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Parasitism of the isopod *Artystone trysibia* in the fish *Chaetostoma dermorhynchum* from the Tena River (Amazonian region, Ecuador)

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ABSTRACT

The isopod *Artystone trysibia* Schioedte, 1866 is described by using a collection of specimens that were found parasitizing loricariid fish *Chaetostoma dermorhynchum* Boulenger, 1887 in the Tena River (Napo province, Ecuador, Amazonian region). Additionally to freshly collected specimens, complementary data of the parasite was obtained from preserved fishes at Ecuadorian museums. This is the first record of *A. trysibia* in Ecuador, and the most upstream location for the species. The new host fish, *Chaetostoma dermorhynchum,* is used locally as food.

1. Introduction

The only record of an isopod fish parasite in Ecuadorian rivers is that of Leigh-Sharpe (1937) on the description of *Asotana splendida* (Leigh-Sharpe, 1937), as a single female taken from an unidentified fish (commonly named as "Boca Chica") in the Napo River.

The unique characteristics of this species (see Brusca, 1981) encouraged a sampling campaign to collect this and other parasitic isopods in the rivers of the Napo basin. Despite such efforts, no additional specimens of *A. splendida* have been collected so far. However, the sampling process provided observations on the loricariid *Chaetostoma dermorhynchum* Boulenger, 1887, a fish which is locally used as food, and that is infected by *Artystone trysibia* Schioedte, 1866; other Cymothoidae species that was unknown in Ecuador.

A. trysibia was originally described by Schioedte (1866) on the basis of a single female specimen collected in the Plata River, Argentina. A second specimen was described and illustrated by Schioedte and Meinert (1884). The species was characterized as having claws on the first six pairs of pereopods but not in the seventh, and an unfused pleon with free segments. These two character states are used by subsequent authors to distinguish *A. trysibia* from other Cymothoidae, which lack detailed descriptions for the species as it is commonly for several members in this family (Brusca, 1981). An unusual characteristic of the species in the genus *Artystone* is that they live encapsulated in the body cavity of the host. This is a property also shared by the South American Cymothoidae *Riggia* Szidat, 1948. The capsule than envelopes the isopod is formed by the body of the fish as a retaining wall, and the isopod maintains an opening to the outside with the movement of its pleopods (Huizinga, 1972). This adaptation contrasts to freshwater species in the family that usually attach externally to hosts' skin, fins, gill chambers or mouth (Thatcher, 2006).

A. trysibia has reported in fishes of rivers and lakes in Paraguay (Rowntree, 1903; Szidat, 1955), Brazil (Van Name, 1936; Leigh-Sharpe, 1937; Lemos de Castro and Machado Filho, 1946; Szidat, 1955; Pugues et al., 1998), and Venezuela (Szidat, 1955; Bowman and Díaz-Ungría, 1957; Martínez and Royero, 1989). The parasite has also been observed in ornamental fishes at ponds and aquaria (Weibezahn and Ramírez, 1957, Huizinga, 1972). As noted by Thatcher and Carvalho (1988), the available descriptions for *A. trysibia* do not include sufficient details on its morphology, making necessary further description for the species.

This paper provides a description of *A. trysibia* based on fresh specimens collected in the Tena River (Amazonian Ecuador). The description includes aspects of the parasitism in *Chaetostoma dermorhynchum*, a previously unknown fish host, locally named as "carachama". This is the first record of *A. trysibia* in Ecuador, and also the most upstream known location for the species in South America.

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2. Material and methods

Three sampling stations were selected along the upper course of the Tena River (Fig 1). This is a pristine area, unaffected by urban or industrial pollution. Sampling stations served as the starting points for moving upstream and casting fishing nets in all likely areas (Table 1).

Fishes were caught with an *atarraya* net, a traditional hand cast net (3 m diameter, 15 mm mesh size) used in Amazonian rivers. Sampling periods started at 19 h and lasted for two hours. Due to changing fluvial morphology and weather conditions, no attempt to standardize the fishing protocol was made. To determine the presence of the isopod in small-sized *C. dermorhynchum*, a total of 34 fish were caught by hand at Station 3 (Fig. 1).

After each sampling period, fishes were transferred alive to the laboratory for their examination. The water in which the fishes were transported was also screened for the presence of parasites.

Table 1
Collection data associated to sampling stations along the Tena River, Ecuador.

Station	Sampling date	high m	Coordinates	
1-Shiri	3 April 2015	760	0°55′13″S	77°52′42″W
2-Atacapi	5 April 2015	640	0°56′55″S	77°51′37″W
3-Ikiam	28 February 2015	615	0°57′27″S	77°51′36″W

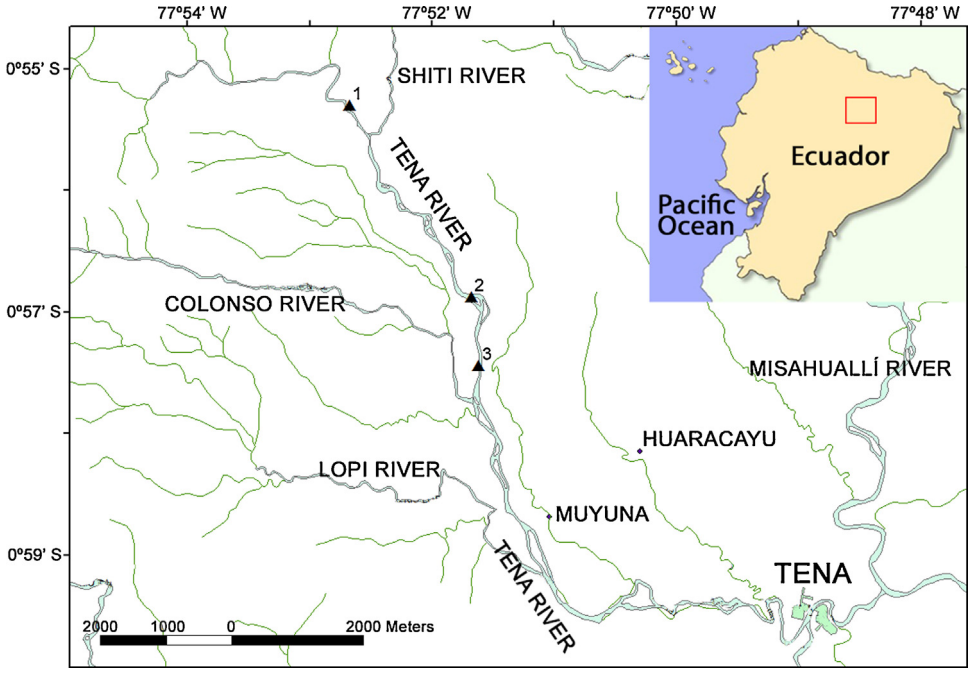

Fig. 1. Map of sampling stations along the Tena River, Ecuador.

Table 2
Characteristics of *Artystone trysibia* specimens and its fish host collected in the Tena River. L: length; W: width, BI: body index. Side, l: left; r: right. Capsule opening position A: lateral above the pectoral fin, B: ventral, C: lateral between pectoral and pelvic fin; D: lateral above the pelvic fins, and E: lateral below the dorsal fin (see Fig. 8).

N°	Station	Artystone trysibia					Host *C. dermorhynchum*		
		L	W	BI	Sex	Marsupium	L	opening	
		mm	mm				cm	side	position
#1	3-Ikiam	21	12	1.75	♀	Empty	11	l	D
#2	3-Ikiam	23	13	1.77	♀	366 juveniles(Stage V)	12.5	r	B
#3	3-Ikiam	26	13	2.00	♀	828 embryos(stage IV)	12.5	r	B
#4	3-Ikiam	17	11	1.55	♀	Empty	9	r	D
#5	3-Ikiam	15	10	1.50	♂		10	l	D
#6	3-Ikiam	19	13	1.46	♀	Broken, (stage II)	10	l	D
#7	3-Ikiam	19	13	1.46	♀	Broken (stage II)	9	l	D
#8	3-Ikiam	17	14	1.21	♀	Empty	9	l	C
#9	3-Ikiam	20.5	11	1.86	♀	311 juveniles(stage IV)	10	l	D
#10	1-Shiri	15	12	1.25	♀	Empty	9	l	D
#11	1-Shiri	19	14.5	1.31	♀	388 eggs (Stage II)	10.5	r	E
#12	1-Shiri	17.5	12	1.46	♂		11	r	D
#13	1-Shiri	22	14	1.57	♀	393 eggs (Stage II)	11.7	r	D
#14	1-Shiri	18	12.2	1.48	♀	Empty	10.5	r	D
#15	1-Shiri	20	14	1.43	♀	Empty	10.5	r	A
#16	1-Shiri	14.3	9.8	1.46	♂		9.5	r	D
#17	1-Shiri	16.7	10.5	1.59	♀	180 eggs (Stage II)	9.5	r	D
#18	1-Shiri	15	10.5	1.43	♀	94 eggs (Stage II)	8	r	D
#19	1-Shiri	16	11	1.45	♂		8.5	r	D
#20	1-Shiri	14.4	12	1.20	♀	Empty	8.5	l	D
#21	1-Shiri	16.3	10.2	1.60	♀	Empty	9.8	r	D
#22	2-Atacapi	29	19	1.52	♂		16	r	C