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A New Genus and New Species of Sciaenidae from the Gulf of Panama (Perciformes: Sciaenidae)

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Abstract: *Paranebris bauchotae*, a new genus and species of sciaenid from the Gulf of Panama is described from three specimens (138-212 mm SL). It is distinguished from all other sciaenids by having granulated tooth plates on the jaws and the premaxillary tooth plates that are exposed laterally of the lower jaw when the mouth is closed. The new genus shares the following characters with the New World genus *Nebris*: a thick fleshy and cartilage gap present between premaxillary bones where the ascending processes form an A-frame arch; gas bladder with a pair of long U-shaped appendages; and a thick, oval-shaped sagitta with deeply grooved caudal section of the sulcus. *Paranebris bauchotae* is distinct from all *Nebris* species in having a firmer interorbital skin and scale cover (spongy to the touch in *Nebris*), a larger eye (6-7 vs. 8-12 times in head length) and large ctenoid scales (vs. small and cycloid in *Nebris*).

Key words: New genus, new species, description, taxonomy, *Nebris*

About 80 species of sciaenid fishes are found along the Pacific coasts of the Americas between southern Alaska and southern Chile. A few species also occur at the offshore islands, such as the Galapagos and Archipelago Juan Fernández. Tropical East Pacific sciaenids are most speciose between Baja California and northern Peru, and new species continue to be discovered and described from that area. Some are restricted to deeper offshore waters, such as *Ctenosciaena peruviana* Chirrichigno 1969, *Cynoscion nannus* Castro & Arvizu 1976, *Cynoscion sp.* Béarez (in this volume) and *Umbrina bussingi* López 1980. Most however occur in inshore waters, such as, *Stellifer mancorensis* Chirrichigno 1962, *Umbrina wintersteeni* Walker & Radford 1992 and additional *Stellifer* species (Chao, in this volume).

A new genus and species of sciaenid fish, *Paranebris bauchotae* (Fig. 1), is described here based on three specimens collected from the Gulf of Panama in two independent collections. *Paranebris bauchotae* is a medium sized fish with an elongated body, and a large and oblique mouth. Although externally the new species looks very different from the species of *Nebris*, these two genera share some distinctive anatomical characters that are not found in other sciaenids, including a thick fleshy gap at front of the upper jaw, between the tips of premaxillary bones, a pair of long U-shaped appendages on

the gas bladder, and a thick oval sagitta with deeply grooved cauda on inner surface. These synapomorphies suggest that the new genus is closely related to the genus *Nebris*. However, difference of overall morphology, including meristic and morphometric characters (Table 1) clearly indicate that this species warrants placement in a new genus.

MATERIALS AND METHODS

All three specimens were collected from the Gulf of Panama. The first specimen (MNHN 1988-261) was collected by Gabriela Bianchi during the course of preparing the FAO Identification Sheets for Central East Pacific in the mid 1980s. Two additional specimens (USNM 360918 and MCZ 157272) were collected recently by the junior co-authors in the Golfo de San Miguel with a small shrimp trawl at about 12 m depth. Unless specifically noted, methods of counting and measuring follow Hubbs and Lagler (1964), and morphological terminology and descriptions follow Chao (1978, 1986, 1995). The standard symbolic code for collections follows Leviton *et al.* (1985). Anatomical descriptions and illustrations were based on the MNHN specimen (211 mm SL).

Paranebris new genus

The type-species of *Paranebris* is designated here as *P. bauchotae* new species. The diagnostic characters of the genus are the same as the type-species. *Paranebris* is a sister group of *Nebris* due to sharing of specific characters, including a premaxillary arch, and morphology of the gas bladder and of the sagitta.

Etymology: The new genus is named *Paranebris* (*para* = near), to suggest that the new genus is closely related to the genus *Nebris*.

Paranebris bauchotae new species

(Fig. 1.)

Holotype: USNM 360918, 185 mm SL, 8°18'N 78° 28'W, Golfo de Miguel, Panama, collected by Philippe Béarez and Ross Robertson during a STRI expedition on board R/V Urraca, by bottom trawl on January 23, 2000, at about 1km west of Punta Patiño on a mud and sand bottom at 12 m depth.

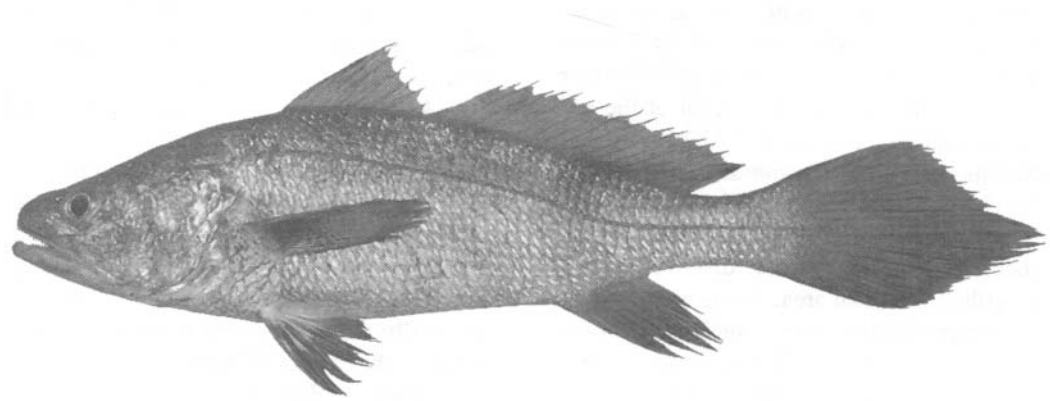

Fig. 1. *Paranebris bauchotae* n. gen. n. sp.; holotype USNM 360918, 185 mm SL (photo by R. Robertson)

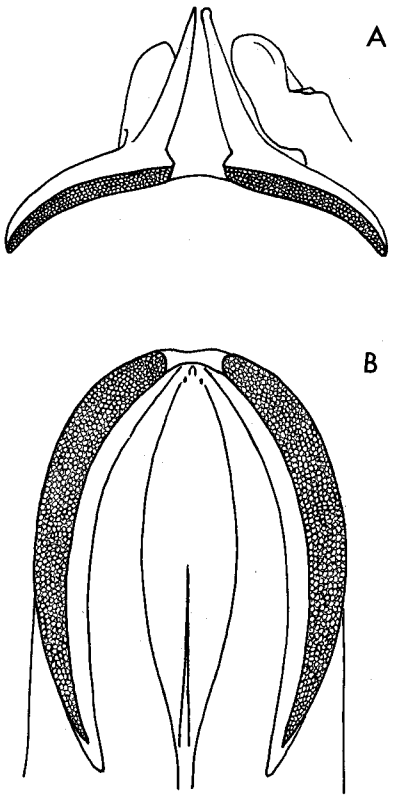

Fig. 2. Premaxillary bones of *Paranebris bauchotae*. Note that their ascending processes form an A-frame arch on tip of snout with a fleshy and cartilage gap in between (top fig. A); their granulated tooth plates are exposed lateral to the lower jaw when viewed from the underside of the head (bottom fig. B).

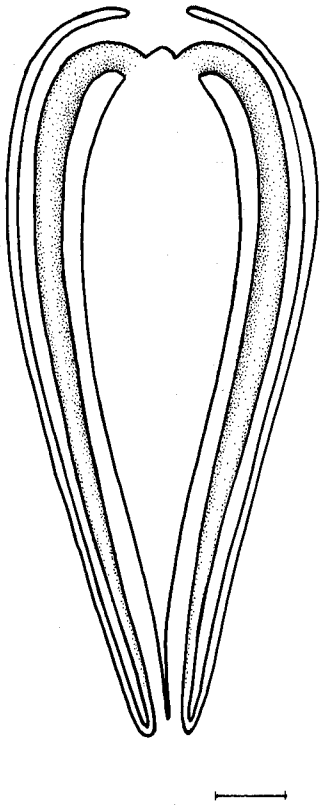

Fig. 3. Gas bladder of *Paranebris bauchotae* with a pair of long U-shaped appendages, a *Nebris*-pattern.

and sand bottom at 12 m depth.

Paratypes: MNHN 1988-261, 212 mm SL, a maturing female specimen, from Gulf of Panama, collected by G. Bianchi. MCZ 157272, 138mm SL caught with holotype.

Diagnosis: Jaw teeth short, conical, rather flat and densely packed, forming granulated tooth plates and rough to touch, like coarse sandpaper. Anterior basal points of premaxillary bones do not converge, and ascending processes of premaxillae forming an A-frame arch at front of wide snout (Fig. 2 A). Toothless fleshy gap present at the front of upper jaws where toothed tip of lower jaw fits in between upper tooth plates; entire lower jaw enclosed within the tooth plates of upper jaws when mouth is completely closed (Fig. 2 B). Gas bladder with a pair of tubular appendages, which extend from anterior margin of gas chamber to posterior end of body cavity, then U-turn back, and extend forward in front of main chamber of gas bladder (Fig. 3). Sagitta thick, elliptical with a large tadpole-shaped sulcus on its inner surface (Fig. 4).

Etymology: The species is named in honor of Dr. M.-L Bauchot for her contribution in caring for the very important fish collections at the Muséum National d'Histoire Naturelle, Paris, and for her enthusiasm and hospitality to many students of fishes.

Description: Dorsal-fin rays IX + I, 21-22; anal-fin rays II, 9; pectoral-fin rays 17; gill rakers 5 + 10 = 15; lateral line pored scales 48; vertebrae 11 + 14 = 25.

TABLE 1.

Comparative morphological characters of Paranebris bauchotae *and the East Pacific* Nebris occidentalis.

	Paranebris bauchotae *n. gen. n. sp*				*Nebris zestus* Jordan & Stark, 1898 (=*N. occidentalis* Vaillant, 1897)		
	USNM 360918 Holotype	MNHN 1988-261 Paratype	MCZ 157272 Paratype	% of SL (in HL)	CAS (SU)433 Syntype 1	CAS (SU)433 Syntype 2	% of SL (in HL)
Morphometrics							
Total length (mm)	235	267	185	126-134	129	110	120
Standard length –SL	185	212	138	- 100	107	91.1	- 100
Head length - HL	59.5	68.5	45.5	32.1-32.9	37.5	34.4	35-37
Snout length (in HL)	16.3 (3.7)	19.2 (3.6)	10.6 (4.3)	8.6-9.1 (3.6-4.3)	10.7	9.4	9.4-10
Eye diameter (in HL)	8.4 (7.0)	10.2 (6.7)	6.6 (6.8)	**4.5-4.8 (6.7-7.0)**	4.5 (8.3)	3.9 (8.8)	**4.1-4.2 (8.3-8.8)**
Interorbital width (in HL)	17.3 (3.4)	19.8 (3.5)	14.2 (3.2)	9.2-10.2 (3.2-3.5)	12.0 (3.2)	11.3 (3.0)	11.2-12.4(3.0-3.2)
Maxilla length (in HL)	27.7 (2.2)	34.8 (2.0)	23.4 (1.9)	15-17	17.2 (2.2)	14.7	16-16.2
Pectoral fin length	43.8	49.2	33.7	**23.2-24.4**	20.5	?	**19.2**
Pelvic fin length	35.8	39.7	22.4	16.2-19.4	16.7	13.7	15-16
2nd doral fin base	64.5	77.8	48.2	**34.8-36.7**	41.3	36.5	**38.6-40.1**
Anal fin base	21.4	23.2	17.4	**10.9–12.6**	19.2	15.6	**17.1-17.9**
2nd anal fin spine	14.1	14.2	11.2	6.7-8.1	?	6.5	7.14
1st anal fin ray	24.7	35.1	24.8	13.3-17.9	?	9.5	10.43
Caudal peduncle depth	17.1	19.2	12.5	9.0-9.2	7.5	6.8	7.0-7.5
Caudal fin length	50	55	47	25.9-34.0	22	18.9	20.6-20.8
Meristics							
Dorsal-fin spine	9+1	9+1	9+1	**10**	7+1	6+1	**7-8**
Soft dorsal-fin rays	22	21	21	**21-22**	29	28	**28-29**
Pectoral-fin rays	17	17	17	**17**	20	20	**20**
Anal-fin rays	8	8	8	**8**	11	13	**11-13**
Gill rakers (lateral)	5+8=13	5+10=15	4+9=13	**13-15**	7+14=21	8+16=24	**21-24**
Pored lateral line scales	48	47/48	47/48	47/48	45-59		45-59
Scale row above lateral line	53/55	48/51	50/51	**48-53**	100-115	?	**100-115**
Vertebrae		**11+14**=25			**12+13**=25		
Trunk scales				Ctenoid			Cycloid

Note: Distinctive characters are in bold font.

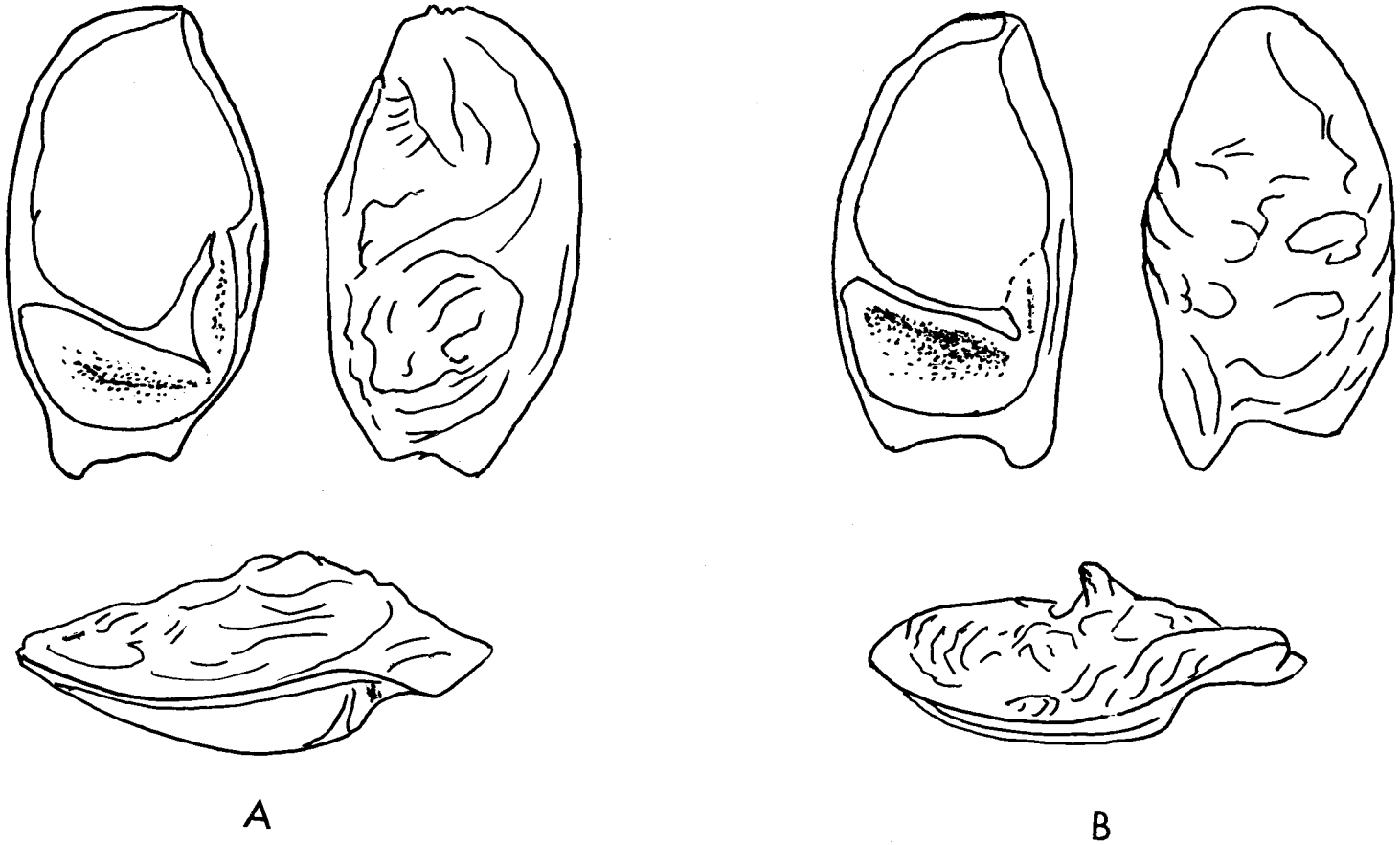

Fig. 4. Sagitta of *Paranebris bauchotae* (A) and *Nebris occidentalis* (B). Note that the inner surface (left) has a tadpole-shaped sulcus with deeply grooved cauda section; the outer surface granulated (right), and thick ovoid in lateral view (bottom).

Head large, almost equilaterally triangular, its length about 32 % of SL; dorsal profile evenly arched, slightly concave above eyes. Top of head flat and firm, covered with thick scaled skin without visible bony ridges. Eye small 6-7 in head length, orbit somewhat ovoid; interorbit wide, 3.2-3.5 in head length. Snout blunt and long, 3.6-4.3 in head length (Table 1). Ascending processes of premaxillary bones form an A-frame arch at tip of snout (Fig. 2a), and anterior basal portion of premaxillary bones do not meet at symphysis of upper jaws, thus a toothless, fleshy gap presents at tip of upper jaw.

Mouth large, terminal, lower jaw slightly projecting, gape slightly oblique no more than an a 30° angle. Teeth short, conical to flat, tightly packed in a mosaic patch, like coarse sandpaper to the touch. Upper-jaw tooth bands well-spaced from each other; lower-jaw tooth plates converge at symphysis. When mouth closed, upper-jaw tooth plates extend laterally, entirely enclosing lower jaw except its tip. Teeth from upper and lower jaws do not appear to touch each other (Fig. 2). Tip of upper lip on a horizontal line passing below lower margins of orbit, with two marginal pores at its lower edge. Underside of lower jaw with two pores at tip and a distinct symphyseal knob (Fig. 2b). Maxillary long, 1.9-2.2 times in head length, its end extending behind eye.

Preopercular margin embedded under scales rather smooth at angle. Opercle ends slightly anterior to origin of pectoral fin. Hind margin of postemporal bone covered with small ctenoid scales, appearing as a bony flap above dorsal end of gill slit.

Lateral gill rakers long and slender, 4-5+8-10 = 13-15, median one (longest) distinctly longer than gill filaments at angle of first gill arch. Inner gill rakers short and knob-like, 2-3+7 = 9-10.

Spinous dorsal fin low, longest spine not reaching origin of second dorsal fin when depressed. Second dorsal fin long with one spine and 21-22 soft rays. Anal fin truncate with two spines, second spine short, about one half length of first ray. Caudal fin long, pointed, nearly rhomboidal, its length about equal to length of head, with margin of upper lobe slightly concave and lower lobe slightly convex. Pectoral fin darkish and moderately long, 23.2-24.4 in SL, its tip extending slightly beyond tip of pelvic fins. Origin of pelvic fin slightly behind that of pectoral fin, and pelvic fin without a filamentous prolongation on first soft ray.

Scales large, ctenoid on trunk and vertical fins, cycloid on head except a few ctenoid scales on opercles; scales on snout much reduced in size, but not embedded. Dorsal and anal fins with one or two rows of small ctenoid scales along base, and a few scales on the membranes up to 1/2 of fin height along hind margin of soft rays.

Pored lateral-line scales ctenoid (47-48), with aborescent lateral line canals and intercalated with smaller ctenoid scales. Scale row just above lateral line similar in size but lacking intercalated scales (48-55).

Paratype: (MNHN 1988-261, 212 mm SL) is a mature female, eggs are visible through ovarian walls. Pyloric ceca well-developed in two clusters of five each. Peritoneal wall pale.

Nebris-pattern gas bladder (Chao 1978); a pair of long tubular appendixes (diverticula) originating from anterior margin of main chamber, extending posterior-laterally along body cavity to base of first anal-fin pterigiophore, then looping back (a U-turn) and extending forward at front of gas bladder to auditory bulla under cranium (Fig. 3). Drumming muscles associated with gas bladder absent in the female; male not examined.

Sagitta oval, very thick, with a notch at posterior margin. A large tadpole-shaped sulcus mark covers almost entire inner surface, with a large ostium expanded along lateral margins and closed in a narrow spurt to the anterior margin of sagitta. Cauda sharply bent, with a deeply grooved and expanded distal portion. Outer surface of sagitta elevated, almost rounded in middle (Fig. 4).

Color: Body uniformly silvery slightly dark above with a bronze cast and yellowish lateral line when freshly caught; turn to light brown in preservative. Side with four faint blotch-like vertical bands, three on and below dorsal fin and one on caudal peduncle. Pectoral fins distinctly dark; pelvic, anal and caudal fins fairly dark, especially toward the distal ends; and tip of spinous dorsal fin also dark. Opercles with a diffused dark blotch due to black lining on inner opercle. First gill arch with a black line along base of gill filaments. Inside of mouth pale.

Relationships: Based on the diagnostic characters described above (Figs. 2-4, Table 1), the new genus *Paranebris* is most closely related to *Nebris*. *Paranebris bauchotae* shares the following synapomorphies with the species of the genus *Nebris*: (1) the ascending process of each premaxilla form an A-frame arch in front of ethmoid bone under the skin of snout (Fig. 2); (2) a pair of long U-shaped appendages on gas bladder (Fig. 3); (3) a thick oval sagitta with a deeply grooved cauda of the tadpole shaped sulcus (Fig. 4). *P. bauchotae* can be distinguished from the *Nebris* species (Table 1) by having a thick, narrow head, that is not spongy to the touch as in *Nebris,* a larger eye (6-7 times in head length vs. 8-12 in *Nebris*), a slightly oblique terminal mouth (a strongly oblique mouth with a projecting lower jaw in *Nebris*), fewer soft dorsal-fin rays (21-22 vs. 27-32 in *Nebris*) and large, ctenoid, pored lateral-line scales (48 vs. 100-116, small cycloid *in Nebris*). Sasaki (1989) proposed that *Nebris* and *Larimus* form a sister group, whereas Chao (1978) suggested a more distant relationship between these two genera. The external morphology of *P. bauchotae* is similar to that of juvenile *Totoaba macdonaldi*, which is endemic to the Gulf of California. The gas bladder of *T. macdonaldi* also has a pair of long tubular diverticula, originating from the anterior margin of the main chamber, but terminating posteriorly without a U-turn as in the *Nebris* – pattern (Chao 1978, 1986). Its sagitta is not rounded and lacks the deeply grooved cauda section seen in the *Nebris*-pattern. Further study is needed to determine the phylogenetic relationship of the sister group of *Paranebris* and *Nebris* with other sciaenids.

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RESUMEN

Se describe una nueva especie y un nuevo género, *Paranebris bauchotae*, del Golfo de Panamá. Su dentadura es característica y el ojo y las escamas permiten diferenciarlo de *Nebris*.

REFERENCES

Chao, L. N. 1978. A basis for classifying western Atlantic Sciaenidae (Pisces: Perciformes). National Marine Fisheries Service, Tech. Rep. Circ. no. 415, 64 p.

Chao N. L. 1986. A synopsis on zoogeography of Sciaenidae. p.570-589. *In* Indo-Pacific Fish Biology - Proceedings of the Second Indo-Pacific Fish Conference, July 28-Agust 3, 1985, Tokyo, Japan.

Chao, N. L. 1995 Sciaenidae. 1201-1813 p. *In* W. Fischer et al (eds.). Guia FAO para la identificación para los fines de la pesca. Pacifico central-oriental.

Hubbs, C. L. & K. F. Lagler. 1964. Fishes of the Great Lakes region. Rev. Ed. University of Michigan, Ann Abor, 213 p.

Leviton, A.E., R. H. Gibbs Jr., E. Heal & C. E. Dawson. 1985. Standard in herpetology and ichthyology: Part I. Standard symbolic code for institutional resource collection in herpetology and ichthyology. Copeia 1985: 802-832.

Sasaki, K. 1989. Phylogeny of the family Sciaenidae, with notes on its zoogeography (Teleostei, Perciformes). Mem. Fac. Fish. Hokaido Univ. 137 p.