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## OWL PREDATION ON THE SUBTERRANEAN RODENT *Ctenomys* (RODENTIA: OCTODONTIDAE) IN URUGUAY, WITH AN ASSESSMENT OF RELATIVE AGE CLASSES

CARLOS A. ALTUNA \* &amp; ENRIQUE M. GONZÁLEZ \*\*

**ABSTRACT:** Information on 69 specimens of subterranean rodents preyed by three species of owls in Uruguay is given. *Ctenomys pearsoni* are usually preyed by burrowing owls (*Athene cunicularia*) and short-eared owls (*Asio flammeus*), but not by barn owls (*Tyto alba*). Preys are classified in three age classes: adults, subadults and lactating pups, on the basis of the incisive width. Lactating pups are infrequent preys, adults are more frequent and subadults are the main group on which owls forage. These rodents should be preyed when they are searching for food above ground or mainly during the subadult dispersion.

**RESUMEN:** Se brinda información acerca de 69 especímenes de roedores subterráneos depredados por 3 especies de lechuzas en Uruguay. *Ctenomys pearsoni* es usualmente depredado por la lechucita de campo (*Athene cunicularia*) y el lechuzón de campo (*Asio flammeus*), pero no por la lechuza de campanario (*Tyto alba*). Las presas son clasificadas en tres clases de edad sobre la base del ancho del incisivo: adultos, subadultos y crías lactantes. Las crías lactantes son presas infrecuentes, los adultos son más frecuentes y los subadultos son el grupo principal sobre el cual depredan las lechuzas. Estos roedores deben ser depredados cuando están forrajeando en el medio epígeo o principalmente durante la dispersión de los subadultos.

**Keywords:** owl predation, subterranean rodents, *Ctenomys*, age classes, Uruguay.

**Palabras clave:** depredación por lechuzas, roedores subterráneos, *Ctenomys*, clases de edad, Uruguay.

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\* Sección Etología, Facultad de Ciencias, Iguá 4225, 11.400, Montevideo, Uruguay  
E-mail: caltuna@fcien.edu.uy

\*\* Museo Nacional de Historia Natural y Antropología, Casilla de Correo 399, 11.000, Montevideo - Uruguay, E-mail: emgonzalez@adinet.com.uy

## Introduction

Subterranean mammals usually have a low exposition to predators (Nevo, 1979), because they inhabit sealed gallery systems. Predation by raptors may take place when animals forage aboveground or during dispersion events (Heth, 1991). In the Neotropical rodent genus *Ctenomys*, occlusion of the burrow's mouths with earth plugs reduces the predation risk, and contributes to the maintenance of microclimatic stability into the tunnels (Altuna, 1991).

Langguth & Abella (1970) list several species as potential predators of *Ctenomys*, but empiric evidence of its impact on individuals or populations has not been discussed.

Pearson *et al.* (1968) recorded predation by the burrowing owl (*Athene cunicularia*) on *Ctenomys talarum*. It mainly occurs on the subadults during dispersal (Pearson *et al.*, 1968). Vasallo *et al.* (1994) report *Ctenomys australis* and *C. talarum* as preys of three species of Strigiformes (the burrowing owl *Athene cunicularia*, the short-eared owl *Asio flammeus* and the barn owl *Tyto alba*) in Argentina. However, *Ctenomys* is not reported as prey of these raptors in Central Chile (Bozinovic & Medel, 1988).

Information on diet of prey birds in Uruguay is restricted to few papers (Langguth, 1965, Mones *et al.*, 1973, González *et al.*, 1995, González & Saralegui, 1996). The first data on *Ctenomys* predation by owls in Uruguay are given in the present paper.

## Material and Methods

Owl pellets and pellets remains were collected from the following species and localities: *Athene cunicularia*: Parque Nacional Santa Teresa (34° 02' S, 53° 32' W), Departamento de Rocha. *Asio flammeus*: Isla Arenosa (32° 48' S, 56° 22' W), Departamento de Tacuarembó. *Tyto alba*: Minas de Corrales (31° 05' S, 55° 30' W), Departamento de Rivera (all them in Uruguay). The pellets of *Athene cunicularia* and *Asio flammeus* were obtained in open fields, exposed to climatic agents. The pellets of *Tyto alba* were taken in a tunnel of an abandoned mine. In most of the cases there were pellet remains or isolated bones. For this reason, the number of preys, and not of pellets, were computed.

Skulls and mandibles remains of *Ctenomys*, particularly rostral, premaxilar and maxilar regions, were identified by comparison with voucher specimens deposited in the Laboratorio de Evolución and Sección Etología (Facultad de Ciencias, Montevideo). All the pellet material was deposited

in the Museo Nacional de Historia Natural y Antropología (Montevideo). The age classification was based in measurements made on captivity-born collection specimens.

## Results and discussion

Remains of 69 individuals of *Ctenomys* were identified in the samples. 37 *C. pearsoni*, were preyed by *A. cunicularia*, 31 *C. torquatus* by *A. flammeus* and one *Ctenomys sp.* by *T. alba*.

Individuals were assigned to three age categories on the basis of both upper incisor width (IW): adults (IW more than 2.4 mm), subadults (less than one year) (IW between 2.3 and 1.8 mm) and lactating pups (between 0 and 90 days) (IW less than 1.7 mm).

These classification is applied to *C. pearsoni* and could demonstrate be useful for another size-class *Ctenomys* species. However, this fact must be checked.

As Table 1 shows, adult *Ctenomys* are frequent preys for *A. cunicularia* and *A. flammeus* (24.3 and 29.0 % of the sample for each species). Nevertheless, subadults are the main group on which both predators fall (64.9 and 67.7 % respectively). The only specimen preyed by *Tyto alba* falls also in this age class. Lactating tucu-tucus are infrequent preys in our samples, being 10.8% of the specimens for *A. cunicularia* and 3.2 % for *A. flammeus*.

	<i>A. cunicularia</i>	<i>A. flammeus</i>	<i>T. alba</i>	Total of individuals per age classes foraged by the three predators
Adults	9 (29.0%)	9 (24.3%)	0 (0.0%)	18 (26%)
Subadults	21 (67.7%)	24 (64.9%)	1 (100.0%)	46 (66.7%)
Lactating pups	1 (3.2%)	4 (10.8%)	0 (0.0%)	5 (7.3%)
Total of individuals in the diet of each predator	31 (44.9%)	37 (53.6%)	1 (1.5%)	69 (100%)

**Table 1.** Age classes of the tucu-tucus preyed by the three species of Strigiformes. Numbers in parenthesis in the three first lines indicate the percentage contribution of each age class to the diet of each predator. Numbers in parenthesis in the bottom line indicate the percentage of individuals consumed by each owl species from the total sample.

Since we assume that predation occurs outside burrows, then it could be related to at least two behavioral events: a) excursions to surface to collect food, which is transported into the burrows (Altuna *et al.*, 1998), and b) dispersion of subadults after the mother-dependence period (Pearson *et al.*, 1968, Altuna, pers. obs.), as determined by Heth (1991) for mole rats in Israel. Nevertheless, the presence of lactating pups in the sample may be not explained in any of these contexts. Four of the five lactating pups were preyed by the burrowing owl *A. cunicularia*. Pups might be taken from the tunnels by an active excavation of the owl. Although this fact is suggested by our results, more field research is needed in order to clarify how owls prey on lactating pups. Differences in proportions of preyed *Ctenomys* by age classes may be explained by the following facts: a) pups have a very low mobility and don't get out from the tunnels, b) subadults and adults search for grasses on the surface and c) subadults make up most of the dispersal events. This explains the probability of being preyed of each age class. The low frequency in capture of *Ctenomys* by the barn owl could be explained from the strictly nocturnal habits of this raptor.

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MUSEO NACIONAL DE HISTORIA NATURAL Y ANTROPOLOGÍA  
CASILLA DE CORREO 399  
11.000 MONTEVIDEO, URUGUAY  
FAX: (005982) 917-0213  
E-MAIL: MNHN@INTERNET.COM.UY  
HTTP://WWW.MEC.GUB.UY/NATURA/

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