

MAMMAL PREY OF THE BARN OWL (*TYTO ALBA*) IN PARQUE LURO RESERVE, LA PAMPA, ARGENTINA

SERGIO I. TIRANTI

Càtedra de Ecologia, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de La Pampa, Uruguay 151 and Museo Provincial de Historia Natural, Pellegrini 180, 6300 Santa Rosa, La Pampa, Argentina.

ABSTRACT - The diet of the barn owl was studied through the analysis of pellets obtained in various sites within the Parque Luro reserve, located in an area of xerophyte Caldén forests. The study of 1241 prey items revealed a high dominance of the cricetid rodents *Calomys* sp., *Akodon molinae* and *Eligmodontia typus*, followed by other 8 species of rodents, one species of marsupial and undetermined birds and anuran amphibians. For comparing the diets from a relatively undisturbed forested area (Parque Luro) and a deforested site, two subcollections of pellets were analyzed. Differences in FNB values and in the prevalence **and** composition of prey assemblages were observed between these areas.

Key words: Rodentia, owl pellets, Argentina.

RIASSUNTO - *Mammiferi predati dal Barbagianni (Tyto alba) nella Riserva Parque Luro, La Pampa, Argentina* - La dieta del Barbagianni (*Tyto alba*) è stata studiata attraverso l'analisi delle borre ottenute in varie località all'interno della riserva Parque Luro, situata in un'area con boschi xerofili a *Prosopis caldenia*. Lo studio di 1241 campioni ha rivelato un'elevata prevalenza di roditori cricetidi *Calomys* sp., *Akodort molinae* and *Eligmodontia typus*, seguiti da altre 8 specie di roditori, una specie di marsupiali e uccelli e anfibi anuri indeterminati. Per il confronto delle diete sono state analizzate due sub-raccolte di borre di rapaci provenienti da un'area boscata relativamente indisturbata e da un sito disboscato. In queste aree sono state osservate differenze nei valori della FNB e nella prevalenza e composizione delle prede.

Parole chiave: Rodentia, borre di barbagianni, Argentina.

INTRODUCTION

The cosmopolitan barn owl has a wide distributional range in Argentina. It is widely known that regurgitated pellets of owls and other birds of prey can be a source of information on composition and distribution of small mammal assemblages (Contoli, 1984).

Parque Luro is a 7607 ha enclosure located 35 km S of Santa Rosa, in a forested area dominated by the xerophyte Caldén (*Prosopis caldenia*), but also having psammophyte grasslands, halophytic shrublands and mosaics of burned and unburned forests, making up an heterogeneous habitat. Despite as being the only existing Caldén forest reserve, no published inventory of its fauna exists, although it is mentioned as a locality

in the distribution for some animal species (Aravena, 1971) and also a general description and history has been given by Aravena (1972).

Presently, the Parque Luro is used mainly for harboring a breeding population of red deer (*Cervus elaphus*) (Schuerholz, 1983).

Herein, an analysis of prey remains from barn owl regurgitated pellets is presented.

METHODS

Pellets were collected from 7 different roosting and nesting sites that were man-made structures in most of the cases, such as warehouses, abandoned buildings, unused windmill tanks and digouts, and plantations in the proximity of buildings, from August 1986 to August 1992. Because collecting was done irregularly and the number of pellets obtained was very variable, no attempt was made to study seasonally or temporally. All samples were pooled to conform a total of 472 pellets which provided 1035 prey remains, also, fragmented pellets and pellet debris yielded 206 individual prey remains, giving a total prey number of 1241. The mean number of prey per pellet was 2.2. The maximum number of prey found in a single pellet was of 10 individuals, containing 9 *Calomys* sp. and 1 *Oligoryzomys flavescens*.

As in an earlier contribution (Tiranti, 1992) identifiable remains, mainly skulls and skull fragments of mammals and birds, but also amphibian bones (Di Palma and Massa, 1981), were recovered from the pellets and identified to the lowest taxonomical level possible by comparison with museum specimens. A few specimens (N= 15) of small rodents (isolated maxillae without or with very young or very worn dentition), could not be determined and were excluded from the analysis.

Food niche breadth (FNB) values were calculated as in Marti (1988). Biomass was computed using the data presented in an earlier contribution (Tiranti, 1992).

For analyzing the differences between prey assemblages from a relatively undisturbed Caldén forest (Parque Luro) and deforested agricultural land and pastures, a subcollection of pellets was selected from one site in Parque Luro and another collection of pellets was obtained from a caliche quarry (Cantera Santa **Rosa**) 15 km N from the reserve. This area is characterized by natural pastures and plots for agriculture, existing also forested patches (road rights of way) nearby. Both subcollections were of approximately the same date (September 1991) and contained a similar number of prey items.

Only *Calomys musculinus* was trapped in Parque Luro (personal observation) but the presence of *Calomys laucha*, very difficult to distinguish from remains in pellets, cannot be ruled out.

Taxonomically problematic species, such as *Ctenomys mendocinus* and *Akodon molinae* were collected and karyotyped for confirmation of specific status.

RESULTS AND DISCUSSION

As widely known, the barn owl is a rodent specialist predator. A recent review for La Pampa province (Tiranti, 1992) showed differences in the prevalence of a particular prey species in barn owl diets, that were mostly dominated by the smaller species of cricetid rodents inhabiting the region.

In Parque Luro, as in other areas of La Pampa and central Argentina, *Calomys* sp. is prevalent, comprising 34.6% of the total prey, followed by *Akodon molinae* (32.6%), *Eligmodontia typus* (10.1%) and smaller proportions of other 8 species of rodents, one species of marsupial and undetermined birds and anurans (Tab. 1).

In central Argentina the vesper mice *Calomys musculinus* (Thomas, 1913), *C. laucha* (Fischer, 1814) and Azara's grass mouse, *Akodon azarae*

Tab. 1 — Barn owl prey derived from pellets collected at Parque Luro and comparison of prey from pellets between a selected site from Parque Luro and Cantera Santa Rosa, September 1991, La Pampa, Argentina.

SPECIES	N	% N	% BIOMASS FORMAMMALS	P. LURO		C. S. ROSA	
				N	% N	N	% N
<i>Calomys</i> sp.	430	34.60	18.20	155	43.1	47	15.8
<i>Akodon molinae</i>	405	32.60	40.70	71	19.7	1	0.3
<i>Eligmodontia typus</i>	125	10.10	5.60	78	21.7	212	71.1
<i>Graomys griseoflavus</i>	88	7.10	14.20	20	5.6	6	2.0
<i>Akodon azarae</i>	88	7.10	5.20	11	3.1	5	1.7
<i>Oligoryzomys flavescens</i>	26	2.10	1.50	6	1.7	5	1.7
<i>Reithrodori auritus</i>	25	2.00	4.90	6	1.7	11	3.7
<i>Ctenomys mendocinus</i>	13	1.05	5.30	1	0.3	3	1.0
<i>Thylamys pusilla</i>	12	0.97	0.70	7	1.9		
<i>Galea musteloides</i>	7	0.60	3.70	1	0.3		
<i>Rattus</i> sp.	1	0.08	0.20				
<i>Mus domesticus</i>	1	0.08	0.03			7	2.3
Anura	12	0.10					
Aves	8	0.64		4	1.1	1	0.3
Total	1241			360		298	
FNB	3.4			3.47		1.87	
FNB for mammals	3.3						

(Fischer, 1829), are generally considered Pampean grassland rodents (Kravetz et al., 1986), Molina's grass mouse, *Akodon molinae* Contreras, 1968 favors areas where more abundant vegetative cover exists, such as shrubs and trees (Ojeda, 1989). The silky desert mouse, *Eligmodontia typus* Cuvier, 1837 has been considered an arid-adapted rodent species from the more arid Monte Desert (Mares, 1977). The rabbit rat *Reithrodon auritus* (Fischer, 1814) is widely distributed generally preferring grassy areas. The white bellied rat, *Graomys griseoflavus* (Waterhouse, 1837) is often associated with forests (can be arboreal) or shrublands, but also inhabits rocky areas. The fossorial tuco tuco, *Ctenomys mendocinus* Philippi, 1869 is also widely distributed living in clearings of forested areas and psammophile grasslands. A species generally associated with more mesic conditions is the rice rat *Oligoryzomys flavescens* (Waterhouse, 1837), which in some areas of La Pampa, inhabits the semi hallophytic shrublands of *Cyclolepis genistoides* and *Allenrolfea* spp. in the borders of salt flats and basins. The mouse opossum *Thylamys pusilla*, is widespread, although not abundant, and lives in forests and shrublands and can be arboreal. The yellow toothed cavy, *Galea musteloides* Meyen, 1832 is generally associated to shrublands, forested areas and sierras. Some remains of adult specimens of this species, as revealed by several intact skulls in pellets, are probably the maximum size that the barn owl is capable of handling, having an approximate weight of 250 g.

The introduced murids *Mus domesticus* Ruty, 1772 and *Rattus* sp. are of rare occurrence in barn owl diets in La Pampa, and were obtained in pellets from highly anthropized areas within the reserve. The single rat specimen, a juvenile, represents the first record for La Pampa province as prey of the barn owl.

The global Parque Luro collection shows the prevalence of open area species (*Culomys* sp., *Eligmodontia typus*), reflecting the owl's predatory habits of using open foraging areas, consuming other species in meager proportions, and having a Food Niche Breadth value of 3.4, which is similar to the mean of values calculated for La Pampa province (Tiranti, 1992). For mammals only, the FNB value is 3.3. From the biomass point of view, *Akodon molinae* is dominant (40.7 %), followed by *Calomys* sp. (18.2 %) and *Graomys griseoflavus* (14.2 %) (Table 1).

Comparison of the subcollections of September 1991 (Cantera Santa Rosa and Parque Luro) (Table 1) shows a narrower FNB in the more altered area of the quarry (1.87), while in the Parque Luro subcollection a broader FNB (3.47) denotes a more equilibrated use of food resources. This effect of anthropization has been demonstrated elsewhere (Contoli, 1988; Marti, 1988). The deforestation deprives types of habitats for some species, such as *Akodon molinae* and *Graomys griseoflavus*, while it may

favor the naturally grassland dwellers, which find suitable habitats in pastures or crops.

The more abundant prey in the quarry were *Eligmodontia typus* and *Culomys* sp., which are open area species. On the other hand, *Akodon molinae* is almost absent. According to Ojeda (1989), *Eligmodontia typus* is an invader of altered areas (as fire in the Monte Desert), a fact that may explain its almost absolute prevalence in the sample of the quarry, although the area studied by Ojeda (1989) is not totally an ecological equivalent to the areas studied here.

Within the Parque Luro global collection, some differences among sites were observed, such as the presence of the few *Galea musteloides* remains recovered, that were found only in the proximity of the Natural Resources warehouse, used as roost and nest by a barn owl. In the same area, the cavies had their burrows and refuges and were easily observable, suggesting opportunistic predation by the owls. Other prey items taken in Parque Luro were birds, some of which could be identified: 1 *Columbina picui* (Columbidae), 3 emberizids similar to *Sicalis luteola*, 1 emberizid similar to *Phrygilus carbonarius* and a furnarid similar to *Synallaxis* or *Tripophagu*.

ACKNOWLEDGMENTS - Park wardens P. Borraz and R. Dosio, made or assisted in making the pellet collections, without their invaluable help this research would not have been possible. Wildlife Department authorities P. Steibel and G. Mereb kindly permitted the work in the reserve. L. Contoli is greatly thanked for the review and helpful comments on the first draft of the manuscript.

REFERENCES

- ARAVENA, R.O. 1971. Reptiles de La Pampa. Biblioteca Pampeana. Serie Folletos N. 14. 68 pp.
- ARAVENA, R.O. 1972. El parque provincial Los Caldenes. Acta Zool. Lilloana 29: 141-147. Tucumán, Argentina.
- CONTOLI, L. 1984. Owl pellets as an indirect sampling source for terrestrial small mammal populations. Atti 4. Simposio Dinamica Popolazioni (Parma 22-24 Ottobre 1981): 167-176.
- CONTOLI, L. 1988. Validità ambientale e diversità trofica: Indice vegetazionali e zoocenotici a confronto. Braun Blanquetia 2 249-255.
- DI PALMA, M.G. & B. MASSA. 1981. Contributo metodologico per lo studio dell'alimentazione dei rapaci. Atti I Convegno Italiano di Ornitologia, Aulla: 69-76.
- KRAVETZ, F.O., R.E. PERCICH. G.A. ZULETA, M.A. CALLELO & M.C. WEISENBACHER. 1986. Distribution of Junin virus and its reservoirs. A tool for Argentine Hemorrhagic Fever risk evaluation, in non-endemic areas. Interciencia 11(4): 185-188.
- MARES, M.A. 1977. Water economy and salt balance in a South American desert rodent, *Eligmodontia typus*. Comp. Biochem. Physiol. 56A: 325-332.
- MARTI. C.D. 1988. A long term study of food-niche dynamics in the Common Barn-Owl: comparisons within and between populations. Can. J. Zool. 66: 1803-1812.
- OJEDA, R.A. 1989. Small-mammal responses to fire in the Monte Desert, Argentina. J. Mamm. 70: 416-420.

SCHUERHOLZ, G. 1983. Informe de consultoria sobre vida silvestre en la provincia de La Pampa. Agosto-Septiembre 1983. Proyecto de cooperacibn tècnica para el desarrollo regional en cinco provincias argentinas, Repùblica Argentina-Organizaciòn de Estados Americanos. Unpublished report. 147 pp.

TIRANTI, S. I. 1992. Barn Owl prey in southern La Pampa, Argentina. J. Raptor Res. 26(2): 89-92.

Ricevuto il 25 gennaio 1993; accettato il 10 settembre 1993 / *Submitted 25 January 1993; accepted 10 September 1993.*