SHORT COMMUNICATIONS

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BARN OWL PREY IN SOUTHERN LA PAMPA, ARGENTINA

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The Barn Owl (*Tyto alba*) is widespread in Argentina, ranging from subtropical forests in Salta and Misiones to arid shrub-steppe habitat in Patagonia. In La Pampa it inhabits Caldén (*Prosopis caldenia*) forests, Monte Desert shrublands and agricultural land of the eastern part of the province where suitable roosting and nesting sites are available.

Previous analyses of Barn Owl pellets in La Pampa have been conducted (Justo and De Santis 1982, De Santis et al. 1983, 1988, Montalvo et al. 1984, Massoia and Vetrano 1988, Tiranti 1988). However, more information would be needed to evaluate the variation in prey from different sites. I present the results of a prey analysis for two pellet collections from southeastern La Pampa.

STUDY AREAS AND METHODS

On 20 November 1986, 96 intact pellets and pellet debris, which yielded 440 prey items, were obtained in a 6 m deep hand-dug well in the proximity of human dwellings, in Estancia Luan Cura Hué (38°05'S 64°33'W), 36 km north of Cuchillo Có, Lihuel Calel region. Two barn owls occupied this site.

A second collection of 110 whole pellets and pellet fragments which rendered 257 prey items, was pooled from three roosting sites near Cuchillo Có (38°20'S 64°40'W) Lihuel Calel region, between 5 and 7 October 1988. One site consisted of a Caldén tree, another was an unused water tank in a windmill, and a third a steep mesa ledge. No owls were observed at these sites but their presence was confirmed by molted feathers. In both collections the period of pellet accumulation must have been at least some months.

All the study areas are characterized by a mosaic of open Caldén forests, mixed shrublands with *Larrea divaricata* and *Condalia microphylla*, and grasslands with *Elionurus muticus* and *Stipa* spp. (Cano et al. 1980). In a broader sense they belong to the ecotone between the Espinal and Monte biomes, that include xerophitic forests and shrublands respectively (Cabrera 1976).

Skulls and skull fragments of mammals and birds, a head of a lizard and chitinous fragments of insects were recovered from the pellets examined. These remains were identified by comparing them with museum specimens collected in various localities and times in La Pampa. Because of the extreme difficulty, no attempt was made to differentiate between the two species of *Calomys* (*C. musculinus* and *C. laucha*) that inhabit La Pampa, but most individuals are likely *C. musculinus*. *Calomys laucha* has been found in only two localities in this province (Justo and Montalvo 1981, unpubl.). The species of *Ctenomys* detected in the diet probably represents *C. azarae*. Of the birds recovered, only *Molothrus* sp. could be identified (from Cuchillo Có).

Prey biomass was computed only for mammals using data from adult specimens collected in various localities and times in La Pampa, except for *Reithrodon auritus*, the weight of which was taken from Pearson (1988). Thus, mean weight and range of prey species are: *Akodon azarae* 22 g (range 14–35, $N = 21$), *Akodon molinae* 38 g (range 20–65, $N = 51$), *Calomys musculinus* 16 g (range 9–37, $N = 27$), *Ctenomys azarae* 153 g (range 105–250, $N = 18$), *Eligmodontia typus* 17 g (range 12–24, $N = 30$), *Galea musteloides* about 200 g, *Graomys griseoflavus* 61 g (range 44–90, $N = 15$), *Oligoryzomys flavescens* 22 g (range 13–35, $N = 10$), *Thylamys pusilla* 23 g (range 15–30, $N = 6$), *Eptesicus furinalis* about 12 g and *Reithrodon auritus* about 74 g.

Food Niche Breadth values were calculated as in Marti (1988), categorizing mammals by genera; birds, lizards and insects (including other invertebrates) by class. For comparison, some sites of La Pampa were selected from the literature and niche breadth was calculated as indicated.

RESULTS AND DISCUSSION

As has been previously observed (Justo and De Santis 1982, De Santis et al. 1983, 1988, Massoia and Vetrano 1988, Tiranti 1988), the Barn Owls studied in La Pampa preyed largely on cricetid rodents. Only in one instance (Montalvo et al. 1984) were birds important. The prey species most frequently taken in this study in Estancia Luan Cura Hué included nearly equal proportions of *A. azarae*, *Calomys* sp. and *E. typus*. Together they represented 60.9% of prey items. In the Cuchillo Có collection, *Calomys* sp. was prevalent (52.1%), followed by *E. typus* (25.7%, Table 1). *Akodon azarae* and *Calomys musculinus* are known to occupy agroecosystems at different stages of succession (fallow fields and crops; Kravetz et al. 1986). *E. typus* has been considered an arid-adapted rodent of the Monte Desert (Mares 1977), that favors low cover or open areas (Ojeda 1989). This agrees with previous descriptions of

Table 1. Barn-Owl prey derived from pellets collected at Luan Cura Hué ($N = 440$) and Cuchillo Có ($N = 257$) in southern La Pampa, Argentina. The combined niche breadth for a total of 697 prey items was 4.75.

	Luan Cura Hué			Cuchillo Có		
Species	*N*	%	% Biomass for Mammals	*N*	%	% Biomass for Mammals
Rodents						
Azara's Grass Mouse (*Akodon azarae*)	99	22.5	16.1	5	1.9	1.8
Molina's Grass Mouse (*Akodon molinae*)	47	10.7	13.3	6	2.3	3.8
Vesper Mouse (*Calomys* sp.)	93	21.1	11.1	134	52.1	35.6
Tuco-tuco (*Ctenomys* sp.)	23	5.2	26.4			
Silky Desert Mouse (*Eligmodontia typus*)	76	17.3	9.6	66	25.7	18.5
Yellow-toothed Cavy (*Galea musteloides*)	1	0.2	1.5			
White-bellied Rat (*Graomys griseoflavus*)	11	2.5	5.0	26	10.1	26.5
Rice Rat (*Oligoryzomys flavescens*)	18	4.1	3.0			
Rabbit Rat (*Reithrodon auritus*)	11	2.5	6.0	8	3.1	9.8
Bats						
Brown Bat (*Eptesicus furinalis*)				1	0.4	0.2
Marsupials						
Mouse Opossum (*Thylamys pusilla*)	47	10.7	8.0	10	3.9	3.8
Passerine birds	11	2.5		1	0.4	
Reptiles						
Green lizard (*Teius oculatus*)	1	0.2				
Insects	2	0.5				

the Barn Owl as an essentially open country predator (Colvin and McLean 1986). Considering biomass, *Ctenomys* sp. becomes important in the Luan Cura Hué collection and *Calomys* sp., *E. typus* and *G. griseoflavus* in the Cuchillo Có collection.

Niche breadth was used to evaluate the use of food resources. The value may vary from unity, if only one prey category is consumed, to a maximum when all resources are used equally (Petraitis 1979, Marti 1988). In this study, most of the niche breadth values (Table 2) are quite similar to those given by Marti (1988) for Barn Owl diets throughout the world. Thus, the extent of variation observed by this author can be reflected at a local scale.

I was unable to compare local abundance of small mammals, as revealed by trapping, with pellet remains. However, at a site about 50 km east of Cuchillo Có, in an ecologically similar habitat (*Larrea divaricata* shrubland), I captured 44 small mammals during 270 trapnights in July 1986. These included 35 (80%) *A. molinae*, 5 (11%) *C musculinus*, 2 (5%) *Oligoryzomys longicaudatus*, 1 (2%) *G. musteloides* and 1 (2%) *T. pusilla*. At this site, in a small sample of Barn Owl pellets containing 42 individual prey remains, *A. molinae* made up 45% ($N = 19$), of the total prey, followed by *Calomys* sp. 36% ($N = 15$), *G. griseoflavus* 14% ($N = 6$), *O. longicaudatus* 2% ($N = 1$) and *T. pusilla* 2% ($N = 1$). Although scant, this information confirms what has been widely observed, that *Tyto alba* preys essentially on whatever small mammals are available in a given area (Marti 1988, Torres Mura and Contreras 1989), constrained by prey size, prey abundance, habitat and behavior of the owls (Colvin and McLean 1986).

Variation in prey has been observed (Table 2). In general, there is a tendency for the smaller species (*Calomys* sp., *Eligmodontia typus*, *Akodon azarae*) to be more frequently consumed by Barn Owls in La Pampa, than the larger species (Table 2). Although small, the Rice Rat *Oligoryzomys flavescens* appeared in low percentages in the Barn Owls studied (Table 1). This is probably because this rodent is restricted to more mesic conditions, generally in proximity of water. The Rice Rat inhabits areas that the owls may not exploit, such as the dense semi-halophytic shrublands of *Cyclolepis genistoides*. Nevertheless, two species of this genus, taken together, are prevalent in barn-owl diets in other parts of Argentina. For example, these rodents make up 30% of the diet in Ibicuy, Entre Rios Province (Massoia 1983), and 51% and 48% for Arroyo Yabebirí and Bonpland, in Misiones Province, respectively (Massoia et al. 1989a, 1989b). Other species of mammals that occasionally fall prey to the Barn Owl in La Pampa besides those found in this study, are the Small Cavy *Microcavia australis*, the Free-tailed Bat *Tadarida brasiliensis* (Montalvo et al. 1984), the Red Vizcacha Rat *Tym-*

Table 2. A regional comparison of small mammal prey used by Barn Owls in La Pampa, Argentina.

LOCALITY	DOMINANT PREY	PERCENT OF DOMINANT PREY	FOOD NICHE BREADTH	PREY NUMBER	SOURCE
Alta Italia	*Calomys* sp.	85	1.37	347	Massoia and Vetrano 1988
La Elenita	*Calomys* sp.	79	1.54	165	Tiranti 1988
Cuchillo Có	*Calomys* sp.	52	2.84	257	This study
Luan Toro[a]	*Calomys* sp.	50	3.01	784	[b]De Santis et al. 1988
Bajo Giuliani	*Calomys* sp.	42	3.61	272	De Santis et al. 1983
Santa Rosa[a]	*Calomys* sp.	42	3.62	273	[b]De Santis et al. 1988
Puelén[a]	*Eligmodontia typus*	38	3.66	362	[b]De Santis et al. 1988
Chacharramendi[a]	*Calomys* sp.	40	3.95	394	[b]De Santis et al. 1988
Casa de Piedra	*Eligmodontia typus*	30	4.39	440	[c]Montalvo et al. 1984
Luan Cura Hué	*Akodon azarae*	23	4.94	440	This study
Los Ranqueles	*Eligmodontia typus*	24	5.19	217	Tiranti 1988

[a] Samples from different localities were pooled.
[b] Only mammals were considered in this study; if other prey were present, niche breadth might be slightly underestimated.
[c] Birds were prevalent in this study.

panoctomys barrerae, a rare octodontid (Justo et al. 1985) and the House Mouse *Mus domesticus* (De Santis et al. 1983).

Geographic variation in diet of owls has been attributed to variations in habitat (Campbell et al. 1987) and differences in patchiness of vegetation (Marti 1988). In agricultural areas and grasslands of La Pampa, for example, prey is comprised almost entirely of *Calomys* sp. (Table 2: Alta Italia). In more heterogenous and less disturbed habitats, the variety of prey is increased (Table 1). Similar observations of variation in Barn Owl diet between agricultural land and natural areas have been made. In Idaho farmland, for example, voles (*Microtus* spp.) were predominant but the percentages decreased as the area dedicated to irrigated farmland diminished and prey species of the surrounding desert began to appear in higher percentages in the Barn Owl's diet (Marti 1988).

Another factor that may influence variation in diet is differences in vulnerability to predation, as recent experiments have demonstrated for North American species (Kotler et al. 1988, Derting and Cranford 1989).

In general, bats and lizards made up a small portion of prey. *Eptesicus furinalis* and *Teius oculatus* were, to my knowledge, recorded for the first time as prey of the Barn Owl in Argentina. The insect remains were tettigoniid grasshoppers.

RESUMEN.—Se analizó un total de 697 presas provenientes de regurgitados de la Lechuza de los Campanarios (*Tyto alba*) de dos localidades del sur de La Pampa, Argentina. Los roedores cricétidos *Calomys* sp. y *Akodon azarae* fueron las especies de presas predominantes en la dieta. Con fines comparativos se presentan datos de la variación de la amplitud del nicho trófico en varios sitios de la provincia.

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