VIERAEA	**Vol. 38**	159-162	Santa Cruz de Tenerife, septiembre 2010	ISSN 0210-945X

Data on the food habits of Barn Owl (*Tyto alba*) in a xeric-anthropic environment in El Hierro, Canary Islands (Aves, Tytonidae)

Siverio, F., B. Rodríguez, R. Barone, A. Rodríguez & M. Siverio (2010). Datos sobre la alimentación de la lechuza común (*Tyto alba*) en una zona xérico-antrópica de El Hierro, islas Canarias (Aves, Tytonidae). *Vieraea* 38: 159-162.

The analysis of owl pellets is not only an efficient method to assess diet composition, but also an indirect way to obtain information on prey communities in a given area. The Barn Owl (*Tyto alba*) is the world's most widespread nocturnal raptor and it has been the focus of the greatest number of feeding ecology studies so far (see reviews in Taylor, 1994 [*Barn Owls. Predator-prey, relationships and conservation*]; del Hoyo *et al*., 1999 [*Handbook of the Birds of the World*. Vol. 5]). Nevertheless, this profuse knowledge comes largely from continental populations (mainly from North America and Europe; Marti, 1992 [*in* Poole *et al*. (eds.), *The Birds of North America*]; Cramp, 1998 [*The Complete Birds of the Western Palearctic on CD-ROM*]), whereas data from islands (e.g. many oceanic ones) are still scarce or lacking.

In the Canarian archipelago, where Barn Owl inhabits practically all islands and islets (Siverio, 2007 [*in* Lorenzo (ed.), *Atlas de las aves nidificantes en el archipiélago canario (1997-2003)*]), the few available studies on diet come from several localities in Tenerife (Martín *et al.*, 1985 [*Ardeola* 32: 9-15]), one locality in El Hierro (Martín & Machado, 1985 [*Vieraea* 15: 43-46]) and another in the islet of Alegranza (North of Lanzarote) (Delgado, 1993 [*Vieraea* 22: 133-137]). Further knowledge is supplemented with some occasional diet data from those or other islands (e.g. Trujillo & Barone, 1991 [*Ardeola* 38: 343]; Siverio & Trujillo, 1992 [*Vieraea* 21: 169]). Given this scarce information, any contribution to the knowledge on this ecological aspect in the Canaries would be of interest, including implications for conservation of prey-species (Tores & Yom-Tov, 2003 [*Israel J. Zoology* 49: 233-236]) and predator. In this study, besides the description of Barn Owl's diet over time at a locality at the island of El Hierro, we also assess (a) possible fluctuations in main preys and trophic niche breadth, and (b) the results based on that seen previously here and in other insular environments.

Our study area is located in the North side of El Hierro, the westernmost island (27º45'N, 18º00'W), with the smallest surface area (269 km², 1,501 m a.s.l.) and most uninhabited (10,753 inhabitants [www2.gobiernodecanarias.org/istac/estadisticas.html]) of the Canaries. Here, there is a breeding cavity, occupied by Barn Owls since early 1980s (Martín & Machado, 1985; pers. obs.), at the base (approx. 100 m a.s.l.) of a high cliff (Risco de Tibataje) that forms part of the great depression of El Golfo. Around this site,

the relatively flat terrain (coastal plain) has been gradually altered by man (scattered houses, crops, roads, etc.), but still retains remnants of xeric scrub. On El Hierro, Barn Owl's population is scarce and our sampled breeding site is the only one that has been found to date (Siverio, 2007; pers. obs.).

Accumulated fresh pellets were collected at the bottom of the cavity and closeby perches in nonconsecutive years over a long period of time (March 1986, n = 35; June 2003, n = 40; August 2007, n = 28; April 2010, n = 36). In order to contrast results, we have taken into account the prey inventory of a larger sample (53 pellets and abundant prey remains from broken pellets) collected on August 1984 by Martín & Machado (1985) in the same place (Table I). By examining all the material (see e.g. Lovari *et al*., 1976 [*Boll. Zool*. 43: 173-191]), we calculated the minimum number of individuals (MNI) quantifying diagnostic remains from vertebrates (skulls, dentaries or post cranial bones) and invertebrates (elytra, pronotum, clypeus, etc.). To test diet diversity in each pellet sample per year, we used Levin's index, $B = 1/\sum p_i^2$ (p_i is the proportion of different taxa; values were standardized (B_{sta}) on a scale of 0 [trophic specialization]-1 [wide range]) and Shannon index, $H' = -\sum p_i \log p_i$ (Krebs, 1998 [*Ecological methodology*]).

In total, we identified 576 prey items belonging to 16 different taxa, with an average per sampled year of 7.3 (6-10), and noticed that the overall niche breadth was very low (Table I). Apart from this low diversity of prey, the constant predation rate suffered by the House Mouse (*Mus musculus*), the highest among all prey taxa (average 77.3%, including the data of Martín & Machado, 1985), justified the degree of specialization in this diet. The great importance of this introduced rodent has always been obvious in the Macaronesian archipelagoes where Barn Owl's diet has been studied (e.g., Martín *et al*., 1985; Rabaça & Mendes, 1997 [*Bol. Mus. Mun. Funchal* 49: 137-141]; Siverio *et al*., 2008 [*Vieraea* 36: 163-165]), but it also reflects the absence in these islands of other similarly sized micromammals typically preyed on the continents (Taylor, 1994). The presence of *Rattus* remains (most probably *R. rattus*) in the different pellet samples were also constant, but understandably with very low percentages (average 2.9%), most of them corresponding to young animals. Our list of captured mammals is completed with the only presence of *Oryctolagus cuniculus* (a young individual), which is very similar to that found here in 1984 (Table I) and in other Macaronesian islands where Soricidae species are absent (e.g. Siverio *et al*., 2008).

Birds were poorly represented. Although this is the general trend in the diet of Barn Owl (see Barbosa *et al*., 1989 [*Ardeola* 36: 206-210]), occasionally birds can play a major role and even be the subject of a certain degree of specialization in their capture, both in insular (e.g., Heim de Balsac, 1965 [*Alauda* 33: 309-322]; Delgado, 1993) and continental environments (e.g., Fernández Cruz & García, 1971 [*Ardeola* 15: 146]). Within reptile consumption, the Gekkonid lizard *Tarentola boettgeri* in the sample of August 2007 (33.3%) was very common compared with the scarcity of the remaining three samples (all < 6%). This is probably the consequence of increased activity levels of these reptiles during the hottest period of the year, which was when the catches were made if we consider that on August 30 we collected the fresh pellets sample (see Bunn *et al*., 1982 [*The Barn Owl*], for daily food intake). Further evidence on the consumption increment of geckos during the summer months within the Canaries comes from Alegranza, where *T. angusti-*

Prey taxa	Sampling years MNI (%)				
	1984[a]	1986	2003	2007	2010
Mammalia					
Rattus rattus[b]	27 (3.4)	3 (2.8)			
Rattus sp.[b]			3 (2.0)	4 (2.0)	6 (4.9)
Mus musculus	584 (72.8)	97 (90.6)	131 (89.1)	83 (42.0)	114 (91.9)
Oryctolagus cuniculus	1 (0.1)				1 (0.8)
Chiroptera	1 (0.1)				
Aves					
Columba livia	1 (0.1)				
Emberiza calandra	1 (0.1)				
Passeriformes			1 (0.7)		1 (0.8)
Reptilia					
Tarentola boettgeri	67 (8.3)	2 (1.9)	8 (5.4)	66 (33.3)	1 (0.8)
Gallotia caesaris	1 (0.1)	1 (0.9)		3 (1.5)	
Insecta					
Periplaneta americana				28 (14.1)	
Periplaneta sp.	18 (2.2)	2 (1.9)			
Gryllus bimaculatus	86 (10.9)				
Gryllidae		1 (0.9)	3 (2.0)		
Decticus albifrons				4 (2.0)	
Platycleis sp.				5 (2.6)	
Tettigonidae	7 (0.9)			1 (0.5)	
Plannipennia				2 (1.0)	
Arhopalus pinetorum				2 (1.0)	
Oryctes prolixus	1 (0.1)				
Hegeter amaroides					1 (0.8)
Hegeter tristis	7 (0.9)				
Coleoptera		1 (0.9)	1 (0.7)		
Total	802	107	147	198	124
Number of taxa	13	7	6	10	6
B_{sta}	0.07	0.04	0.05	0.25	0.04
H'	0.44	0.20	0.20	0.63	0.16

Table I.- Diet composition and niche breadth for the Barn Owl (*Tyto alba*) at the study site of El Hierro (Canary Islands). [a] Data taken from Martín & Machado (1985). [b] Taxa grouped generically to calculate Levin's and Shannon indexes.

mentalis, with 69.7% of the catches, exceeded even that of *M. musculus* (Delgado, 1993). On other Mid-Atlantic islands, the genus *Tarentola* goes from being a minor supplement (Tenerife, Martín *et al*., 1985; Fogo, Siverio *et al.*, 2008) to constitute the basic prey in the diet of Barn Owl (Branco and Razo islets, Cape Verde; Naurois, 1982 [*Riv. ital. Orn*. 52: 154-166]).

Blattaria and Orthoptera are the two insect orders more predated upon. However, this is mainly due to an utmost occurrence of these prey taxa in the summer sample (Table I). Within these insects, predominated the predation of the anthropophilic *Periplaneta* and Tettigonidae species, all prone to show demographic explosions during the warmer periods. Although in general the prevalence of these prey taxa was already noted by Martín & Machado (1985), it is surprising that *Gryllus bimaculatus*, the second most captured prey (10.9%) of their sample, was not registered in our subsequent samplings suggesting a possible population decline. The rest of the insects, mostly beetle species, seem to play an insignificant role in the diet. Thus, insect predation rate in El Hierro is very similar to that of other nearby insular environments, where Orthoptera always predominate over the rest of invertebrate fauna (Martín *et al*., 1985; Rabaça & Mendes, 1997; Siverio *et al*., 2008).

The slightly higher diversity of prey species found by Martín & Machado (1985) compared to our results could may be due the material examined by these authors, which clearly corresponded to a much broader period of predatory activity. We conclude that, coinciding with much of the breeding cycle, the diet of Barn Owl at the studied site has remained fairly constant over the years, showing always low values of niche breadth. Our results confirms once again that the rodent *M. musculus* is the main prey and some other prey taxa, such as the gecko *T. boettgeri*, can provide a significant additional seasonal contribution to the diet.

We would like to thank Heriberto López and Juan C. Rando for their help with the identification of some prey taxa, as well as to Julio González for his collaboration during the pellet collection in 1986. Michael Jowers and Miguel Fernández del Castillo improved the English version.

FELIPE SIVERIO[1], BENEHARO RODRÍGUEZ[2], RUBÉN BARONE[3],
AIRAM RODRÍGUEZ[4] & MANUEL SIVERIO[1]

[1]*Los Barros 21, 38410 Los Realejos, Tenerife, Canary Islands, Spain*
(felipe.siverio@telefonica.net)
[2]*La Malecita s/n, 38480 Buenavista del Norte, Tenerife, Canary Islands, Spain*
[3]*Eduardo Zamacois 13-3ºA, 38005, Santa Cruz de Tenerife, Canary Islands, Spain*
[4]*Deparment of Evolutionary Ecology, Estación Biológica de Doñana (CSIC)*
Avenida Américo Vespucio s/n, 41092 Seville, Spain

Fecha de recepción: 28 junio 2010 Fecha de aceptación: 7 julio 2010