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FEEDING OF THE NEOTROPICAL RIVER OTTER (*Lontra longicaudis*) IN THE COASTAL REGION OF THE RIO GRANDE DO SUL STATE, SOUTHERN BRAZIL

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Abstract: In the coastal region of the Rio Grande do Sul State, in southern Brazil, three areas were monitored to study the feeding habits of the neotropical river otter (*Lontra longicaudis*) using spraint analysis. The National Park of the Peixe Lagoon was monitored seasonally between August 1995 and July 1996, in the Senandes Creek five samplings were done between June and December 1995 and in the Estiva Creek monthly samplings were done between May 1995 and July 1996. In each of these areas spraints were collected and stored. In the laboratory they were washed, separated and identified. The only area where it was possible to do a seasonal analysis of the feeding habits was the Estiva Creek. In all areas fish was the item found in the great number of spraints and crustaceans also had a considerable importance in areas with salt-water influence. The other items found were present in few samples, being them mollusks, insect, reptiles, birds and mammals. The differences observed in the feeding habits of the species between seasons and areas probably reflects the availability of different preys, agreeing the species opportunism.
keywords: Neotropical River otter, *Lontra longicaudis*, diet

INTRODUCTION

Studies on the feeding habits of different otter species have shown that they are mainly opportunists and feed on prey that are more abundant and/or species less active (ERLINGE, 1968; ADRIAN and DELIBES, 1987; OLIMPIO, 1992). Although there are large numbers of studies on the diets of *Lutra lutra* and *Lutra canadensis*, almost nothing is known about *Lontra longicaudis*. This despite its wide distribution, occurring from Mexico to the north of Argentina, studies on the feeding habits of this species in Brazil were made in the states of Sao Paulo and Espirito Santo, both in the central region of the country (PARDINI, 1998; HELDER-JOSÉ and DE ANDRADE, 1997).

The present work aimed at the determination of the diet of the neotropical river otter, *Lontra longicaudis*, in the coastal region of the Rio Grande do Sul state, in the south of Brazil.

MATERIAL AND METHODS

The three study areas are in the coastal region of the Rio Grande do Sul state (Figure 1). This is Brazil's southernmost state, and exhibits a sub-tropical climate, markedly cold and rainy in winter, and hot and drier in summer. The coastal plain originated from successive progressions and retractions of the sea-level, which cut off large areas of the Atlantic Ocean, resulting in the largest lagoon complex in South America, being made up of the large lagoons of Patos, Mirim and Mangueira. There are also many wetland areas and a complex of smaller lagoons.

National Park of the Peixe Lagoon

The National Park of the Peixe Lagoon, approximately 34.000 hectares, contains lagoons, wetlands and creeks, as well as an area of marine habitat. Within the Park there are some fresh water lakes and a Lagoon Complex (called Peixe Lagoon), which is connected to the sea by a barra, which is opened

annually by local fishermen. The North and South Areas of the Park are differentiated by basic characteristics. The North Area contains fresh-water bodies with depths that can exceed three metres, and is largely made up of shores with five to ten metre high banks. The bankside tends to be covered with arboreal vegetation. The water bodies of the South Area (Peixe Lagoon), are much shallower, approximately 0.5 metres deep and having low banks (0.5 m) or beaches and low vegetation. The area is more saline, the salinity can vary throughout the year due to its connection with the ocean.

The Pai João and the "Véia" Ana Lakes were monitored on the North Area. The "Véia" Terra and Ponta Sul lagoons, the Ponta Sul Channel and the channel connecting the "Véia" Terra Lagoon with the Ruivo Lagoon were monitored in the South Area (National Park of the Peixe Lagoon). Fieldwork was done seasonally, between August 1995 and July 1996, totalling 4 samples.

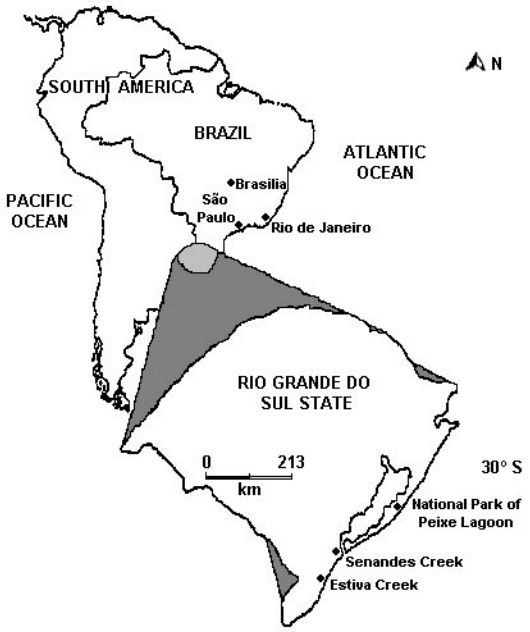

Figure 1: Study Area

Senandes Creek

The Senandes Creek, part of the Bolaxa Lake-Creek complex, is in the Rio Grande county. It is fed by water from the Senandes, Bolaxa and Vieira creeks, and empties into the Saco da Mangueira, an estuarine bay, which is connected to the Patos Lagoon. During winter the Bolaxa Lagoon receives salt water, conferring to it special characteristics on the species which are present. During summer the water is completely fresh and, since this is the dry season, the water levels fall.

The Senandes Creek is approximately two kilometres long, 1 to 4 metres wide and 0.5 to 2 metres deep. It is slow flowing with a great number of bends. The creek margin is banks approximately 0.5 metres high, with graminaceous vegetation or ciliar woods. Five samples were collected in this area between June and December of 1995.

Estiva Creek

The Creek is a fresh water body, one to five metres wide, and approximately one and a half kilometres long, originating and terminating in wetlands. It is formed by many bends and has low water flow, except during times of high rain fall. The margins are banks approximately 0.5 metres high, covered by grass or ciliar woods. Depth varies from one to four metres, with large amounts of floating vegetation. In this area the work was done between May 1995 and June 1996, with monthly samplings.

METHODS

Spraints from neotropical river otters, were collected, packaged in plastic bags and individually labelled. In the laboratory they were washed with abundant water over a small mesh (1 mm) sieve. The parts retained were separated at the level higher taxa and identified by specialists.
The data were presented by frequency of occurrence, which consists in the percentage of the total number of spraints analyzed in which a specific food item was present. All statistical analysis were performed using STATISTIKA 5.1. for WINDOWS.

RESULTS

Only in the Estiva Creek was it possible to study the seasonality of the feeding habits, since in the Senandes Creek no samplings were done in one year and in the National Park of the Peixe Lagoon the number of samples found was too small, to allow any seasonal analysis.

In the North Area of the National Park of the Peixe Lagoon 33 spraints were collected and analyzed, and in the South Area nine. In the North Area, fish had the highest frequency of occurrence, being present in 97% of the analysed spraints, birds and reptiles were each present in 12% of the spraints, mammals in 9%, while insects, crustaceans and molluscs were each present in 3%. In the South Area fish were again the item with the highest frequency of occurrence(66% of the samples), followed by crustaceans (33%) and mammals and birds (11% each) (Figure 2).

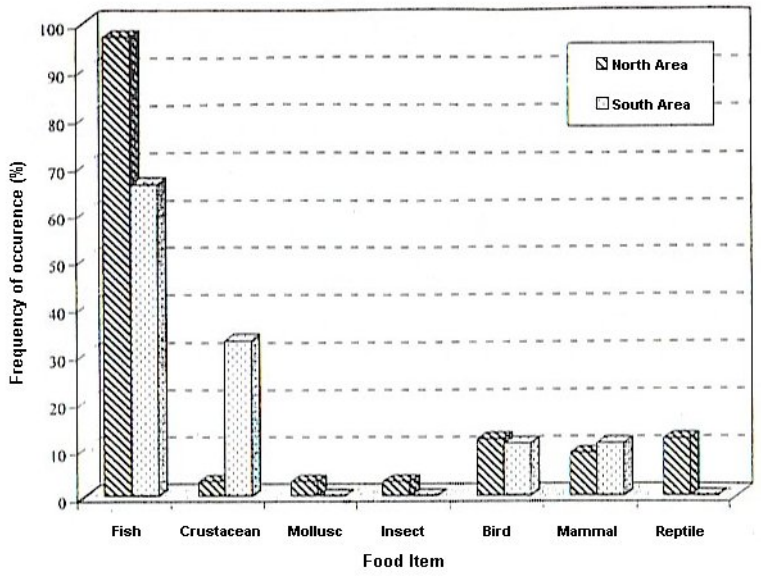

Figure 2. Feeding habits of the otter in the Lagoa do Peixe National Park

It can also be seen in this figure that there was a highly significant difference between the frequency of occurrence of fishes in spraints of the North and South Areas (P=0.0040) and frequency of occurrence of crustaceans (P=0.0043). Did not occur highly significant difference between the frequency of occurrence of the other food items (P_{birds}= 0.4673; $P_{mammals}$= 0.4283; $P_{molluscs}$ and P_{insect} = 0.3009 and $P_{reptile}$ = 0.1407).

Only spraints from the North Area contained insects, the "water cockroaches" (Family Belostomatidae). Crustaceans, Family Trichodactilidae, fresh water crustaceans were found in only one sample collected in the North Area. In the South Area remains of *Parastacus* sp., a crustacean that dwells in galleries close to the water table, as well as remains of the Grapsidae and Xantidae families, which are estuarine, and a hermit-crab (either Paguridae or Diogenidae families). Molluscs, *Pomacea* sp. were found only in samples of the North Area. Reptile remains were only found in the North Area, and belonged to snakes of the Colubridae family, and in three spraints that exhibited this item this family was represented by *Helicops infrataeniatu*s and in another they couldn't be identified below the family level. Some spraints exhibited small mammal hair, which, largely could not be identified and in two spraints, hairs belonged to *Myocastor coipus*. Bird parts comprised only of small fragments and were not identified.

In the Senandes Creek 48 spraints were analyzed, with fishes present in 96% of the samples, crustaceans in 23%, birds in 17%, mammals in 8% and reptiles and molluscs in 2% (Figure 3). Crustaceans were identified as *Callinectes sapidus*, a marine species that enters estuaries during some parts of its life cycle and occurs in fresh water bodies which are connected to the sea. Mammals consisted of young capybaras (*Hydrochaeris hydrochaeris*), while there was only one sample with a reptile from Family Colubridae. The single mollusc remain was an operculum of a specimen from the *Pomacea* group. Birds were not identified also due to the small quantity of material present.

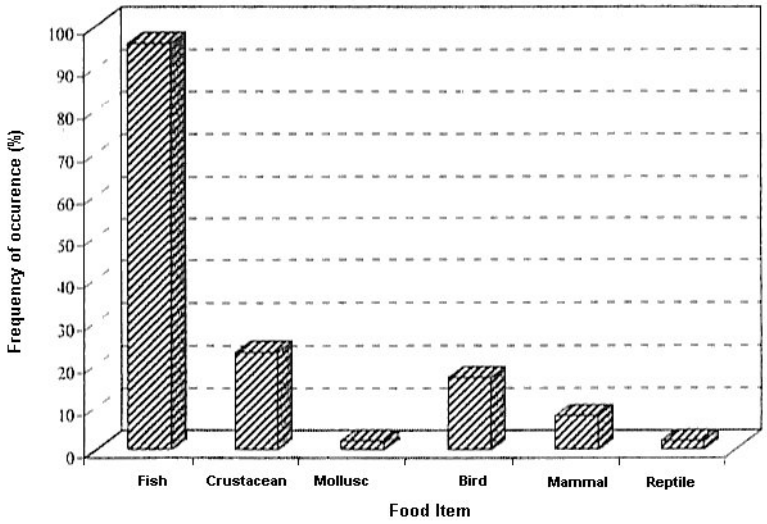

Figure 3. Feeding habits of the otter in the Senandes Creek

In the Vargas Creek, 64 spraints were analysed, nine in spring (September - November), 14 in summer (December - February), 34 in autumn (March - May) and 7 in winter (June - August). From the total, fish were present in 92% of the samples, molluscs in 23%, crustaceans in 20%, mammals in 8%, insects in 7% and birds in 2%. Fish were present in more than 90% of the samples in all seasons, mammals only during summer and autumn months, molluscs were also present in all seasons but with a higher percentage during autumn. Crustaceans were present in lower percentages in the summer samples, insects did not occur in winter, while birds were absent in summer and winter (Figure 4). The insect remains were "water cockroaches", mammals were *Myocastor coipus* and young of *Hydrochaeris hydrochaeris*, and other unidentified small mammals. The remains of molluscs belonged to specimens from the *Pomacea* group (Gastropoda), the crustaceans were *Parastacus* sp. Birds could not be identified.

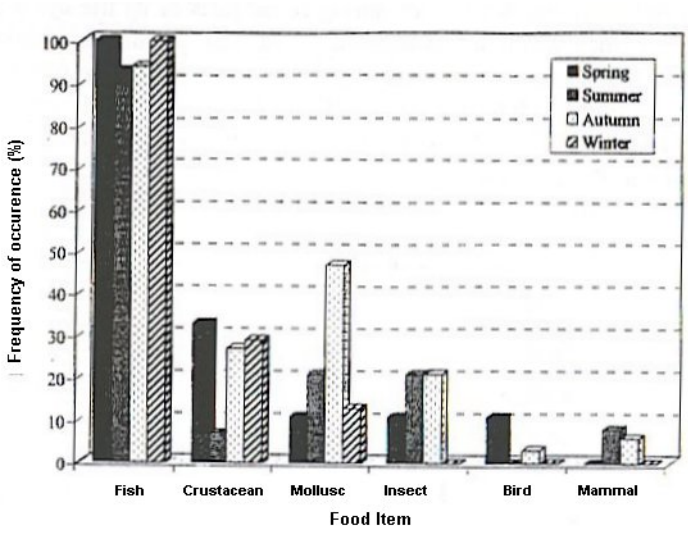

Figure 4. Feeding habits of the otter in the Estiva Creek

DISCUSSION

Fish are an important item in the diet of *L. longicaudis.* PARDINI (1998) found fishes in 93% of the spraints from *L. longicaudis* collected in the Betari River in the São Paulo state while HELDER-JOSÉ and DE ANDRADE (1997) found this item in 97.2% of the samples in a Espirito Santo State reservoir. To other otter species fish were also found to be of great importance in their diets (CHANIN, 1985; MASON and MACDONALD, 1986). This work has shown that in all areas fish are of great importance to otters in the Rio Grande do Sul state. It was not possible to identify the fish species, since the number of species present in the region is fairly large and there is no identification key.

It has been already shown in some studies that crustaceans can be of great importance in the diet of some otter species. ADRIAN and DELIBES (1987) studied the feeding habits of *Lutra lutra* in two water bodies, the Rocina Creek into which crustaceans (*Procambarus clarkii* and *P. acutus*) were introduced before the study and the Lucio Bolin, which did not have introduced crustaceans. Their study found that 80.3% of the spraints collected in the Rocina Creek had crustaceans and 96 5% had fishes. In the Lucio Bolin, however, crustaceans were not found and fish occurred in 94.3% of spraints. In this work a higher predation on crustaceans was found in some areas, which can be related to a greater abundance of these organisms in that areas. In the studied area the fresh water crustacean families are composed of species of smaller size, while the estuarine and marine species are usually larger. Therefore another hypothesis that can be considered is that the neotropical river otters are predating crustaceans only in areas where larger species exist. In the Estiva Creek crustaceans were highly important during parts of the year due to the greater availability of *Parastacus* sp.

The opportunism of the otters has been reported by many authors. OLIMPIO (1992) while studying *L longicaudis* in the Peri Lake, Brazil, concluded that as this species is opportunist, it can feed on species which are less appreciated but which occurs in a greater amount. JENKINS and HARPER (1980) in a study of *L. lutra* found that the studied otters were opportunist predators, capturing what was available. In the work of TUMLISON and KARNES (1987), the hypothesis that *Lontra canadensis* is opportunist was substantiated, since it was found a seasonal substitution between fishes and crustaceans, probably due to the availability of these items in the study area.

In this work, reptiles, mammals and insects identified were from aquatic animals or which have a strong relationship with this environment. There are some indication despite the small sample size, that *Lontra longicaudis* may be an opportunistic feeder' as has been found for other otter species, predating organisms of easier access. The variation in the percentage of species along the year in the Vargas Creek is probably related to the seasonal presence of the preyed items.

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REFERENCES

Adrian, M.I. & Delibes, M. (1987) Food habits of the otter (*Lutra lutra*) in two habitats of the Doñana National Park, SW Spain. *J. Zool, Lond*. **212:** 399-406

Chanin, P. (1985). The Natural History of Otters. Croom Helm. Australia. 179 pp.

Erlinge, S. (1968). Food studies on captive otters *Lutra lutra* L. *Oikos* **19:** 259-270

Helder-José, De Andrade, H.K. (1997). Food and feeding habitats of the neotropical river otter *Lontra longicaudis* (Carmvora, Mustelidae). *Mammalia* **61**: 193-203.

Jenkins, D. & Harper, R.J. (1980). Ecology of otters in Northern Scotland - II. Analyses of otter (*Lutra lutra*) and mink (*Mustela vison*) faeces from Deeside, N.E. Scotland in 1977-78. *J. Anim. Ecol*. **49**: 737-754.

Mason, C. & Macdonald, S.M. (1986). Otters ecology and conservation. Cambridge Univ. Press. Cambridge. 236 p.

Olimpio, J. (1992). Considerações preliminares sobre hábitos alimentares de *Lutra longicaudis* (OLFERS, 1818) (Carnivora :Mustelidae) na Lagoa do Peri, Ilha de Santa Catarina. In: III Reunión de Trabajos de Especialistas en Mamíferos Acuáticos de América del Sur. Montevideo. Anales. 36-42.

Pardini, R. (1998). Feeding ecology of the neotropical river otter *Lontra longicaudis* in an Atlantic Forest Stream, south-eastern Brazil. *J. Zool.* **245:** 385-391.

Tumlison, R. & Karnes, M. (1987). Seasonal changes in food habits of river otters in southwestern Arkansas beaver swamps. *Mammalia* **51:** 225-232.

Resúmen: Alimentación de la nutria neotropical (*Lontra longicaudis*) en la región costera del estado de Rio Grande do Sul, Sur de Brasil

Se monitorearon tres áreas en la región costera del estado de Rio Grande do Sul, sur de Brasil, para estudiar los hábitos alimentarios de la nutria neotropical (*Lontra longicaudis*) a través del análisis de heces. El Parque Nacional de Lagoa do Peixe fue monitoreado en forma estacional, entre agosto de 1995 y julio de 1996. En el arroyo Senandes fueran realizados cinco muestreos entre junio y diciembre de 1995, y en el arroyo da Estiva fueron efectuados muestreos mensuales entre mayo de 1995 y julio de 1996. En cada una de las áreas de estudio, las heces fueron recolectadas y almacenadas. En laboratorio se procedió a lavarlas, separarlas e identificarlas. La única área en la que fue posible realizar un análisis estacional del habito alimentario fue en el arroyo da Estiva. En todas las áreas, el ítem alimentario encontrado en mayor numero de heces fueron peces, en tanto que los crustáceos tuvieron importancia considerable en algunas áreas. Los demás ítems encontrados estuvieron presentes en pocas muestras, siendo estos: moluscos, insectos, reptiles, aves y mamíferos. Probablemente la diferencia encontrada en el hábito alimentario de esta especie, entre diferentes áreas y épocas del año, refleja la disponibilidad de las presas, lo que concuerda con el oportunismo que presentaria *L. longicaudis*.