Anal fin rays	I, 9	I, 9	I, 9	I, 9	I, 9	I, 9	I, 9
Segmented caudal fin rays	10+9=19	10+9=19	10+9=19	10+9=19	10+9=19	9+8=17	10+9=19
Pectoral fin rays (left side)	26	25	26	26	25	24	26
Upper free rays	7	6	6	8	7	6	7
Lower free rays	1	2	1	2	1	2	2
Scales in a longitudinal row	56	60	58	59	59	55	58
Scales in a transverse row	22	20	21	19	20	20	21
Predorsal scales	0	0	0	0	0	0	0
Relation between pterygiophores of dorsal fins and vertebrae	6/III000/12·13	6/II000/12	7/II0100/12·13	6/III000/12·13	6/III000/12·13	6/II0100/12	7/II000/12·13
Vertebrae	15+15=30	14+16=30	14+16=30	14+16=30	14+16=30	14+16=30	14+16=30
		ZUMT					
		28675	29243	35951	35952	35953	
Sex	♀	♂	♀	?	?	♀	?
Total length (mm)	51.6	45.6	42.0	26.7	25.5	45.4	31.0
Standard length (mm)	42.7	37.2	33.9	19.8	21.4	38.6	25.4
Dorsal fin rays	III-I, 10	III-I, 10	III-I, 10	III-I, 10	III-I, 10	III-I, 10	III-I, 10
Anal fin rays	I, 9	I, 9	I, 9	I, 9	I, 9	I, 9	I, 9
Segmented caudal fin rays	10+9=19	10+9=19	10+9=19	10+9=19	10+8=18	9+8=17	10+9=19
Pectoral fin rays (left side)	28	26	26	25	25	24	26
Upper free rays	7	6	7	7	7	6	7
Lower free rays	2	1	1	1	1	2	2
Scales in a longitudinal row	60	56	59	58	59	55	58
Scales in a transverse row	22	21	22	21	22	20	21
Predorsal scales	0	0	0	0	0	0	0
Relation between pterygiophores of dorsal fins and vertebrae	6/II01000/12·13	6/III000/12·13	6/III00/12	6/III00/12	6/III000/12·13	6/II0100/12	7/II000/12·13
Vertebrae	14+16=30	14+16=30	14+16=30	14+16=30	14+16=30	14+16=30	14+16=30

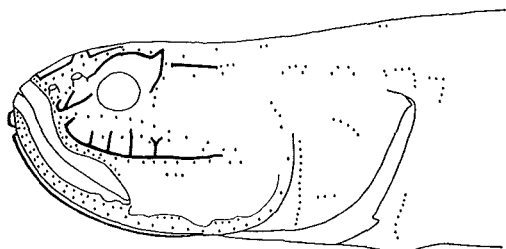


Fig. 2. Dermal folds and sensory papillae of *Astrabe lactisella*, LICPP 1982164, female, 38.6 mm SL. Bold lines indicate the edges of the dermal folds.

short transverse dermal folds on upper side of longitudinal dermal fold below eye.

Six to 8 free rays in upper part and 1 to 2 free rays in lower part of pectoral fin.

No predorsal scales. Belly without scales. Distribution of scales to base of 1st dorsal, 2nd dorsal and anal fins individually different, in holotype scales not extending to base of 1st dorsal, 2nd dorsal and anal fins, but in specimen LICPP 1982164 scales extending to near posterior end of base of 1st dorsal fin and posterior part of base of 2nd dorsal and anal fins. Width of scaled area 80.3 to 88.5% (mean 84.7%) of body depth at origin of anal fin, in holotype 81.6%.

The colour of the holotype and the specimens USNM 071533 and LICPP 1982164 in preservative is well kept and is as follows. But the width of a white transverse band across the base of pectoral fins was measured on all the specimens. Ground colour dark. White spots scattered on head. A wide white transverse band across base of pectoral fins whose width at median dorsal line is 11.1 to 16.7% (mean 13.6%) of standard length, in holotype 16.7%. No white transverse band across anterior part of 1st dorsal fin extending to ventral side of body; in two specimens USNM 071533 (28.8 and 39.2 mm SL) a white blotch on anterior part of 1st dorsal fin extending to adjacent dorsal side of body; in specimen LICPP 1982164 a white blotch confined to anterior part of dorsal fin; in holotype and two specimens USNM 071533 (24.1 and 37.2 mm SL) no white blotch on anterior part of 1st dorsal fin. A white transverse band across anterior part of 2nd dorsal fin extending downwards to about middle part of lateral side of body and not continuous with a white blotch at origin of anal fin. Two white blotches on upper and lower sides of base of cau-

dal fin. Pectoral fin, in addition to a white transverse band at base, with white blotches and a white edge. Body and other fins except for pale pelvic fins with white blotches.

The ground colour is dark brown and the white markings are white in the photograph taken immediately after fixation.

Habitat. The holotype and the specimens USNM 071533 were collected in pools (Jordan and Snyder, 1901; Snyder, 1912). The specimen LICPP 1982164 was found under a stone on a sandy bottom with stones of 30 cm to 1 m in diameter at a depth of 5 m (Mr. H. Masuda, pers. comm.).

Collection localities. Uchiura, Amatsukomina-to, Awa-gun, Chiba Pref.; Misaki, Miura, Kanagawa Pref.; Izu Oceanic Park, Futo, Ito, Shizuoka Pref.; Oshima, Wagu, Shima, Shima-gun, Mie Pref. (Fig. 7).

Remarks. The distribution of *A. lactisella* recorded by Prince Akihito (1984) must be corrected for the following reasons. The specimen from Onahama, Fukushima Pref., which had been identified by Tomiyama (1936) as *A. lactisella*, could not be classified as *A. lactisella* owing to its small size. The specimen from Tanegashima recorded by Snyder (1912) and that from Tassha, Sadogashima, Niigata Pref. recorded by Honma and Tamura (1972) as *A. lactisella* were found to be not identical with *A. lactisella*; each of them belongs to a separate species, as described below.

Astrabe flavimaculata sp. nov.

(Japanese name: Kimadarahaze)

(Fig. 3)

Astrabe sp.: Prince Akihito, 1984: 280, pl. 254-J, K, fig. 193.

Material. Holotype: NSMT (National Science Museum, Tokyo)-P 44138, 31.4 mm SL, male, at 5 m depth, Izu Oceanic Park, Futo, Ito, Shizuoka Pref., December 29, 1984, collected by Ono and Otaki.

Paratypes: USNM 071404, 35.1 mm SL, female, Tanegashima, Kagoshima Pref., 1906, collected by Snyder and Sindo. NSMT-P 44139, 42.0 mm SL, male, at 6 m depth, same locality as holotype, June 28, 1983, collected by Masuda. NSMT-P 44140, 39.8 mm SL, female, same data as NSMT-P 44139. NSMT-P 44141, 39.1 mm SL, male, at 5 m depth, same locality as holotype, February 9, 1981, collected by Naito. NSMT-P 44142, 32.0 mm SL, male, same data as holotype. NSMT-P 44143, 28.0 mm SL, male, same



Fig. 3. *Astrabe flavimaculata* sp. nov., holotype, NSMT-P 44138, male, 31.4 mm SL from Izu Oceanic Park, Shizuoka Pref., Japan.

data as holotype.

Non-types: No catalogue number, kept in Nagasaki University, 5 specimens, 23.8–38.0 mm SL, Mageshima, Nishinoomote, Kagoshima Pref., May 29–30, 1950, collected by Imai.

Diagnosis. No protrusion on upper posterior part of dermal fold along upper margin of eye; 49 to 53 (mean 51.9) scales in a longitudinal row; 18 to 20 (mean 19.0) scales in a transverse row; 7 to 11 predorsal scales; belly with scales; scales extending to a wide part of base of 1st dorsal, 2nd dorsal and anal fins; a narrow white transverse band across base of pectoral fins whose width at median dorsal line is 1.4 to 4.8% (mean 3.7%) of standard length; no white transverse band across anterior part of 1st dorsal fin extending to ventral side of body; in life yellow markings on a dark brown ground colour except for white transverse band across base of pectoral fins.

Description. Counts and measurements of the holotype and the paratypes are shown in Table 2.

The arrangement of the dermal folds and sensory papillae on the head is shown in Fig. 4. Low dermal fold along upper margin of eye. Several low and short transverse dermal folds on upper side of longitudinal dermal fold below eye.

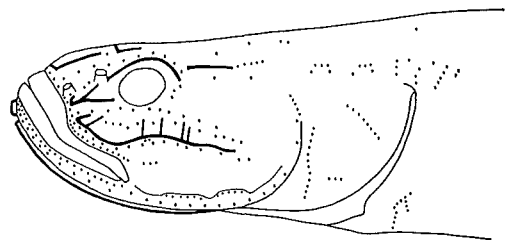


Fig. 4. Dermal folds and sensory papillae of *Astrabe flavimaculata* sp. nov., holotype, NSMT-P 44138, male, 31.4 mm SL. Bold lines indicate the edges of the dermal folds.

Six to 8 free rays in upper part and 1 to 2 free rays in lower part of pectoral fin.

Seven to 11 predorsal scales, anteriormost scale not reaching posterior margin of gill membrane. Belly with scales. Scales extending to a wide part of base of 1st dorsal, 2nd dorsal and anal fins.

The colour of the holotype and the paratypes in preservative is well kept and is as follows. Ground colour dark. White spots scattered closely on head. A narrow white transverse band across base of pectoral fins whose width at median

dorsal line is 1.4 to 4.8% (mean 3.7%) of standard length, in holotype 3.8%. No white transverse band across anterior part of 1st dorsal fin extending to ventral side of body; in holotype and all paratypes a white blotch on anterior part of 1st dorsal fin extending to adjacent dorsal side of body. A white transverse band across anterior part of 2nd dorsal fin continuous with that of anal fin on each side in holotype and in paratypes USNM 071404 and NSMT-P 44141. Other paratypes with band interrupted on each side. Two white blotches on upper and lower sides of base of caudal fin. Pectoral fin, in addition to a white transverse band at base, with white blotches and a white edge, but both sides of pectoral fins of paratypes USNM 071404 and NSMT-P 44142 with a broad white transverse band and a white edge. Body and other fins except for pale pelvic fins with white blotches.

The ground colour is dark brown and the white transverse band across the base of pectoral fins is white, but the other white markings are yellow in the photographs taken immediately after fixation.

Habitat. The holotype and the paratypes NSMT-P 44139–44143 were found under stones of 30 cm to 1 m in diameter on a sandy bottom at a depth of 5 to 6 m. *A. lactisella* is also collected at the same place (Mr. H. Masuda, pers. comm.). The paratype USNM 071404 and the specimens from Mageshima were collected in pools (Snyder, 1912; Dr. Y. Dotsu, pers. comm.).

Collection localities. Izu Oceanic Park, Futo, Ito, Shizuoka Pref.; Tanegashima, Kagoshima Pref.; Mageshima, Nishinoomote, Kagoshima Pref. (Fig. 7).

Etymology. The name for this species is taken from the yellow blotches on the body and fins.

Comparison with *A. lactisella*. *A. flavimaculata* differs from *A. lactisella* in the following characteristics. *A. flavimaculata* has no protrusion on the upper posterior part of the dermal fold along the upper margin of the eye, whereas *A. lactisella* has a protrusion. *A. flavimaculata* has 49 to 53 (mean 51.9) scales in a longitudinal row, whereas *A. lactisella* has 55 to 60 (mean 58.1) scales. *A. flavimaculata* has 7 to 11 predorsal scales, whereas *A. lactisella* has none. *A. flavimaculata* has scales on the belly, whereas *A. lactisella* has none. *A. flavimaculata* has a narrow white transverse band across the base of the pectoral fins whose width at the median dorsal line is 1.4

to 4.8% (mean 3.7%) of the standard length, whereas *A. lactisella* has a broad band whose width is 11.1 to 16.7% (mean 13.6%) of the standard length. In life *A. flavimaculata* has yellow markings on a dark brown ground colour except for the white transverse band across the base of the pectoral fins, whereas *A. lactisella* has only white markings on a dark brown ground colour.

Remarks. Some corrections are made in this description to the previous explanation of this species by Prince Akihito (1984). Fig. 193 accompanied by this explanation does not show a dermal fold on the upper margin of the eye. However, though lower than that of *A. lactisella*, a dermal fold is present but without a protrusion on its upper posterior part. The previous explanation denies the presence of several short transverse dermal folds on the upper side of the longitudinal dermal fold below the eye, but they are present, although lower than those of *A. lactisella*.

The specimen recorded from Tanegashima by Snyder (1912) as *A. lactisella* is found to be *A. flavimaculata*; therefore it is designated as one of the paratypes. The specimens recorded from Mageshima by Dotsu and Shiohaki (1971) as *A. lactisella* are also found to be *A. flavimaculata*. Tanegashima and Mageshima should be added to the locality recorded in the previous explanation.

Astrabe fasciata sp. nov.

(New Japanese name: Shima-shirokurahaze)

(Fig. 5)

Material. Holotype: NSMT-P 44535, 48.0 mm SL, male, Tappizaki, Miumaya, Higashitsugaru-gun, Aomori Pref., September 19, 1982, collected by Shiohaki.

Paratypes: NSMT-P 44536, 27.2 mm SL, same data as holotype. NUSMBS (Sado Marine Biological Station, Niigata University) 1956523, 35.0 mm SL, female, Tassha, Aikawa, Sado-gun, Sadogashima, Niigata Pref., May 23, 1956.

Diagnosis. A protrusion on upper posterior part of dermal fold along upper margin of eye; 51 to 54 (mean 52.7) scales in a longitudinal row; 10 to 14 (mean 11.7) scales in a transverse row; no predorsal scales; belly without scales; scales not extending to 1st dorsal, 2nd dorsal and anal fins; width of scaled area 44.0 to 66.7% (mean 57.7%)

Table 2. Counts and measurements of *Astrabe flavimaculata* sp. nov. *Upper 4 rays are united at tip and 5th and 6th rays are free.

	Holotype NSMT-P 44138	Paratypes					
		USNM 071404	NSMT-P				
			44139	44140	44141	44142	44143
Sex	♂	♀	♂	♀	♂	♂	♂
Total length (mm)	40.5	43.0	51.7	49.0	48.5	39.6	35.8
Standard length (mm)	31.4	35.1	42.0	39.8	39.1	32.0	28.0
Dorsal fin rays	III-I, 10	III-I, 10	III-I, 10	III-I, 10	III-I, 9	III-I, 9	III-I, 10
Anal fin rays	I, 9	I, 9	I, 9	I, 8	I, 8	I, 9	I, 9
Segmented caudal fin rays	9+8=17	10+9=19	9+8=17	9+8=17	9+8=17	9+8=17	9+8=17
Pectoral fin rays (left side)	24	26	26	25	26	25	26
Upper free rays	7	6 (abnormal)*	8	7	7	6	7
Lower free rays	1	1	2	1	2	2	2
Scales in a longitudinal row	49	53	53	50	52	53	53
Scales in a transverse row	19	18	19	20	19	18	20
Predorsal scales	10	7	7	8	9	11	9
Relation between pterygiophores of dorsal fins and vertebrae	6/III000/12·13	6/III00/12	6/III000/12·13	6/III00/12	6/III00/12	7/II0100/13	6/III00/12
Vertebrae	14+16=30	14+16=30	14+16=30	14+16=30	14+16=30	15+15=30	14+16=30



Fig. 5. *Astrabe fasciata* sp. nov., holotype, NSMT-P 44535, male, 48.0 mm SL from Tappizaki, Aomori Pref., Japan.

of body depth at origin of anal fin; a narrow white transverse band across base of pectoral fins whose width at median dorsal line is 4.0 to 8.0% (mean 6.2%) of standard length; a white transverse band of similar width across anterior part

of 1st dorsal fin extending to ventral side of body; in life white markings on a dark brown ground colour.

Description. Counts and measurements of the holotype and the paratypes are shown in Table 3.

Table 3. Counts and measurements of *Astrabe fasciata* sp. nov.

	Holotype NSMT-P 44535	Paratypes	
		NSMT-P 44536	NUSMBS 1956523
Sex	♂	?	♀
Total length (mm)	58.4	32.6	42.4
Standard length (mm)	48.0	27.2	35.0
Dorsal fin rays	III-I, 10	III-I, 10	III-I, 11
Anal fin rays	I, 9	I, 9	I, 9
Segmented caudal fin rays	11+9=20	10+9=19	10+9=19
Pectoral fin rays (left side)	26	27	25
Upper free rays	5	5	5
Lower free rays	1	2	2
Scales in a longitudinal row	54	53	51
Scales in a transverse row	11	14	10
Predorsal scales	0	0	0
Relation between pteryg'ophores of dorsal fins and vertebrae	6/III000/12·13	6/III000/12·13	6/III000/12·13
Vertebrae	14+16=30	14+16=30	14+16=30

The arrangement of the dermal folds and sensory papillae on the head is shown in Fig. 6. Large dermal fold along upper margin of eye with a protrusion on upper posterior part. Several short transverse dermal folds on upper side of longitudinal dermal fold below eye.

Five free rays in upper part and 1 to 2 free rays in lower part of pectoral fin.

No predorsal scales. Belly without scales. Scales not extending to base of 1st dorsal, 2nd dorsal and anal fins. Width of scaled area 62.3% of body depth at origin of anal fin in holotype and 66.7% in paratype NSMT-P 44536 and 44.0% in paratype NUSMBS 1956523.

The colour of the holotype and the paratypes in preservative is as follows. Since the colour of the paratype NUSMBS 1956523 has faded, the colour description is based on the original photograph of the paratype NUSMBS 1956523 shown in Fig. 2 by Honma and Tamura (1972), except for the width of the 1st and 2nd white transverse bands on the body which was measured on the paratype. Ground colour dark. White spots scattered on head. Four white transverse bands on body. First band across base of pectoral fins, whose width at median dorsal line is 4.0% of standard length in holotype and 6.6% in paratype NSMT-P 44536 and 8.0% in paratype NUSMBS 1956523. Second band across anterior part of 1st dorsal fin extending downwards to about the level of lower side of base of pectoral fins; its width at median dorsal line wider than that across base of pectoral fins in holotype and narrower in paratypes. Third band across anterior part of 2nd dorsal fin extending to anterior part of anal fin; in holotype right side band interrupted at middle and near anal fin. Fourth band across posterior part of 2nd dorsal fin extending downwards but not reaching anal fin except for paratype NSMT-P 44536, whose right side band reaches anal fin; in holotype and in paratype NUSMBS 1956523 left side band interrupted at middle. Two white blotches on upper and lower sides of caudal fin. Paratype NSMT-P 44536 with a white transverse band on caudal fin. Pectoral fin with, in addition to a white transverse band at base, 4 narrow white transverse bands and a white edge in holotype and 2 white transverse bands and a white edge in paratypes NSMT-P 44536 and NUSMBS 1956523. Body and other fins except for pale pelvic fins with white blotches.

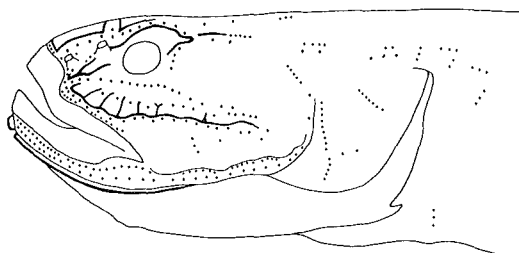


Fig. 6. Dermal folds and sensory papillae of *Astrabe fasciata* sp. nov., holotype, NSMT-P 44535, male, 48.0 mm SL. Bold lines indicate the edges of the dermal folds.

The ground colour is dark brown and the white markings are white in the photographs taken several days after fixation.

Habitat. The holotype and the paratype NSMT-P 44536 were found under stones of 5 cm to 30 cm in diameter on a rocky bottom at a depth of 1 to 2 m (Dr. M. Shiogaki, pers. comm.).

Collection localities. Tappizaki, Miumaya, Higashisugaru-gun, Aomori Pref.; Tassha, Aikawa, Sado-gun, Sadogashima, Niigata Pref.; Nomozaki, Nishisonogi-gun, Nagasaki Pref. (identified from Fig. 1 of Dotsu and Shiogaki, 1971) (Fig. 7).

Etymology. The name for this species is taken from the white bands on the body.

Comparison with *A. lactisella*. *A. fasciata* is not different from *A. lactisella* in the dermal folds. *A. fasciata* differs from *A. lactisella* in the following characteristics. *A. fasciata* has 10 to 14 (mean 11.7) scales in a transverse row, whereas *A. lactisella* has 19 to 22 (mean 20.9) scales. *A. fasciata* has a narrower scaled area on the lateral side of the body, its width being 44.0 to 66.7% (mean 57.7%) of the body depth at the origin of the anal fin, whereas *A. lactisella* has a broader scaled area, its width being 80.3 to 88.5% (mean 84.7%) of the body depth at the origin of the anal fin. *A. fasciata* has a narrower white transverse band across the base of the pectoral fins, whose width at the median dorsal line is 4.0 to 8.0% (mean 6.2%) of the standard length, whereas *A. lactisella* has a broader band, whose width is 11.1 to 16.7% (mean 13.6%) of the standard length. *A. fasciata* has a white transverse band across the anterior part of the 1st dorsal fin extending to the ventral side of the body, whereas *A. lactisella* has a blotch on the anterior part of the 1st dorsal fin or none.

In addition the following characteristics seem

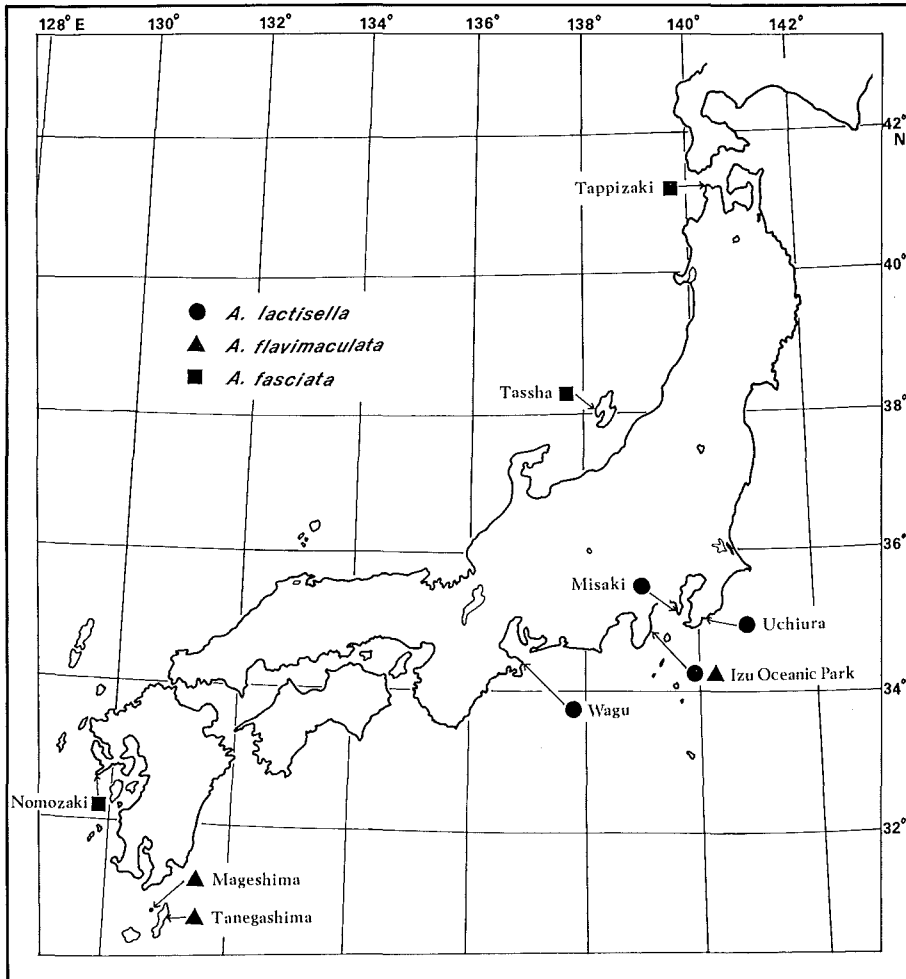


Fig. 7. The collection localities of the three species of the genus *Astrabe*.

to show some differences between the two species. *A. fasciata* has 5 free rays in the upper part of the pectoral fin, whereas *A. lactisella* has 6 to 8 free rays; *A. fasciata* has 51 to 54 (mean 52.7) scales in a longitudinal row, whereas *A. lactisella* has 55 to 60 (mean 58.1) scales; *A. fasciata* has white-banded pectoral fins, whereas *A. lactisella* has white-blotched pectoral fins.

Comparison with *A. flavimaculata*. *A. fasciata* differs from *A. flavimaculata* in the following characteristics. *A. fasciata* has a protrusion on the upper posterior part of the dermal fold along the upper margin of the eye, whereas *A. flavimaculata* has no protrusion. *A. fasciata* has 10 to 14 (mean 11.7) scales in a transverse row, whereas *A. flavimaculata* has 18 to 20 (mean 19.0) scales.

A. fasciata has no predorsal scales, whereas *A. flavimaculata* has 7 to 11 predorsal scales. *A. fasciata* has no scales on the belly, whereas *A. flavimaculata* has them. *A. fasciata* has no scales extending to the 1st dorsal, 2nd dorsal and anal fins, whereas *A. flavimaculata* has scales extending to a wide part of the base of the 1st dorsal, 2nd dorsal and anal fins. *A. fasciata* has a white transverse band across the anterior part of the 1st dorsal fin extending to the ventral side of the body, whereas *A. flavimaculata* has a blotch on the anterior part of the 1st dorsal fin.

In life *A. fasciata* has only white markings on a dark brown ground colour, whereas *A. flavimaculata* has yellow markings on a dark brown ground colour except for the white transverse band across

the base of the pectoral fins.

In addition the width of the white transverse band across the base of the pectoral fins seems to show some difference. *A. fasciata* has a broader band whose width at the median dorsal line is 4.0 to 8.0% (mean 6.2%) of the standard length, whereas *A. flavimaculata* has a narrower band whose width is 1.4 to 4.8% (mean 3.7%) of the standard length.

Remarks. The examination of the specimen from Tassha, Sadogashima, shown in Fig. 2 of Honma and Tamura (1972) as *A. lactisella* showed that it is *A. fasciata*; therefore it is designated as one of the paratypes. This paratype is the only specimen from Sadogashima which is available for examination (Dr. Y. Honma, pers. comm.).

Although not available for examination, the specimen collected at Nomozaki, shown in Fig. 1A, B, and C of Dotsu and Shioyaki (1971) as *A. lactisella* is considered to be *A. fasciata*, because, in addition to the presence of a white transverse band across the anterior part of the 1st dorsal fin extending to the ventral side, the width of the white transverse band across the base of the pectoral fins is 7.6% of the standard length calculated from the figure.

Key to the species of the genus *Astrabe*

- 1a. A protrusion on upper posterior part of dermal fold along upper margin of eye; no predorsal scales; belly without scales; in life white markings on a dark brown ground colour 2
- 1b. No protrusion on upper posterior part of dermal fold along upper margin of eye; predorsal scales present; belly with scales; in life yellow markings on a dark brown ground colour except for white transverse band across base of pectoral fins
.....*A. flavimaculata* sp. nov.
- 2a. Scales in a transverse row 19 to 22; width of scaled area 80 to 89% of body depth at origin of anal fin; width of white transverse band across base of pectoral fins 11 to 17% of standard length; no white transverse band across anterior part of 1st dorsal fin extending to ventral side of body
..... *A. lactisella* Jordan et Snyder
- 2b. Scales in a transverse row 10 to 14; width of scaled area 44 to 67% of body depth at

origin of anal fin; width of white transverse band across base of pectoral fins 4 to 8% of standard length; a white transverse band across anterior part of 1st dorsal fin extending to ventral side of body
..... *A. fasciata* sp. nov.

Acknowledgments

We wish to thank Mr. Hajime Masuda of Masuda Marine Productions for the gift of the specimens of *Astrabe lactisella* and *A. flavimaculata*, of which the latter have now been deposited in the National Science Museum, Tokyo, as the types; Dr. William N. Eschmeyer of California Academy of Sciences for the loan of the holotype of *A. lactisella*; Dr. Masaru Shioyaki of the Aquaculture Center, Aomori Prefecture for the loan of the specimens of *A. fasciata* which have now been deposited in the National Science Museum, Tokyo as the types; Dr. Yoshiharu Honma of Niigata University for the loan of the specimen of *A. fasciata* which we have designated as the paratype; Dr. Yoshie Dotsu of Nagasaki University for the loan of the specimens of *A. flavimaculata*; Dr. Ernest A. Lachner and Miss Susan Jewett of the National Museum of Natural History, Smithsonian Institution, Washington, D. C. for the loan of the specimens of *A. lactisella* one of which we have designated as the paratype of *A. flavimaculata*; Dr. Yoshiaki Tominaga of the Department of Zoology, University Museum, University of Tokyo, and Mr. Yasuo Tomida of the Mie Prefectural Museum for the loan of the specimens of *A. lactisella*.

We are grateful to Drs. Ryoichi Arai of the National Science Museum, Tokyo, and Richard C. Goris of Yokohama City University for their advice about the manuscript. We are indebted to Mr. Katsuichi Sakamoto of the Office of the Crown Prince's Household for drawing the figures; and to Mr. Akihisa Iwata of the Office of the Crown Prince's Household for taking the photographs.

Literature cited

Akihito, Prince. 1984. *Astrabe lactisella* (p. 280, fig. 192, pl. 254-I); *Astrabe* sp. (p. 280-281, fig. 193, pl. 254-J, K). In H. Masuda, K. Amaoka, C. Araga, T. Uyeno and T. Yoshino, eds. The fishes of the

- Japanese Archipelago. English text and plates. Tokai Univ. Press, Tokyo.
- Dotsu, Y. and M. Shioyaki. 1971. Larvae, juveniles, and young of the gobioid fish, *Astrabe lactisella*. Japan. J. Ichthyol., 18 (4): 182-186. (In Japanese.)
- Honma, Y. and E. Tamura. 1972. A revised list of the gobioid fishes (suborder Gobioidae) from the waters adjacent to Niigata and Sado Island in the Japan Sea. Bull. Niigata Pref. Biol. Soc. Educ., (8): 33-38. (In Japanese.)
- Jordan, D. S. and J. O. Snyder. 1901. A review of the gobioid fishes of Japan, with descriptions of twenty-one new species. Proc. U. S. Natn. Mus., 24 (1244): 33-132.
- Snyder, J. O. 1912. Japanese shore fishes collected by the United States Bureau of Fisheries steamer "Albatross" expedition of 1906. Proc. U. S. Natn. Mus., 42: 399-450, pls. 51-61.
- Tomiyaama, I. 1936. Gobiidae of Japan. Japan. J. Zool., 7 (1): 37-112.
- (The Crown Prince's Palace, Motoakasaka, Minato-ku, Tokyo 107, Japan)

日本で採集されたシロクラハゼ属の2新種

明仁親王・目黒勝介

シロクラハゼ属の2種キマダラハゼ *Astrabe flavima-*

culata とシマシロクラハゼ *A. fasciata* を新種として記載し、シロクラハゼ属の模式種であり、今まで知られていた唯一の種であるシロクラハゼ *A. lactisella* についても前2種と比較して再記載した。キマダラハゼは日本産魚類大図鑑の中でキマダラハゼ *Astrabe* sp. として明仁親王 (1984) が解説を付したものである。キマダラハゼはシロクラハゼとは眼の上縁にある皮褶の上後部が突出しないこと、縦列鱗数が少ないこと、第1背鰭前方と腹部に鱗があること、胸鰭基部を通る白色横帯の幅が狭いこと、生時には胸鰭基部を通る白色横帯を除き、暗褐色地に黄色模様が見られることによって区別される。シマシロクラハゼはシロクラハゼとは横列鱗数が少ないこと、体側の鱗のある部分の幅が狭いこと、胸鰭基部を通る白色横帯の幅が狭いこと、第1背鰭前部から体の腹側に向かう白色横帯があることによって区別される。この度の標本の調査により、Snyder (1912) が記録した種子島産の *A. lactisella* はキマダラハゼであり、本間・田村 (1972) が記録した佐渡島達者産のシロクラハゼはシマシロクラハゼであることが判明したので、これらの標本はそれぞれの種の副模式標本とした。また道津・塩垣 (1971) がシロクラハゼとして扱ったものの中、標本を調べることが出来た鹿児島県馬毛島産のものはキマダラハゼであった。長崎県野母崎産の標本は図から判断するとシマシロクラハゼと考えられる。明仁親王 (1984) のシロクラハゼとキマダラハゼの解説は訂正しなければならない。

(107 東京都港区元赤坂 東宮御所)