

Diet of the Barn Owl (*Tyto alba*) from Chaddra-Akkar, Northern Lebanon

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Abstract

Pellets, regurgitated by the Barn Owl, *Tyto alba*, were collected from Chaddra-Akkar region in northern Lebanon. Pellets analyses yielded remains of 249 individuals, representing nine mammalian species and one species of a passerine bird. Small mammals constituted 96.4% of its diet (90.4% rodents and 6.0% insectivores), while birds constituted 3.6%. Günther's Vole, *Microtus guentheri*, and the House Mouse, *Mus domesticus/macedonicus*, were the most abundant prey items, representing 34.4% and 32.1% of the total number of recovered prey items respectively. The number of prey items per one pellet ranged from 1-6 individuals (Average 2.15 ± 1.23 skull/pellet, N= 55).

Keywords: Barn Owl, *Tyto alba*, Owl pellets, Small mammals, Rodentia, Lebanon.

1. Introduction

Owl pellets have been studied on a few occasions in Lebanon. Bate (1945) recoded eight species of mammals recovered from the Long-eared Owl, *Asio otus*, pellets collected from Cedars of Bsherreh. Bayle and Prior (2006) examined pellets of the Euroasian Eagle Owl, *Bubo bubo*, that included cranial remains for mammals, reptiles and birds in addition to insects from Qab Elias. Obuch and Benda (2009) reported on remains recovered from the Barn Owl, *Tyto alba*, from Sour and Saïda, southern Lebanon.

Pellet analyses of Barn Owl, *T. alba*, in the Middle East was investigated by several authors (Dor, 1947; Hoppe, 1986; Kasperek, 1988; Brinkmann *et al.*, 1990; Rekasi and Hovel, 1997; Rifai *et al.*, 1998; Pokines and Peterhans, 1998; Abu Baker *et al.*, 2005; Pokines *et al.*, 2011).

Owl pellets investigation is a quick method to report on the diversity of small mammals. Many recent studies have been published in the neighboring countries to report on the diversity of small mammals from owl pellets. Reports on the diversity of small mammals in Lebanon has been scarce during the last few decades, with few that have been published recently (Abi-Said, 2004 and 2009; Abi-Said and Kryštufek, 2012).

In this account, we report on the diet composition of the Barn Owl in the Chaddra-Akkar region, northern Lebanon.

2. Material and Methods

The material of this study consists of intact pellets and pellets' fragments regurgitated by the Barn Owl, *Tyto alba*, collected in December 2012 from the ground under a rock shelter from Chaddra-Akkar region (34° 37'.327" N, 36° 19'.231" E). The pellets were found in a typical Mediterranean forest dominated by oak trees (*Quercus* sp.). Most of the pellets had accumulated a long time ago and this was evident from the presence of moth moulting cocoons on the pellets while few were fresh.

A total of 55 intact pellets, besides many incomplete pellets, were collected. Each pellet was soaked in water for few seconds. Cranial remains (skulls and mandibles) were removed and kept separately. The identification was based on cranial elements, and the number of individuals was determined based on the highest number of cranial elements using reference specimens deposited at the Natural History Museum at the American University of Beirut.

3. Results and Discussion

The examined material yielded a total of 249 individual prey items (Table 1). By species, seven, two and one species of rodents, insectivores and passerine bird, were recovered, respectively. Small mammals were the main prey items accounting for 96.4% of the diet (rodents 90.4% and shrews 6.0%), while birds represented 3.6% of the diet. The number of prey items

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per pellet ranged from 1-6 individuals (average 2.15 ±1.23 skull/pellet, N= 55).

Table 1. Summary for prey items consumed by the Barn Owl in Chaddra-Akkar, Lebanon.

Species	No. of individuals	%
Order Rodentia		
<i>Apodemus mystacinus</i>	14	5.6
<i>Mus domesticus/macedonicus</i>	80	32.1
<i>Cricetulus migratorius</i>	6	2.4
<i>Microtus guentheri</i>	108	43.4
<i>Meriones tristrami</i>	9	3.6
<i>Dipodillus dasyurus</i>	7	2.9
<i>Spalax ehrenbergi</i>	1	0.4
Order Soricomorpha		
<i>Crocidura suaveolens</i>	13	5.2
<i>Suncus etruscus</i>	2	0.8
Aves		
Passeriformes sp.	9	3.6
Total	249	100

Order Rodentia

Seven rodent species belonging to three families were identified (Muridae: *Apodemus mystacinus*, *Dipodillus dasyurus*, *Meriones tristrami*, *Mus domesticus/macedonicus*; Cricetidae: *Cricetulus migratorius*, *Microtus guentheri*; Spalacidae: *Spalax ehrenbergi*).

Family Muridae

Apodemus mystacinus (Danford & Alston 1877)

Remains of 14 skulls of the Eastern Broad-toothed Field Mouse were recovered. Shehab (2005) recovered this species from *T. alba* pellets from, Kharabow, southern Syria, and from Qala'at al Hosn, Qala'at Salah ad Din and Qala'at Sheisar in Syria (Obuch and Benda, 2009). Cranial measurements and teeth structure are in agreement with Harrison and Bates (1991) and Kryštufek and Vohralík (2009). Bayle and Prior (2006) recovered *A. mystacinus* from *B. bubo* pellets near Qab Elias, Lebanon.

Dipodillus dasyurus (Wagner, 1842)

Seven skulls of Wagner's Dipodil were recovered from the collected pellets accounting for 2.9%. This species is not very common in Lebanon; it was recorded by Abi-Said (2009) from Jabal Moussa- Biosphere Reserve. Pellets of *T. alba* contained remains of this species in Jordan and the Negve desert (Rekasi and Hovel, 1997; Abu Baker *et al.*, 2005). Collected from pellets of Desert Eagle Owl, *Bubo bubo ascalaphus* (Rifai *et al.*, 2000), and the Little Owl, *Athene noctua*, from the eastern deserts of Jordan (Al-Melhim *et al.*, 1997).

Meriones tristrami Thomas, 1892

The nine skulls of Tristram's Jird were recovered representing 3.6%. It is found to be common in *T. alba* pellets collected from Sour, southern Lebanon and localities in western Syria (Obuch and Benda, 2009). Bate (1945) recovered *M. tristrami* remains from *A. otus* pellets collected from Cedars of Bsherreh. Bayle and Prior (2006) recovered this species from *B. bubo* pellets near Qab Elias, Lebanon. Cranial measurements and skull morphology agreed with those given by many authors (Lewis *et al.*, 1967; Atallah, 1978; Tohmé and Tohmé, 1985, Harrison and Bates, 1991; Kryštufek and Vohralík, 2009).

Mus domesticus/macedonicus

The Western House Mouse/Macedonian House Mouse ranked second in the diet of the owl, where 80 skulls of this species were recovered representing 32.1% of the total number of prey items. The largest number of skulls per pellet (6 skulls) was found for this species. Similar maximum number of *Mus* sp. in diet of Barn Owl was recorded in Syria (Shehab, 2005) and from Shaumari Wildlife Reserve, Eastern Jordan (Abu Baker *et al.*, 2005). Other authors indicated that this species is the most frequent food item of the Barn Owl in the Middle East (Nader, 1968; Hoppe, 1986; Kasperek, 1988; Brinkmann *et al.*, 1990). The *Mus* sp. is a commensal and invasive species that can establish colonies around human settlements.

Family Cricetidae

Cricetulus migratorius (Pallas, 1773)

Six skulls of the Grey Dwarf Hamster were recovered, constituting 2.4%. Seeds were observed on the surface of those pellets containing remains of the Grey Dwarf Hamster. Such a finding was indicated from owl pellets containing *C. migratorius* remains from Syria (Shehab *et al.*, 1999). Cheek pouches of the Grey Dwarf Hamster are usually filled with seeds while foraging, explaining their occurrence in pellets (Shehab, 2005). This species was recovered from *T. alba* pellets collected from ar'Rasafeh, Syria (Shehab *et al.*, 2004) and other localities in western Syria (Obuch and Benda, 2009).

Microtus guentheri (Danford & Alston, 1880)

Günther's Vole was the most common prey item found, with a total of 108 skulls recovered constituting 43.4%. This perhaps suggests that voles are very abundant in the study area, and indicates that owls play a vital role in regulating voles' populations in this area. It was recovered from *T. alba* pellets from several locations in Syria (Shehab *et al.*, 2004; Obuch and Benda, 2009) and Jordan (Rifai *et al.*, 1998). Pellets recovered from *T. alba* from Saida, southern Lebanon, are characterized by the complete absence of Günther's Vole remains (Obuch and Benda, 2009). Bate (1945) recovered Günther's Vole remains from *A. otus* pellets collected from Cedars of Bsherreh. Bayle and Prior (2006) recovered *Microtus socialis* (= *Microtus*

guentheri) from *B. bubo* pellets near Qab Elias, Lebanon.

Family Spalacidae

Spalax ehrenbergi (Nehring, 1898)

Only one skull of the Palestinian Mole Rat was found (0.4% of the diet). Similarly, Obuch and Benda (2009) found one skull in southern Lebanon in *T. alba* pellets, and Bayle and Prior (2006) recovered one single specimen of this mole from *B. bubo* pellets near Qab Elias, Lebanon. The presence of this species in very low numbers in the owl's diet does not mean that this species is rare, but is due to the fossorial lifestyle, thus avoiding predation.

Order Soricomorpha

Family Soricidae

Crocidura suaveolens (Pallas, 1811)

Thirteen skulls of Lesser White-toothed Shrew were found, representing 5.2%. Previously recorded from *T. alba* pellets were collected from Sida and Sour (Obuch and Benda, 2009). Remains of the Lesser White-toothed Shrew were recovered from *T. alba* pellets collected in Jordan and Syria (Rifai *et al.*, 1998; Abu Baker *et al.*, 2005; Shehab, 2005; Shehab and Al Charabi, 2006). Bate (1945) found remains of *Crocidura russula* in *A. otus* remains collected from Cedars of Bsherreh.

The cranial measurements, skull and teeth structure are in agreement with the specimens of *C. suaveolens* collected by Sana Atallah, kept at the mammalian collection at the Natural History Museum of the American University of Beirut.

Suncus etruscus (Savi, 1822)

Only two skulls of the Pygmy White-toothed Shrew were recovered. Similar results were obtained from pellets of *T. alba*, collected from southern Lebanon, Jordan and Syria (Abu Baker *et al.*, 2005; Shehab, 2005; Shehab and Al Charabi, 2006; Obuch and Benda, 2009).

Birds

Nine skulls of one species of a passerine bird were found, representing 3.6% of the total number of the prey items.

4. Conclusion

Owls are generally opportunistic feeders and rely on available food resources within their home range. Variable food items are consumed depending on the synchrony of owl's activity and the prey. *Tyto alba* is a nocturnal species that feeds on nocturnal small-sized animals including mammals, birds as well as some insects. In this study, most small mammals that were consumed by the Barn Owl, except *Spalax ehrenbergi*, are nocturnal. This explains the low number of consumed rat moles. Amount of small nocturnal mammals in pellets may very well provide an estimate

to their spatial abundance in a particular habitat inhabited by the Barn Owl.

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