Surprising record of a Chinook Salmon *Oncorhynchus tshawytscha* (Walbaum, 1792) from the Paraná river delta in San Pedro, Buenos Aires, Argentina.

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Abstract

An individual of Chinook Salmon, *Oncorhynchus tshawytscha* (Walbaum, 1792) was registered for the first time in the lower reach of the Paraná river (33°37’S, 59°45’W) near San Pedro, Buenos Aires province, Argentina. The species, cultured in southern Chile, had been mentioned for natural rivers of Patagonia in Chubut, Santa Cruz and Tierra del Fuego provinces. Previous data and factors that could define its establishment are discussed.

Resumen

Un ejemplar de salmón rey o Chinook, *Oncorhynchus tshawytscha* (Walbaum, 1792) fue registrado por primera vez en el tramo inferior del río Paraná (33°37’S, 059°45’W) cerca de San Pedro, provincia de Buenos Aires, Argentina. La especie, cultivada en el sur de Chile, ha sido mencionada para ambientes naturales de ríos de la Patagonia en las provincias de Chubut, Santa Cruz y Tierra del Fuego. Se comentan antecedentes y factores que podrían modular su dispersión.

Introduction

The Pacific salmon *Oncorhynchus tshawytscha* (Walbaum, 1792) is native from arctic regions of the Northern hemisphere that drain into the Pacific Ocean from both, Northwest North America and Northeast Asia (Allen & Smith, 1988).

Most of its populations are anadromous, utilizing rivers for spawning and early juvenile development, and marine waters for growth to adulthood (Healey, 1991).

It was introduced for the first time in Southern Chile at the end of the 19th century (Basulto, 2003) where it is cultivated. In Argentina, a number of introduction events are described by Baigún & Quirós (1985), Grosman (1991), Becker et al. (2007), Di Prinzio et al. (2015); and established reports by Ciancio et al. (2005), Di Prinzio & Pascual (2008) and Di Prinzio & Arismendi (2018). It has been recorded from rivers of pacific drainages: Carrenleufú, Futaleufú and Pico rivers (Grosman, 1991; Soto et al., 2007; Di Prinzio & Pascual, 2008), all of them in Chubut province. Later, populations were established in patagonian rivers of Atlantic drainages in the provinces of Tierra del Fuego: Ovando-Lapataia river (Fernández et al., 2010) and Grande river (Riva Rossi et al., 2012), and Santa Cruz: Gallegos river (Riva Rossi et al., 2012) and diverse sites in Santa Cruz river (Ciancio et al., 2005; Riva Rossi et al., 2017). According to Arismendi et al. (2014) one of the reasons for establishment includes the species life cycle with short freshwater residency which allows rapid use and expansion in the marine environment.

The aim of this contribution is to report the first capture of an individual in the lower Paraná river, near San Pedro city, Buenos Aires.

Examined material

The material is deposited in the Museo de Ciencias Naturales “P. A. Scasso” (MPS): MPS-T0031 y 32. 2 samples (muscle and fin tissues in ethanol 96°), belonging to 1 specimen of 723 mm total length, 143 mm head length, 4,5kg eviscerated weight (fig. 1). Buenos Aires province, San Pedro, Paraná river near the mouth of San Pedro stream, 33°37’S, 059°45’W. Coll: Hugo Mastroianni, 24.Oct.2018.

fig. 1. *Oncorhynchus tshawytscha*, río Paraná, San Pedro, Buenos Aires. Total length: 732 mm

Habitat

The salmon was captured by an artisanal fisherman, with gillnets, in backwaters of the main course of the Paraná river (with a width of nearly 1500 m and a depth of ca. 20 m), near the mouth of a secondary channel, riacho San Pedro, upstream of the homonymous city (see fig. 4).

Identification

The specimen was identified as *Oncorhynchus tshawytscha* (Walbaum, 1792) by the diagnostic characters provided in Page & Burr (2011): coloration and spots on the back of the body and both lobes of the caudal fin (fig. 2), strong implanted teeth, dark-colored gums and surface of implantation of teeth in the lower jaw (fig. 3), relationship between height and length of the base of the anal fin.
Although the fish had been eviscerated, it was very probably a female because of the “remarkable strong reddish gonad” observed by the fisherman.

fig. 2. Caudal showing black spots in both lobes.

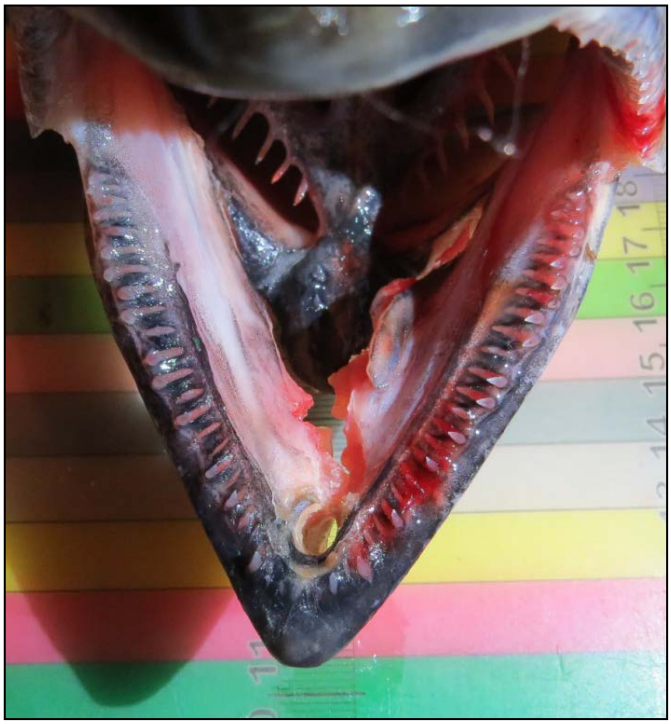

fig. 3. Lower jaw, showing teeth and typical gum dark coloration.

Discussion

Donaldson & Joyner (1983) described successful ranching experiments with Chinook salmon made in Chilean Magellan strait in the 1980s and expected its expansion along the Atlantic continental shelf

reaching Río de la Plata estuary and coasts of Uruguay and Southern Brazil (see Fig. 4). Agreeing with that expectation, populations established in Santa Cruz river were founded from those Chilean ranching experiences (Ciancio et al., 2015). This record, located within the range suggested by Donaldson & Joyner (1983), occurred in freshwater, 350 km far from typical marine environment (located beyond the limit of the Río de la Plata estuary) and more than 2.000 km straight from the closest published record, in the Santa Cruz river. This long distance falls into the known migration range of Chinook salmon, which can migrate up more than 4.500 km (Browning, 1980). In South American populations, Riva-Rossi et al. (2012) detected events of long distance dispersal (> 1.100km, from Northern to Southern Chile) following the ocean circulation patterns around Southern South America; recently, Gómez-Uchida et al. (2018) founded evidence for long-distance dispersal between Pacific Ocean and Atlantic Ocean basin, and vice versa.

On the other hand, Correa & Gross (2008) commented that warmer climate and suboptimal water conditions may prevent establishment further North than 39°S in the pacific coast of Chile; in Atlantic coast, moreover, diverse conditions could prevent establishment: rivers become considerably longer, with little slope in most of their course, and the adjacent terrestrial habitat is much drier and warmer; river mouths become farther apart, and basins become larger with several sub-basins, all of which are characteristics that diminish the likelihood of sufficient numbers of strays gathering in particular spawning grounds to facilitate establishment. The environmental conditions of the Río de la Plata basin also differ from the biological and ecological requirements of this species in terms of water temperature, dissolved oxygen, and type of sediment needed for reproduction, among others, reducing the odds of establishment of the salmon in this region.

More than ten years ago, the establishment of Chinook populations in South America appeared to be an ongoing process (Correa & Gross, 2008). Even though there is still no evidence of establishment, and that it has *a priori* a low probability to occur, its surprising arrival to the Río de la Plata basin requires attention, especially considering that this has become the most widespread anadromous salmon invasion ever documented (Correa & Moran, 2017).

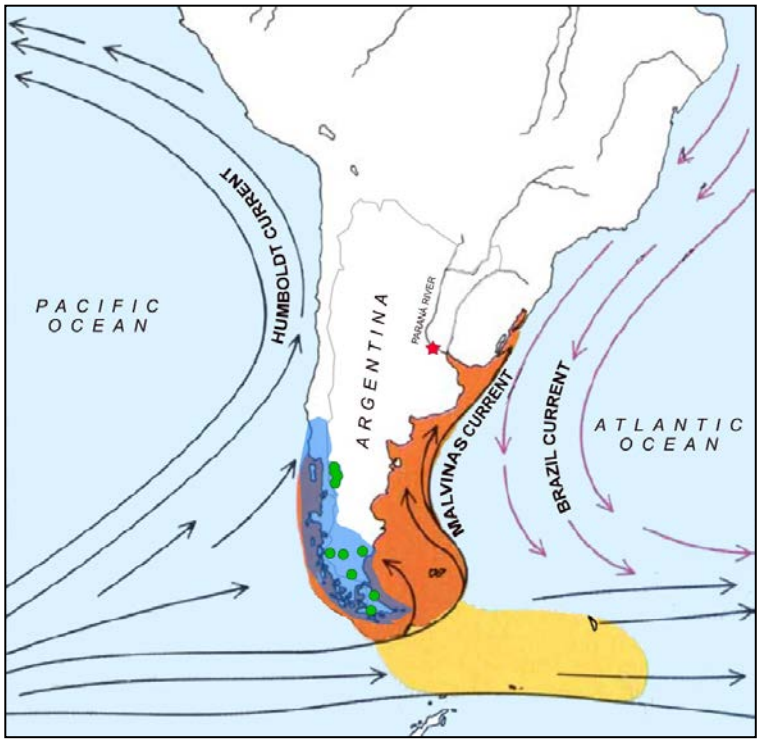

fig. 4.
Map (modified from Donaldson & Joyner, 1983) showing prospective ranges of Chinook salmon in the region following Donaldson & Joyner (1983) (orange shading for round-year range, and yellow shading for summer range) and Correa & Gross (2008) (blue shading); previous known records for Argentina (green circles) and current record (red star); warm currents (pink arrows) and cold currents (black arrows).

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