Japanese Journal of Ichthyology
Vol. 23, No. 1 1976

魚類学雑誌
23巻1号 1976年

A Study of the Western North Pacific *Sebastes vulpes* Species Complex (Scorpaenidae), with Description of a New Species

Lo-chai Chen and V. V. Barsukov

(Received January 8, 1976)

Abstract Three western North Pacific scorpaenids, including a new species, *Sebastes zonatus*, and two closely related species, *S. vulpes* and *S. ijimae*, are described and compared. Their relationships to other species of *Sebastes* are discussed.

In his monumental monograph on scorpaenids of Japan, Matsubara (1943) recognized 26 species of *Sebastes*. Among them are two very similar species, *S. vulpes* and *S. ijimae*. Matsubara found it difficult to distinguish these two species, although he recognized that *S. vulpes* was represented by two color morphs. We have evidence that the two color morphs are indeed two distinct species. This paper names the additional species and comments on the relationships of the *S. vulpes* species complex.

Materials and methods

Seventy eight specimens of the *Sebastes vulpes* complex and numerous specimens of other species of *Sebastes* were examined in this study. Most of the materials were in preserved condition but we have had specimens of every species in fresh or frozen condition.

Abbreviations for the listed collections are: CAS, California Academy of Sciences; FMNH, Chicago Field Museum of Natural History, UMMZ, University of Michigan, Museum of Zoology; SIO, Scripps Institution of Oceanography; USNM, United States National Museum; ZIAS, Zoological Institute, Academy of Sciences, USSR.

The terminology of head spines follows that of Eschmeyer (1969), other terminology and methods in this report follow those of Chen (1971). Vertebral counts and some of the caudal fin-ray counts were made from radiographs.

Diagnosis of the *Sebastes vulpes* species complex

Supraocular and coronal spines and usually nuchal spines absent; top of head with well developed nasal, preocular, postocular, tympanic, and parietal spines. Interorbital relatively flat, may be divided by weakly developed frontal ridges into three shallow grooves. Lower edge of lachrymal smooth or with a single sharp projection at rear end.

Body black or grayish and often mottled with white spots or stripes, or pinkish to whitish and mottled with black spots or reticulate stripes. Three vertical dark bands often on sides of body, sometimes very distinct. One extends from dorsal fin between 4th or 5th and 11th or 12th spines to distal half of pectoral fin, one extends from soft-dorsal to near anal fin, another across caudal-peduncle. Peritoneum white.

Each one of the extrinsic gas-bladder muscles extends backward from an origin on or near opisthotic. Without forming any connection with cleithrum or Baudelot's ligament, the muscle ends into a tendon which passes between second and third ribs, then splits into three tendons which run straight along inner side of succeeding ribs without attaching to peritoneum adjacent to gas bladder. These tendons then insert respectively on parapophyses of 9th, 10th, and 11th centra.

Other characteristics shared by species of the complex

Base of skull (parasphenoid) nearly straight. Cranial spines sharp, moderately strong for a *Sebastes*. Parietal ridges well developed. Preopercular spines 5, moderately developed, equally spaced, and usually directed backward. Upper posttemporal, supracleithral, and the two opercular spines well developed. Upper opercular spine never reaches rear margin of opercular flap. Cleithral spine usually present, lower posttemporal spine usually absent. Sphenotic,

pterotic, postorbital, and suborbital spines absent, although a spine may rarely be found on the second suborbital.

Symphyseal knob inconscpicuous. Jaws subequal, tip of lower jaw sometimes projects slightly beyond tip of upper jaw, teeth on lower jaw never protrude in front of upper lip. Maxillary reaching to between vertical from rear margin of pupil and vertical from beyond rear margin of orbit. Premaxillary tooth band with 7～9 teeth across the anterior widest part and 4～6 teeth across the rear narrower part. The corresponding numbers of teeth are 4～8 and 3～5 for the dentary tooth band, 2～7 and 2～6 for the palatine tooth band, and 4～6 and 3～4 for the vomerine tooth band.

Rakers in outer row on first gill arch short, anterior 2 to 4 rakers often spinulated and rudimentary and sometimes fused into plate in specimens 15 cm or longer.

Scales ctenoid. Maxillary, mandible, branchiostegals, and the part of head before eyes usually scaleless; head scaled elsewhere. Fin rays scaled, membranes scaled basally, most extensively on caudal, anal, and soft dorsal.

Dorsal spines increasing in length to 4th, 5th or 6th, then decreasing gradually to 12th; 13th spine longer than 12th. Second anal spine stronger and longer than third, its tip reaching to near tip of third spine and to about half the length of first anal soft-ray when depressed. Origin of pectoral below 3rd or occasionally 4th dorsal spines; margin of pectoral fin usually round, 9th to 11th rays from above longest. Pectoral extends farther back then pelvic, usually reaching anus or beyond in young specimens but not in adults. Origin of pelvic below 4th dorsal spine. Origin of anal below 1st or 2nd dorsal soft-ray, insertion of anal below 9th to 11th dorsal soft-ray. Caudal truncate or rounded. Profile of distal edges of soft dorsal and anal fins round, with the longest rays at midsection of fins; tips of soft dorsal and anal reaching to near vertical of caudal base when fins depressed.

Principal caudal rays (number of branched rays+2) usually 15. Vertebrae usually 26 (11+15).

Key to the species of the *Sebastes vulpes* complex

1a. Rakers on first gill arch usually 28～30; body and median fins grayish, with, distinct dense lighter spots..*S. vulpes*

1b. Rakers on first gill arch usually 25～28.. 2

2a. Body uniformly blackish or grayish, with trace of light mottlings; vertical bands, if present, poorly defined; pectoral membrane black; rakers on first gill arch usually 25～27....*S. ijimae*

2b. Body white to pink, mottled with dark frecklings or spots; three distinct vertical dark bands, one extends from dorsal fin between 4th or 5th and 11th or 12th dorsal spines downward to distal edge of pectoral fin, one extends from soft dorsal downward to near anal fin, another across caudal peduncle; pectoral membrane clear or slightly dusky; rakers on first gill arch usually 27～28.....*S. zonatus*

Sebastes vulpes Döderlein
(Fig. 1a)

Sebastes vulpes Döderlein, 1884 (in Steindachner and Döderlein, 1884), pp. 203～204 (type locality: Tokyo). Matsubara, 1943, pp. 230～231 and other pages (in part; key, description, anatomy); 1955, p. 1076 (in part; key). Hallacher, 1974, pp. 66 & 71, fig. 2 (gas-bladder muscles).

Sebastodes vulpes: Jordan and Evermann, 1898, p. 1835 (description).

Sebastichthys vulpes: Jordan and Starks, 1904, p. 113 (in part; description).

Description

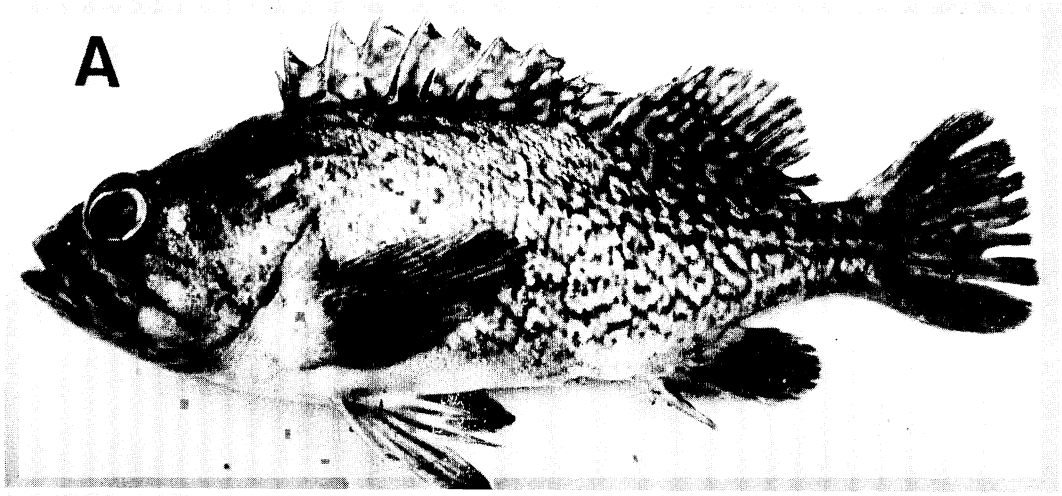
Lower edge of gill-cover where interopercular and subopercular meet often with two or more small spines.

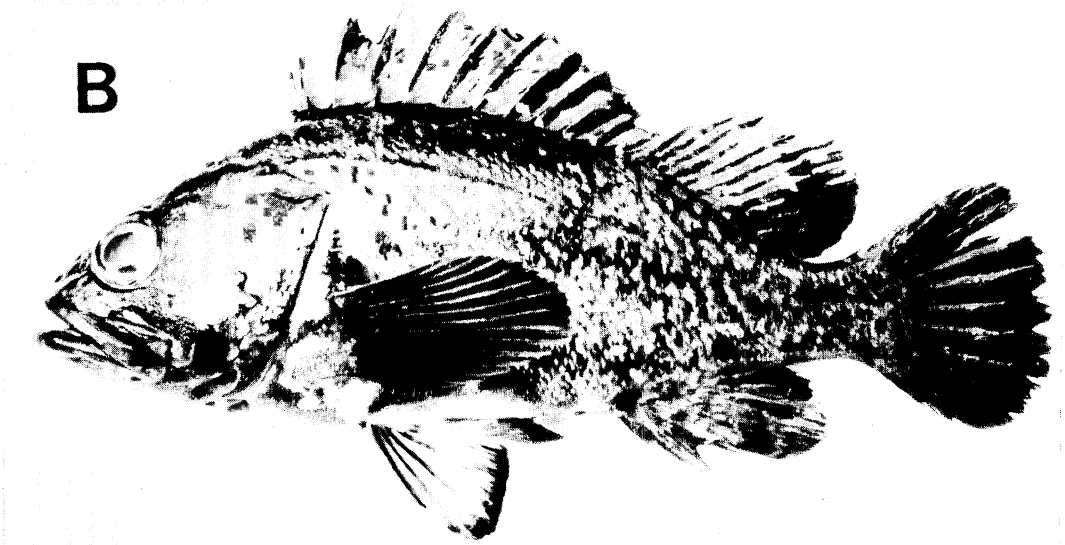
Body and median fins grayish, with conspicuous dense light spots; or light grayish, with dense reticulate dark stripes. Pelvic dark, pectoral grayish. Very faint vertical bands show up occasionally.

For morphometrics and meristics, see tables 1 and 2 and figure 2. For other characteristics, see description of the species complex.

Identity

The color pattern and the pectoral ray count of 18 given in the original description of *Sebastes vulpes* Döderlein clearly indicate the identity of the species herein described. We have not examined the types but at least two of the type





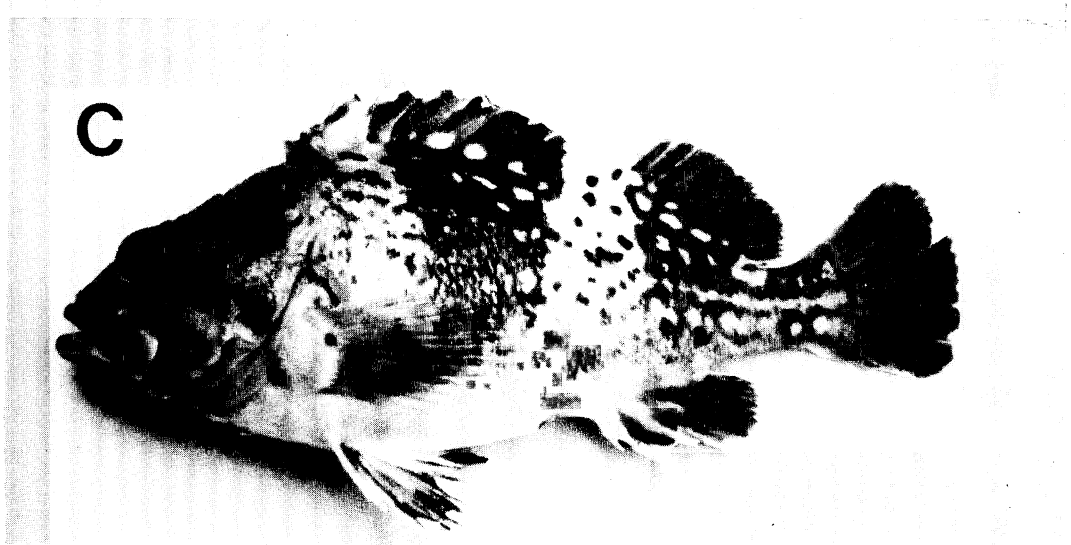


Fig. 1. A: *Sebastes vulpes,* adult, 172 mm, from Tokyo market. B: *Sebastes ijimae*, adult female, 175 mm, SIO 75–481. C: *Sebastes zonatus*, holotype, adult female, 168 mm, SIO 75–475.

Table 1. Morphometrics (in per cent of standard length) of *Sebastes vulpes*, *Sebastes ijimae*, and *Sebastes zonatus*. Data of the holotypes are in parentheses. "+" means positive allometry and "−" means negative allometry, both are significant at the level of .025 or less. (1) means difference between *S. ijimae* and *S. vulpes*, (2) means difference between *S. vulpes* and *S. zonatus*, and (3) means difference between *S. ijimae* and *S. zonatus*; all three are significant at the level of .01 or less.

	S. vulpes	*S. ijimae*	*S. zonatus*
Size range (mm)	118～327	146～366	112～376
No. of specimens	24	22	26
2nd anal spine	12～ 17 "−"	13～ 18 (17) "−"	12～ 17 (16) "−"
Gill-raker at angle (1) (3)	3～ 5 "−"	3～ 4 (3)	3～ 5 (5)
3rd anal spine	11～ 16 "−"	12～ 16 (16) "−"	13～ 17 (15)
2nd dorsal soft-ray	15～ 20	16～ 20 (20)	15～ 21 (17)
1st anal spine (3)	6～ 8 "−"	5～ 8 (7) "−"	5～ 9 (8) "−"
Orbit length	8～ 11 "−"	9～ 11 (11)	9～ 11 (10) "−"
Total length	120～124	117～125 (124)	119～123 (119)
4th dorsal spine (1)	15～ 18	15～ 20 (19)	15～ 18 (17)
1st anal soft-ray	18～ 23	18～ 22 (22)	17～ 21 (20)
Anal-fine base	13～ 15	13～ 16 (16) "−"	12～ 16 (16) "−"
Pelvic-fin length	20～ 25	20～ 25 (25)	20～ 24 (23)
Predorsal length (1) (3)	33～ 38	35～ 39 (38)	33～ 38 (35)
Pectoral-fin length (2)	26～ 32	25～ 32 (30)	26～ 31 (29) "−"
Lower peduncle length	16～ 21	17～ 21 (17)	17～ 20 (19)
Soft-dorsal base (1)	18～ 25	20～ 25 (23)	19～ 24 (23)
Dorsal-fin incision	7～ 10	8～ 11 (11)	8～ 11 (9) "+"
Caudal-peducle depth (1) (3)	11～ 13	11～ 13 (12)	10～ 12 (11)
Upper peduncle length	11～ 13	11～ 13 (12) "+"	11～ 13 (13)
Spinous-dorsal base	35～ 43	36～ 42 (42)	33～ 42 (39)
Snout length (2)	9～ 11	9～ 11 (9)	9～ 11 (10)
Prepelvic length	37～ 43	37～ 44 (42)	38～ 43 (38)
Head length (1) (3)	38～ 42	37～ 43 (40)	37～ 41 (39)
Upper-jaw length (1) (3)	18～ 21	19～ 22 (21)	19～ 21 (20)
Preanal length	67～ 74	67～ 74 (71)	67～ 78 (68) "+"
Body depth	35～ 41	36～ 42 (38)	34～ 41 (37)
Head width (1) (3)	18～ 23 "+"	18～ 25 (19) "+"	17～ 24 (20)
Lachrymal width (3)	3～ 4 "+"	3～ 4 (4)	3～ 4 (4)
Interorbital width (2)	6～ 8 "+"	6～ 8 (7) "+"	6～ 8 (7) "+"

specimens of *S. vulpes* are available at the Naturhistorisches Museum, Vienna, Austria. (W. Eschmeyer, personal communication).

Material examined

A total of 25 specimens (118～327 mm).

Sea of Japan along coast of Honshu:

Hamada: UMMZ 191953, 1 (219).

Nō: UMMZ 191985, 9 (196).

Hakodate vicinity: USNM 71787, 2 (152 & 156) ZIAS 37490, 1 (184); ZIAS 37491, 1 (213).

East coast of Honshu:

Sendai: UMMZ 191983, 1 (258).

Chochi: UMMZ 197585, 1 (208); SIO 75-478, 1 (325).

Tokyo vicinity: CAS SU 53416, 1 (248); SIO 75-480, 4 (158～219); SIO 75-479, 2 (280 & 286); ZIAS 42099, 7 (194～327).

Uncertain localities in Japan: USNM 48143, 1 (118); ZIAS 42100, 1 (267).

Sebastes ijimae (Jordan and Metz)
(Fig. 1b)

Sebastodes ijimae Jordan and Metz, 1913, pp. 49～50 (type locality: Fusan, Korea).

Sebastichthys ijimae: Matsubara, 1940, p. 375 (suborbital ring, meristics).

Sebastes ijimae: Matsubara, 1943, pp. 231～233 and other pages (key, description, anatomy); 1955, p. 1076 (key). Hallacher, 1974,

Table 2. Meristics of *Sebastes vulpes, Sebastes ijimae*, and *Sebastes zonatus*. "*" indicates count from holotype of the species.

	Anal soft-rays			Dorsal soft-rays		Pectoral rays				Dorsal spines
	5	6	7	12	13	15	16	17	18	13
S. vulpes	1	20	—	9	14	—	1	29	20	25
S. ijimae	2*	19	—	6	14*	—	—	39*	1	18*
S. zonatus	—	23*	1	2	22*	1	1	48*	6	26*

	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Rakers on outer row of first gill arch																				
S. vulpes	—	—	—	10	20	12	1	—	—	—	—	—	—	—	—	—	—	—	—	—
S. ijimae	12	17*	9	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S. zonatus	—	5	17*	15*	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oblique rows of scales																				
S. vulpes	—	—	—	—	—	—	—	—	—	—	1	5	4	2	5	2	—	—	—	—
S. ijimae	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2	2	1	3	—
S. zonatus	—	—	—	—	—	—	—	—	—	—	1	1	1	4	7	5	3	—	—	1
Lateral line pores																				
S. vulpes	—	—	—	—	—	1	4	7	5	11	7	5	3	—	—	—	1	—	—	—
S. ijimae	—	—	—	—	—	1	6*	6	4	5*	4	5	1	—	—	—	1	—	—	—
S. zonatus	—	—	—	—	—	—	2	4	7	10	9	8*	2*	—	—	—	—	—	—	—

	Principal caudal rays		Total caudal rays					Trunk vertebrae	Caudal vertebrae
	14 (7+7)	15 (8+7)	33	34	35	36	37	11	15
S. vulpes	—	11	—	—	4	1	1	11	11
S. ijimae	—	8	—	—	2	—	—	5	5
S. zonatus	3	10	1	1	4	—	—	12	12

pp. 65 & 71, fig. 2 (gas-bladder muscles).

Description

Lower edge of gill cover where interopercular and subopercular meet often spineless or with but blunt projections.

Body and fins black or grayish, sometimes with trace of mottlings of lighter hue. Grayish specimens may show very faint dark vertical bands. Membrane of pectoral black or grayish. In preserved condition, black may become brown but pattern remains the same.

For morphometrics and meristics, see tables 1 and 2 and figure 2. For other characteristics, see description of the species complex.

Material examined

A total of 25 specimens (123~366 mm).

Holotype: FMNH 55437 (formerly CM 4172), 156 mm, from Fusan, Korea, by D. S. Jordan, 1911.

Other material:

Korea: Fusan: UMMZ 191950, 1 (216); UMMZ 197590, 4 (146–245).
Kori Bay: UMMZ 191951, 1 (236).

Sea of Japan along coast of Honshu:
Hamada: UMMZ 197589, 1 (225).
Oki Island: UMMZ 191954, 1 (205)
Tottori: UMMZ 191984, 2 (216 & 232).
Wakasa Bay: UMMZ 191982, 2 (195 & 230).
Fukui: UMMZ 191952, 1 (186).

Hakodate: SIO 57-481, 3 (175~204).

East coast of Honshu:
Ojika-Hanto: UMMZ 191947, 2 (123 & 151).
Tokyo vicinity: ZIAS 42402, 3 (220~329).

Uncertain localities in Japan: UMMZ 197588, 1 (202); UMMZ 191948, 1 (175); ZIAS 42401, 1 (366).

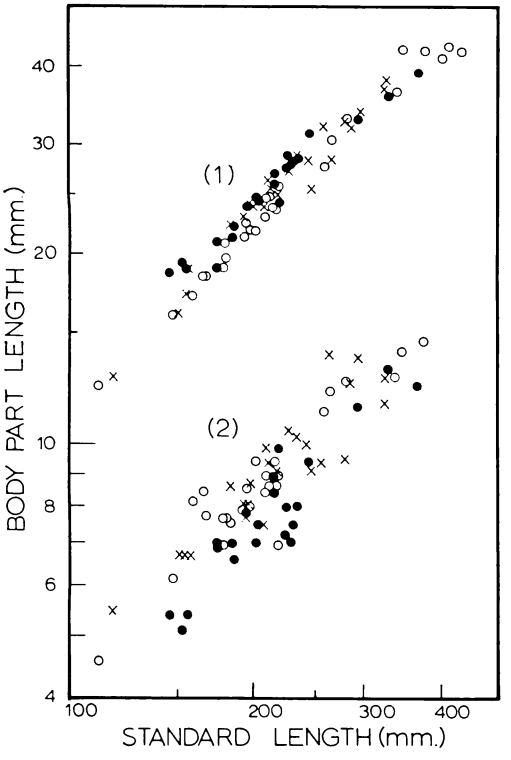


Fig. 2. (1) Caudal-peduncle depth and (2) length of raker at angle of first gill-arch of *Sebastes vulpes* (×), *Sebastes ijimae* (●), and *Sebastes zonatus* (○).

Sebastes ***zonatus*** Chen and Barsukov, sp. nov. (Fig. 1c)

Sebastes vulpes (not Döderlein): Matsubara, 1943, pp. 230～231, pl. I-1 (in part; key, description, anatomy).

Sebastichthys vulpes: Jordan and Starks, 1904, p. 113 (in part; description).

Sebastes sp. n. Snytko and Fedorov, 1974, p. 945 (east coast of Honshu).

Diagnosis

See sections under "Diagnosis of the *Sebastes vulpes* species complex" and "Key to the species of the *Sebastes vulpes* complex".

Description

Lower edge of gill-cover where interopercular and opercular meet often with two or more small spines.

Body white to pink, with dark frecklings or spots. Vertical dark bands on sides of body distinct, speckled with white spots. Area of dorsal fin between dark bands white, speckled with dark spots. Caudal dark, with trace of white specklings. Pelvic and anal grayish. Pectoral clear to grayish. Cheek with three oblique black bars, one extends from lower posterior edge of orbit across first (uppermost) preopercular spine to edge of gill cover, one extends from below orbit to 4th preopercular spine, one runs along mid-line of maxillary to posterior end of maxillary. Edges of all median fins white.

For morphometrics and meristics, see Tables 1 and 2 and Fig. 2. For other characteristics, see description of the species complex.

Etymology

The name *zonatus*, from the Latin, refers to the banded color pattern.

Material examined

A total of 28 specimens (112～376 mm).

Holotype: SIO 75-475, 168 mm female; from off Furube, near Usujiri, Hakodate, Japan; collected by gill net at 120 m on July 23, 1973; specimen procured from Sinei Maru through Dr. Kunio Amaoka.

Paratypes: SIO 75-476, 3 (148～198), collected together with the holotype. CAS 34077, 2 (179 & 194), collected together with the holotype.

Other material:

Sea of Japan along coast of Honshu:

Toyama Bay: UMMZ 197587, 1 (184).

Off Kyoto-fu: UMMZ 197586, 1 (219).

35°27′N, 131°17′E: ZIAS 42093, 1 (180).

Hokkaido:

Hokodate vicinity: USNM 51314, 1 (112); USNM 71787, 1 (181); ZIAS 37492, 3 (210～282).

Otaru: UMMZ 142653, 1 (102).

Tokyo vicinity: SIO 75-477, 2 (209 & 339); SIO 75-478, 1 (219); ZIAS 42096, 2 (202 & 215); ZIAS 42099 a, 3 (220～347).

Shikoku, Susaki vicinity: ZIAS 42095, 1 (160).

Uncertain localities in Japan: UMMZ 191949 1 (254); ZIAS 42094, 1 (376); ZIAS 42098. 3 (166～267).

We have used data from 3 additional specimens (400～430 mm) from the Tokyo vicinity, taken by V. V. Fedorov.

Discussion

The separation of the above three species is very delicate. Although color pattern appears

to be the best single characteristic for the separation of these species, two of the smallest specimens of *S. ijimae* we have examined (UMMZ 197590) have color pattern of *S. vulpes* and two of the largest specimens of *S. vulpes* we have examined (SIO 75–479) have color pattern much like that of *S. ijimae*. The banded pattern characteristic for *S. zonatus* often is present faintly in *S. vulpes* and *S. ijimae*.

The number of rakers on the outer row of the first gill arch, although useful in species separation here, is also variable and shows certain degree of overlap among the species (table 2). In addition to these differences, *S. vulpes* and *S. zonatus* also are significantly different in the frefrequency distribution of the pectoral rays and dorsal soft-rays (table 2).

Using the technique of analysis of covariance on the least-square linear regressions of the log-log transformed power regressions of various morphometric characters, we find that the three species are also significantly different in a number of body measurements (table 1). Among these the most conspicuous are in the caudal-peduncle depth ($\alpha=0.00003$) and the length of the raker at angle of first gill-arch ($\alpha=0.000005$) between *S. ijimae* and *S. zonatus* (fig. 2 and table 1).

While morphometrically *S. vulpes* and *S. zonatus* are very similar and differ significantly ($\alpha<0.01$) only in the length of pectoral fin, the length of snout, and the width of interorbital, the gill raker count and pectoral ray count of *S. zonatus* are more similar to those of *S. vulpes*. This suggests that the three species we recognize here each is indeed a natural unit rather than artificial section of a natural continuum.

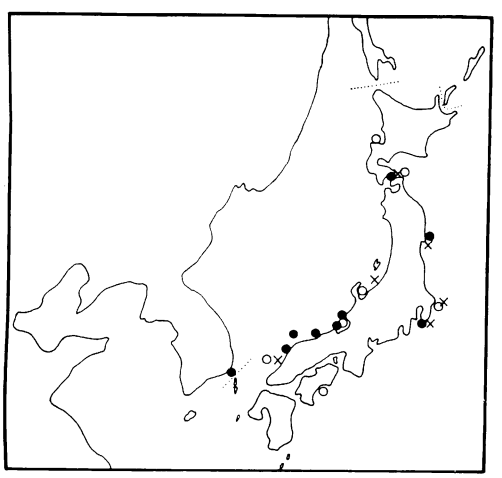


Fig. 3. Distribution of *Sebastes vulpes* (×), *Sebastes ijimae* (●), and *Sebastes zonatus* (○).

With the above differences and the fact that the three forms are sympatric (fig. 3), there should be no question that the three species are distinct.

We do not know the bathymetric ranges of these three species. We have had *S. ijimae* from 20～50 m, *S. vulpes* from 50～100 m, and *S. zonatus* from 50～175 m. According to a fisherman at Hakodate, *S. zonatus* usually occur at much greater depth than *S. ijimae*.

Relationships

Matsubara (1943) erected the subgenus *Neohispaniscus*, included in it *Sebastes schlegeli* Hilgendorf (type species), *S. ijimae*, and *S. vulpes* (including *S. zonatus*). We believe that *Neohispaniscus* is monotypic and that the *S. vulpes* complex is part of a natural group of species, which also includes *Sebastes nivosus* Hilgendorf and *Sebastes trivittatus* Hilgendorf.

Members of this species group are characterized by: (1) the cranial spine pattern, with well developed nasal, preocular, postocular, tympanic and parietal spines but lacks supraocular spines and usually lacks coronal and nuchal spines; (2) the low ocular ridges (except *S. nivosus*) and the relatively flat interorbital, often divided by weakly developed frontal ridges into three shallow grooves; (3) the general body shape, with subequal jaws, deep body, and large and round soft dorsal and anal fins, the tips of rear ends of which often nearly reaching the base of caudal when these fins are depressed; (4) extrinsic gas-bladder muscles free from the Baudelot's ligaments and the cleithra, tendonous portion of the muscle free from the peritoneum adjacent to the gas-bladder, with insertions on parapophyses of 9th, 10th, and 11th centra; and (5) principal caudal rays usually 15.

Sebastes nivosus and *S. trivittatus* have been erroneously placed by Matsubara in the subgenus *Pteropodus*. Species of *Pteropodus* differ from those of the *vulpes-ijimae-zonatus-nivosus-trivittatus* group in having rasied ocular ridges but lacking frontal ridges in general, in usually having 14 instead of 15 principal caudal rays and in having firm connection between tendonous protion of the extrinsic gas-bladder muscle and

peritoneum adjacent to the gas-bladder.

Acknowledgments

We thank those persons who supplied materials or allowed us to examine specimens in their care. In alphabetical order of the names of their institutions, they are: W. E. Eschmeyer, California Academy of Sciences; L. P. Woods, Chicago Field Museum of Natural History; K. Amaoka and K. Kobayashi, Hokkaido University, Japan; V. V. Fedorov and V. V. Kozlov, Pacific Research Institute of Marine Fisheries and Oceanography, USSR; T. Abe, Tokai Regional Fisheries Research Laboratory, Japan; R. M. Bailey and R. R. Miller, Museum of Zoology, University of Michigan; V. Springer and R. Taylor, United States National Museum; A. A. Korovkina and A. V. Frederikhsen, Zoological Institute, Academy of Sciences, USSR.

This study was supported by the Zoological Institute, Academy of Sciences, USSR, and by U. S. NSF grant GB 34213.

Literature cited

Chen, L. 1971. Systematics, variation, distribution, and biology of rockfishes of the subgenus *Sebastomus* (Pisces, Scorpaenidae, *Sebastes*). Bull. Scripps Inst. Oceanogr., 18: 1～107, 16 figs., 6 pls.

Eschmeyer, W. N. 1969. A systematic review of the scorpionfishes of the Atlantic Ocean (Pisces: Scorpaenidae). Occ. Pap. Calif. Acad. Sci., (79): 1～130, 13 figs.

Hallacher, L. E. 1974. The comparative morphology of extrinsic gasbladder musculature in the scorpionfish genus *Sebastes* (Pisces: Scorpaenidae). Proc. Calif. Acad. Sci., 40 (3): 59～86, 4 figs.

Jordan, D. S. and B. W. Evermann. 1898. The fishes of North and Middle America. Bull. U. S. Nat. Mus., 47 (2): 1241～2183.

Jordan, D. S. and C. W. Metz. 1913. A catalog of the fishes known from the waters of Korea. Mem. Carnegie Mus., 6 (1): 1～65, 67 figs., 10 pls.

Jordan, D. S. and E. C. Starks. 1904. A review of the Scorpaenoid fishes of Japan. Proc. U. S. Nat. Mus., 27: 91～175, 21 figs., 2 pls.

Matsubara, K. 1940. Studies on the scorpaenoid fishes of Japan. IV. On a new classification of two subfamilies, Sebastinae and Scorpaeninae based on the osteological characteristics of suborbital ring (preliminary report). Bull. Jap. Soc. Sci. Fish., 8 (6): 373～378, 1 fig.

Matsubara, K. 1943. Studies on the scorpaenoid fishes of Japan. Anatomy, phylogeny and taxonomy. I, II. Transactions of the Sigenkagaku Kenkyusyo Nos. 1 and 2. Tokyo. 486 pp., 156 figs., 4 pls.

Matsubara, K. 1955. Fish morphology and hierarchy. Ishizakishoten, Tokyo. Part 2, pp. i～v+791～1605, figs. 290～536. (in Japanese).

Snytko, V. A. and V. V. Fedorov. 1974. Recent data on the distribution of rockfishes of the subfamily Sebastinae and observations on their biology. Probl. Ichthyol., 14, 6 (89): 939～947. (in Russian).

Steindachner, F. and L. Döderlein. 1884. Beiträge zur Kenntniss der Fische Japan's. III. Denkschr. mathem.-naturw. Cl. K. Akad. Wissenschaften, 49: 171～212, 7 pls.

(LC: Department of Zoology, San Diego State University, San Diego, CA 92182, USA; VVB: Zoological Institute, Academy of Sciences, Leningrad, V-164, USSR)

***Sebastes* 属の 1 新種を含む北太平洋西部産 *Sebastes vulpes* species complex**

Lo-chai Chen and V. V. Barsukov

北太平洋西部に分布する *Sebastes vulpes* species complex 3 種，キツネメバル *S. vulpes*，コウライキツネメバル *S. ijimae*，*S. zonatus* について記載した．*S. zonatus* は新種である．上記 3 種の形態的特徴を比較するとともに *Sebastes vulpes* species complex とその他の *Sebastes* 属との類縁関係を論じた．