

THE QUALITY OF THE DETRITUS USED BY AMAZONIAN FISH DURING THE LOW WATER SEASON

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Introduction

Detritivores fish are reported to feed on fine particulate organic matter - FPOM (Bowen, 1979). The composition and nutritional value of FPOM ingested by fish in the Amazon has not been directly addressed yet. Some early studies found the carbon assimilated by characiforms detritivores came from phytoplankton, but it could not identify the carbon source for the siluriforms (Araujo-Lima et al, 1986). In this study we are investigating the differences in the quality of the detritus ingested by the siluriform *Liposarcus pardalis* and the characiform *Prochilodus nigricans*, two abundant fish species of the Amazon. We sampled these species during the low and high water season and analyzed the ash and organic matter content of the ingested detritus. We also measured the fraction of hydrolysis resistant organic matter, protein and algae carbon of the organic matter content. Here, we are presenting the results of our work related to the detritus quality during the low water season.

Material and methods

We sampled the fish in three floodplain lakes of Central Amazon near Manaus, Brazil. They were caught together with gill net sets in the edge the marginal vegetation. The digestive tract of *P. nigricans* and *L. pardalis* were removed in the field as the fish was taken from the nets. The tracts were placed in ice and brought to the laboratory for analysis. The detritus was removed from the stomach of *P. nigricans*. For *L. pardalis* we extracted the detritus from the first quarter of the gut, as it did not had food in the stomach, which is used also for respiration. The ash, hydrolysis resistant organic matter, and total organic matter was measured using the technique

describe by Buddington (1980). Protein content of the organic matter was measured with and C:N autoanalyser and algae carbon with chlorophyll analysis. Chlorophyll (ug/mg of organic matter) was transformed to algae carbon (mg C/mg organic matter) multiplying it by 0.12 (Araujo-Lima and Hardy, 1987).

Results and discussion

We collected 74 *Liposarcus pardalis* and 80 *Prochilodus nigricans*, totaling 154 fish. Most fish had empty stomach and gut. This seems to be related with the development of the gonads. Only 20% of *L.pardalis* and 30% of *P.nigricans* had food in their digestive tracts. These data do not agree with previous reports that the detritivores always have full stomach (Carvalho, 1984; Sazima and Caramachi, 1989).

Most of the detritus ingested by *P. nigricans* (~72%) were not potentially digestible, comprising 57% of ash and 16% of hydrolysis resistant organic matter (lignin+cellulose) (table 1). Conversely, *L. pardalis* ingested a detritus richer in digestible organic matter than *P. nigricans* (t= 6.6; d.f.=13; p<0.0001). Organic matter content was not the only difference between the detritus consumed by these two species. The protein content of the detritus was significantly higher (t=5.8; d.f.=18; p<0.0001) and the algae carbon was significantly lower (t=22.38; d.f.=13; p<0.0001) for the siluriform. Therefore the two species are ingesting detritus of different qualities.

The organic matter content of the detritus during the lower season seems higher in the Amazon than in the Pantanal wetlands, where Almeida et al (1993) found only 15% of organic matter in the stomach content of *Prochilodus lineatus*. The protein content of the organic matter is, however, within the range reported by studies in Africa (Bowen, 1979) and Sri Lanka (De Silva et al, 1984).

Table 1. Average detritus quality in stomach content and gut content (first quarter) for *Prochilodus nigricans* and *Liposarcus pardalis*, respectively, during low water season. Data are percentage of total stomach/gut content, except for protein and plant carbon, which refers to percentage of total organic matter. The average size of *Prochilodus nigricans* was 28.5 mm and of *Liposarcus pardalis* was 21.5 mm. Percentage data were arcsin corrected.

	% of digestible organic matter	% hydrolysis resistant organic matter	% ash	% protein	% plant carbon
<i>L. pardalis</i>					
average	42.44	14.11	43.45	17.09	1.88
sd	7.55	2.48	7.35	5.32	0.76
range	(36.14 - 50.47)	(11.49 - 21.36)	(35.32 - 62.36)	(5.36 - 26.90)	(0.24 - 2.74)
n	12	12	12	14	10
<i>P. nigricans</i>					
average	27.4	15.7	56.9	8.42	14.58
sd	2.79	1.88	2.61	2.75	1.41
range	(20.98 - 33.93)	(12.17 - 19.62)	(51.45 - 61.34)	(4.44 - 13.16)	(11.53 - 17.45)
n	24	24	24	20	10

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