

# Breeding and food habits of a pair of urban Desert Eagle Owls *Bubo ascalaphus* in Hurghada, Red Sea coast, Egypt

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The breeding ecology and diet of an urban pair of Desert Eagle Owls *Bubo ascalaphus* was studied in Hurghada 2007/8, based on nest visits and prey remains. The primary breeding period of the Desert Eagle Owl is early spring, although the adult birds were present at the nesting place in December. Eggs were laid in January; however, a second clutch was apparently laid in May 2008. The diet comprised mostly mammals (78%) and birds (11.3%) with a small proportion of arthropods (9.2%) and reptiles (2.1%). The diet showed low diversity and consisted primarily of the Brown Rat *Rattus norvegicus*, House Mouse *Mus musculus* and Common Quail *Coturnix coturnix*, a temporally abundant migrant bird species. The mammalian component of the diet was the most important in terms of biomass (91.7%), with the Brown Rat dominating both by number (66.1%) and by biomass (89.1%). The results suggest that Desert Eagle Owls living in the outskirts of Hurghada are opportunistic feeders, relying on urban rodents.

## INTRODUCTION

The Desert Eagle Owl *Bubo ascalaphus* is a regular resident in most of the desert regions of the Sahara and the Middle East (Cramp 1985). Although widely distributed and occurring around a number of desert oases, its habitat selection, breeding ecology and diet are poorly known compared to its European counterpart, the Eurasian Eagle Owl *Bubo bubo* (Jánossy & Schmidt 1970). Only anecdotal observations exist regarding the nesting period of the Desert Eagle Owl (Goodman *et al* 1986). Information regarding laying dates, number of nestlings and brooding time is also scanty (Goodman 1990). Studies performed have concentrated on food selection, mostly in the western and north-western regions of its distribution (Morocco: Lesne & Thévenot 1981, Vein & Thévenot 1978; Algeria: Biche *et al* 2001, Boukhamza *et al* 1994; Tunisia: Alaya & Nourira 2007) and in the east (Syria: Shehab 2004; United Arab Emirates: Cunningham & Aspinall 2001; Saudi Arabia: Evans & Bates 1993 and the eastern desert of Jordan: Amr *et al* 1997, Rifai *et al* 2000). There is a small account of its diet from Algeria (Tammanrasset, Hoggar mountains, Niethammer 1963) and a few studies from Egypt: Jánossy & Schmidt (1970) presented information on a few pellets collected in Saqqara, close to Cairo, containing less than two dozen animals; Goodman (1990) collected and analysed pellets from Kharga oasis, the first study of the Desert Eagle Owl diet in true desert habitats of Egypt; while Sándor & Orbán (2008) detailed a handful of pellets from Siwa oasis.



**Plate 1.** Landscape as seen from the nest entrance, Hurghada, Egypt. © István Moldován



**Plate 2.** Typical habitat in the nesting territory, Hurghada, Egypt. © István Moldován

The purpose of the present study was to collect information on the breeding ecology and phenology, habitat selection and diet of an urban pair of Desert Eagle Owls in the extreme east of the Egyptian Eastern Desert, in Hurghada, based on visual observations and prey remains.

## STUDY AREA AND METHODS

A pair of Desert Eagle Owls was located in the suburbs of Hurghada (27° 13' N, 33° 48' E) and bred there in a rock crevice in 2007 and 2008. The nest was c100 m from a block of flats (Plate 1) in the outskirts of Hurghada. The habitat of the area (Plate 2) is hyperarid sandstone desert and is within the boundaries of a housing estate, with a mixture of non-native and local plant species (*Acacia raddiana*, *Hyphaene thebaica*, *Tamarix nilotica*, *Bougainvillea* sp bushes etc), and there is an artificial water hole with a typical reed bed (*Phragmites australis*) not more than 30 m from the nest site. There are several industrial and household refuse dumps in the surrounding area. Desert Eagle Owls were observed several times roosting on the top of a quarry site.

In each visit, the owls were located and nest site found by observing 'white-wash' (Penteriani & Delgado 2008) and pellets. Clutch size and laying date were not recorded because we avoided inspecting the nest in the period from mid-January to mid-March to minimize disturbance. All pellets and food remains were collected below the nest and on prominent rocks in the surroundings. The pellets were soaked in water and the bones of vertebrates and exoskeleton remains of arthropods removed from the pellets. The contents of each pellet were ascertained if possible, but a few pellets were broken and number of individuals per pellet not calculated. For identification of prey species, we used the skulls, mandibles, humeri and tibias of mammals, humeri and tarsometatarsi of birds and chelicerae, telsons and elytras of arthropods. Mammal and bird remains were compared to the authors' reference collection. Paired elements for each taxon were separated and the largest number of these was considered the minimum number of individuals (MNI) per taxon for the entire sample. Original animal biomass was calculated by multiplying the number of



**Plate 3.** Adult female Desert Eagle Owl *Bubo ascalaphus* near the nest, March 2007. © István Moldován

individuals of each species found in the pellets by the mean body mass (weight) obtained from the literature (Osborn and Helmy 1980, Hoath 2003) or from direct mass measurements of birds captured for ringing close to the study region (IM unpub). We calculated food niche breadth (NB) using Levins' (1968) equation:  $NB = (1/\sum P_i^2) - 1$ , where  $P_i$  is the proportion of prey in different categories (mainly by species). We calculated the mean prey weight (MPW) summing the product of the prey number and mean body weight and dividing by the number of prey items.

## RESULTS

The birds were first observed on 8 March 2007, when a territorial male was observed. The nest was in a rock crevice, where the female (Plate 3) laid in a scrape in sand and was surrounded by food remains. The adult birds usually stayed close to the nest, warning when approached. No aggressive contact was noted. Three nestlings were present on 15 March. On subsequent visits, the nestlings were observed and two of them ringed on 07 April. The third was ringed on 27 April (Plate 4). On 9 May, only two of the ringed nestlings were present in the nest, though fully feathered and able to fly. The owls left the breeding area but were usually located nearby. No birds were observed from August through December. Two adults were present in the breeding area on 28 Dec 2007 and they used the same nest in 2008.

The site was visited several times in the period January–March 2008, and both adults were observed at the nest in most visits (Plates 5 & 6). There was one nestling. On 12 March the nestling was measured and based on its size considered to be 52–55 days old post-hatching (measurements of primary length, regression equations in Penteriani *et al* 2004). It is estimated to have hatched in early January 2008. The adults were observed until 20 April, when they were seen some 500 m NE of the nest site, together with the only



**Plate 4.** Downy youngster about to be ringed, 27 April 2007. © Jacek Chruściel

**Table 1.** Identified prey remains in Desert Eagle Owl pellets, Hurghada, Egypt. MNI, minimum number of individuals.

Prey species	MNI	Frequency (%)	Biomass (%)
<i>Rattus norvegicus</i> ad	44	11.64	23.78
<i>Rattus norvegicus</i> juv	203	53.70	65.83
<i>Mus musculus</i> ad	39	10.32	1.58
<i>Mus musculus</i> juv	10	2.65	0.27
<i>Gerbillus pyramidum</i>	1	0.26	0.04
Total mammals	297	78.57	91.51
<i>Coturnix coturnix</i>	22	5.82	5.95
<i>Charadrius alexandrinus</i>	1	0.26	0.11
<i>Charadrius dubius</i>	1	0.26	0.11
<i>Columba livia</i>	1	0.26	0.95
Alaudidae spp	4	1.06	0.38
<i>Hirundo daurica</i>	1	0.26	0.05
<i>Cisticola juncidis</i>	1	0.26	0.04
Sylviidae spp	4	1.06	0.16
<i>Emberiza</i> sp	1	0.26	0.07
Passeriformes spp	2	0.53	0.16
Total birds	38	10.05	7.97
Total reptiles	14	3.70	0.38
Tenebrionidae sp	5	1.32	0.01
Coleoptera sp	22	5.82	0.12
<i>Leiurus quinquestratus</i>	2	0.53	0.01
Total arthropods	29	7.67	0.00
TOTAL	378		





**Plate 5.** Adult male Desert Eagle Owl *Bubo ascalaphus*, leaving the nest crevice, January 2008. © István Moldován

'nestling', found in a hole. The nest site was not visited again until 28 June, when one more, small, nestling was found. Based on its measurements it was 30–33 days old and apparently hatched in late May. A fully feathered juvenile (Plate 7) was present close by, presumably the earlier nestling of 2008.

A total of 378 individual prey were identified in the pellets, representing three rodent species, at least 10 bird species, one reptile and a minimum of four arthropod species (Table 1). Remains of a minimum of 349 individual vertebrate prey (92.3% of MNI) were found in the pellets. Mammals comprised 78.5% of the diet by number, birds 10%, reptiles (small agamid lizards) 3.7% and arthropods (coleopteran sp, tenebrionid beetle sp, two Death Stalker Scorpions *Leiurus quinquestriatus*) 7.6% by number. The Brown Rat was the most common prey, followed by House Mouse, Common Quail, then the beetles and lizards. All other species were represented by a few individuals and comprised less than 5% of the diet. Mammals made up to 91.5% by biomass, followed by birds 7.9%, while lizards and the arthropods constituted less than 0.5% together. The Brown Rat was the most important prey item both by number and biomass, juvenile rats making up 64.8% of the total biomass consumed. The Common Quail was the second species with an important share (6.4%), while all other categories together were below 5% of the total biomass. The prey diversity was extremely low (NB = 1.32), the mean prey weight was 97.9 g (SD  $\pm$  89.17 g, n = 378).

## DISCUSSION

The Desert Eagle Owl is a resident breeding bird in the desert regions of Egypt and it has been noted in several oases and cities, including Hurghada (Goodman *et al* 1986, Goodman & Meiningner 1991). Its breeding period in Egypt is thought to be the spring, as fledglings were found in spring in Kharga depression (Al Hussaini 1959). The owl uses a wide range of habitats in Egypt, but is most commonly found in wadis and abandoned quarries, although pellets have also been collected from abandoned buildings (Jánossy & Schmidt



**Plate 6.** Adult male at a favourite roosting site, March 2008. © István Moldován



**Plate 7.** Juvenile at the age of 90 days (presumably the first 2008 youngster), April 2008. © István Moldován

1970). According to our Hurghada observations, the primary breeding period is winter to early spring, with adults present at the nesting place in December. In 2007 and 2008 laying apparently occurred in January, though laying appeared to have occurred again in May 2008.

The diet of Desert Eagle Owls varies, and samples collected at one site may contain a different selection of prey species than from another site, as is the case in Egypt. Jánossy & Schmidt (1970) found only rodents in the small sample collected close to Cairo, with House Rats *Rattus rattus*, two species of gerbils, and one jerboa *Jaculus orientalis*. The sample collected by Goodman (1990) from Kharga oasis showed a much broader food spectrum, with mammals (64.3% of species), birds (10%), reptiles (4.3%) and arthropods (21%). There, the most numerous prey species was the House Mouse, followed by Trident Horseshoe Bat *Asellia tridens* and the Common Gerbil *Gerbillus gerbillus*. The Common Gerbil was the dominant prey in the diet at Siwa oasis, with four more mammalian prey species, some birds and a large number of arthropods (Sándor & Orbán 2008).

In marked contrast to the studies above, the diet in Hurghada was dominated by one medium sized, human-commensal, rodent species, the Brown Rat. The other important prey species (in terms of biomass) was a common migratory bird, which migrates through the area in large numbers (IM unpub). The rest of the prey species were found only in small numbers, comprising less than 5% of all food consumed. The food diversity was low, which is typical for an urbanized species (McKinney 2008). Thus, Desert Eagle Owls in Hurghada in the breeding period are clearly opportunistic, feeding largely on urban rodents.

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