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Description of a New Nomeid Fish from Japan*

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Since 1958, one of the authors (ABE) has noticed a close ally of *Psenes cyanophrys* VALENCIENNES appearing very rarely in Sagami Bay. Recently additional much larger specimens of this species have been received for study, and the specimen upon which undoubtedly the record of *Psenes cyanophrys* by Dr. KAMOHARA (1942) was based has been sent on loan from the Seto Maine Biological Station, Kyoto University. Further, a radiograph of the type specimen of *Psenes cyanophrys* VALENCIENNES has been received through courtesy of Prof. J. GUIBÉ and Dr. M. BLANC. Although there remains much to be studied about the change of the dentiton with growth and the individual variation in the number of the spines and soft rays of the dosal and anal fins, the present authors think it better to give a new scientific name to the nomeid fish from Japan to which Dr. KAMOHARA gave a Japanese name "Sudji-hanabira-uwo". This species has teeth on the vomer, palatines and tongue suggesting its close relation with *Cubices* and *Parapsenes*, but lacks the mucous pores on the body which are remarkable in some stromateoid fishes. The authors wish to express their sincere thanks to Dr. Fujio UTINOUMI (Seto Marine Biological Station), Prof. GUIBÉ (Museum National d'Histoire Naturelle, Paris), Dr. BLANC (the same museum as above), Mr. D. AOKI (Manazuru Fish Market) and Mr. M. WATANABE (Izumi Junior High School, Atami City) for their kindness and cooperation.

Psenes kamoharai, new name

"Sudji-hanabira-uwo"

Psenes cyanophrys KAMOHARA (not of VALENCIENNS), 1942, pp. 165 & 166. Kii Peninsula, Japan.

Study material.—Holotype: A young example (Cat. No. SMBL Type 198). Total length *ca.* 102 mm., fork length 86 mm., standard length *ca.* 76 mm. This specimen is believed to be the one upon which Dr. KAMOHARA's record of *Psenes cyanophrys* was based. Its locality is believed to be Kii Peninsula.

Paratypes: 1 specimen** (Cat. No. 52309, Zoological Institute, Faculty of Science, University of Tokyo) measuring 248 mm. in total length, 203 mm. in fork length and 185 mm. in standard length. Taken at 5:00 p.m., 20/VIII 1963, 40 miles northwest of Hamada, Shimane Prefecture (in Japan Sea) along with 15 individuals of *Coryphaena*

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hippurus LINNAEUS measuring *ca.* 500 mm. in fork length, 5 individuals of *Aluterus monoceros* LINNAEUS measuring 350-400 mm. in total length, 1 individual of *Kyphosus* sp. measuring 150 mm. in total length, more than 50 individuals of *Stephanolepis cirrhifer* (TEMMINCK & SCHLEGEL) measuring 20-50 mm. in total length and *Oplegnathus fasciatus* (TEMMINCK & SCHLEGEL) measuring *ca.* 50 mm. in total length.

1 specimen* measuring 250 mm. in total length, 212 mm. in fork length and 197 mm. in standard length. Taken on 31/VII 1960, off Hamada, Shimane Prefecture, by "Shiira-zuke" (a peculiar type of purse seine fishing for the dolphin, *Coryphaena hippurus* LINNAEUS, using bamboo-tree raft as floating shelter).

1 specimen** measuring *ca.* 240 mm. in total length, 210 mm. in fork length and 194 mm. in standard length. Taken on 23/VIII 1960, off Hamada, Shimane Prefecture, by "Shiira-zuke".

1 specimen† measuring 195 mm. in total length, 164 mm. in fork length and 146 mm. in standard length. Undoubtedly from the western part of Sagami Bay. Collected during 1956-1960.

1 specimen (Cat. No. ABE '58-236) measuring *ca.* 154 mm. in total length, 128 mm. in fork length and 115 mm. in standard length. Collected during the first half of 1958 at Manazuru, probably by trap net.

1 specimen (Cat. No. ABE '58-235) measuring more than 160 mm. in total length, 140 mm. in fork length and 126 mm. in standard length. Collected during the first half of 1958 at Manazuru probably by trap net.

Measurements and counts—These are given in table 1.

General appearance.—As the holotype is not in a good state, there remains little to be added to the brief description given by Dr. KAMOHARA (1942) who regarded the specimen to represent *Psenes cyanophrys*. The following description is based on one of the paratypes (Cat. No. '60-1961) which, though eviscerated prior to the receipt, is believed to be adult. The body is fairly compressed and deep. The interorbital area is very high, and scaled excepting for the orbital rim. The snout is blunt, rounded and naked. The pelvic fin orinates below the lowermost third of pectoral base, attached to the abdomen by membrane and depressible in a fairly deep furrow. The pectoral fin is long, the tip nearly reaching the vertical through the middle of the soft dorsal, and the upper end of the pectoral base is below the straight line from the lowermost point of the eye and parallel to the line connecting the eye-center and the median line of the caudal peduncle. The prepelvic area is long, slightly rounded and narrow. The caudal fin is deeply forked. The soft dorsal and anal are densely covered with scales. The pectoral, pelvic and caudal fins are covered with scales only basally.

* Tentative catalogue number was ABE '60-1961.

** Tentative catalogue number was ABE '60-1962.

† On loan from Izumi Junior High School, Atami City.

Table 1. Measurements and counts.

	Holotype	Paratypes					
		52309 ZI	'60-1961	'60-1962	On loan from Izumi School	'58-236	'58-235
Total length (mm.)	*ca.* 102	248	250	*ca.* 240	195	*ca.* 154	more than 160
Fork length (mm.)	86	203	212	212	166	128	140
Standard length (mm.)	76	185	197	194	144	115	126
Greatest depth of body (mm.)	40	94	107	*ca.* 100	78	a little damaged 56	64
Greatest wide of body (mm.)	11	29	31	*ca.* 26	21	a little damaged 14	18
Least depth of caudal peduncle (mm.)	8	20	20	*ca.* 18	16	10	12
Length of head (mm.) left	24	54	57	56	43	33	36
Length of head (mm.) right	24	56	57	54	43	34	36
Length of snout (mm.) left	7	16	18	20	14	9	10
Length of snout (mm.) right	7	18	19	19	14	9	12
Horizontal diameter of eye (mm.) left	6	13	14	12	10	9	8
Horizontal diameter of eye (mm.) right	6	13	15	13	10	9	9
Vertical diameter of eye (mm.) left	6	15	15	13	10	9	9
Vertical diameter of eye (mm.) right	6	14	15	13	10	9	9
Interorbital width above eye-centers (mm.)	10	22	24	18	16	13	13
Length of upper jaw (mm.) left	*ca.* 7	17	18	18	14	10	10
Length of upper jaw (mm.) right	8	16	18	18	15	10	11
Least depth of preorbital* (mm.) left	3	7	9	8	6	5	5
Least depth of preorbital* (mm.) right	3	7	9	8	6	4	5
Length of longest dorsal spine (mm.)	(3rd) 12	(3rd) 26	damaged	damaged	(3rd) 24	(4th) 18	(4th) 18
Length of longest dorsal soft rays (mm.)	(2nd & 3rd) 12	(1st) 26	(2nd) 32	(2nd) 32	(2nd & 3rd) 24	(2nd) 17	(2nd) 18
Length of longest anal spine (mm.)	(3rd) *ca.* 6	(3rd) *ca.* 12	(3rd) 15	(2nd) (1st soft ray) 6 16	(2nd) (1st soft ray) 6 16	(3rd) 9	(3rd) 10
Length of longest anal soft rays (mm.)	(2nd & 3rd) 10	(2nd & 3rd) 28	(1st & 2nd) 28	(2nd & 3rd) 30	(3rd & 4th) 22	(2nd & 3rd) 16	(2nd & 3rd) 15
Length of longest pectoral fin-ray (mm.) left	*ca.* 20	(5th**) *ca.* 63	*ca.* 70 (6th**) 72	(5th**) *ca.* 65	(5th** & 6th**) 46	34	(5th & 6th) 35
Length of longest pectoral fin-ray (mm.) right	*ca.* 21	*ca.* 63		*ca.* 65	48	35	(5th & 6th) 35
Length of longest pelvic fin-rays (mm.) left	14	(2nd & 3rd from outside) 22	*ca.* 24	24	19	16	(3rd) 17
Length of longest pelvic fin-rays (mm.) right	13	23	*ca.* 24	24	19	16	(3rd) 17
Length of longest gill-raker (mm.) left	3	5	5	5	5	3	3
Length of longest gill-raker (mm.) right	3	5	5	6	5	3	4
Length of longest gill-filaments on 1st arch (mm.) left	5	9	10	11	8	6	7
Length of longest gill-filaments on 1st arch (mm.) right	5	9	10	11	8	6	7
D	X I 26 (=i+25)	X I 23 (=i+22)	X I 26 (=i+25)	X I 25 (=i+24)	IX I 27 (=ii+25)	X 25 (=i+24)	X 26 (=ii+24)
A	III 25 (or 26)	III 24 (=i+23)	III 27 (=i+26)	II 26 (=i+25)	II 26 (=i+25)	III 25 (=i+24)	III 26 (all branched)
P left	19 (=ii+16+i)	i?+19 (=ii+16+i)	*ca.* i+19 (=ii+*ca.* 17)	i?+19 (=ii+17)	i+19 (=ii+17)	i?+19 (=ii+16+i)	i?+18 (=i+16+i)
P right	19 (=ii+16+i)	i?+19 (=ii+16+i)	*ca.* i+19 (=ii+*ca.* 17)	i?+19 (=ii+17)	i+19 (=ii+17)	i?+19 (=ii+16+i)	i?+18 (=i+17)
V (soft rays all branched) left	I 5	I 5	I 5	I 5	I 5	I 5	I 5
V (soft rays all branched) right	I 5	I 5	I 5	I 5	I 5	I 5	I 5
C	x+i+8+7+i+x			x+i+8+7+i+x			
Number of vertebrae	30 or 31			31=13+18 or 14+17	31=14+17		*ca.* 31
Number of pored scales in lateral line left	*ca.* 60	*ca.* 61	*ca.* 65	*ca.* 60	*ca.* 60		
Number of pored scales in lateral line right	*ca.* 60	*ca.* 62	*ca.* 65	*ca.* 60	*ca.* 60		
Number of scales above lateral line at dorsal origin left	1/2 8	*ca.* 1/2 8	1/2 9	1/2 8	*ca.* 1/2 8		
Number of scales above lateral line at dorsal origin right	1/2 8	*ca.* 1/2 8	1/2 8	*ca.* 8	*ca.* 1/2 8	*ca.* 1/2 8	1/2 8
Number of gill-rakers on 1st arch left	10+1+18	9+1+20	9+1+21	9+1+19+i	10+1+20	11+1+19+i	9+1+20
Number of gill-rakers on 1st arch right	11+1+19		9+1+21	9+1+19+i	10+1+20	8+1+19	9 or 10+1+20

* From antero-ventral part of eye to a point near the hind end of upper jaw.

** The uppermost fin-ray hidden beneath the skin is not counted here.

The lateral line is nearly parallel to the dorsal contour of the body. The preoperculum is broadly produced postero-ventrally, and its margin is smooth on the right side; on the left side, where the skin has been rubbed off, there are weak serrations. The mouth is rather small, the hind end of the upper jaw not reaching the vertical through the anterior margin of the eye*. The upper lip is higher than the lower lip. The upper jaw slips completely beneath the preorbital when the mouth is shut. The nostrils are paired on either side, close together, and placed far forward. The anterior nostril is rounded while the posterior one is a vertical slit reaching a little higher than the former. There are minute close-set pores on the head.

The color of the specimen preserved informalin for three years and in which the scales have mostly rubbed off is brownish with blackish mottles. Excepting for the pectoral, all the fins are blackish.

In another paratype taken on August 20, 1953, the dorsal part of the body and head are brownish, but the other parts are silvery with blackish spot in each scale. The pectoral fins are light gray, the dorsal and pectoral fins are black and the caudal fin is dark brown. There is a short light horizontal band from the nostril to the to the anterior orbital rim on either side of the snout, and this band is bordered above and below by darker horizontal bands. The prepelvic area is yellowish. In some parts of the opercular bones, where the scales have been rubbed off, the ground color is yellowish or brownish.

Teeth.—Teeth are present on the jaws, vomer, palatines and tongue. They are all fairly small. The shape and number of the jaw teeth vary considerably from individual to individual, and the change may be associated with growth. Speaking generally, the jaw teeth are arranged in a single row and covered basaly by fairly hard membrane, and only their tips are visible. Sometimes the posterior teeth of the lower jaw are entirely hidden in the membrane. The teeth of the lower jaw are expanded distally, and there are weak barbs along the margin of the distal expanded part. The teeth of the upper jaw are usually curved inwards and rarely expanded and barbed in smaller individuals. The number of the upper jaw teeth is *ca.* 16+*ca.* 13 in the holotype, and *ca.* (13+*ca.* 9?)-(*ca.* 30+*ca.* 30) in the paratypes. The upper jaw teeth are less close-set than the lower jaw teeth. In larger individuals, the upper jaw teeth are expanded distally and barbed as in the lower jaw teeth. The latter are close-set, and number *ca.* 20+*ca.* 20 in the holotype, and (*ca.* 15+*ca.* 15)-(*ca.* 44+*ca.* 46) in the paratypes. In larger individuals the lower jaw teeth are more numerous than in smaller ones.

The vomer bears 1 or 2 teeth. In the holotype the vomerine teeth number 2.

* In the holotype, the hind end of the upper jaw extends beyond the vertical through the anterior margin of the eye on the left side. On the right side, the upper jaw just reaches the vertical through the anterior margin of the eye.

The paratine teeth are invisible in the holotype, but in the other specimens 1-3 teeth are mostly visible on each palatine. The teeth on the tongue are arranged in a longitudinal row on the elevated ridge, and begin far behind. As the teeth are apt to be lost while examining with pincette or pins, the number of teeth, or their presence should be mentioned carefully.

Scales.—Scales are entirely lost in the holotype. In the paratypes the scales are cycloid and of moderate size. The scales on the fins are slightly elongate. The number of the scales is given in table 1.

Esophageal teeth.—As the viscera have mostly been lost in two of the three larger specimens, mention will be made here only of the pair of pockets of the esophagus which have been kept in good shape.

The pocket on either side resembles the trunk of a boiled shrimp in shape and segment-like bands. It is difficult to see the structure of the inside of the pocket in preserved specimens because of the hardening of the mucus, but it may be stated that there are upper and lower bony supports at the entrance both of which are covered with bristle-like teeth, and that there are irregular outgrowths of varied size which are covered by minute teeth. If circumstances will permit, mention will be made elsewhere about the teeth of the esophageal pocket in Stromateoidei.

Pseudobranchiae and gill-arches.—Pseudobranchiae are well developed. In all the specimens examined, there is a well-developed septum between the outer and inner rows of gill-rakers of the second to fourth gill-arches. The septum is much higer than the gill-rakers. On the first gill-arch, the septum is high only anteriorly; there, its height is a little greater than that of the adjoining gill-rakers. Behind the fourth gill-slit there is a row of distinct rakers.

Distinctive characters and relationships.—The present new species is very close to *Psenes cyanophrys* VALENCIENNES, but differs from the latter in having teeth on the vomer, platines and tongue, and probably in the absence of the blue line above the eye on either side. Although there are no mucous pores in the skin of the scale pockets of the trunk, the present species and *Parapsenes rotundus* introduced by Prof. J. L. B. SMITH in 1949 suggest the close relationships between *Psenes* and *Cubiceps*.

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As for the earlier papers, readers are requested to consult the publications by LEGASPI, 1956, and MCKENNEY, 1961, listed below.

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