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Helminths of Sheepshead, Archosargus Probatocephalus (Pisces: Sparidae) From Alvarado, Veracruz. Mexico

Jesús Montoya-Mendoza[1]*, María del refugio Castañeda Chávez[2] & Fabiola Lango Reynoso[3]
Laboratorio de Investigación Acuícola Aplicada, Instituto Tecnológico de Boca del Río. Veracruz. México
*Corresponding Author

Abstract

This study is a survey of helminths in sheepshead, *Archosargus probatocephalus*, collected in the Alvarado Lagoon and El Conchal estuary, Veracruz, Mexico. In both sites, nine species were found: 5 digeneans (4 adults, and 1 metacercaria); 3 monogeneans, and 1 adult nematode; in the lagoon and estuarine 77.7% of these species were already registered, 2 species are new records for this host, and 4 are new records for Mexico.
Key Word: Estuarine fishes, helminth, parasites.

1. Introduction

A. probatocephalus is a relevant fishing resource in the Gulf of Mexico and Caribbean littoral. As a species, sheepheads enter from the sea into estuaries or coastal lagoons for feeding and growing purposes, as in the low salinities of these environments they find an adequate environment for their development. Based on the above, this organism has strong cultivating potential (VanderKooy, 2006). This is the reason why it is so relevant to unveil symbioses they have with other species, particularly with parasites, as parasitic relations in wild hosts usually change when taken into farming conditions. Several parasitic helminths have been reported for *A. probatocephalus* in the Gulf of Mexico and the Caribbean, including digeneans (Corkum, 1959; Sogandares-Bernal and Hutton, 1959; Sparks, 1954), aspidogastreans (Hendrix and Overstreet, 1977), monogeneans (Kritsky and Bakenhaster, 2011), and nematodes (Deardorff and Overstreet, 1981). Some of these species were registered in Tamaulipas, México (Pérez-Ponce de León, 2007), but it is unknown which are present in the Veracruz coasts. This work assesses prevalence and mean intensity of parasitic helminths on wild sheepheads populations in two estuarine systems.

2. Material and Methods

A total of 33 specimens of *A. probatocephalus* were collected for helminthological examination between October, 2011 and January, 2012. Organisms were captured using cast-net fishing in the Alvarado Lagoon (n = 18) (18º45'30" N, 95º46'30" W) and El Conchal estuary (n = 15) (19º05'03" N, 96º06'50" W), Alvarado, Veracruz. Mexico, in Southern Gulf of Mexico. Captured fish specimens were placed in plastic containers with ice, and transported to the laboratory for examination within 24 hours post-capture. All tissues and organs were reviewed using a stereomicroscope. The external examination included skin, scales, fins, gills, eyes, nostrils, mouth and anus. Gills were removed and analyzed separately in Petri dishes with brackish water. Internal examination included mesenteries, liver, kidney, and gonads. For examination purposes, the whole digestive system was placed in Petri dishes with 0.75% saline solution. Helminths found were fixed in hot 4% formalin and preserved in 70% ethanol.

For the taxonomical determination, Platyhelminthes were stained using either Mayer's paracarmine or Gomori's triple stain; dehydrated in a graded alcohol series, cleared with clove oil, and mounted whole in Canada balsam. Nematodes were studied on temporary slides, cleared in glycerin; and then preserved in 70% alcohol. In order to study sclerotized structures, some monogeneans specimens were fixed with ammonium picrate (Vidal-Martínez et al., 2001). Voucher specimens were deposited at the "Helminths National Collection" *(Colección Nacional de Helmintos)* (CNHE), in the Institute of Biology of the National Autonomous University of Mexico, Mexico City. Prevalence (percent of infected hosts) and mean intensity of infection (mean number of parasites per infected fish), were calculated following Bush et al. (1997).

3. Results

Total length of 18 *A. probatocephalus* examined from the Alvarado Lagoon ranged from 120 to 320 mm (242 ± 53 mm), while weight range was from 124 to 705 g (335.8 ± 186.5 g). In El Conchal estuary, length of 15 organisms ranged from 162 to 390 mm (218 ± 76 mm), and weight from 87 to 1118 g (273.4 ± 344.6 g). A total 768 helminth parasites inventory from sampled hosts included 9 species, as follows: 5 digeneans (4 adults and 1 metacercaria), 3 monogeneans and 1 adult nematode (Table 1).

Almost the same parasites were found in both sites, with 77.7 % of species registered in Alvarado Lagoon, and also 77.7% in El Conchal estuary. Differences lay on the *Lepocreadum* and Capillaridae records for hosts from the Alvarado Lagoon, and *Rhipidocotyle* and *Microcotyle archosargi* records for hosts from El Conchal. Parasites with the highest prevalence and mean intensity were *Euryhaliotrema amydrum* followed by *Megasolena archosargi*, and *E. amydrum* followed by *Multitestis rotundus*, in the Alvarado Lagoon and El Conchal, respectively. The differences lie in *Lepocreadum* and Capillaridae records for Alvarado lagoon hosts, and *Rhipidocotyle* and *Microcotyle archosargi* in El Conchal hosts. Parasites with higher prevalence and mean abundance were *Euryhaliotrema amydrum*, followed by *Megasolena archosargi* for Alvarado lagoon, and *E. Amydrum* followed by *Multitestis rotundus* in the estuary El Conchal.

4. Discussion

Based on the parasites lists for *A. probatocephalus* from the Gulf of Mexico and Caribbean coasts, this is the first time *Crassicutis archosargii*, *Megasolena archosargi*, *E. amydrum* y *E. dunlapae* have been registered in Mexico, and this work contributes with two new records for this host, *Rhipidocotyle* and Capillaridae, which add to previous data for *A. probatocephalus* in the Mexican littoral (Pérez-Ponce de León, 2007). The number of parasites found in *A. probatocephalus* is lower than the one recorded for *A. rhomboidalis*, despite being sympatric species sharing only few parasites, such as *M. rotundus* (Overstreet, 1969; Kohn et al., 2007).

Results of this work allow us to consider that parasites found pose no zoonotic risk or compromise the biology of *A. probatocephalus*, and preventive measures in farms of this organism usually reduce epizootics of monogeneans, particularly of eurihalyne genus such as *Euryhaliotrema*.

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Annexure:

Table 1. Prevalence, mean intensity, and site of infection of helminthic parasites of sheepshead, *Archosargus probatocephalus*, from Alvarado lagoon and El Conchal estuary, Veracruz, Mexico. n, number of hosts infected; % p, prevalence; MI, mean intensity. Sites abbreviations are: f, fins; g, gill; i, intestine. * New host records. † New record for Mexico.

Species	CNHE	Site	Alvarado lagoon			El Conchal estuary		
			n (% p)	MI (± SE)	Range	n (% p)	MI (± SE)	Range
Digenea								
Crassicutis archosargii Sparks & Thatcher, 1960†	xxxx	i	1 (5.5)	30 ± -	30	2 (13.3)	5.5 ± 2.1	4-7
Megasolena archosargi Sogandares-Bernal & Hutton, 1959†	xxxx	i	5 (27.7)	6.8 ± 11.8	1-28	3 (20)	7 ± 8.5	1-18
Multitestis rotundus Sparks, 1954	xxxx	i	3 (16.6)	22.3 ± 23.1	8-49	4 (26.6)	52.7 ± 40.6	2-135
Lepocreadium sp.	xxxx	i	1 (5.5)	1 ± -	1			
Rhipidocotyle sp. *	xxxx	f				5 (33.3)	1 ± 0	1
Monogenea								
Euryhaliotrema amydrum Kritsky & Bakenhaster 2011†	xxxx	g	9 (50)	19.4 ± 16.2	4-60	5 (33.3)	35.4 ± 13.9	2-50
Euryhaliotrema dunlapae Kritsky & Bakenhaster 2011†	xxxx	g	5 (27.7)	3 ± 2	1-6	3 (20)	1.3 ± 0.5	1-2
Microcotyle archosargi MacCallum, 1913	xxxx	g				1 (6.6)	2.0 ± -	2
Nematoda								
Capillaridae *	xxxx	i	2 (11.1)	7.5 ± 9.2	1-14			
Total species			**7**			**7**		