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A NEW SPECIES OF ROCKFISH, GENUS *SEBASTES* (SCORPAENIDAE), FROM THE EASTERN NORTH PACIFIC OFF MEXICO AND CALIFORNIA¹

By Robert N. Lea² and John E. Fitch³

ABSTRACT: A new species of rockfish, *Sebastes melanosema*, is described from three specimens collected in the eastern North Pacific. This form is distinguished from all other Pacific species of *Sebastes* by a combination of characters: six anal soft-rays, 11 to 12 dorsal soft-rays, 34 to 37 gill rakers, black fringing of the spinous portion of the dorsal and anal fin membranes, and morphology of the lachrymal projections. The terminology of shoulder spines is corrected from previous work on this genus. The description of this rockfish brings to 69 the known number of *Sebastes* for the eastern North Pacific.

During a cruise in 1971 off Baja California, Mexico, aboard the California Department of Fish and Game research vessel *Alaska*, two small rockfish were collected which could not be identified with any known *Sebastes* from the eastern North Pacific. These specimens were taken in June from San Pablo submarine canyon in traps which had been fished at 100 fm (183 m) on the slope of the canyon.

On 16 February 1976 a single individual belonging to this same unidentified species was taken on hook-and-line by Louis N. Murphy (Costa Mesa, Calif.) while fishing in about 75 fm (137 m) off Laguna Beach, Orange County, California, over 420 miles (676 km) north of the San Pablo canyon locality.

The following description of this new rockfish is based upon these three individuals comprising the holotype and two paratypes, and brings to 69 the number of known species of *Sebastes* for the eastern North Pacific (Chen 1975). To facilitate comparison with other California species, most measurements and counts follow the format of Phillips (1957). In several instances, as noted, we have followed Chen (1971). Terminology of the shoulder spines has been modified, however.

In previous publications on the rockfishes of the eastern North Pacific, the first shoulder spine has been referred to, erroneously, as the supracleithral (Clemens and Wilby 1946, 1961; Phillips 1957; Chen 1971, 1975; Morgenroth and Morgenroth 1969; Lea and Fitch 1972; Miller and Lea 1972; Hart 1973; and others) but since it is actually a projection of the posttemporal bone (Matsubara 1943; Smith 1957; and Eschmeyer 1969), its correct terminology would be posttemporal spine. It may be either single or

double in the genus *Sebastes*. The second shoulder spine, historically noted as the cleithral in *Sebastes*, projects from the supra-cleithrum and thus should be the supracleithral spine. It is usually single but occasionally double. The true cleithral spine is on the cleithrum just above the pectoral fin base, and in *Sebastes* it may be buried and not visible or may appear as a slight to moderate projection. The degree of development of the cleithral spine may prove useful at the specific level (taxonomically) as have most of the cranial and other shoulder spines in this group of fishes.

The following description is based upon the three known specimens.

¹REVIEW COMMITTEE FOR THIS CONTRIBUTION:

LO-CHAI CHEN
MICHAEL H. HORN
ROBERT J. LAVENBERG

²California Department of Fish and Game, Operations Research Branch, 2201 Garden Rd., Monterey, California 93940; and Research Associate in Ichthyology, Natural History Museum of Los Angeles County, Los Angeles, Calif. 90007.

³California Department of Fish and Game, Operations Research Branch, 350 Golden Shore, Long Beach, California 90802; and Research Associate in Ichthyology and Vertebrate Paleontology, Natural History Museum of Los Angeles County, Los Angeles, Calif. 90007.

Sebastes melanosema NEW SPECIES
Semaphore rockfish

Figures 1 and 2

DIAGNOSIS: The following combination of characters serves to distinguish *S. melanosema* from all other known species of *Sebastes* from the eastern North Pacific. Six anal soft-rays, 11 to 12 dorsal soft-rays and 34 to 37 gill rakers will separate *S. melanosema* from the vast majority of eastern Pacific *Sebastes*. The morphology of the lachrymal projections, the anterior projection sharp and directed forward and the posterior projection distinctly bifid and directed downward, does not appear to be closely similar to any other member of the genus. Melanistic fringing of the spinous portion of the dorsal and anal fin membranes is characteristic of this new species.

DESCRIPTION: Where there is any variance in the three specimens, data concerning the paratypes are given in parentheses.

D. XIII, 12(11); A. III, 6; Pect. 18(17); Pelvics I, 5; rakers on first gill-arch 35, 36 (34, 37); pored lateral-line scales 38, 39 (34, 40); principal caudal rays 14; vertebrae including hypural 10 + 16 = 26.

Top of head at midorbit concave, a median groove between a pair of low frontal ridges; nasal, preocular, postocular, tympanic, parietal, and nuchal spines present — on left side a spine is present between the postocular and tympanic, its position and shape indicate it is simply an extra spine (nuchal spine present only on left side in Baja California paratype, and both nuchal spines absent in California specimen); cranial spines moderately strong and sharp; parietal ridges moderately high and thin; the five preopercular spines strong and sharp, upper two directed posteriad, lower three radially directed, these spines decreasing in size from top to bottom with lowermost spine mostly embedded; the two opercular spines strong and sharp, uppermost the longest; posttemporal and supracleithral spines present, well-developed (on right side of Baja California paratype a second spine projecting from area of supracleithrum); cleithral spine a bony projection, not a discrete spine; lachrymal projections three-pointed, first point sharp and directed anteriorly, second is bifid with points moderately sharp and directed ventroanteriorly [this terminology from Chen 1971; referred to by Phillips (1957) as sub-orbital spines], lower posterior edge of gillcover smooth.

A moderately developed, downward projecting, symphyseal knob; teeth on tip of lower jaw slightly elevated, but not a definite raised patch; end of maxillary reaches to vertical of posterior third of orbit (to mid-orbit in California paratype, under rear edge of orbit in Baja California paratype); maxillaries and branchiostegals covered with scales; mandibles finely scaled, smooth to touch; premaxillaries smooth; tips of pectorals extend beyond origin of anal fin, reach a vertical to third anal spine (extend beyond anus but not to origin of anal fin in paratypes); tips of pelvics extend beyond anus but not to origin of anal fin (not quite to anus in paratypes); second anal fin spine twice as thick as third, extends slightly past tip of third when depressed (equal in length to third in California paratype); spinous dorsal fin membranes moderately incised; caudal fin slightly indented; terminal profile of anal fin with a slight posterior slant.

Color when fresh reddish with lighter colored blotching on dorsum, blotches ventrad to D III–IV, VIII–IX, XI–1 and 12.

Lateral line in a clear, light-red zone. Dorsal and anal fin membranes red with black dotting, outer fringe of membrane between spines solid black; caudal fin membrane red; pectoral fin membrane with a black mid-section, proximal and distal portions of fin red. Mouth dusky, a dark blotch on underside of opercle. Peritoneum black.

The otoliths (sagittae) were removed from all three individuals and examined for evidence of age as well as for distinguishing characters. Those of the holotype (Fig. 3) measured 8.7 mm long by 5.3 mm high, and there were either 7 or 8 hyaline growth zones. Unfortunately, the holotype was preserved in formalin for nearly a month prior to removing its otoliths, and the acidic formalin reacted with the aragonitic otoliths in such a manner as to leave all exposed surfaces slightly chalky, which effectively masked one or two of the marginal hyaline zones. The six annuli inside these were quite distinct, however. Since the otoliths from the paratypes were removed prior to preservation, marginal annuli were crisp and readily distinguishable. The right sagitta of the Baja California specimen was 7.8 mm long by 4.7 mm high and showed six excellent annuli. The left sagitta of that fish had several freakishly-developed areas, which precluded making an age determination from it. Both sagittae of the Laguna Beach fish were in good condition and seven winter annuli (hyaline zones) could be discerned; they were of identical length and height: 9.0 by 4.8 mm.

The sagittae of *S. melanosema* (Fig. 3) are easily distinguished from those of the other five dwarf (i.e., shorter than 250 mm maximum length) species which inhabit the eastern Pacific between Magdalena Bay, Baja California, and British Columbia. Sagittae of *dalli* (Eigenmann and Beeson), *rufinanus* Lea and Fitch, and *wilsoni* (Gilbert) are less high for their lengths than those of *semicinctus* (Gilbert), *melanosema*, and most *emphaeus* (Starks). The ratio of height into length for these first three ranges from 1:1.9 to 1:2.2 as compared with 1:1.7 to 1:1.9 for *melanosema* and *semicinctus* and 1:1.8 to 1:2.0 for *emphaeus*. In *melanosema* and *emphaeus*, the anterodorsal margin of the otolith turns abruptly downward (is deeply concave) and a blunt, finger-like rostrum is present. In *semicinctus*, the anterodorsal rim slopes in a nearly straight line and results in an angular, wedge-shaped rostrum. Sagittae of *melanosema* are highest at a point anterior to midlength, whereas in *emphaeus*, greatest otolith height is almost exactly at midlength. Sagittae of the larger species of *Sebastes* need not be considered because at identical lengths these would have significantly fewer annuli (growth zones) than otoliths of the dwarf forms.

Meristic and morphometric data are presented in Table 1.

RANGE: Known only from the type locality off San Pablo Point, Baja California, Mexico and from off Laguna Beach, Orange County, California.

DERIVATION OF NAME: From the Greek *melanos*, meaning black (adj.), and *sema*, a mark or flag (noun). The combination *melanosema* when used with *Sebastes* stands as a noun in apposition. The specific name is an allusion to the black marks or "flags" on the spinous portion of the dorsal and anal fin membranes.

DISPOSITION OF TYPE MATERIAL: The holotype, an adult male 155.5 mm SL (185.5 mm TL) collected at 183 m in a submarine canyon off San Pablo Point, Baja California, Mexico (Lat. 27°12.9'N, Long. 114°30.5'W) on 21 June 1971, is de-

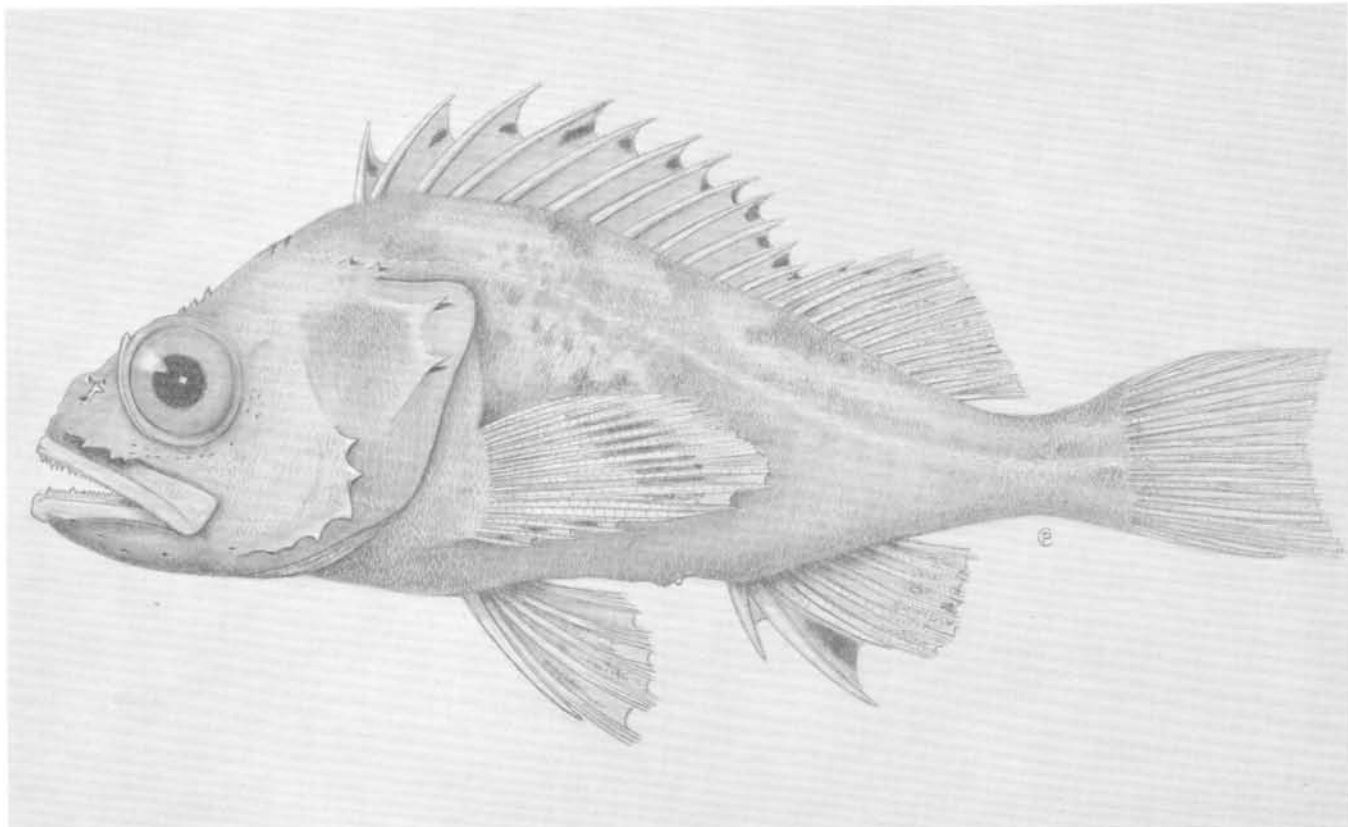


FIGURE 1. Holotype of *Sebastes melanosema*, CAS 27631, from off San Pablo Point, Baja California, Mexico.

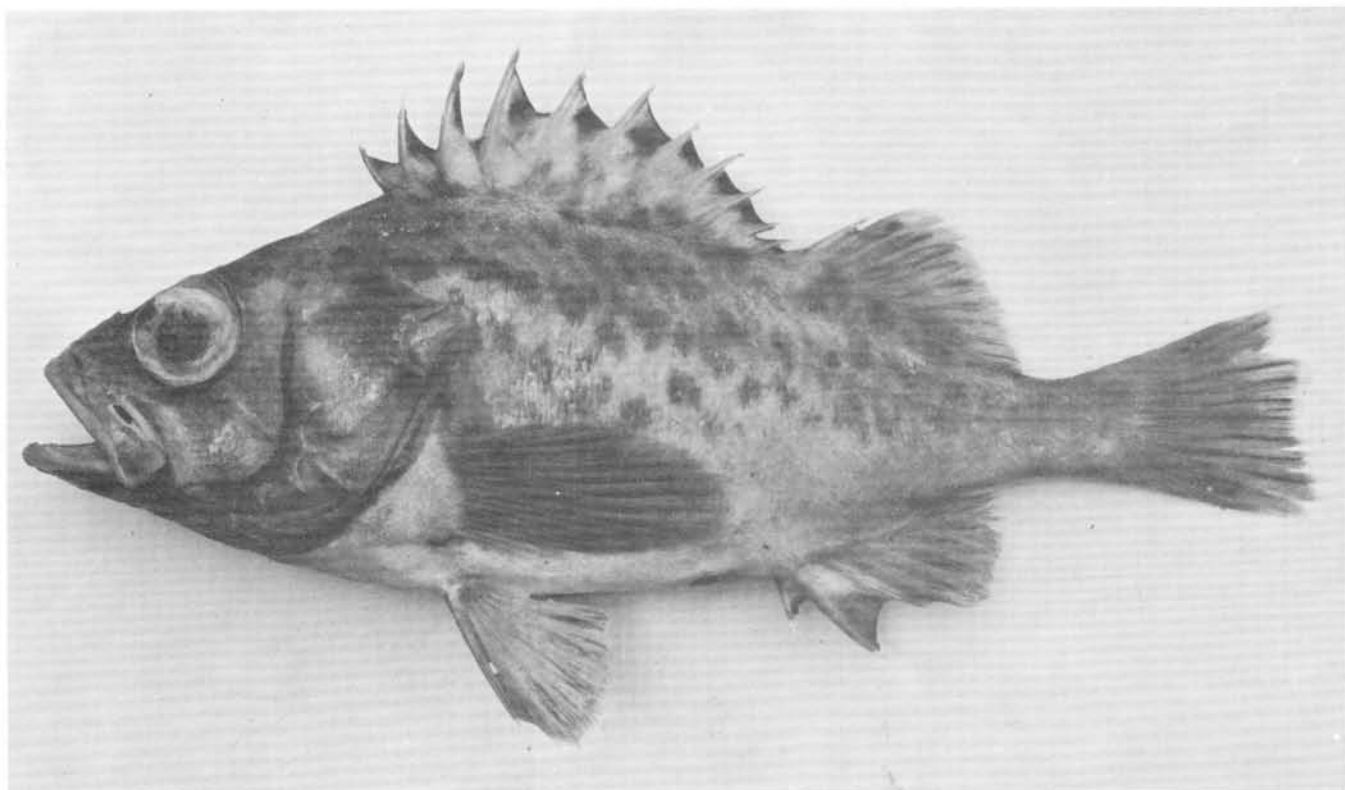


FIGURE 2. Paratype of *Sebastes melanosema*, LACM 36965-1, from off Laguna Beach, California.

TABLE 1

Measurements (in mm proportional measurement into SL and as percent of standard length — %SL) and Counts of Meristic Characters for *Sebastes melanosema*.

Measurement	LACM 33538-1			CAS 27631*			LACM 36965-1		
	mm	SL	%SL	mm	SL	%SL	mm	SL	%SL
Standard length	124.8	—	—	155.5	—	—	166.0	—	—
Head length	55.0	2.3	44	68.5	2.3	44	67.2	2.5	40
Body depth at pelvic origin	46.5	2.7	37	57.0	2.7	37	61.7	2.7	37
Body depth at anal origin	32.0	3.9	26	40.5	3.8	26	47.3	3.5	28
Length of anal base	17.9	7.0	14	23.5	6.6	15	24.2	6.9	15
Length of dorsal base	72.6	1.7	58	92.0	1.7	59	95.7	1.7	58
Snout length	11.6	10.8	09	16.5	9.4	11	16.2	10.2	10
Orbit width	17.0	7.3	14	18.0	8.6	12	17.7	9.4	11
Bony interorbital width	9.6	13.0	08	12.8	12.1	08	11.1	15.0	07
Bony suborbital height	3.7	33.7	03	4.5	34.6	03	2.6	63.8	02
Upper jaw length	24.5	5.1	20	30.6	5.1	20	28.8	5.8	17
Lower jaw projection	0.5	249.6	00	0.0	—	00	0.2	830.0	00
Body width	21.0	5.9	17	26.5	5.9	17	30.5	5.4	18
Pectoral base height	12.2	10.2	10	15.6	10.0	10	15.8	10.5	10
Pectoral length	36.2	3.5	29	44.3	3.5	29	47.9	3.5	29
Pelvic length	25.8	4.8	21	32.2	4.8	21	34.5	4.8	21
Pelvic spine length	18.9	6.6	15	23.6	6.6	15	26.7	6.2	16
First anal spine length	10.3	12.1	08	13.1	11.9	08	10.6	15.7	06
Second anal spine length	20.0	6.2	16	25.7	6.1	17	21.1	7.9	13
Third anal spine length	16.3	7.7	13	21.3	7.3	14	20.3	8.2	12
Anal ray length (longest)	22.2	5.6	18	25.8	6.0	17	26.9	6.2	16
Dorsal spine length (longest)	21.2	5.9	17	28.8	5.4	19	25.8	6.4	16
Dorsal ray length (longest)	21.1	5.9	17	25.1	6.2	16	25.3	6.6	15
Caudal peduncle depth (least)	10.8	11.5	09	14.7	10.6	09	14.1	11.8	08
Caudal peduncle length (ventral)	24.7	5.1	20	32.8	4.7	21	35.0	4.7	21
Caudal peduncle length (dorsal)	15.8	7.9	13	22.3	7.0	14	26.3	6.3	16
Posterior anus to anal origin	4.5	27.7	04	5.7	27.3	04	9.4	17.7	06
Gill raker length (longest)	7.5	16.6	06	9.1	17.1	06	6.2	26.8	04
Predorsal length	46.0	2.7	37	59.0	2.6	38	54.7	3.0	33
Preanal length	89.2	1.4	71	103.4	1.5	66	112.2	1.5	68
Prepectoral length	52.8	2.4	42	60.5	2.6	39	62.2	2.7	37
Prepelvic length	53.6	2.3	43	63.9	2.4	41	65.3	2.5	39
Total length	154.0	0.8	123	185.5	0.8	119	203.0	0.8	122
Dorsal soft-rays		12			12			11	
Anal soft-rays		6			6			6	
Pectoral rays (left/right)		18/18			18/18			17/17	
Unbranched lowermost pectoral rays		9/9			8/8			7/6	
Total gill rakers (left/right)		37/37			36/35			35/34	
Pored lateral-line scales (left/right)		34+1/34+1			39+2/38+2			40+1/ca.41+2	

*Holotype

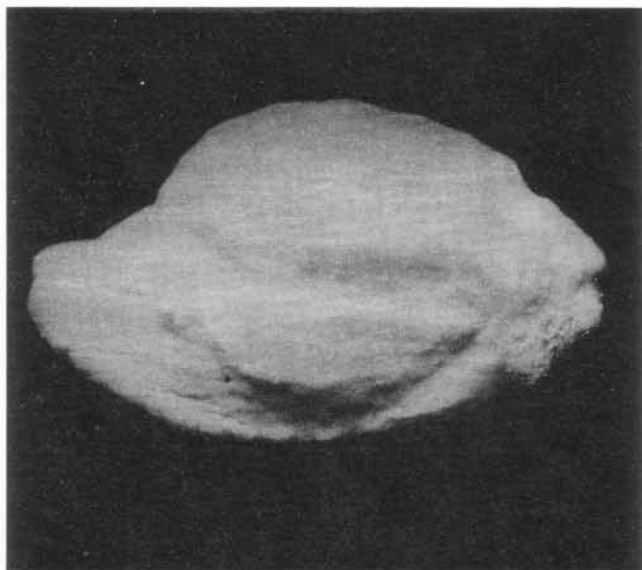


FIGURE 3. Right sagitta, inner face, from holotype of *Sebastes melanosema*.

posited in the ichthyological collection of the California Academy of Sciences (CAS 27631). One paratype, a male 124.8 mm SL (154.0 mm TL), collected at the same time and place as the holotype, has been placed in the fish collection of the Natural History Museum of Los Angeles County (LACM 33538-1). The other paratype, a male 166.0 mm SL (203.0 mm TL) collected off Laguna Beach, Orange County, California, on 16 February 1976 in about 137 m is also deposited at the Natural History Museum of Los Angeles County (LACM 36965-1).

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RESUMEN

Una especie nueva de la familia Scorpaenidae, *Sebastes melanosema* es descrita basado en 3 especímenes del este del Pacífico del Norte. Esta forma se distingue de las otras especies de *Sebastes* en el Pacífico con una combinación de caracteres: 6

rayos en la aleta anal, 11 a 12 rayos en la aleta dorsal, 34 a 37 branquispinas, color negro bordeando la membrana en la porción espinosa de la aleta dorsal y anal, y la morfología de las espinas lacrimales. La terminología de las espinas escapulares en escritos previos sobre este género se corrige. La descripción de este especie eleva a 69 el número de *Sebastes* en el este del Pacífico del Norte.

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