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Short Communication

First report of *Livoneca guianensis* (Isopoda: Cymothoidae) in *Leporinus fasciatus* (Pisces: Anostomidae) in Brazil

Primeiro registro de *Livoneca guianensis* (Isopoda: Cymothoidae) em *Leporinus fasciatus* (Pisces: Anostomidae) no Brasil

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Abstract

This study aimed to report the first record of the occurrence of the parasite *Livoneca guianensis* in *Leporinus fasciatus* in Brazil. In September 2019, during surveys of the parasites in 12 specimens of *L. fasciatus* from the lower Jari River basin, in Amapá State, Brazil, one specimen of *L. guianensis* was found in the tongue of one host. The prevalence of *L. guianensis* was 8.3%, and it was observed that this parasite has a geographic distribution restricted to South America, parasitizing fish species from Guyana and Brazil. This study contributed to the first report on the occurrence of *L. guianensis* for *L. fasciatus* in Brazil. In addition, increased the knowledge on the geographic distribution of this parasite with morphometric data, which are scarce for this Cymothoidae.

Keywords: Isopoda, ectoparasite, gill, freshwater fish, Jari River.

Resumo

Este estudo objetivou registrar a primeira ocorrência de *Livoneca guianensis* em *Leporinus fasciatus* no Brasil. Em setembro de 2019, durante uma pesquisa sobre parasitos em 12 espécimes de *L. fasciatus* do baixo Rio Jari, Estado do Amapá, norte do Brasil, um espécime de *L. guianensis* foi encontrado na língua de um hospedeiro. A prevalência de *L. guianensis* foi de 8,3% e foi observado que esse parasito tem distribuição geográfica restrita à América do Sul, parasitando espécies de peixes da Guiana e do Brasil. Este estudo contribuiu com o primeiro relato da ocorrência de *L. guianensis* para *L. fasciatus* no Brasil. Além disso, aumentou o conhecimento sobre a distribuição geográfica desse parasito, contribuindo com dados morfométricos que são escassos para esse Cymothoidae.

Palavras-chave: Isopoda, ectoparasitos, brânquia, peixe de água doce, Rio Jari.

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Isopoda of the family Cymothoidae Leach, 1818 are obligatory ectoparasites with direct life cycle and they parasitize both marine and freshwater fish (Smit et al., 2014; Tavares-Dias et al., 2015; Oliveira et al., 2017). The genus *Livoneca* Leach, 1818 is consisted of 18 species of ectoparasites: *Livoneca bowmani* Brusca, 1981; *Livoneca ovalis* Say, 1818; *Livoneca redmanii* Leach, 1818; *Livoneca desterroensis* Thatcher, Souza-Conceição & Jost de 2003; *Livoneca enigmatica* Fryer, 1968; *Livoneca galinae* Kononenko, 1989; *Livoneca guianensis* Van Name, 1925; *Livoneca intermedia* Nierstrasz, 1931; *Livoneca lazzari* Pearse, 1921; *Livoneca orinoco* Bowman & Diaz-Ungria, 1957; *Livoneca papernea* Trilles, Colorni & Golani, 1999; *Livoneca parasilura* Shen, 1933; *Livoneca pomatoi* Gaillat Airoldi, 1940; *Livoneca reniformis* Menzies & Frankenberg, 1966; *Livoneca ricinoides* Risso, 1816; *Livoneca soudanensis* Richardson, 1911; *Livoneca tenuistylis* Richardson, 1912 and *Livoneca texana* Pearse, 1952 (Boyko et al., 2008). *Livoneca guianensis* was described only from the oral cavity of the fish *Leporinus fasciatus* Bloch, 1794 (Anostomidae) and *Pimelodus clarias* (Pimelodidae) from Guyana (Van Name, 1925). Thus, the present study contributes with the first report of *L. guianensis* for *L. fasciatus* in Brazil, in addition to providing morphometric data for this parasite, which are scarce.

In September 2019, 12 specimens of *L. fasciatus* were collected in the lower Jari River system [1°9'6.23"S 51°59'25.94"W], near the Jarilândia District, municipality of Vitória do Jari, Amapá State, Northern Brazil (Figure 1). Fish were collected using gillnets (15 m long, 1.5 deep, 20, 25 and 30 mm between knots) and were measured for total length (cm) and weight (g). All fish were examined for crustacean ectoparasites, which were maintained in ethanol solution (70%) for 24 h, and then preserved in alcohol (70%) with glycerin (10%) for further morphological analyses. Measurements recorded for the *L. guianensis* were the length and width of the body; length of the pereons, dactyls and pleonites; as well as length and width of the telson. The host and parasite were identified at the higher taxonomic level according to specialized literature (Van Name, 1925; Queiroz et al., 2013).

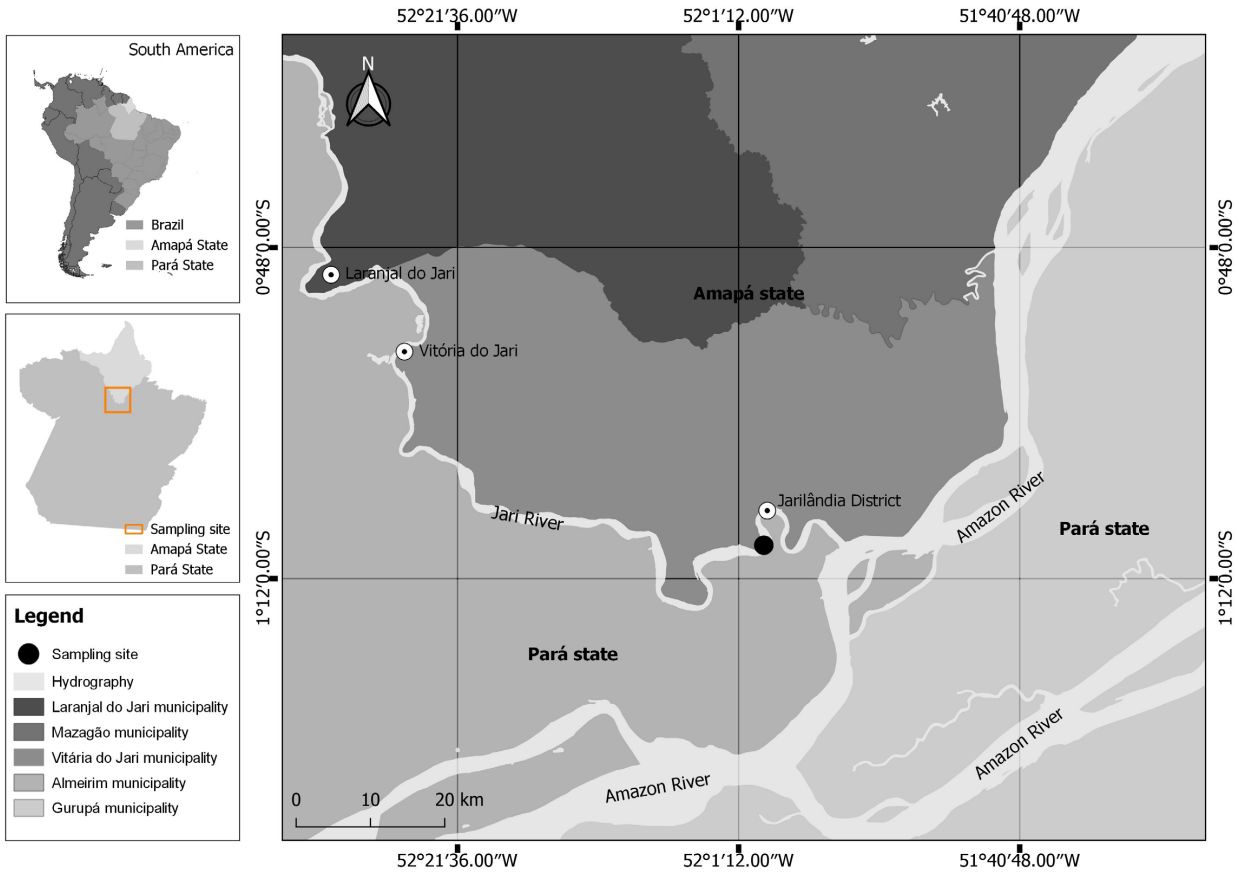

Figure 1. Collection site of *Leporinus fasciatus* in the Jari River basin, in eastern Amazon (Brazil).

Specimens of *L. fasciatus* (Figure 2A, B) showed an average media length of 18.1 (10.8-26.2) cm and average weight of 83.6 (11.8-183.8) g. Only one specimen (8.3%) of *L. fasciatus* measuring 22.2 cm in length and weighing 111.2 g was parasitized by *L. guianensis* ♀ (Figure 2C-F) that was found in the tongue of this host (Figure 2B). Small lesions were observed on the host tongue due to the fixation of the parasite claws. The measurements of *L. guianensis* are shown in Table 1.

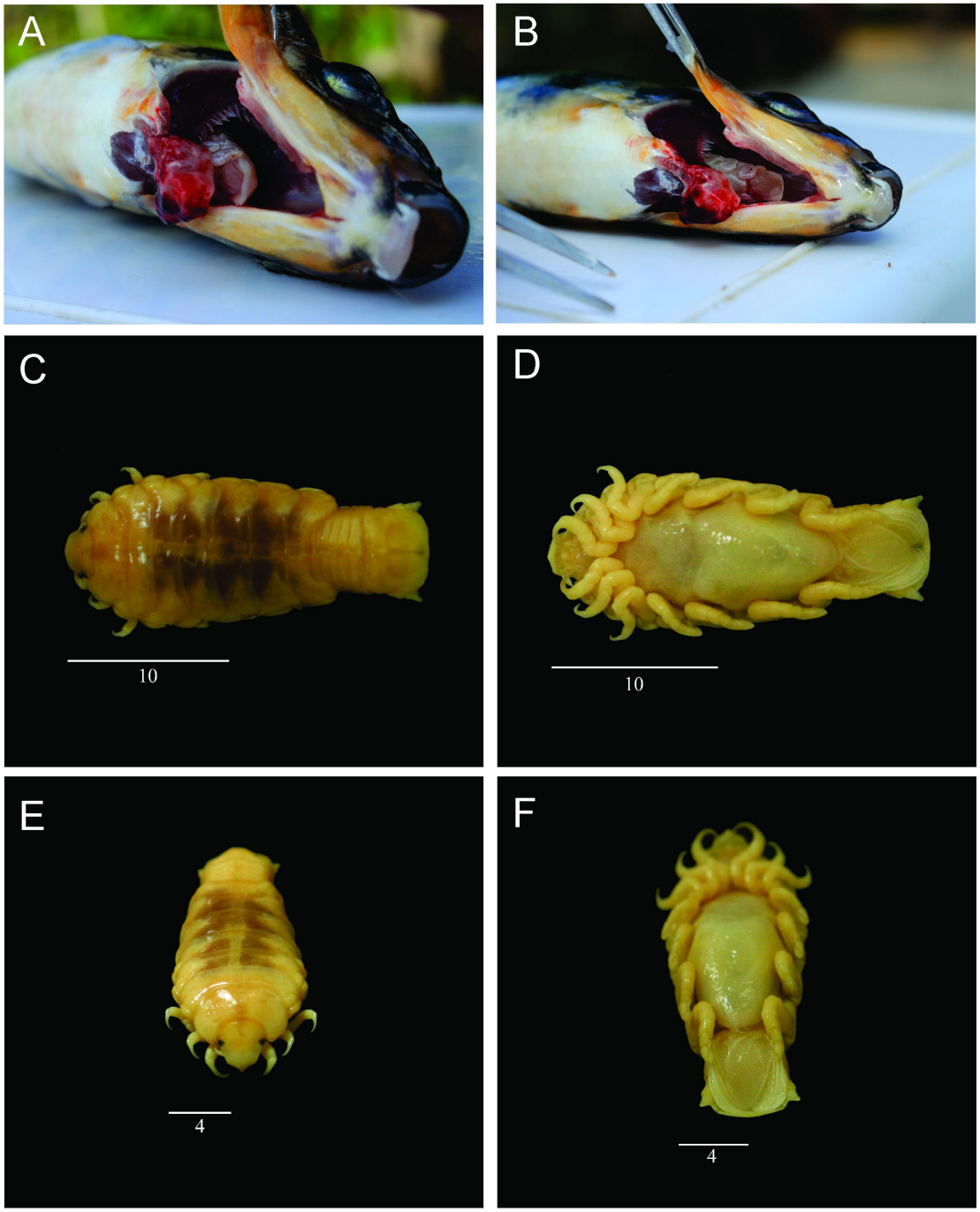

Figure 2. Female of *Livoneca guianensis* fixed on the tongue of *Leporinus fasciatus* from the Jari River basin, in eastern Amazon, Brazil (A, B). Views of the *Livoneca guianensis* dorsal (C) ventral (D), frontal (E) and back (F).

In general, parasitic cymothoids occur with little infestation in gills of host fish because these ectoparasites may cause considerable damage to fish when feeding from mucous and epithelial cells, perforating the fish skin (Tavares-Dias et al., 2014, 2015). This is related to competition for resource, because possibly the size of the infestation site (i. e. tongue) is a limiting factor for cohabiting two or more specimens of *L. guianensis* or other isopod species of large size. The registration of *L. guianensis* in larger *L. fasciatus* corroborates the hypothesis that larger fish with a larger available area are more prone to infestation by this isopod species (Arneberg et al., 1998; Poulin, 1999). The low prevalence of this cymothoids may be due to its low fertility rate, infestation, survival, environmental conditions, predation or even host behavior. These parasites infest the ventral part of the opercular cavity or the mouth of their hosts (Thatcher, 2006; Tavares-Dias et al., 2014; Oliveira et al., 2017). In general, the cymothoid species are

Table 1. Measurement of *Livoneca guianensis* female collected in *Leporinus fasciatus* gills from the Jari River, in eastern Amazon (Brazil).

Measured parameters	Measurements (mm)
Total length	22.0
Total width	9.0
Head length	3.4
Head width	3.3
1st pereon length	6.8
2nd pereon length	8.5
3rd pereon length	9.0
4th pereon length	9.0
5th pereon length	9.0
6th pereon length	8.3
7th pereon length	7.5
1st dactyl length	2.5
2nd dactyl length	1.5
3rd dactyl length	1.0
4th dactyl length	1.0
5th dactyl length	1.0
6th dactyl length	1.5
7th dactyl length	1.5
Length 1st to 5th pleonite	6.5
Pleotelson Length	4.0
Pleotelson width	5.0

protandrous hermaphrodites, and mainly females are found parasitizing fish, however, males are occasionally found together with females. The presence of *L. guianensis* female without a male partner is a strong indication that the males may have been swept from the oral cavity or swallowed by the host fish (Bakenhaster et al., 2006), but is also possible that the male spontaneously leaves the host, either due to biological necessity or perception of fish stress at the time of host collection. In the present study, *L. guianensis* was found in the tongue of *L. fasciatus*, in which small lesions caused by the attachment of the parasite claws were observed. Similar lesions were also attributed to the isopod *Braga patagonica* Schioedte & Meinert, 1884 in *Colossoma macropomum* Cuvier, 1816 tegument (Tavares-Dias et al., 2014).

Species of the genus *Livoneca* have a wide geographical distribution, with records in Asia, Africa, North America, Central America, South America, and Europe (Bruce, 1990). However, the taxonomic status of most *Livoneca* species, including *L. guianensis*, is considered uncertain (Bruce, 1990). Therefore, new taxonomic revisions of these species are necessary, of which can change the biogeographical status currently established for these isopods. After description of *L. guianensis* collected in *L. fasciatus* and *P. clarias* in Guyana (Van Name, 1925), this parasite was found in Brazil in the oral cavity of *Leporinus friderici* Bloch, 1794 in the Jari River, a tributary of the Amazon River basin in Northern Brazil (Oliveira et al., 2017). Therefore, *L. guianensis* has a distribution exclusive to South America and may be widely distributed in this Neotropical region. In conclusion, this study contributed the first report of the occurrence of *L. guianensis* in *L. fasciatus* in Brazil, thus increasing our knowledge about the geographic distribution of this parasite. Furthermore, the present study contributed morphometric data, which are scarce for this cymothoid.

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