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Authors: Khaleghizadeh, Abolghasem, Arbabi, Tayebeh, Noori, Gholamreza, Javidkar, Mohammad, and Shahriari, Alireza

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Diet of wintering Long-eared Owl *Asio otus* in Zabol, southeastern Iran

Abolghasem Khaleghizadeh[1,*], Tayebeh Arbabi[2], Gholamreza Noori[3], Mohammad Javidkar[2] & Alireza Shahriari[2]

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We examined 250 pellets of Long-eared Owls *Asio otus* in 2006 and 2007 from winter roost sites in southeastern Iran. In contrast to the diet of wintering owls (e.g. mainly small mammals) reported elsewhere in the world, the diet of wintering Long-eared Owls at Zabol was predominantly larger rodents (c. 150 g). Specifically, big-size rodents, including the Indian Gerbil *Tatera indica*, and a Bandikoot Rat *Nesokia indica* made up 72.9% of the total biomass in the diet of the owls at Zabol. In addition to small mammal and bird species found in Long-eared Owl pellets from other regions, we found *Meriones* spp. and *Gerbillus* spp. (both are types of Gerbils) that, thus far, had not been reported in the diet of this owl.

Key words: Long-eared Owl, *Asio otus*, Iran, pellet, diet, rodentia, *Tatera indica*

[1]Ornithology Laboratory, Agricultural Zoology Res. Dep., Iranian Research Institute of Plant Protection, Tehran, Iran; [2]Department of Environment, University of Zabol, Zabol, Iran; [3]Faculty of Geography, University of Seistan & Baluchestan, Zahedan, Iran;
*corresponding author (akhaleghizadeh@gmail.com)

INTRODUCTION

There is extensive literature on the diet of Long-eared Owls from the Western Palearctic (Birrer 2009), but no data on this species from Iran. Thus far in Iran, diet analysis on owls has been limited to the Little Owl *Athene noctua* (Obuch & Kristin 2004) and Barn Owl *Tyto alba* (Khaleghizadeh & Rokni 2008). In Iran, the Long-eared Owl *Asio otus* is resident in the regions of the Alburz and Zagross Mountains and is a winter migrant in other parts of the country (Mansoori 2001, D.A. Scott pers. comm.). It is a winter migrant to Zabol, southeastern Iran (Noori *et al.* 2007). We examined pellets of the Long-eared Owl, collected from the outskirt of the town of Zabol, southeastern Iran, to offer the first report on the diet of this owl for the region.

METHODS

Study area

Long-eared Owl pellets were collected at the Emam Ali (Jazinak) Forest Park (51 ha; 30°53'N, 61°33'E), c. 15 km southeast of Zabol, southeastern Iran. This area is characterized by a flat and dry region with a seasonal river. Twenty-three plant species belonging to 12 families such as Poaceae, Asteraceae, Chenopodiaceae were identified in the patchy cover of the Forest Park. *Atriplex lentiformis* was the most frequently encountered plant, while *Populus euphratica* had the lowest frequency. This vegetation is typical of the surrounding Sistan Plain. The Zabol area (elevation 489 m a.s.l.) is found within the Sistan Plain in Sistan and Baluchestan Province, and borders Afghanistan and Pakistan. The

Sistan area is a dry region of about 15 200 km^2 with average annual temperature of 22.7°C; the warmest month is July and the coldest January. The annual precipitation is 59.6 mm with the maximum precipitation observed in March (14.6 mm). Under such conditions, life depends on the inland delta of the Helmand River originating from the mountains of the southern Hindu Kush (Afghanistan) and the associated wetland, Hamoon. The water cover in the Hamoon is extensive but shallow (less than 3 m at the highest water levels). Strong winds (>9 m/s) in this very dry region makes evaporation more than 3 m annually. Thus, this water source is very sensitive to climatic fluctuations and modifications of water inflow by humans. Agricultural lands encompass 25 861 ha, with wheat the dominant crop (about 50% of the area); barley, alfalfa, watermelon, melon and grapes are also grown. Other green areas consist of rangelands with about 474 595 ha, natural forests with about 11 000 ha and afforested areas with 1633 ha. Zabol's population is estimated about 130 642 people (Noori *et al.* 2007b).

Data collection

Long-eared Owl pellets were collected at a winter roost site in Tamarix *Tamarix stricta* in the Emam Ali Forest Park. Owls were seen on several occasions and about 40 owls were counted at this roost on 28 December 2006 (Noori *et al.* 2007a). Pellets were collected under owl roosts located in *Tamarix* vegetation. About 250 pellets were collected on 26 January 2006, 12 February and 18 March 2007. Intact pellets were air dried and weighed, and their length and diameter recorded. Each pellet was soaked in 95% alcohol and teased apart using a pair of forceps and a needle. Bone remains and skulls of Rodentia in each pellet were placed in separate containers. The mammal remains were identified following Etemad (1978). Frequency (numbers of each prey) and biomass of the prey were calculated based on Ziaie (2008).

RESULTS AND DISCUSSION

The colour of pellets was dark grey to black, average dry weight was 2.5 g. On average, pellets were 37.5 mm in length and 21.0 mm in diameter. From 250 pellets, 258 prey items were found (average 1.03 prey items per pellet). Rodentia were present in 99% of the pellets. Of the 258 prey identified, the composition was as follows (Table 1): rodents (not identified to species) 47.7%, *Gerbillus* spp. 26.7%, and Indian Gerbil *Tatera indica* 17.8%. Other identified mammals included the Bandikoot Rat *Nesokia indica*, jerbil/jird *Meriones* spp., mouse *Mus* spp. and shrews Soricidae, each with < 1% of the total number of prey taken. Fifteen (5.8% by frequency) of the prey found in the pellets were birds. Importantly, big-size rodents (c. 150 g) including *Tatera indica* and *Nesokia indica* made up 72.9% of the total biomass in the diet of the owls. The respective percent biomass for all prey is shown in Table 1.

Overall, the prey taken by Long-eared Owls wintering in our study area was consistent with that taken by wintering owls in many other locations, i.e. majority of prey were mammals, with a few birds also taken. However, the majority of prey here were big-size rodents, specifically *Tatera indica*. Neither *Meriones* spp. nor *Gerbillus* spp. (types of jirds/gerbils) had previously been reported in the diet of this owl (Cramp

Table 1. Diet of the Long-eared Owl at Zabol, Sistan and Baluchestan Province, Iran. In total, 258 prey items were identified.

Prey species		Frequency	Frequency (%)	Average weight (g)	Biomass (%)
Tatera indica	Indian Gerbil	45	17.4	163.0	33.1
Nesokia indica	Bandikoot Rat	1	0.4	155.0	0.7
Meriones spp.	jird	1	0.4	150.0	0.7
Gerbillus spp.	gerbil	69	26.7	25.0	7.8
Mus spp.	mouse	2	0.8	21.0	0.2
Rodentia	small-size rodents	20	7.8	30.0	2.7
	medium-size rodents	46	17.8	70.0	14.5
	big-size rodents	57	22.1	150.0	38.5
Soricidae	shrew	2	0.8	12.5	0.1
Passer domesticus	House Sparrow	8	7.8	22.0	0.8
Passeriformes	birds	7	17.8	30.0	1.0

1985). While there were insufficient remains in the pellets to make clear identifications, the high frequency of big-size rodents in the present study was presumably due to the higher population of *T. indica* compared to other rodents in the Zabol area (M. Javidkar, unpubl. data). Most of the unidentified big-size rodents were probably *T. indica*, and the unidentified small-sized *Gerbillus* spp. were likely dominated by *Gerbillus nanus*.

In a synthesis on the Long-eared Owl, Cramp (1985) reported an average of 2.3 prey items per pellet (range 0–8; n = 11 390 pellets). Similarly, in Lithuania, Balčiauskienà *et al.* (2006) found 1.75 prey items per pellet. In Diyarbakir, Turkey, Long-eared Owl pellets collected from July 2000 to June 2001 contained generally 1–2 prey items per pellet (Seçkin & Coşkun 2005). In the present study, we found an average of 1.0 prey item in each pellet. Compared to other regions, the number of prey per pellet in the present study was less – simply due to the larger size of prey taken in the Zabol region.

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SAMENVATTING

In 2006–07 werden 250 braakballen van Ransuilen *Asio otus* onderzocht die afkomstig waren van verschillende winterroestplaatsen in Zabol, ZO-Iran. De uilen bleken voornamelijk knaagdieren van zo'n 150 gram te eten. Dit is in tegenstelling tot het gangbare wintervoedsel elders, dat voornamelijk kleinere zoogdieren omvat. De Indische Naaktzoolrenmuis *Tatera indica* en de Kortstaartmolrat *Nesokia indica* maakten 72,9% van de totale biomassa van het voedsel in Zabol uit. Er werden naast eerder in het voedsel van Ransuilen aangetroffen soorten ook renmuizen van de geslachten *Meriones* en *Gerbillus* aangetroffen, knaagdieren die nog niet eerder in het voedsel van Ransuilen werden gevonden.

ARDEA

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