

**OCCURRENCE OF COHO SALMON, *ONCORHYNCHUS KISUTCH*
(ACTINOPTERYGII: SALMONIFORMES: SALMONIDAE),
OFF THE WEST COAST OF BAJA CALIFORNIA SUR, MEXICO**

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Abstract. We provide the first record of a coho salmon, *Oncorhynchus kisutch* (Walbaum, 1792), off the western coast of Baja California Sur, Mexico, approximately 690 km south of the previously reported distribution in the Northwest Pacific. The specimen was captured in the regional commercial fishery. It was a female, 520 mm standard length, weighing 1855 g. Morphometric and meristic data are presented.

Keywords: first record, silver salmon, locality record, Las Barrancas, Pacific Decadal Oscillation, upwelling index

Pacific salmon of the genus *Oncorhynchus* are commercially important species, characterized by an anadromous life cycle, in which the adults move upriver to spawn and then die (Pauly 2004). In the Eastern Pacific, salmon are represented by five species: coho salmon, *Oncorhynchus kisutch* (Walbaum, 1792); pink salmon *Oncorhynchus gorbuscha* (Walbaum, 1792); chum salmon, *Oncorhynchus keta* (Walbaum, 1792); sockeye salmon, *Oncorhynchus nerka* (Walbaum, 1792); and Chinook salmon, *Oncorhynchus tshawytscha* (Walbaum, 1792) (see Schiewe and Kareiva 2000). Only *O. kisutch* and *O. tshawytscha* are distributed in the temperate waters off the western Baja California peninsula, Mexico (Byers 1942, Messersmith 1965, De La Cruz-Agüero 1999). Coho salmon, *Oncorhynchus kisutch*, is the most widely distributed, although the less abundant, salmon species in the Pacific (Sandercock 1991, Schiewe and Kareiva 2000). Its known distribution in North America ranges from Point Hope in Alaska to Camalu Bay (30°50'N; 116°11'W) in Baja California, Mexico (Messersmith 1965, Loiselle and Thoney 2003).

A specimen of coho salmon was captured in July 2013 by artisanal fishermen in Las Barrancas (25°59'N, 112°11'W), off the western coast of Baja California Sur, Mexico, approximately 690 km south of the reported distribution limit (Fig. 1). Captures were done using 6" gill-

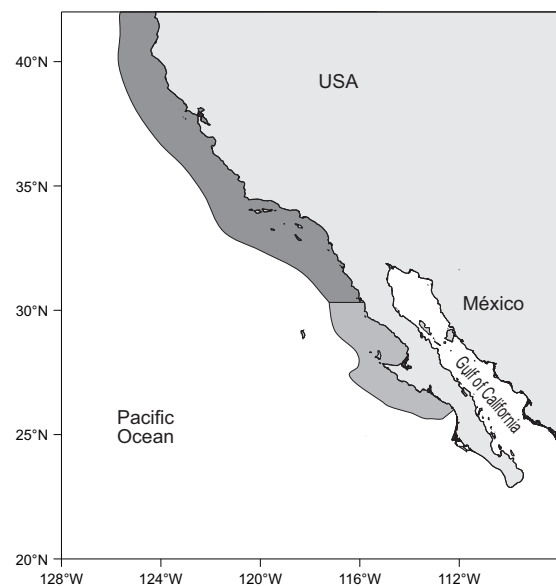


Fig. 1. Map showing the presently described range extension of the coho salmon, *Oncorhynchus kisutch*; The habitat expansion is of approximately 690 km; The black fringe shows the previously known distribution; last reported distribution to Camalu BC (1); light grey fringe, range expansion to Las Barrancas BCS (2)

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nets set at 10 m depth, approximately two km from the coast. The specimen was identified using the keys by Miller and Lea (1976) and Eschmeyer et al. (1983). Once identified, it was catalogued and stored in the ichthyological collection of the Escuela Nacional de Ingeniería Pesquera (ENIP-CI481), San Blas, Nayarit, Mexico.

The *Oncorhynchus kisutch* specimen (Fig. 2) was a female, 590-mm long, weighing 1855 g (Table 1). This species can be easily distinguished from *O. gorbuscha* and *O. keta* by the presence of teeth on the tongue and by the number of pyloric caeca (Table 1). It can be distinguished from *O. nerka* by the number of gill rakers (21 in *O. kisutch* vs. 28–40 in *O. nerka*), and by the presence of teeth at the base of the tongue. It differs from *O. tshawytscha* in the number of pyloric caeca (71 in *O. kisutch* vs. 140–185 in *O. tshawytscha*), and in the gum coloration (white in *O. kisutch* vs. black in *O. tshawytscha*) (Miller and Lea 1976, Eschmeyer et al. 1983).

Coho salmon reach sexual maturity at between two and four years old (Loiselle and Thoney 2003). They generally enter freshwater systems between August and January, and move upstream to spawn in the coastal rivers and small tributaries of the great river systems. Juveniles remain in the smaller tributaries approximately 18 months

before starting to migrate towards the ocean during the spring of their second year of life. They then tend to remain over the continental platform, feeding and growing in marine waters located approximately at the same latitude as their river of origin (Sandercock 1991, Schiewe and Kareiva 2000). The presently described specimen, however, was captured 690 km south from the limit of its known distribution, establishing thus a significant expansion of its habitat. The area lacks river tributaries that could serve as natural habitat for this species, so that the habitat expansion could be a consequence of the environment, which affects directly the abundance and distribution of marine species (De La Cruz-Agüero 1999, Hopkins and Cech 2003, Fernández et al. 2011). It has been mentioned that at the watershed level there is a positive correlation between ocean and atmosphere indices such as the Pacific Decadal Oscillation (PDO), and the time series of salmon catches in the northern Pacific (Mantua et al. 1997). It has also been observed that salmon abundance increases as a consequence of the increase in the coastal upwelling index (Scarnecchia 1981, Mueter et al. 2002, Lawson et al. 2004).

The presence of *Oncorhynchus kisutch* in waters close to Las Barrancas could be the result of a combination



Fig. 2. Female of coho salmon, *Oncorhynchus kisutch* (ENIP-CI-387), 520 mm SL, collected at Las Barrancas, Baja California Sur, Mexico, on 30 July 2013

Table 1
Morphometric and meristic characteristics of coho salmon, *Oncorhynchus kisutch*, from the Pacific coast of the Baja California Peninsula, Mexico

	Parameter	Value	
Morphometric measurements	[g] Weight	1855	
	[mm] Total length (TL)	590	
	Standard length (SL)	520	
	Maximum body height	20.28	
	Caudal peduncle height	7.71	
	Head length	23.36	
	Pre-dorsal length	47.08	
	[% of SL]	Length of dorsal fin	10.30
		Length of pelvic fin	8.21
		Length of anal fin	12.22
		Length of pectoral fin	12.23
		Interorbital distance	7.78
	Ocular diameter	2.43	
	Pre-orbit length	5.30	
	Post-orbital length	13.03	
Meristic counts	Number of rays in dorsal fin	14	
	Number of rays in anal fin	17	
	Number of rays in pectoral fin	10	
	Number of rays in pelvic fin	15	
	Number of gill rakers	21	
	Number of pyloric caeca	71	

of increased upwelling and negative PDO values that have affected the western coast of the Baja California Peninsula (Perry et al. 2005). It is probable that the *O. kisutch* specimen found a cold water corridor rich in nutrients, with availability of potential prey that allowed it to enter waters south of the area it normally inhabits. However, there are no data at present to adequately support this hypothesis.

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