Sedimentologic Characterization of the Swamps of Negra Lagoon and Palácio Lagoon, Itapuã state Park, Porto Alegre, Brazil.

Aline Rezende Peixoto and Janice Rezende V. Peixoto
Universidade Federal do Rio Grande do Sul
Avenida Paulo Gama, 40, P 12106, 90046900, Porto Alegre, RS, Brasil
alinepeixotodoc@yahoo.com.br

INTRODUCTION

Aquatic vegetation can colonize different environments, such as waterfalls, rivers, rapids, lagoons, swamps, salt marshes, mangroves and dam. Its distribution is determined manly by environmental factors, such as topography, water turbidity and wind direction, forming a bands zonation from the edges to the inside of the water flow.

The swamps are areas of transition between the water and the land environments; are considered extremely relevant and are where most of the aquatic vegetation are found. In this environment the variation of physical-chemical aspects is very significant, with abundance of nutrients and a great complete in the trofic net.

The aquatic vegetation is the main producer of organic material within the aquatic ecosystem, predominantly used in the form of debris enriched by bacteria bio mass. They support the trofic net in a particularly important way in shallow waters (Mitsch and Gosselink, 1986), being fundamental for the biogeochemical local cycles, forming temporary reservoirs and remobilizing nutrients (NPK) and toxic elements (Hg, Pb, Cu) in the sediment.

The swamps are also used as refuges, birthplaces, areas of reproduction and feeding of various species, including, birds, mammals, fishes and mollusks (ADAM, 1990).

In addition to being very useful for the maintenance of the ecological balance of the aquatic vegetation, they can also be used against erosion as they are trap naturals of the sediment and, with that make the environment stable (Nieva, 1996; Peixoto et al., 1998; MITSCH & GOSSELINK, 1986).

According to SCHWARZBOLD (1982) Rio Grande do Sul a plain has a total area of 37.000 km^2, of which 14.260 km^2 are lagoons and can be included as one of the largest extension of wet land in South America.

NICOLODI (2002), emphasizes that there are few areas destined to the conservation of coastal systems and their respective associated ecosystems, excepting the National Park of Peixe Lagoon, the Guarita Park in Torres and the Taim swamp as areas facing the Altantic Ocean and the Itapuã State Park as an area facing the Patos Lagoon and the Guaíba Lagoon. The water communities are essential in the fixation of segments and

formation of protected coastal areas. Under natural conditions, the system of lakes work within a complex biotic environmental matrix, vulnerable to human impact (SIERRA DE LEDO & SORIANO SERRA, 1988).

OBJECTIVES

This work aims at presenting a grain size analysis of the Negra Lagoon and Palácio Lagoon swamps and the vegetation existing in these environments.

AREA OF STUDY

The Itapuã State Park is located in the district having the same name, in the municipality of Viamão, within the metropolitan area of Porto Alegre, in the state of Rio Grande do Sul, Brazil.

The Park has 53.33 km^2, most of it consisting of a flat area of quaternary formation including the Negra Lagoon with an area of 17.5 km^2, the Lagoon of Palácio with an area of 5 km^2, and other smaller swamps (FIGURE 1). This work has been developed in areas distinct from the Negra Lagoon and the Palácio Lagoon in the Itapuã State Park consisting of swamps located in the most protected areas of these lagoons The area is flooded by the Patos Lagoon.

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Grain ed, having each sample five replies within two swamps located in the Negra Lagoon end Palácio Lagoon, respectively. Initially, the organic material in the samples was burned throught oxidation with (H_20_2), based on a technique adapted from GROSS (1971). For the grain size analysis of slim sediments, the method according to the WENTHWHORT (1922) scale was used.

The statistical treatment of the samples of sediments used the PANCOM program, conceived by TOLDO JR. & MEDEIROS, (1986), which manipulates the grain size parameters following the FOLK & WARD (1957) methods.

Vegetation

To identify the aquatic specimens, we made a field research having defined the dominant specimen as the one having a visual coverage higher than 70 %, with further confirmation of the vegetation existing in the area in the laboratory.

RESULTS AND DISCUSSION

The transformation of coastal lake swamp seems to register a relevant development tendency involving relevant components of the lake system. These transformations are controlled by four main mechanisms: variation of the relative sea level; the progressive development of the vegetation in the edge of lagoons; the accumulation of clastic segments brought by rivers, the migration of dunes which concentrate in the various depositional environments (VILLWOCK & TOMAZELLI, 1995).

The same mechanisms, such as variation of water level in larger lagoons, e.g., the Patos Lagoon; the accumulation of clastic segments brought by intermittent rivers; the development of edge vegetation in these lagoons; as well as the movement of dunes are verified in the lake formations researched in the State Park of Itapuã, both at the Negra Lagoon and at the Palácio Lagoon

At Patos Lagoon, TOLDO JR. *et al*. (1995) made a relation between the silly/argillaceous surface and the predominance of holocenic muddy sediments, formed mainly by clastic sediments of continental origin and secondarily by organic sediments

The level of organic material found in the area of study was 6% in the Palácio's Lagoon swamp and 13,5% in the Negra's Lagoon swamp.

The statistic treatment of the samples of sediments using grade sizing parameters shows a great concentration of silt in both lagoons and a greater percentage of argil in the Negra Lagoon (FIGURE 2).

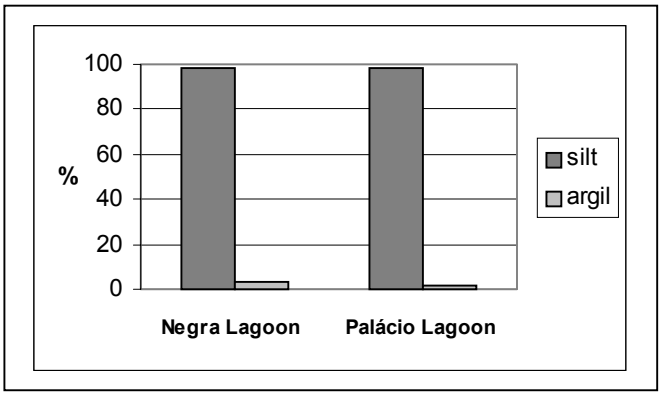

FIGURE 2 – Graphic with percentage of silt and argil in the Negra's Lagoon swamp and Palácio's Lagoon swamp.

The great difference between the water vegetation and that of drier environment is the path of development of each vegetation. While the biological phenomena are early noticed in a natural forest within a period corresponding to a human generation, in a water area , like a lake or a river, the variation between the presence and the absence of vegetal specimens can occur in minutes (IRGANG, 1999).

The water vegetation are describes each moment since, as they live in a dynamic environment, they change in time and space very rapidly .

In the research, a high diversity of vegetal specimens were found, being eight different vegetation, showing a high space heterogeneity. This makes the phisiography of this region differentiated. The main vegetation identified in these lagoons were:

Palácio Lagoon	**Negra Lagoon**
Community of Eryngium pandanifolium Cham & Schl.	**Community of Ludwigia spp.**
Azolla filiculoides Lam.	Hydrocotyle ranunculoides L. f.
Bacopa monnieri (L.) Penn	Myriophyllum aquaticum (Vell.) Verdcourt.
Commelina diffusa Burm. f.	Salvinia herzogii De La Sota
Cyperus giganteus Vahl.	Salvinia minima Bak.
Eichhornia azurea (Sw.) Kunth.	**Community of Pistia stratiotes L.**
Hydrocotyle verticilliata Thumb.	Alternanthera philoxeroides (Mart.) Gris.
Lemna sp	Azolla filiculoides Lam.
Ludwigia sp	Bacopa monnieri (L.) Penn
Mayaca sellowiana Kunth.	Enhydra anagallis Gardn.
Mikania sp	Hydrocotyle ranunculoides L. f.
Myriophyllum aquaticum (Vell.) Verdcourt.	Myriophyllum aquaticum (Vell.) Verdcourt.
Nynphoides indica (L.) O. Kze	Nynphoides indica (L.) O. Kze
Polygonum hidropiperoides Michx.	Salvinia herzogii De La Sota
Pontederia lanceolata Nutt.	Salvinia minima Bak.

Ricciocarpus natans (L.) Corda	Senecio bonariensis H. & A.
Sesbanea punicea (Cav) Benth.	Wolffiela sp
Sphagnum spp	**Community of Salvinia herzogii De La Sota**
Utricularia inflata L.	Azolla filiculoides Lam.
Xyris jupicai L.C. Rich.	Bacopa monnieri (L.) Penn
Community of Scirpus giganteus kunth.	Eichhornia crassipes (Mart.) Sloms-Laubach.
Bacopa monnieri (L.) Penn	Hydrocotyle verticilliata Thumb.
Budleja sp	Luziola peruviana Gmeiln
Cyperus giganteus Vahl.	Nynphoides indica (L.) O. Kze
Eichhornia crassipes (Mart.) Sloms-Laubach.	Polygonum sp
Eryngium pandanifolium Cham & Schl.	Salvinia minima Bak.
Ludwigia sp	Wolffiela sp
Myriophyllum aquaticum (Vell.) Verdcourt.	**Community of Scirpus californicus (C. A. Mey) Steud**.
Pistia stratiotes L.	Bacopa monnieri (L.) Penn
Polygonum sp	Eichhornia crassipes (Mart.) Sloms-Laubach.
Sapium glandulatum (Vell.) Pax.	Eryngium pandanifolium Cham & Schl.
Sphagum spp	Hydrocotyle ranunculoides L. f.
Spirodela intermedia W. koch.	Luziola peruviana Gmeiln
Thelipteris interrupta (Wild.) Iwatsuki	Myriophyllum aquaticum (Vell.) Verdcourt.
	Nynphoides indica (L.) O. Kze
Community of Spirodela intermedia W. koch.	Polygonum sp
Azolla filiculoides Lam.	Ricciocarpus natans (L.) Corda
Cyperus giganteus Vahl.	Salvinia herzogii De La Sota
Eichhornia crassipes (Mart.) Sloms-Laubach.	Sesbania punicea (Cav) Benth.
Eryngium pandanifolium Cham & Schl.	Utricularia foliosa L.

Hydrocotyle ranunculoides L. f.	**Community of Zizaniopsis bonariensis (Bal. & Poit) Speg**.
Lemna sp	Eichhornia crassipes (Mart.) Sloms-Laubach.
Ludwigia sp	Enhydra anagallis Gardn.
Mecardonia montevidensis (Spr.) Penn	Luziola peruviana Gmeiln
Myriophyllum aquaticum (Vell.) Verdcourt.	Mikania sp
Nynphoides indica (L.) O. Kze	Myriophyllum aquaticum (Vell.) Verdcourt.
Polygonum sp	Nynphoides indica (L.) O. Kze
Ricciocarpus natans (L.) Corda	Pistia stratiotes L.
Wolffiela sp	Salvinia herzogii De La Sota
Wolfia sp	Salvinia minima Bak.
	Utricularia foliosa L.

TABLE 1 – Community vegetation's found in the Negra Lagoon and Palácio Lagoon.

CONCLUSION

In the swamps of Negra Lagoon and Palácio Lagoon, the places where sediment samples were collected are characteristic of protected environments with low hydrodynamics. These lagoons have a high level of organic materials and the presence of muddy sediments in the edges due to a low hydrodynamic power in these areas, associated with the dynamics of the vegetation.

Community vegetation have a preference for a protected environments with predominance of fine sediments The aquatic vegetation are primarily responsible for the high level of organic materials found in the sediments of these swamps. The predominance of winds in the area of the study cause the groups of floating aquatic vegetation to tend to be located in the northwest edge of lagoons, causing the free floating vegetation to decompose close to the groups of rooted vegetation.

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