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Cover Page Footnote

We thank Callie Mack, Tara Howell, and Roger Uzun for bringing this species to our attention and to John Moore, Wendy Dorr, Bill Bushing, Janna Nichols, and Dan Richards for further observations. We thank John Snow for helping us obtain the specimens, and Rick Feeney for confirming identifications of museum specimens. The following researchers reviewed the key: Don Buth, Craig Campbell, Dario Diehl, Rick Feeney, Robin Gartman, Peter Major, Jim Mann, Mike Mengel, Terra Petry, Bill Power, Jim Rounds, and Fred Stern.

The Largemouth Blenny, *Labrisomus xanti*, New to the California Marine Fauna with a List of and Key to the Species of Labrisomidae, Clinidae, and Chaenopsidae found in California Waters

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We report here on the first observations and capture of breeding populations of the largemouth blenny, *Labrisomus xanti* Gill, 1860 (Family Labrisomidae) in California marine waters. We also provide a list of those members of the closely related families Labrisomidae, Clinidae, and Chaenopsidae that are found off California with a key to these species.

The first observation of this species in California waters occurred on 15 July 2015, when Callie Mack and Tara Howell observed one individual in about 5 m of water in front of the Marine Room Restaurant (La Jolla Shores) (32°51'N, 117°16'W) among low lying rocks. Ms. Mack described the fish as having “a blenny-like profile, about 6 or 7 inches long (the length of my hand), bright red and covered with many small blue spots, and a partial bright blue ring at the base of each eye. It was perched in a rock crevice on its red pelvic fins. Pectoral fins were red shading to yellow. Dorsal fin was also bright red with blue spots on the foredorsal [sic] part. It had 3 rows of small fur-like (or eyelash-like) cirri, also covered with blue spots, on the top of its head, one set just below each eye, and 2 rows above the eyes on the forehead. It was either curious or territorial (probably the latter); kept coming out of its crevice, sitting in the open for a few moments, then going back in.”

Ms. Mack and Ms. Howell returned to the same general area on 19 July 2015 and observed at least four different individuals, two on each dive and all at a bottom depth of 3–4 m. On this occasion she provided us with a number of images of one of the individuals that was red and she described it as quite territorial as it chased off a California sheephead and lunged at Ms. Howell’s video camera. From Ms. Mack’s initial description, and her subsequent photographs, we determined that these fish were most likely the largemouth blenny, *Labrisomus xanti* and that the red individuals were breeding males (Thomson et al. 2000).

Additional observations were made of this species at the same general site on 11 and 19 August 2015 by Roger Uzun who observed at least five unique individuals. Similar to previous sightings, he observed the fish at depth of 3–4 m on low-lying rocks. However on these days, Mr. Uzun observed what was likely mating behavior and nest guarding. On both 11 and 19 August, he observed, photographed, and video recorded a bright red individual (Fig. 1) courting and apparently fertilizing the eggs of two drabber individuals (Fig. 2). This male then guarded and aerated the apparent eggs. Similar courtship and parental behaviors are known for other species of the genus *Labrisomus* (Gibran et al. 2004).

Janna Nichols made the first observation of this species known to us away from the La Jolla area on 31 October 2015 off Casino Point at Santa Catalina Island (33°20.9'N, 118°19.4'W) in

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Fig. 1. Male largemouth blenny, *Labrisomus xanti*, photographed near La Jolla, California, August 2015. Photograph by Roger Uzun.

about 7 m of water among rocks. Based on the images Ms. Nichols provided, the Casino Point fish (brownish-gray) may have been a female or a male (mature males lose their red coloration during the non-reproductive season — Mark Steele, pers. comm. to M. L.). Ms. Nichols notes that she likely saw another, similarly colored, individual later in the day off Torqua Springs (33°23.0'N, 118°21.6'W) about 5 km up northwest of Casino Point.

Through December, recreational divers continued to see at least several individuals on the shallow Marine Room reefs. However, we received no reports of *L. xanti* sightings from unique areas until Dan Richards and party found several fish, again at Catalina Island, but this time further west of the previous sightings. Mr. Richards, along with Steve Lee and Jessie Altstatt, saw one individual among cobbles in 5–6 m in Big Fisherman Cove (33°26.7'N, 118°29.1'W) on 2 May 2016. On 4 May 2016, Mr. Richards saw an additional fish under a small rocky overhang in 3 m of water at nearby Isthmus Reef.

Lastly, Mark Steele informs us that, as of late summer and early fall 2016, “I searched a band that was approximately 150 m long and 3 m wide in 1.2 – 2 m depth in the back of Big Fisherman Cove and counted 19 different individuals. This was not an exhaustive search and this species is pretty shy, so I’m sure 19 is an underestimate of true abundance in that area.” He goes on to note that an associate had also seen this species at several other sites around the island.



Fig. 2. Female (left) and male (right) largemouth blennies, *Labrisomus xanti*, exhibiting breeding behavior, August 2015, La Jolla, California. Photograph by Roger Uzun.

Table 1. Members of the families Clinidae, Labrisomidae, and Chaenopsidae from California waters with notes on their maximum sizes, and geographic and depth ranges. CAS = California Academy of Sciences; LACM = Los Angeles County Museum of Natural History; SIO = Scripps Institution of Oceanography Marine Vertebrate Collection. Min. = minimum depth observed; max. = maximum depth observed. D = dorsal-fin elements; A = anal-fin elements; Pect. = pectoral-fin rays; Pelvic = pelvic-fin rays; LLs = lateral line scales; LLp = pored lateral line scales; GR = gill rakers, lower + upper; GRt = total gill rakers; Vert. = total vertebrae.

Family Clinidae — Kelp Blennies

Gibbonsia elegans (Cooper, 1864). Spotted Kelpfish. To 16 cm TL (Miller et al. 2008). San Francisco Bay (CAS 215456), northern California to Bahia Magdalena, southern Baja California, including Isla Guadalupe (Eschmeyer and Herald 1983). Intertidal and to 56 m (min.: Wells 1986; max.: Eschmeyer and Herald 1983). D XXXI–XXXV,5–8; A I–III,21–25; Pect. 11–13; Pelvic 1,2–3; LLp 62–71; GR 4–5 + 8–12 = 12–16; Vert. 47–49. The spotted kelpfish was mistakenly given the name *Gibbonsia evides* by Eschmeyer (1998); for explanation see Nelson et al. (2004:243).

Gibbonsia metzi Hubbs, 1927. Striped Kelpfish. To 23.5 cm TL (Miller and Lea 1972). Vancouver Island, British Columbia to Punta Rompiente, central Baja California (Miller and Lea 1972). Intertidal, including tide pools, and to 18 m (min.: Eschmeyer and Herald 1983; max.: LACM 35689-2). D XXXIV–XXXVII,7–10; A II,24–29; Pect. 11–13; Pelvic 1,3; LLp 64–71; GR 3–4 + 7–8 = 11; Vert. 50–53.

Gibbonsia montereyensis Hubbs, 1927. Crevice Kelpfish. To 13.9 cm SL (SIO 80–19). Vancouver Island, British Columbia (Lamb and Edgell 2010) to Isla Guadalupe (SIO 60–15), Bahia San Carlos (SIO 52–215) and Isla Cedros, Islas San Benito, and Isla Natividad, central Baja California (Ramírez-Valdez et al. 2015). Intertidal and to 37 m (min.: M. L., unpubl. data; max.: J. Carroll, pers. comm. to M. L.).

Gibbonsia erythra Hubbs, 1952, is a junior synonym (Stepien and Rosenblatt 1991). D XXXIV–XXXVI,5–8; A II, 23–28; Pect. 11–13; Pelvic 1,3; LLp 61–70; GR 2–5 + 7–10; Vert. 49–51.

Heterostichus rostratus Girard, 1854. Giant Kelpfish. To 61 cm TL (Miller and Lea 1972). British Columbia to Cabo San Lucas, southern Baja California, including Isla Guadalupe (Miller and Lea 1972). Intertidal and to 40 m (min.: M. L. unpubl. data; max.: Eschmeyer and Herald, 1983). D XXXIII–XXXVIII,11–13; A II,31–35; Pect. 12–14; Pelvic 1,3; LLs 73–83; GR 5–8 + 12–13 = 18–20; Vert. 56–58.

Family Labrisomidae — Labrisomid Blennies

Alloclinus holderi (Lauderbach 1907). Island Kelpfish. To 11.5 cm TL (M. L., unpubl. data). San Miguel Island, southern California (D. Kushner, pers. comm. to M. L.) to Punta San Pablo (27° 12'N, 114° 29'W), southern Baja California (Miller and Lea 1972). Intertidal and to 91 m (min.: M. L., unpubl. data; max.: SCCWRP). D XXIV–XXVI,9–13; A II,21–23; Pect. 13–14; Pelvic 1,3; LLs 47–54; GR 4 + 9; Vert. 41–42.

Cryptotrema corallinum Gilbert, 1890. Deepwater Blenny. To 12.7 cm TL (Miller and Lea 1972). Off Cook Point, San Miguel Island, southern California (D. Schroeder, pers. comm. to M. L.) to Bahia San Quintin, northern Baja California (Miller and Lea 1972). At depths of 24–195 m (min.: Miller and Lea 1972; max.: M. L., unpubl. data). D XXVI–XXVIII,11–13; A I–II,24–27; Pect. 13–15; Pelvic 1,3; LLs 65–75; GR 4–5 + 8–12.

Labrisomus xanti Gill, 1860. Largemouth Blenny. To 17.8 cm TL (Thomson et al. 2000). Agua Hedionda Lagoon, La Jolla, and Santa Catalina Island, southern California (C. Mack, B. Cantrell, and J. Nichols, respectively, pers. comm. to M. L.); Isla Cedros and Isla Natividad (Ramírez-Valdez et al. 2015) and (mainland) Bahia de Sebastián Vizcaino, southern Baja California into Gulf of California (Thomson et al. 2000) and to Bahia Chamela, Jalisco, Mexico (Galván et al. 2016). Tide pools and to 11 m (min.: Thomson and Lehner 1976; max.: LACM 31768.028. D XVII–XIX,10–13; A II,17–19; Pect. 13–15; LLs 64–69; GR 3 + 6–7; Vert. 34.

Paraclinus integripinnis (Smith, 1880). Reef Finspot. To 7.8 cm TL (Rosales-Casián 1996). Santa Cruz Island, southern California (Rosenblatt and Parr 1969) and Naples, Santa Barbara County, southern California (S. Norton, pers. comm. to M. L.) to Bahia Almejas, southern Baja California (Miller and Lea 1972). Intertidal and to 15 m (Miller and Lea 1972). D XXVII–XXIII; A II,18–21; Pect. 12–14; Pelvic 0–1,3; LLs 34–39; GR 2 + 4 = 6; Vert. 37–39.

Family Chaenopsidae — Tube Blennies

Chaenopsis alepidota (Gilbert, 1890). Orangethroat Pikeblenny. To 15.2 cm TL (Miller and Lea 1972). Point Sur, central California (T. Laidig, pers. comm. to M. L.) to Gulf of California (Thomson et al. 2000). The only known mainland population in southern California is in King Harbor, southern California (Stephens et al. 1989). At depths of 1–23 m (min.: Robertson and Allen 2002; max.: Allen and Robertson 1994). D XVIII–XXI,32–38; A II,34–38; Pect. 12–14; Pelvic 1,3; GRt 11–12; Vert. 56–60.

Table 1. Continued.

<i>Neoclinus blanchardi</i> Girard, 1858. Sarcastic Fringehead. To 30.5 cm TL (Miller and Lea 1972). Bodega Bay, northern California (D. Stephens, pers. comm. to M. L.) to Isla Cedros, central Baja California (Miller and Lea 1972). At depths of 3–73 m (min.: Miller and Lea 1972; max.: Carlisle 1969). D XXIII–XXVII, 15–18; A II, 26–30; Pect. 14–15; Pelvic I, 3; LLs 20–27; GR 4–6 + 8 = 12–14; Vert. 46–49.
<i>Neoclinus stephensae</i> Hubbs, 1953. Yellowfin Fringehead. To 10 cm TL (Miller and Lea 1972). San Francisco, northern California (Ryan 1986) to Punta San Hipolito, central Baja California (Miller and Lea 1972). Intertidal (Hubbs 1953) to 27 m (Miller and Lea 1972). D XIV–XXVII, 15–18; A II, 29–31; Pect. 15; Pelvic I, 3; LLs 19–20; GR 6–8 + 12–14 = 18–22; Vert. 47–50.
<i>Neoclinus uninotatus</i> Hubbs, 1953. Onespot Fringehead. To 25 cm TL (Eschmeyer and Herald 1983). Bodega Bay, northern California to northern Baja California (Eschmeyer and Herald 1983). Surf zone to 55 m (min.: Carlisle et al. 1960; max.: Fay et al. 1978). D XXIII–XXVII, 14–17; A II, 26–31; Pect. 14–16; LLs 17–26; GR 3–5 + 8–11 = 11–16; Vert. 47–49.

Through all of these sightings we were fairly confident in our identification of this species as *L. xanti*, based on overall appearance and coloration of the breeding males. However, we felt that publishing this report had to await our being able to examine a specimen. This opportunity was provided by the third author (BC) who caught three individuals, using hook-and-line, on 30 June 2016 in Agua Hedionda Lagoon (33°08.8'N, 117°19.9'W). He caught these specimens in an area of the lagoon that is lined by small boulders that occur from above the tide line into the shallow subtidal. He reports that of the first three fish he caught one was a male and two were females. Returning on 6 July 2016, he caught five more at low tide. Good water clarity allowed him to see other *L. xanti* under a number of barely subtidal boulders.

These five specimens were deposited in the Scripps Institution of Oceanography Marine Vertebrate Collection (SIO 16-30) and range in size from 97.2 to 122.3 mm SL. All specimens fit the description of *L. xanti* (Hubbs, 1953), having relatively few cephalic sensory pores (compared to the similar species *L. multiporosus*), no teeth on the palatine, XVIII–XIX dorsal-fin spines, 12–13 dorsal-fin rays, two anal-fin spines and 16–18 rays. The largest specimen is a ripe male that was bright red with iridescent blue spots when captured. Three specimens are females with ripe eggs, confirming the presence of spawning-capable individuals in southern California waters.

Prior to this the known distribution of the Largemouth Blenny included the Pacific coast of Mexico, from the outer Baja peninsula, the Gulf of California, and southward to southern Mexico (Hubbs 1953; Springer 1959; Thomson et al. 2000). It is known from throughout the Gulf of California from Roca Consag (SIO 04-124; 31°7.3'N, 114°29.0'W) southward to Mazatlán and is the most common species in the genus found in the Gulf (Thomson et al. 2000). It is found along the Pacific coast of southern Mexico with confirmed records as far south as Bahía Chamela, Jalisco (Galván-Villa et al. 2016). It has also been recorded from the Islas Tres Marias (Erisman et al. 2015) including Isla San Juanito (SIO 62-8, 62-9; 21°43.5'N, 106°42.3'W) and Isla Cleopha (SIO 62-56; 21°15.5'N, 106°17.6'W), as well as Isla Clarion (LACM 32097-47; 18°21'N, 114°43'W). Reports of the species from Peru (e.g., Love et al. 2005) and Ecuador (Bearez 1996) appear to be based on its inclusion in keys to fish species of that region (Chirichigno 1974; Chirichigno and Vélez 1998). It was listed as occurring in northern Chile in 1999 (Sielfeld et al. 2010) but that record may be based on the similar species *L. multiporosus*, known to occur in that area (Hubbs 1953; Springer 1959). *Labrisomus xanti* was not recorded in a detailed systematic treatment of related blennies from the Pacific coast of South America (Stephens and Springer 1974), and to our knowledge no specimens from south of Mexico exist. Thus its occurrence south of Mexico is unconfirmed.

Along the outer coast of Baja California *L. xanti* had been recorded as far north as Puerto Mala Arrimo in Bahía San Sebastián Vizcaino (SIO 14-174, formerly W51-224; 27°48'N, 114°43'W). Hubbs (1953) reported the species (as *Labrisomus xanthusi*) from Isla San Benito based on two specimens collected in 1950 (SU 17545; ca 28°18'N, 115°35'W). The species has also been reported from Rocas Alijos (ca 24°57.5'N, 115°45'W) based on visual observations (Gotshall 1996). The southern California records represent the northernmost occurrence of the species, extending its known range approximately 626 km northward from Isla San Benito to Santa Catalina Island, California.

These records are the first from California. Whether the species arrived in these waters as larvae, juveniles, or as adults (unlikely given their benthic habits), is unknown. We note that the first individuals observed were adults. It is one of the numerous tropical fishes that arrived in California waters during the strong El Niño of 2015. While we have documented that the fish were breeding off La Jolla in 2015 and Agua Hedionda in 2016 it remains to be seen whether recruitment from these spawning sites will be successful. We note that as of fall 2016, no young or newly recruited individuals have been observed. Thus, it is possible that successful reproduction will not occur and that this species will disappear over time from California waters.

Key to the California Kelp, Labrisomid, and Tube Blennies, Families Clinidae,
Labrisomidae, and Chaenopsidae

- 1a Large ocellus present in posterior portion of dorsal fin (between 22nd to 27th dorsal-fin spines); dorsal fin wholly of spines *Paraclinus integripinnis* (Labrisomidae)
- 1b No ocellus in dorsal fin as above; dorsal fin with both spines and soft-rays 2
- 2a Greatest body depth into total length more than 10 times; more soft-rays than spines in dorsal fin *Chaenopsis alepidota* (Chaenopsidae)
- 2b Greatest body depth into total length less than 8 times; more spines than soft-rays in dorsal fin 3
- 3a Maxillary extending well behind eye 4
- 3b Maxillary not extending behind eye 6
- 4a Supraorbital cirri divided from base; no large ocellus in center of membrane between 1st and 2nd dorsal spines; total gill rakers 18–22; head length 4.2–5.3 into standard length *Neoclinus stephensae* (Chaenopsidae)
- 4b Supraorbital cirri simple or divided only on distal half; ocellus present between 1st and 2nd dorsal-fin spines; total gill rakers 11–16; head length 3.5–3.8 into standard length. . . 5
- 5a One ocellus in dorsal fin between 1st and 2nd spines, none between 5th to 9th spines; anteriormost supraorbital cirrus longer than eye and divided at tip *Neoclinus uninotatus* (Chaenopsidae)
- 5b Two ocelli in dorsal fin (rarely one; if one, located between 1st and 2nd dorsal spines), one between 1st and 2nd spines, the other between 5th to 9th spines; all supraorbital cirri shorter than eye and undivided *Neoclinus blanchardi* (Chaenopsidae)
- 6a *From 3b: maxillary not extending behind eye*
Tail forked; head elongated and pointed; anal-fin soft-rays 30 or more *Heterostichus rostratus* (Clinidae)
- 6b Tail rounded (in adults); head not as above, more stout; anal-fin soft-rays less than 30. . . 7
- 7a Pectoral fin long, extending beyond 1st anal-fin soft-ray; maxillary goes into head less than 2.5 times 8

- 7b Pectoral fin short, not extending to 1st anal-fin soft-ray; maxillary goes into head more than 2.5 times 10
- 8a Ocellus between 2nd and 3rd dorsal-fin spines typically present; supraorbital cirri heavily branched; anal-fin soft-rays 17 to 19 *Labrisomus xanti* (Labrisomidae)
- 8b No ocellus on dorsal fin (Island Kelpfish may have dark patch on 1st and 2nd dorsal spine); supraorbital cirri simple, with 2 or more tips; anal-fin soft-rays 21 or more 9
- 9a Lateral line descends to midbody immediately posterior to tip of pectoral fin; anal-fin soft-rays 21–23 *Alloclinus holderi* (Labrisomidae)
- 9b Lateral line remains in upper portion of body for at least 2/3 of distance to caudal fin; anal-fin soft-rays 24–27 *Cryptotrema corallinum* (Labrisomidae)
- 10a Dorsal-fin soft-rays equally spaced, 7–10 in number; total length may be > 16 cm *Gibbonsia metzi* (Clinidae)
- 10b Dorsal-fin soft-rays not equally spaced, posterior spacing wider than anterior, 5–8 in number; total length < 16 cm 11
- 11a Scales present on caudal fin; ocellus on body with ring *Gibbonsia elegans* (Clinidae)
- 11b No scales on caudal fin; ocellus on body with no ring *Gibbonsia montereyensis* (Clinidae)

Acknowledgments

We thank Callie Mack, Tara Howell, and Roger Uzun for bringing this species to our attention and to John Moore, Wendy Dorr, Bill Bushing, Janna Nichols, Dan Richards, and Mark Steele for further observations. We thank John Snow for helping us obtain the specimens, and Rick Feeney for confirming identifications of museum specimens. The following researchers reviewed the key: Don Buth, Craig Campbell, Dario Diehl, Rick Feeney, Robin Gartman, Peter Major, Jim Mann, Mike Mengel, Terra Petry, Bill Power, Jim Rounds, and Fred Stern.

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