PROGRESS REPORT

EVALUATION OF ECOLOGICAL FUNCTION OF FRESHWATER STINGRAY Potamotrygonmagdalenae ON A TROPHIC FOOD WEB OF THE COLOMBIAN ANDES

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Applicant Name: Viviana Márquez Velásquez

Organisation: Foundation SQUALUS

Country: Colombia

Summary

This study aims to establish the trophic relationships and evaluate the ecological role of the freshwater stingray *Potamotrygon magdalenae* in the Magdalena River, through isotopic analysis and topological index. Thereby, based on energy sources, the relative contribution of preys, the breadth and trophic niche overlap, we will establish how redundant is the trophic function *P. magdalenae* and therefore, assess the importance of this species in the structure and stability of the food web. Thus, the study will determine whether *P. magdalenae* is a key species in the ecosystem and help us to suggestmanagement scenariosbased on the species uses.

The sampling was conducted along the Magdalena River basin: in the upper portion, in the Betaniareservoir (El Hobo, Fig. 1.a); in the middle portion, in the town Puerto Serviez, in the main channel of the Magdalena river (Fig.1.b) and in the lower portions, in the Malambo floodplain lake (Fig. 1.c); where fishing activity occurs. These samplings were performed from July, after the end of the ENSO event (El Niño Southern OscillationENSO).



Fig. 1.a).Betania reservoir (El Hobo), upper Magdalena river.b) Puerto Serviez, middle Magdalena river.c). The Malambo floodplain lake, lower Magdalena river

Thesamplings were performed with the help of local fisherman using the cast-netand an experimental gill-net($100 \times 3 m$)(Fig. 2, Annexes), and by collecting samples of fishes in the main fishing landings of each zone (Table 1).Length, weight and sex data were collected from each fish (See annexes).



Fig. 2.Local fishermen in the Betania reservoir

Table 1.Sampled fish species in the Magdalena basin

Portion of the Magdalena

River	Locality	Species	N
Upper	Betania Reservoir	Astyanax sp.	9
Upper	Betania Reservoir	Caquetaia kraussii	4
Upper	Betania Reservoir	Cyphocharax magdalenae	6
Upper	Betania Reservoir	Kronoheros umbrifer	5
Upper	Betania Reservoir	Oreochromissp.	3
Upper	Betania Reservoir	Oreochromis niloticus	1
Upper	Betania Reservoir	Pimelodus grosskopfii	7
Upper	Betania Reservoir	Potamotrygon magdalenae	13
Upper	Betania Reservoir	Prochilodus magdalenae	1
Middle	Puerto Serviez	Apteronotus mariae	1
Middle	Puerto Serviez	<i>Astyanax</i> sp.	10
Middle	Puerto Serviez	Brycon moorei	1
Middle	Puerto Serviez	Centrochir crocodili	17
Middle	Puerto Serviez	Chaetostoma spp.	3
Middle	Puerto Serviez	Crossoloricaria variegata	2
Middle	Puerto Serviez	Curimata mivartii	35
Middle	Puerto Serviez	Cynopotamus magdalenae	11
Middle	Puerto Serviez	Cyphocharax magdalenae	2
Middle	Puerto Serviez	Dasyloricaria filamentosa	1
Middle	Puerto Serviez	Eigenmannia humboldtii	1
Middle	Puerto Serviez	Hypostomus hondae	12
Middle	Puerto Serviez	Ichthyoelephas longirostris	1
Middle	Puerto Serviez	Leporinus muyscorum	9
Middle	Puerto Serviez	Megalonema xanthum	8
Middle	Puerto Serviez	Oreochromis niloticus	2
Middle	Puerto Serviez	Pimelodus blochii	15
Middle	Puerto Serviez	Pimelodus grosskopfii	15
Middle	Puerto Serviez	Potamotrygon magdalenae	53
Middle	Puerto Serviez	Prochilodus magdalenae	68
Middle	Puerto Serviez	Pseudopimelodus bufonius	6
Middle	Puerto Serviez	Pseudoplatystoma	11

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Middle	Puerto Serviez	Pterygoplichthysundecimalis	2
Middle	Puerto Serviez	Roeboides dayii	1
Middle	Puerto Serviez	Salminus affinis	1
Middle	Puerto Serviez	Sorubim cuspicaudus	35
Middle	Puerto Serviez	Spatuloricaria gymnogaster	13
Middle	Puerto Serviez	Squaliforma tenuicauda	2
Middle	Puerto Serviez	Sternopygus aequilabiatus	6
Middle	Puerto Serviez	Sturisomatichthyspanamensis	3
Middle	Puerto Serviez	Trachelyopterus insignis	9
Middle	Puerto Serviez	Triportheus magdalenae	16
Lower	Malambo lake	Andinoacara latiforns	7
Lower	Malambo lake	Andinoacara sp.	3
Lower	Malambo lake	Caquetaia kraussii	4
Lower	Malambo lake	Cyphocharax magdalenae	1
Lower	Malambo lake	Oreochromis niloticus	24
Lower	Malambo lake	Pimelodus blochii	6
Lower	Malambo lake	Prochilodus magdalenae	10
Lower	Malambo lake	Pygocentrus cariba	13
Lower	Malambo lake	Triportheus magdalenae	11
Lower	Malambo lake	Potamotrygon magdalenae	30

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In the specific locations where the catches were made, we obtained samples of vegetation, periphyton, detritus, zooplankton, phytoplankton and invertebrates (when possible) for to the determination of food sources of the *P. magdalenae* and the other fishes. Riparian vegetation and macrophytes samples were collected by hand from the shores of the water bodies. Leaves were clipped, placed in plastic bags, and frozen for later processing. Periphyton samples were collected from the macrophytes (leaves and branches), and their surfaces were scraped and gently rinsed with water. The zooplankton and phytoplankton was collected using respectively a 50 μ m and 25 μ m mesh net towed through the surface waters (0–2 m) (Fig 3).



Fig. 3.Zooplankton and phytoplankton sampling

All samples were stored on ice in the field and immediately processed upon arrival at the laboratory for later analysis.

Muscle tissues were subsampled from *P. magdalenae* and all the other fishes(Fig. 4). In the laboratory these samples were freeze-dried at 60°C for 48 h, ground and lipids extracted by twice agitating the ground tissue in 2:1 chloroform/methanol solution for 24 h and decanting the solvent (Fig. 5).



Fig. 4.Samplingof muscle tissue from fishes



Fig. 5. Freeze-drying, ground and lipid extraction of the tissue

Finally, all the samples were ground to a fine powder using a pestle and mortar for the subsequent analysis.

Comments

In the specific case of the Upper and lower portion of the basin Betania reservoir and Malambo floodplain lake, the diversity was very low.

In Betania reservoir, the main captured fishes species were alien species, wich are cultivated in floating net pens for small-scale extensive production (Fig. 6)



Fig. 6. Alien species captured in Betania reservoir

In Malambo Floodplain Lake, were detected strong anthropic disturbances: many factories and many fisherman's houses surrounding this system and consequently direct discharges of organic matter (sewage) and pollutants (Fig. 7). Other impacts result from the high number of fishermen depending on the fish resource, causing overfishing, and from the introduction of exotic fish species.



Fig. 7. Anthropic disturbances in Malambo floodplain lake

This panorama was aggravated by the recent ENSO, which had strong effects on the fish fauna of the systems such as dams and lakes.

ANNEXES

1. Sampling in Betania reservoir (El Hobo), upper Magdalena river





2. Sampling in Puerto Serviez, middle Magdalena river



3. Sampling in Malambo floodplain lake, lower Magdalena river

