
First occurrence of speckletail flounder, *Engyophrys sanctilaurentii* Jordan & Bollman 1890 (Pisces: Bothidae), in California

M. James Allen and Ami K. Groce¹

ABSTRACT - Three families (Paralichthyidae, Pleuronectidae, Cynoglossidae) and 29 species of flatfishes have been reported from California. This paper reports the first occurrence of speckletail flounder (*Engyophrys sanctilaurentii*), the 30th species and the first member of the family Bothidae in California. One specimen of this species (80 mm standard length) was collected by small otter trawl (7.6-m headrope) at a depth of 60 m north of La Jolla Submarine Canyon on August 6, 1998, during the Southern California Bight 1998 Regional Survey. The capture of the speckletail flounder off La Jolla, California, represents a range extension of 600 km north of its northernmost record near Sebastian Vizcaino Bay, Baja California, Mexico.

Currently there are 29 species of flatfishes representing three families (Paralichthyidae, Pleuronectidae, and Cynoglossidae) in California, with an additional species and family (Pacific lined sole, *Achirus mazatlanus*; family Achiridae) reported just below the United States-Mexico international border (Hubbs *et al.* 1979; Lea *et al.* 1989; Lea, in prep.). This article reports the first occurrence of the 30th species of flatfish in California and the first occurrence of the family Bothidae in the state. Seven California species (gulf sanddab, *Citharichthys fragilis*; Pacific sanddab, *Citharichthys sordidus*; speckled sanddab, *Citharichthys stigmaeus*; longfin sanddab, *Citharichthys xanthostigma*; bigmouth sole, *Hippoglossina stomata*; California halibut, *Paralichthys californicus*; and fantail sole, *Xystreurus liolepis*) placed in Bothidae in Robins *et al.* (1991) and earlier references have been placed in Paralichthyidae by most recent authoritative references (Nelson 1994, Hensley 1995b, Moser and Sumida 1996, Eschmeyer 1998).

On August 6, 1998, an unusual flatfish, 80 mm standard length (SL), was collected north of La Jolla Submarine Canyon, California (latitude 32°53.32' N and longitude 117°16.66' W) at a depth of 63 m in a 7.6-m wide (headrope) semiballoon otter trawl with 1.2-cm cod-end mesh. It was collected during the Southern California Bight 1998 Regional Survey (Bight'98), a bight-wide survey of the mainland and island shelves of southern California coordinated by the Southern California Coastal Water Research Project. Scientists working for the City of San Diego, Metropolitan Wastewater Department, Environmental Monitoring and Technical Services brought the specimen to the attention of M.J. Allen, who identified it as a speckletail flounder, *Engyophrys sanctilaurentii* Jordan & Bollman 1890. This specimen has been catalogued in the Scripps Institution of Oceanography (SIO) Marine Vertebrates Collection (SIO 00-81).

Although the speckletail flounder occurs commonly along the southern coast of Mexico, Central America, and northwestern South America, it had not previously been caught north of Sebastian Vizcaino Bay, Baja California, Mexico (Moser and Charter 1996). The capture of the speckletail flounder off La Jolla, California, represents a range extension of 600 km north of its northernmost record (published and unpublished) and the first record of this species in California. Based on this specimen, the current geographic range of speckletail flounder is now from La Jolla, California, and the northern Gulf of California (SIO 60-120: latitude 30°22.3'N, longitude 113°08.0'W) to Peru (Hensley 1995a). Its range extends along the warm-temperate San Diego and Cortez Provinces and the tropical Mexican and Panamic Provinces of Briggs (1974). Speckletail flounder occurs on mud, sand, gravel, or shell bottoms at depths of 10 m (LACM 32559.004) to 232 m (Hensley 1995a), with most specimens deeper than

¹City of San Diego, Metropolitan Wastewater Dept., 4918 N. Harbor Dr., San Diego, CA 92106

40 m, and is thus characteristic of the middle and outer shelf zones of Allen and Smith (1988).

The specimen has the following characteristics (Figure 1): left-eyed; small mouth reaching to the anterior part of the eye; teeth only on the blind side; narrow interorbital ridge between eyes with a small sharp spine facing posteriorly; dorsal fin beginning slightly on blind side of head behind posterior nostril; pectoral fins relatively short; pelvic fins short, asymmetrical with the left having longer base and on ventral midline about two rays anterior to the right fin on blind side; rounded caudal fin; high arch in lateral line over the pectoral fin and a short anterior bifurcating branch; no lateral line on the blind side. The specimen has the following meristic characteristics: dorsal fin rays – 81; anal fin rays – 67; pectoral rays – 11; pelvic fin rays – 6; lateral line pores, eyed side – 65; and lateral line pores, blind side – 0. Body scales ctenoid and imbricating. Gill membranes entirely separate. The coloration olive tan on the eyed side with dark spots on the body and medial fins: five along each margin of body near dorsal and anal fins; three along lateral line posterior to arch; six each on dorsal and anal fins; and posterior edge of caudal fin with four dark blotches (Figure 1a). The blind side dusky posteriorly and white anteriorly with five curved, dusky bands on anterior body and head (Figure b). The anteriormost extends upward and backward from the cheek to dorsal margin of body, the next arches upward and backward from preopercle, the third arches backward from the opercle, the fourth (broken) arches upward and backward from the ventral body margin below the pectoral fin; and the fifth almost defines a circle behind the gut cavity.

Combining this information with that in the literature (Jordan and Evermann 1898; Norman 1934; Hensley 1995a; Moser and Charter 1996), speckletail flounder has the following ranges of meristics: dorsal fin (78-89); anal fin (66-72); pectoral fins (10-13); pelvic fins (6); caudal fin (17 total); gill rakers (3-4 upper, 6 lower); lateral line pores (64-68 eyed side, no lateral line on blind side); lateral line scales (59-68). Its maximum reported size is 200 mm total length (Hensley 1995a).

Speckletail flounder is the only California flatfish with the following characters in combination: left-eyed; small mouth (reaching anterior part of eye); jaw teeth only on the blind side; a narrow interorbital crest between the eye with a backward facing spine; dorsal and anal fins separate from caudal fin; rounded caudal fin with four to five dark blotches; five to six curved dusky bands on blind side of body; lateral line of eyed side with high arch over the pectoral fin and a short bifurcating branch anteriorly, and no lateral line on blind side; and asymmetrical pelvic fins with that of eyed side on ventral midline, having longer base, and beginning two rays more anteriorly than that of blind side. The curved dusky bands on the blind side are faint or obsolete in small individuals (Jordan and Evermann 1898) and sometimes fade in larger individuals with preservation.

This species was one of a number of species collected for the first time in California or the South-

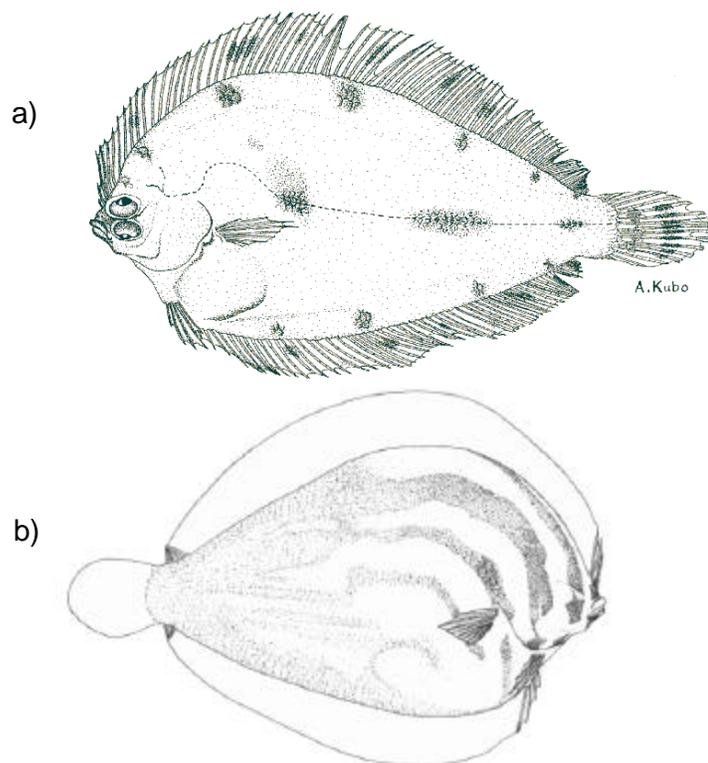


FIGURE 1. Speckletail flounder, *Engyophrys sanctilaurentii*, (80 mm SL) collected near La Jolla Canyon, California, at a depth of 63 m on August 6, 1998 (SIO 00-81): a) Eyed side (scale patches indicate size of scales on body); and b) blind side (details of medial fin rays are not shown). Drawings by Atsuhiko Kubo.

ern California Bight during the 1997-1998 El Niño (Lea and Rosenblatt 2000). Speckletail flounder transforms at a length of 27-37 mm, a size typical of flatfish species spending a longer time in the plankton and settling on the middle or outer shelf habitats (Richardson and Pearcy 1977, Allen 1982, Kramer 1991, Charter and Moser 1996, Moser and Charter 1996, Moser and Sumida 1996). For comparison, eggs and larvae of California halibut are in the plankton for about one month before settling to the bottom in shallow water at 10 mm SL (Allen 1988). As speckletail flounder transforms at a larger size, it may be in the plankton for a longer period (perhaps to about three months). If so, the species could reach southern California from Sebastian Vizcaino Bay (about 600 km distance) during this period if water currents were about 7.5 cm/sec, without eddies. Extreme values for the California Current range from 2 to 10 cm/sec (Hickey 1993). Thus it is possible that speckletail flounder, spawned near its reported northern limit, could reach southern California during this period. It is probably more likely the specimen collected was transported north from spawning in unreported populations further north along the Baja California coast than its reported range. The generally tropical distribution of the species and the warm-temperate or cooler environment of the outer coast of Baja California suggest that the species may have expanded northward along the Baja California coast during the ocean warming of the past two decades (Smith 1995).

Speckletail flounder larvae can be taken year-round (Moser and Charter 1996). The age of the specimen collected is not known. If the 80 mm SL specimen collected in southern California represents young of the year, it may have been spawned in fall of 1997, settling in southern California between fall and early spring during the middle of the El Niño. If it is older, then its occurrence in southern California cannot be attributed to the 1997-1998 El Niño.

Little is known about the ecology or behavior of this species. However, the general body morphology as an adult (i.e., small mouth with teeth only on blind side, sharp ridge between the eyes) is quite similar to that of pleuronectid flatfishes of the genus *Pleuronichthys* (Allen 1982). Given its depth range, this species may be an ecological counterpart of the hornyhead turbot, *Pleuronichthys verticalis*, which occurs off California and the outer coast of Baja California and of the ocellated turbot, *Pleuronichthys ocellatus*, which occurs in the northern Gulf of California (Fitch 1963, Allen 1982). At least among

southern California flatfishes, the absence of teeth on the eyed side of the jaws is characteristic of flatfishes that extract polychaetes from tubes and clip off clam siphons (Allen 1982). Other species of small-mouthed flatfishes with jaw teeth only on blind side apparently do not occur along the coast of Mexico south of Baja California nor off Central America (Norman 1934; Hensley 1995a,b; Sommer 1995). There are, however, several species of paralichthyids which have reduced tooth development on jaws on the eyed side (Norman 1934, Hensley 1995b), a morphology that is somewhat less appropriate for this type of foraging behavior (Allen 1982).

There are a number of nomenclatural problems associated with the names (both scientific and common) of this species. The genus and species was first described by Jordan and Bollman (1890). The date of 1889 originally given for this citation (Jordan and Evermann 1898) is incorrect as the signature date of this document was February 5, 1890 (Hays 1952). **The original species name was *sancti-laurentii***, named for Saint Lawrence, and referring to the gridiron-like markings on the blind side. Since that time, the name has been variously given in the literature as *sancti-laurentii* (Jordan and Bollman 1890, Jordan and Evermann 1898, Norman 1934), *sanctilaurentii* (Bussing and Lopez 1994, Eschmeyer 1998), or *sanctilaurentia* (Hensley 1995a, Moser and Charter 1996, Escobar-Fernandez and Siri 1997). The International Code of Zoological Nomenclature (ICZN 1999) indicates that hyphens should be removed from compound species-group names originally published with a hyphen (unless the first element is a Latin letter) and both words should be united. Thus the hyphenated version is not appropriate. Regarding the correct ending, 'ii' is used if the name refers to a male person and 'ia' if it refers to a quality, state of being, or disease (Jaeger 1966). The species was named after Saint Lawrence, a 3rd century AD deacon of the early Catholic church who was tortured to death by a Roman prefect on a hot grill, which branded him with gridiron marks (Kirsch 1910). Thus, 'ia' would refer to the condition of having the gridiron marks similar to those of Saint Lawrence whereas 'ii' would refer to Saint Lawrence, the person who had the gridiron marks. Although Jordan and Bollman (1890) refer to the gridiron pattern on the fish for justifying the name, the name they gave was of the person rather than the Latinized version of the grid-iron condition. Hence, it appears appropriate to maintain the original ending of the name, with the correct species name (without a

hyphen) for this species being *sanctilaurentii*.

Published English common names for this species include 'speckletail flounder' (Bussing and Lopez 1994), 'speckled-tail flounder' (Hensley 1995a), and 'speckledtail flounder' (Escobar-Martinez and Siri 1997). The American Fisheries Society Committee on Names of Fishes (Robins *et al.* 1991) recommends that common names be simple and with no hyphens, unless it is necessary to avoid misunderstanding. Although there is precedent for combining plural modifiers with nouns to form compound modifying words (e.g., 'spottedtail goosfish', 'spottedfin tonguefish', and 'stripedfin ronquil') in Robins *et al.* (1991), there is no precedent for 'speckledtail.' 'Speckle' when combined with a noun is always treated as singular (e.g., 'specklefin midshipman', 'specklemouth eelpout'), presumably due to the generally plural nature of 'speckle.' Thus we recommend 'speckletail flounder' as the common name for this species.

LITERATURE CITED

- Allen, L.G. 1988. Recruitment, distribution, and feeding habits of young-of-the-year California halibut (*Paralichthys californicus*) in the vicinity of Alamitos Bay-Long Beach Harbor, California, 1983-1985. *Bulletin of the Southern California Academy of Sciences* 87: 19-30.
- Allen, M.J. 1982. Functional structure of soft-bottom fish communities of the southern California shelf. Ph.D. dissertation. University of California, San Diego, CA.
- Allen, M.J., and G.B. Smith. 1988. Atlas and zoogeography of common fishes in the Bering Sea and northeastern Pacific. NOAA Technical Report, NMFS 66. Seattle, WA.
- Briggs, J.C. 1974. Marine Zoogeography. McGraw-Hill Book Co., New York, NY.
- Bussing, W.A., and M.I. Lopez. 1994 (1993 on back cover but printed in Feb. 1994). Demersal and pelagic inshore fishes of the Pacific coast of lower central America. *Revista Biología Tropical*, Special Publication. Sacramento, CA.
- Charter, S.R., and H.G. Moser. 1996. Pleuronectidae: righteye flounders. pp. 1369-1403 *in*: H.G. Moser (ed.), The early stages of fishes in the California Current Region, California Cooperative Oceanic Fisheries Investigations Atlas No. 33. Allen Press Inc., Lawrence, KS.
- Eschmeyer, W.N. (ed.). 1998. Catalog of fishes. California Academy of Sciences, San Francisco, CA.
- Escobar-Fernández, R., and M. Siri. 1997. Nombres vernáculos y científicos de los peces del Pacífico mexicano. [Vernacular and scientific names of fishes of the Mexican Pacific]. Universidad Autónoma de Baja California, Sociedad Ictiológica Mexicana, A. C., MX.
- Fitch, J.E. 1963. A review of the genus *Pleuronichthys*. Los Angeles County Museum, Los Angeles, CA. *Contributions in Science* 76.
- Hays, A.N. 1952. David Starr Jordan: a bibliography of his writings, 1871-1931. Stanford University Press. Stanford, CA.
- Hensley, D.A. 1995a. Bothidae. pp. 931-936 *in*: W. Fischer, W. Schneider, C. Sommer, K.E. Carpenter, and V.H. Niem (eds.), Guía FAO para la identificación de especies para los fines de la pesca. Pacífico centro-oriental. Vol. II. Vertebrados – Parte 1. United Nations, Food and Agriculture Administration. Roma, IT.
- Hensley, D.A. 1995b. Paralichthyidae. pp. 1349-1380 *in*: W. Fischer, W. Schneider, C. Sommer, K. E. Carpenter, and V.H. Niem (eds.), Guía FAO para la identificación de especies para los fines de la pesca. Pacífico centro-oriental. Vol. III. Vertebrados – Parte 2. United Nations, Food and Agriculture Administration. Roma, IT.
- Hickey, B. M. 1993. Physical oceanography. pp. 19-70 *in*: M.D. Dailey, D.J. Reish, and J.W. Anderson (eds.), Ecology of the Southern California Bight. University of California Press. Berkeley, CA.
- Hubbs, C.L., W.I. Follett, and L.J. Dempster. 1979. List of fishes of California. Occasional Papers of the California Academy of Sciences 133. San Francisco, CA.
- International Commission on Zoological Nomenclature (ICZN). 1999. International code of zoological nomenclature. Fourth edition. International Trust for Zoological Nomenclature. The Natural History Museum. London, UK.
- Jaeger, E.C. 1966. A source-book of biological names and terms, third edition. Charles C. Thomas, Publisher, Springfield, IL.
- Jordan, D. S., and C. H. Bollman. 1890. Descriptions of new species of fishes collected at the Galápagos Islands and along the coast of the United States of Colombia, 1887-88. *Proceedings of the United States National Museum* 12: 49-183.
- Jordan, D.S., and B.W. Evermann. 1898. The fishes of North and Middle America: A descriptive catalogue of the species of fish-like vertebrates found in the waters of North America north of the Isthmus of Panama. Part III. *Bulletin of the United States National Museum* No. 47: 2183-3136.

- Kirsch, J.P. 1910. St. Lawrence. *in*: The Catholic Encyclopedia, Vol. IX. Robert Appleton Company.
- Kramer, S. H. 1991. Growth, mortality, and movements of juvenile California halibut *Paralichthys californicus* in shallow coastal and bay habitats of San Diego, California. *Fishery Bulletin* 89: 195-207.
- Lea, R. N., K. A. Karpov, and L. F. Quirillo. 1989. Record of the roughscale sole, *Clidoderma asperrimum*, from northern California, with a note on the Pacific lined sole, *Achirus mazatlanus*. *California Fish and Game* 75: 239-241.
- Lea, R.N., and R.H. Rosenblatt. 2000. Observations on fishes associated with the 1997-1998 El Niño of California. *California Cooperative Oceanic Fisheries Investigations Reports* 41: 117-129.
- Moser, H.G., and S.R. Charter. 1996. Bothidae: Lefteye flounders. pp. 1357-1367 *in*: H. G. Moser (ed.), The early stages of fishes in the California Current Region. California Cooperative Fisheries Investigations Atlas No. 33. Allen Press Inc., Lawrence, KS.
- Moser, H.G., and S.R. Sumida. 1996. Paralichthyidae: Lefteye flounders and sanddabs. pp. 1325-1355 *in*: H. G. Moser (ed.), The early stages of fishes in the California Current Region. California Cooperative Oceanic Fisheries Investigations Atlas No. 33. Allen Press Inc., Lawrence, KS.
- Nelson, J.S. 1994. *Fishes of the World*. Third edition. John Wiley & Sons, Inc., New York, NY. 600 pp.
- Norman, J.R. 1934. A systematic monograph of the flatfishes (Heterostomata), Vol. I. Psettodidae, Bothidae, Pleuronectidae. British Museum (Natural History). London, UK.
- Richardson, S.L., and W.G. Pearcy. 1977. Coastal and oceanic fish larvae in an area of upwelling off Yaquina Bay, Oregon. *Fishery Bulletin* 75: 125-145.
- Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea, and W.B. Scott. 1991. Common and scientific names of fishes from the United States and Canada. 5th edition. American Fisheries Society Special Publication 20.
- Smith, P.E. 1995. A warm decade in the Southern California Bight. *California Cooperative Oceanic Fisheries Investigations Reports* 36: 120-126.
- Sommer, C. 1995. Pleuronectidae. pp. 1381-1385 *in*: W. Fischer, W. Schneider, C. Sommer, K. E. Carpenter, and V. H. Niem (eds.), Guía FAO para la identificación de especies para los fines de la pesca. Pacífico centro-oriental. Vol. III. Vertebrados – Parte 2, United Nations, Food and Agriculture Administration, Roma, IT.

ACKNOWLEDGEMENTS

The authors thank Steven Lagos of the City of San Diego Ocean Monitoring Program for retaining the specimen for further identification. We thank Atsuhiko Kubo for providing drawings of the La Jolla specimen. We also thank Phillip Hastings and H. J. Walker of Scripps Institution of Oceanography, University of California, San Diego, and Richard Feeney and Jeffrey Siegel of the Natural History Museum of Los Angeles for collection information on speckletail flounder.

Engyophrys sanctilaurentii Jordan & Bollman, 1890. Speckled-tail flounder. Add your observation in Fish Watcher. Native range. Reviewed map. Engyophrys sanctilaurentii AquaMaps Data sources: GBIF OBIS. Upload your photos and videos Pictures | Google image. Engyophrys sanctilaurentii Picture by Robertson, R. Classification / Names Common names | Synonyms | Catalog of Fishes (gen., sp.) | Countries FAO areas Ecosystems Occurrences Introductions Stocks Ecology Diet Food items Food consumption Ration. Most assessments of fish contamination in Southern California use ecologically different species from different sites. Use of ecologically similar species (a guild) might provide better assessments (More). First Occurrence of Speckletail Flounder, Engyophrys sanctilaurentii Jordan & Bollman 1890 (Pisces: Bothidae), in California.