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Artigo

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Occurrence of *Ergasilus versicolor* (Copepoda: Ergasilidae) in *Mugil gaimardianus* (Osteichthyes: Perciformes) from the estuarine area of Bragança, Pará, Brazil

Ergasilus versicolor and *Mugil gaimardianus*

Arthur Felipe Lima dos Santos[1], Daniel Guerreiro Diniz[1], Ricardo Massato Takemoto[2], Carina Caroline Silva França[3] and Rodrigo Yudi Fujimoto[4,*]

[1] *Universidade Federal do Pará, Bragança, Pará, Brasil.*
[2]*Universidade Estadual de Maringá, Maringá, Paraná, Brasil .*
[3]*Universidade Federal de Sergipe, São Cristóvão, Sergipe, Brasil.*
[4]*Embrapa Tabuleiros Costeiros, Aracaju, Sergipe, Brasil.*

*Contato: ryfujim@hotmail.com

Resumo. O presente trabalho teve por objetivo avaliar relação parasita hospedeiro em tainhas (Mugil gaimardianus) parasitadas pelo copépodo *Ergasilus versicolor*. Os peixes foram capturados nos estuários da região de Bragança, nordeste paraense, entre os meses de agosto de 2006 e julho de 2007. Das 60 tainhas capturadas, apenas 13 não estavam infestadas, os 47 indivíduos restantes apresentaram um total de 1187 parasitas, o que resultou em 78,33% de prevalência, 25,55±39,2 de intensidade média e 19,7 de abundância. Esse é o primeiro relato dessa espécie de parasita em peixes do litoral do Pará.
Palavras-chave. *Tainha, Amazônia, Sazonalidade, Doença.*

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Abstract. The current study aims to evaluate the host/parasite ratio in Mugil gaimardianus parasitized by *Ergasilus versicolor* and its seasonality. Fish were caught in the estuaries of Bragança, Pará-Brazil, between August 2006 and July 2007. Sixty mullets were captured, but only 13 were not infested, and the other forty-seven specimens held a total of 1,187 parasites. It resulted in a prevalence of 78.33%, 25.55 ± 39.2 of mean intensity and abundance of 19.7. It is the first record of this parasite in Pará State.
Keywords. Mullet, Amazon, Seasonality, Disease.

Introduction

Mullets are fish that inhabit coastal and estuarine water of tropical and subtropical seas worldwide. They are euryhaline and usually swim into lagoons and estuaries and are commonly found in estuarine low salinity water, but migrate to the sea during the spawning period (Menezes, 1983). They are commercially important since they are one of the main resources exploited by artisanal fishermen in all regions where they occur because they represent an important source of protein for human consumption (Cervigón et al., 1993).They are popularly known in Brazil by names such as tainha (mullet), paraty, curimã, caíca and pratiqueira (Menezes, 1983).

The Mugilidae family includes 13 genera and 70 species distributed worldwide (Nelson, 1994). Among the mullets, Mugil spp. occurs on the Northern coast of South America (Cervigón et al., 1993) only and it is represented in the Bragança coast by three species: Mugil curema Valenciennes, 1836 M. gaimardianus Desmarest, 1831 and M. liza Valenciennes, 1836 (Espírito Santo et al., 2005). There are approximately 35 known copepod crustaceans parasitic on teleost fish. Marine fish of the Belonidae, Scombridae, Mugilidae, and Haemulidae families show the worse infestations (Luque & Takemoto, 1996). However, the state of Pará reports the most scarce ergasilid infestations in fish in the Northern coast of the country.

The Ergasilidae family comprises 8 genera and 38 species. Twenty-one (21) Ergasilus species parasitic on Brazilian fish were recorded (Boxshall & Montú, 1997). They attach to the hosts and can be found in different places on the hosts' bodies, such as the oral cavity, gill cavity, nostrils, fin and skin (Thatcher, 1991; Varella et al., 1992). The Ergasilids inhabit fresh and salty water and estuarine environments. Once attached to the gills, they show preference for a given gill arch or a certain position in the secondary lamellae. They cling their second antennae to the gill and the antennae works as hooks. It leads to considerable damages in the epithelium when the parasito-

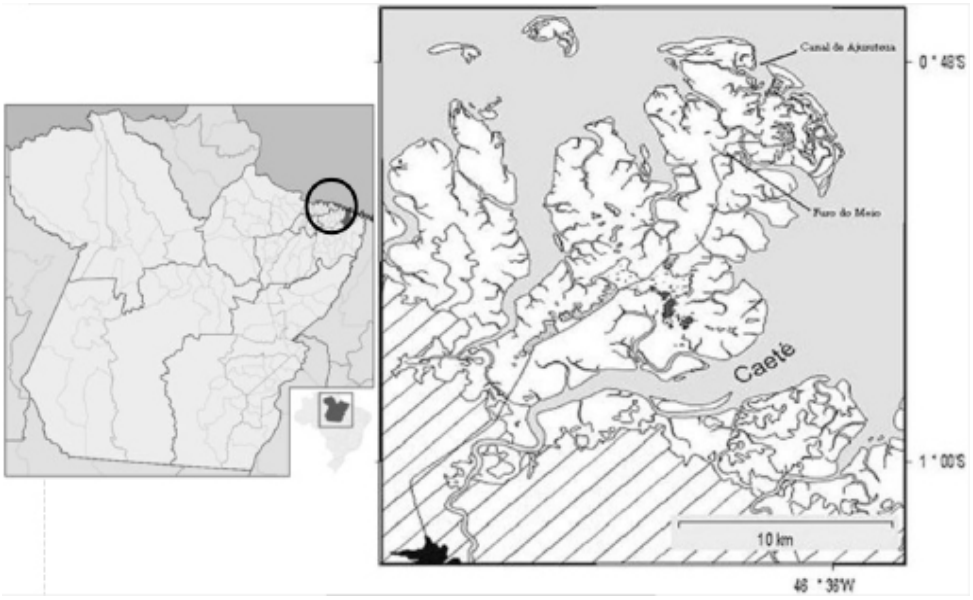

Figure 1. Collection area, Bragança estuarine region (Furo do Meio and Ajuruteua Beach).

sis intensity is high, since it causes bleeding and weight loss in the host or even death, as seen in Mugil cephalus Linnaeus, 1758, parasitized by hundreds of *Ergasilus lizae* Kroyer, 1863 (Paperna, 1975).

Thus, the current study aims to evaluate the parasite/host in mullets parasitized by *Ergasilus versicolor* Wilson, 1911, in the Bragança region, Northeastern Pará.

Material and methods

Samples were collected in two points of the Bragantina estuary region, Furo do Meio (L 46º39'29 ''; W 0º49'14 '') and Ajuruteua beach (L 46 ° 39'15"W, 0º49'14 '') (Figure 1), from August 2006 to July 2007, using gill nets with 18, 20 and 25 mm internode meshes. The nets were randomly and transversely placed in the canal for five hours. They were checked every 30 minutes and then relocated in the site. Trawls of approximately 15 to 20 min were performed using the same nets, when the collection was performed on the beach. Fish were placed in net-tanks for species' maintenance until their transference to the Laboratory of ictioparasitology and fish farming of the Federal University of Pará (UFPA) – Bragança Campus. Fish were transported alive in Styrofoam boxes containing clean water collected at the site. The living individuals were transferred to 300L water tanks with recirculating and artificial oxygenation system within the laboratory and were kept there for 24 hours. The fish that arrived dead in the laboratory were identified, autopsied and stored at -18°C.

Parasitological analyses

Prior to the parasitological analysis, fish were sacrificed by deepening anesthesia with benzocaine baths (approximately 1g /10L). Then, the species' full length, weight and identification were performed. The autopsy, fixing, parasite collection (Amato et al., 1991; Eiras, 1994) and identification procedures were done (e.g. Knoff et al. 1994; Johnson & Rogers, 1972) after the fish's death. The parasitological rates of prevalence, mean intensity and abundance followed the determinations by Bush (1997).

The parasitological data were then correlated (Pearson correlation) with the individuals' length and weight. The mean intensity of infections found in the dry and wet seasons was compared by t test. The division into two seasons followed the recommendations by Schaelfer-Novelli & Cintrón (1986). The Biostat 4 software was used for statistical analysis (Ayres et al. 2005).

Results and Discussion

Sixty (60) Mugil gaimardianus specimens were captured (total length from 13.8 to 28.1 ± 2.58 cm and weight from 33.2 to 177.4 ± 31.3g) and only 13 showed no infestation by the parasite. The ergasilid species found in the current study was identified as Ergasilus versicolor Wilson, 1911 with sample size of 1,187 individuals. This is the first report on the occurrence of E. versicolor in Northeastern Pará, Bragantina region.

Regarding the host/parasite ratio, the following parasitological indexes were obtained: 19.7 abundance, 25.6 ± 39.2 parasites/fish of mean intensity and 78.33% prevalence. High degree of infestation by ergasilids was found when comparing the current study with that by Knoff et

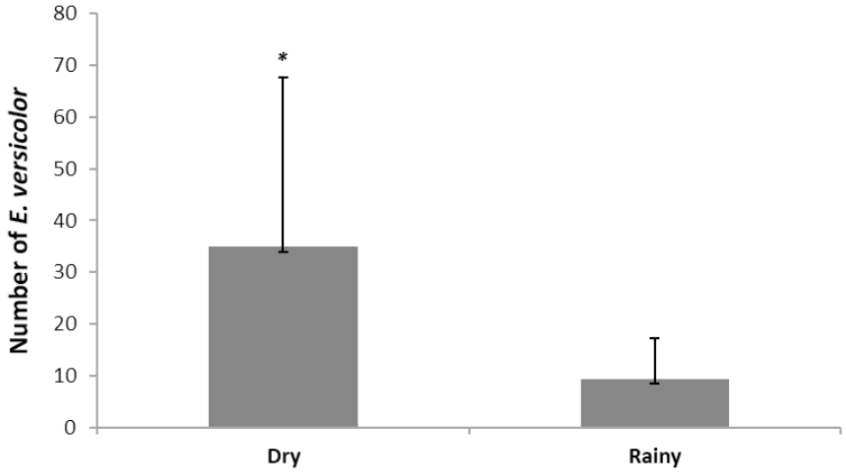

Figure 2. Seasonal variation in the number of E. versicolor collected in the Bragança estuarine region, Pará, Brazil.

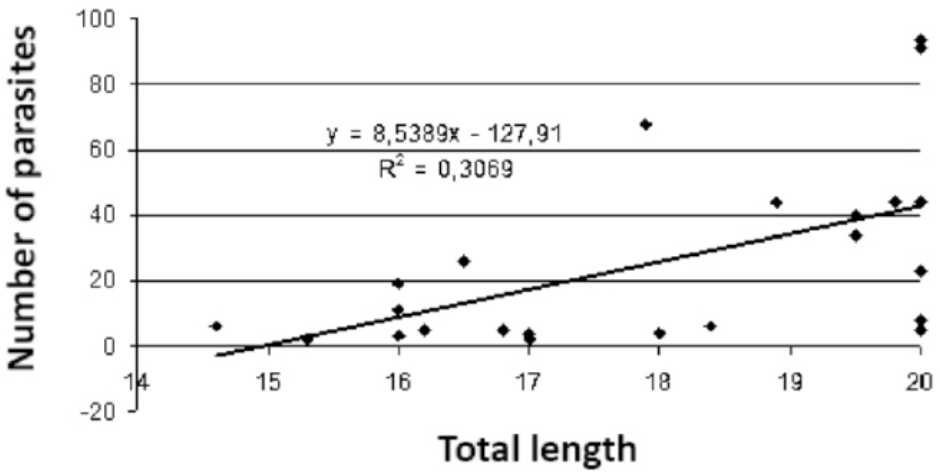

Figure 3. Correlation between the host's total length and the number of E. versicolor collected in the estuary of Bragança, Pará, Brazil.

al. (1994) who found prevalence of 20.66% in Mugil platanus captured in Rio de Janeiro, thus corresponding to a number 3.8 times lower than the one found in the present study. Cavalcanti et al. (2005) found intermediate values, with prevalence of 58.06% in Mugil curema captured in Rio Grande do Norte. The period in which higher prevalence (94.57%) of E. versicolor was recorded corresponds to the months from January to July, which is the rainy season in the region. In contrast, results showed that the dry period showed bigger number of parasites in Pará (Figure 2). It happens because these parasites are directly related to water temperature, and the rising temperature provides greater abundance and egg production capability (Cloutman & Becker, 1977; Jones, 1981)

IIn other countries, such as Mexico, Mugil cephalus presented the following parasitological indexes: 72.7% prevalence and mean intensity of 4.01 (Valles Ríos et al., 2000), prevalence value similar to the one found in the current study, but with less infection intensity. The authors of the current study ruled out the hypothesis that the infestation is subject to factors such as salinity, because E. versicolor would show euryhaline capacity (Valles Ríos et al. 2000).

In addition to the abiotic factors, biotic factors such as fish size influence the parasitic load. Larger fish would present major infestations due to longer exposure to the environment and larger contact surface (Thatcher & Boeger, 1983; Tavares et al., 2005). However, the correlation between the host's total length and the number of parasites in the current study showed $r^2 = 0.30$ (Figure 3). This result is lower than that found by Tavares et al. (2005) who found a correlation of $r = 0.5$ to parasitism by Ergasilus sp. on Anchoa tricolor. As for the weight, no correlation was found.

Conclusion

This is the first report of E. versicolor parasitism on M. gaimardianus in the coast of Pará. It showed increased infestation during the dry season, mainly due to temperature rise. However, such infestation is not influenced by the size of the fish.

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