The Wilson Journal of Ornithology 119(3):484–485, 2007

Diets of Urban Breeding Barn Owls (*Tyto alba*) in Tel Aviv, Israel

Motti Charter,[1,3] Ido Izhaki,[2] Lev Shapira,[1] and Yossi Leshem[1]

ABSTRACT.—Examination of 193 whole pellets and a number of partial pellets of a pair of Barn Owls (*Tyto alba*) in Neve Shiret, a neighborhood of Tel Aviv, Israel during the 2005 and 2006 breeding seasons revealed a total of 711 prey specimens. Six species of small mammals comprised 99.3% of the diet with a frequency of occurrence of 100% in pellets. Levant voles (*Microtus socialis guentheri*) (48.1%) and house mice (*Mus musculus*) (32.9%) were the most common prey species. The Barn Owl pair hunted in croplands adjacent to an urban residential area. *Received 19 August 2006. Accepted 25 November 2006.*

The diet of Barn Owls (*Tyto alba*) is well known throughout the world because of their cosmopolitan distribution and ease of pellet analysis (Taylor 1994), a method that accurately represents what they consume (Raczynski and Ruprecht 1974). The diet of urban dwelling Barn Owls is poorly known in Israel as most studies have concentrated in semi-desert, desert (Pokines and Peterhans 1997, Yom-Tov and Wool 1997, Tores and Yom-Tov 2003), and agricultural (Kahila 1992, Tores et al. 2005) areas. Our objective was to investigate the diet of a Barn Owl pair breeding in a residential neighborhood of Tel Aviv, Israel.

METHODS

A Barn Owl pair was found breeding from 2003 to 2006 in a building in northeast Tel Aviv in the neighborhood of Neve Sharet (32° 05′ N, 34° 46′ E). The neighborhood consisted of approximately 150 buildings most of which were three to six story tall apartment buildings. The nest was in a hollow in the wooden roof built over the window of a three-story apartment. The building was 300 m from the nearest croplands and citrus orchards. The regurgitated pellets of the Barn Owls were collected from under the nest after the nestlings fledged in the 2005 and 2006 breeding seasons. The number of eggs or chicks could not be ascertained as the nest was not accessible. However, three young were observed fledging from this nest in early July during both the 2005 and 2006 breeding seasons.

All pellets were brought into the laboratory and soaked in water for 4 days; whole pellets were dissected individually while partial pellets were grouped together. Mandibles, skulls, and femurs of mammals and wings of beetles were separated and identified. Data are presented as the minimum number of individuals (MNI) and percent frequency of occurrence, which is the proportion of the total number of pellets containing a given prey item. Body mass of rodents was calculated by averaging mean male and female weights provided in Mendelssohn and Yom-Tov (1999).

RESULTS

Eighty-two and 111 whole pellets, and a number of partial pellets were collected during the 2005 and 2006 breeding seasons, respectively. These pellets contained at least 711 prey specimens (Table 1). There was a significant difference ($\chi^2 = 46.37$, $P < 0.001$). between the 2 years in frequency of prey species. However, we pooled both years because Barn Owls are opportunistic predators. The differences observed were most likely caused by prey abundance. The assemblage was comprised mainly of small mammals (99.3%), which occurred in 100% of the pellets. The Levant vole (*Microtus socialis guentheri*) was the most common prey (48.1%) by number and occurred in 61.1% of the pellets, followed by house mice (*Mus musculus*) (32.9%) and Tristram's jirds (*Meriones tristrami tristrami*) (9.7%) in 38.3% and 17.6% of the pellets, respectively. The lesser white-toothed shrew (*Crocidura suaveolens monacha*) (7.5%) and blind mole rat (*Spalex leucodon ehrenbergi*) (0.6%) occurred in only 9.8% and 1.6% of the pellets. The remains of four black rats (*Rattus rattus rattus*) were found in broken pellets. Remnants of four birds and one insect were also found. The average number of prey per pellet during 2005 ($n = 80$) and 2006 ($n = 111$) was 1.4 and 2.0 specimens.

[1] Department of Zoology, Tel Aviv University, Tel Aviv 69978, Israel.

[2] Department of Biology, University of Haifa at Oranim, Tivon 36910, Israel.

[3] Corresponding author; e-mail: charterm@post.tau.ac.il

TABLE 1. The diet of Barn Owls breeding in Tel Aviv, Israel during the 2005 and 2006 breeding seasons (MNI = Minimum number of individuals, PF = percent frequency).

		2005		2006		All years	
	Species	MN	PF	MNI	PF	MNI	PF
Mammals							
	Crocidura suaveolens monacha	11	5.3	42	8.3	53	7.5
	Microtus socialis guentheri	114	55.1	228	45.2	342	48.1
	Meriones tristrami tristrami	24	11.6	45	8.9	69	9.7
	Rattus rattus rattus	3	1.4	1	0.2	4	0.6
	Mus musculus	54	26.1	180	35.7	234	32.9
	Spalex leucodon ehrenbergi	0	0.0	4	0.8	4	0.6
Aves							
	Passer domesticus	0	0.0	2	0.4	2	0.3
	Columbidae	0	0.0	2	0.4	2	0.3
Arthropods							
	Coleoptera	1	0.5	0	0.0	1	0.1
Total individuals		207		504		711	

DISCUSSION

All prey species are known to occur within the area (Mendelssohn and Yom-Tov 1999). The pair of Barn Owls appeared to forage more frequently in croplands adjacent to Neve Sharet since Levant vole and Tristram's jirds do not inhabit urban areas. However, house mice and black rats occur in both habitats.

Common Kestrels (*Falco tinnunculus*) in urban areas of Israel (M. Charter, unpubl. data) and Europe (Yalden 1980, Pikula et al. 1984, Kübler et al. 2005) switch their diet from small mammals to birds due to the low availability of small mammals in cities. Unlike the Common Kestrel, the Barn Owl in Israel is a small mammal specialist (Pokines and Peterhans 1997, Yom-Tov and Wool 1997, Tores and Yom-Tov 2003, Tores et al. 2005).

The Barn Owls in this study were able to breed in the city by hunting in agricultural areas as mammals living in agriculture formed the majority of their diet. Nest site and prey availability are two of the major factors affecting distribution of raptor populations (Newton 1979) and it is unclear which is most lacking.

ACKNOWLEDGMENTS

We thank Igor Gavrilov for technical assistance, Zev Labinger and Shaul Aviel for comments, and the residents of Neve Sharet, Tel Aviv, for cooperation during the study. We also thank Giore Biram, Head of the Department of Sanitation, Tel Aviv Municipality. This work was supported by the city of Tel Aviv-Yaffo, Department of Sanitation.

LITERATURE CITED

KAHILA, G. 1992. The Barn Owl (*Tyto alba*) as a biological controller of rodent populations in agriculture area. Thesis. Hebrew University of Jerusalem, Jerusalem, Israel.

KÜBLER, S., S. KUPKO, AND U. ZELLER. 2005. The kestrel (*Falco tinnunculus L.*) in Berlin: investigation of breeding biology and feeding ecology. Journal of Ornithology 146:271–278.

MEDELSSOHN, H. AND Y. YOM-TOV. 1999. Mammalia in Israel. Israel Academy of Sciences and Humanities, Jerusalem.

NEWTON, I. 1979. Population ecology of raptors. Buteo Books, Vermillion, South Dakota, USA.

PIKULA, J., M. BEKLOVÁ, AND V. KUBIK. 1984. The nidobiology of *Falco tinnunculus*. cta Scientiarum Naturalium Academiae Scientiarum Bohemoslovacae 18:1–55.

POKINES, J. T. AND J. K. PETERHANS. 1997. Barn Owls (*Tyto alba*) taphonomy in the Negev Desert, Israel. Israel Journal of Zoology 43:19–27.

RACZYNSKI, J. AND A. L. RUPRECHT. 1974. The effect of digestion on the osteological composition of owl pellets. Acta Ornithologica 14:25–37.

TAYLOR, I. 1994 Barn Owls: predator- prey relationships and conservation. University Press, Cambridge, United Kingdom.

TORES, M. AND Y. YOM-TOV. 2003. The diet of the Barn Owl (*Tyto alba*) in the Negev Desert. Israel Journal of Zoology 49:233–236.

TORES, M., Y. MOTRO, U. MOTRI, AND Y. YOM-TOV. 2005. The Barn Owl- a selective opportunist predator. Israel Journal of Zoology 51:349–360.

YOM-TOV, Y. AND D. WOOL. 1997. Do the contents of Barn Owl pellets accurately represent the proportion of prey species in the field? Condor 99:972–976.

YALDEN, D. W. 1980. Notes on the diet of urban kestrels. Bird Study 27:235–238.