

**A PACIFIC FAT SLEEPER, *DORMITATOR LATIFRONS*
(PERCIFORMES: ELEOTRIDIDAE), FROM LAKE MERRITT,
SAN FRANCISCO BAY, CALIFORNIA**

DOUGLAS J. LONG
Department of Ichthyology
California Academy of Sciences
Golden Gate Park
San Francisco, California 94118

The Pacific fat sleeper, *Dormitator latifrons* (Richardson 1844), lives in coastal marine, brackish, and fresh waters of the eastern Pacific Ocean from Ecuador to Mexico (Follett 1961, Allen and Robertson 1994, Watson 1996); a single specimen is known from coastal marine waters of southern California (Fitch 1962). This specimen, 230 mm standard length (SL), was caught by hook and line off a rocky shoreline near Palos Verdes, Los Angeles County (33°47'N, 118°26'W) on 8 July 1961. It is now in the Marine Vertebrates Collection at the Scripps Institution of Oceanography (SIO 61-401). Recently, a second California specimen was collected from Lake Merritt within the San Francisco Bay complex, representing the most northern locality known for the species and a range extension of >600 km. Although this is a new locality record for the species, the possible origin of the specimen in Lake Merritt can only be surmised.

The specimen was found by R. Bailey of the Lake Merritt Institute during a routine survey of Lake Merritt in Oakland, Alameda County, California (37°47.60'N, 122°15.10'W). Lake Merritt is a brackish estuary that takes freshwater runoff from the surrounding Oakland and Piedmont hills and adjacent metropolitan area and is connected to San Francisco Bay via a canal to the Port of Oakland in Oakland Harbor on the east side of the bay. The *D. latifrons* was collected from shallow water (about 1 m) in Lake Merritt, west of the boating center docks at Lakeside Park at approximately 1000 on 7 October 1995. It was frozen soon thereafter, but subsequent defrosting and refreezing caused minor damage to the fish. The specimen was donated to the Department of Ichthyology, California Academy of Sciences, where it was preserved and catalogued (CAS 87870).

Identification as *D. latifrons* was based primarily on the large size of the individual (212.5 mm SL), separate ventral fins, heavily scaled body, large and wide dorsally depressed head, and relatively small upturned jaw that did not extend posteriorly beyond the small eyes. The specimen was grayish-blue overall. It had thin dark bars on the soft dorsal and anal fins, as well as a dark postopercular spot on each side of the body and a dark vertical bar at the base of the pectoral fins. Fin ray counts were D VII+I, 9; Pectoral 1+14; Pelvic I, 5; A I, 9; all in agreement with meristic counts given in Miller and Lea (1972) and Allen and Robertson (1994). Additionally, comparison with other *D. latifrons* specimens from Latin America in the CAS collection confirmed the initial identification.

The mode of introduction of this specimen into the San Francisco Bay area is subject to speculation. Larvae believed to be from *D. latifrons* have been collected from marine waters off western Mexico (Watson 1996). Possibly, the Lake Merritt specimen was carried north from southern California or Mexico in its larval form by the warm 1983 or 1991 El Niño currents and later settled in San Francisco Bay. This natural transport mechanism has been used to explain the extralimital occurrences of some Mexican species in southern California waters (Fitch 1962, Lea et al. 1989, Moore 1991, Lea and Rosenblatt 1992). It is also possible that this specimen was released alive into the lake (Lachner et al. 1970), but this is unlikely since the species is rarely sold as an aquarium fish in California and is not sold in the live fish markets in the area.

The most plausible explanation is that the specimen arrived in egg, larval, or juvenile form in ballast water discharged into Oakland Harbor from a cargo ship coming from Latin America (Carlton 1985); the fish could have traveled to Lake Merritt from there. This is also the suspected transport mechanism for the eleotridid, *Prionobutis koilomatodon*, from Indo-west Pacific waters to Panama, where it is now established (Dawson 1973). Additionally, at least three species of Asian gobies (yellowfin goby, *Acanthogobius flavimanus*; chameleon goby, *Tridentiger trigonocephalus*; and shimofuri goby, *T. bifasciatus*) may have arrived in California by this means and are now established in marine, brackish, and freshwaters of San Francisco Bay and other areas of California (Brittan et al. 1963, Haaker 1979, Matern and Fleming 1995). Both *A. flavimanus* and *T. trigonocephalus* have been collected from Lake Merritt. If ballast water transport is the method of introduction for *D. latifrons*, it is possible that additional specimens are living in San Francisco Bay and that more may be caught in the future.

ACKNOWLEDGMENTS

I thank R. Bailey of the Lake Merritt Institute for bringing the specimen to my attention, for donating it to the California Academy of Sciences, and for information on the ichthyofauna of the lake. Thanks also to J. McCosker, C. Ferraris, and J.D. Fong of the Department of Ichthyology, California Academy of Sciences and H.J. Walker Jr. of Scripps Institution of Oceanography for assistance.

LITERATURE CITED

- Allen, G.R. and D.R. Robertson. 1994. Fishes of the tropical Eastern Pacific. University of Hawaii Press, Honolulu, Hawaii, USA.
- Brittan, M.R., A.B. Albrecht, and J.D. Hopkirk. 1963. An oriental goby collected in the San Joaquin River Delta near Stockton, California. California Fish and Game 49:302-304.
- Carlton, J.T. 1985. Transoceanic and interoceanic dispersal of coastal marine organisms: The biology of ballast water. Oceanography and Marine Biology Annual Review 23:313-371.
- Dawson, C.E. 1973. Occurrence of an exotic eleotrid fish in Panama with discussion of probable origin and mode of introduction. Copeia 1973:141-144.

- Fitch, J.E. 1962. A sea urchin, a lobster and a fish, new to the marine fauna of California. *California Fish and Game* 48:216-221.
- Follett, W.I. 1961. The fresh water fishes - their origins and affinities. *Systematic Zoology* 9:212-232.
- Haaker, P.L. 1979. Two Asiatic gobiid fishes, *Tridentiger trigonocephalus* and *Acanthogobius flavimanus*, in Southern California. *Bulletin of the Southern California Academy of Sciences* 78:56-61.
- Lachner, E.A., C.R. Robins, and W.R. Courtenay. 1970. Exotic fishes and other aquatic organisms introduced into North America. *Smithsonian Contributions in Zoology* 59:129.
- Lea, R.N., J.M. Duffy, and K.C. Wilson. 1989. The Cortez angelfish, *Pomacanthus zonipectus*, recorded from southern California. *California Fish and Game* 75:45-47.
- Lea, R.N. and R.H. Rosenblatt. 1992. The Cortez grunt (*Haemulon flaviguttatum*) recorded from two embayments in southern California. *California Fish and Game* 78:163-165.
- Matern, S.A. and K.J. Fleming. 1995. Invasion of a third Asian goby, *Tridentiger bifasciatus*, into California. *California Fish and Game* 81:71-76.
- Miller, D.J. and R.N. Lea. 1972. Guide to the coastal marine fishes of California. Department of Fish and Game, Fish Bulletin 157.
- Moore, R.H. 1991. First record of the leather bass (*Epinephelus dermatolepis*, Boulenger) in southern California. *California Fish and Game* 77:145-147.
- Watson, W. 1996. Eleotridae: Sleepers. Pages 1209-1213 in: H.G. Moser, editor. The early stages of fishes in the California Current region. *California Cooperative Oceanic Fisheries Investigations, Atlas No. 33*.

Received: 3 June 1996

Accepted: 12 December 1996

- Fitch, J.C. 1962. A sea urchin, a lobster and a fish, new to the marine fauna of California. *California Fish and Game* 48:216-221.
- Forbes, S.L. 1961. The fresh water fishes - their origins and affinities. *Systematic Zoology* 10:322-332.
- Hatch, P.L. 1959. Two Asian gobiid fishes, *Tetraodon lineatus* and *Acanthopagrus* *lineatus*, in southern California. *Bulletin of the Southern California Academy of Sciences* 58:50-61.
- Lyndon, E.A., C.S. Robbins, and W.K. Greenway. 1970. Exotic fishes and other aquatic organisms introduced into North America. *Smithsonian Contributions in Zoology* 124:1-39.
- Lee, R.W., J.M. Duffy, and K.C. Wilson. 1989. The Conox sagittalis, *Parocentrus* *lineatus*, recorded from southern California. *California Fish and Game* 75:43-47.
- Lee, R.W. and R.H. Rosenblatt. 1992. The Conox genus (*Parocentrus*) recorded from two emporiums in southern California. *California Fish and Game* 78:163-165.
- Mason, S.A. and K.J. Fleming. 1995. Invasion of a third Asian goby, *Tetraodon lineatus*, into California. *California Fish and Game* 61:71-76.
- Moser, D.L. and K.N. Lee. 1977. Guide to the coastal marine fishes of California. Department of Fish and Game, Fish Bulletin 137.
- Moser, R.H. 1991. First record of the leather bass (*Epinephelus leucostictus*, Boulenger) in southern California. *California Fish and Game* 77:145-147.
- Wasson, W. 1996. *Elasmobranch Species*. Pages 1209-1313. In: H.G. Moser, editor. The early stages of fishes in the California Current region. California Cooperative Oceanic Fisheries Investigations, Atlas No. 33.

Received: 1 June 1998

Accepted: 12 December 1998