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Authors: Mahmood-ul-Hassan, Muhammad, Beg, Mirza Azhar, Mushtaq-ul-Hassan, Muhammad, and Rana, Shahnaz Ahmed

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NESTING AND BREEDING HABITS OF THE SPOTTED OWLET (*ATHENE BRAMA*) IN PUNJAB, PAKISTAN

MUHAMMAD MAHMOOD-UL-HASSAN[1]
Department of Wildlife and Ecosystem, University of Veterinary and Animal Sciences, Syed abdul Qader Jilani Road, Lahore, 54000, Pakistan

MIRZA AZHAR BEG
Department of Zoology and Fisheries, University of Agriculture, Faisalabad, Pakistan

MUHAMMAD MUSHTAQ-UL-HASSAN
Department of Zoology, Govt. College University, Faisalabad, Pakistan

SHAHNAZ AHMED RANA
Department of Zoology and Fisheries, University of Agriculture, Faisalabad, Pakistan

KEY WORDS: *Spotted Owlet*; Athene brama; *brood*; *clutch*; *hatching success*; *nest cavities*.

The Spotted Owlet (*Athene brama*) is a common resident raptor found all over the plains of Punjab in Pakistan (Roberts 1991). Although some information is available about its food habits (Akhtar and Beg 1985, Beg et al. 1990, Tariq et al. 2003), less is known regarding its nesting and breeding habits. Whistler (1930), Ali and Ripley (1969), and Roberts (1991) have briefly described the breeding biology of this species in Pakistan, but no detailed field study has been published on the roosting, nesting, and breeding habits of the Spotted Owlet in Pakistan. Similarly, no estimates of population size or density of this owlet are available. However, much is known about the population status, roosting, nesting and breeding habits of the closely related Little Owl (*Athene noctua*), which is an ecological equivalent of this raptor in Europe and is also found in the highlands of Baluchistan Province, Pakistan (Roberts 1991). The present study provides baseline data on nesting and breeding habits of the Spotted Owlet in the agro-ecosystems of Punjab.

STUDY AREA AND METHODS

This study was carried out from December 2000 to November 2002. Nests and roosts of the Spotted Owlet were located in Hafizabad (32°04′N, 73°41′E), Sheikhupura (31°42′N, 73°30′E), Faisalabad (31°25′N, 73°07′E), Jhang (31°16′N, 72°19′E) and Toba Tek Singh (30°57′N, 72°28′E) districts. The study area was dominated by a mosaic of agricultural lands. Crops, including wheat, rice, sugarcane, and cotton were prevalent in different portions of the study area. Villages and farmhouses, blocks of forest plantations, rail- and roadside tree plantations and remnants of tropical thorn forest in the form of scrublands and sand dunes were scattered throughout the landscape. Climate ranged from subhumid to subtropical. Average rainfall was variable and most of it fell during late July–August (monsoon season) and during the winter (January and February).

Because owlets were common resident raptors in the study areas, their nests were easy to locate. The owlets roosted in thick foliage of shady trees close to their nests during the day and emitted loud calls when disturbed (Roberts 1991). We opportunistically located 40 nests of the owlets during a field survey that was mainly focused on locating Barn Owl (*Tyto alba*) nests in the same area. Of these, we selected 23 nests that were located within 1 km of the nearest Barn Owl nest for inclusion in this study.

Nests were checked once per month to record clutch and brood sizes. The onset of nesting was ascertained by the presence of eggs or young in the nest cavities and a nesting attempt was defined as a nest that contained at least one egg. Eggs hatched asynchronously and young were seen perching close to their nest for almost three weeks before fledging (Roberts 1991). We attempted to determine the brood size at a stage when all of the nestlings were fully feathered. A nest was considered successful when at least one nestling survived to fledge (Otteni et al. 1972).

We also recorded the species of each nest tree, diameter at breast height (DBH), the height of the nest above the ground, the nest location (in the main trunk, in a tree limb or in a snag), and the number of openings in each nest cavity.

RESULTS

Nesting and Roosting Habits. Twenty-three nests/roosts of the Spotted Owlet were monitored during the two years of this study. Nesting attempts were recorded at fifteen nests during the first year and nineteen during the second year of the study. Twenty-one of these 23 nests were in tree hollows and the remaining two were in cracks of the walls

[1] Email address: drmmhassan@uvas.edu.pk

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Table 1. Reproductive rate of the Spotted Owlet in Punjab, Pakistan, 2001—2002.

YEAR	NO. NEST ATTEMPTS[1]	CLUTCH SIZE MEAN ± SE, RANGE, (*N*)	BROOD SIZE MEAN ± SE, RANGE, (*N*)	NO. SUCCESSFUL (% SUCCESS)[2]
2001	15	3.8 ± 0.2, 3–5 (15)	3.2 ± 0.3, 2–5 (14)	14 (93%)
2002	19	3.7 ± 0.2, 1–5 (19)	3.4 ± 0.2, 2–5 (17)	17 (90%)
TOTAL	34	3.8 ± 0.2, 1–5 (34)	3.3 ± 0.2, 2–5 (31)	31 (91%)

[1] A nest attempt was defined as a nest with at least one egg.
[2] A successful nest was one that fledged at least one nestling.

of buildings. Nine nests were located in *Dalbergia sissu,* four in *Acacia nilotica,* three in *Butea monosperma,* two each in *Ficus bengalensis* and *Mangifera indica* and one in *Eucalyptus citriodora.* The mean DBH and the mean height of nests above the ground were 54.8 ± 7.8 (SD) cm (range = 55–75 cm; $N = 21$) and 4.2 ± 1.2 m (range = 2.7–6.7; $N = 21$), respectively. Fourteen of the nests were in the main trunk of the tree, five were in the tree limbs and the remaining two were in uncovered depressions at the top of snapped tree trunks (snags). Thirteen nest cavities had one opening, four had two and two each had three and four openings, respectively.

Breeding Phenology. Egg-laying took place from February through April ($N = 34$ nesting attempts). In 2001, the first clutch of the season was recorded on 4 March 2001 (four eggs) and no new eggs were found after 19 April 2001. The next year, the first clutch (one egg) was recorded on 13 February and no new eggs were found after 26 April. However, most egg-laying took place from the first week of March through April.

The newly hatched young were recorded primarily between the last week of March and mid-May. Fledglings were seen foraging in the company of their parents as early as the last week of May. During May, June, and July, three to five owlets were seen perched and foraging together. The young owlets foraged in the parental territories until August. All pairs produced one brood in a year, with no second clutches or replacement broods observed.

Clutch and Brood Size. Thirty-four clutches and 31 broods of the Spotted Owlet were recorded during this study (Table 1). Median clutch and brood sizes for the two years together were 4 and 4. More than 90% of the nests were successful and 80% of the eggs hatched (Table 2). However, this latter value may be overestimated because we observed the nests only once per month and so were able to record only the final clutch size; individual eggs or partial clutches lost early in the laying period and then replaced likely would not have been recorded by our sampling strategy.

DISCUSSION

In our study area, egg laying spanned a period of 46 ± 5 (SD) days. Hatching occurred from the last week of March until the first half of May. Fledging started at the end of May and was completed by the end of June or early July. During May, June and July, the young of the year accompanied their parents in their hunting trips and were observed feeding on insects, which were abundant at that time of the year.

The Spotted Owlets in our study area used tree cavities, cracks and holes in the walls of buildings and, in a previous study, they were also reported to nest in cliffs (Roberts 1991). In the plains of Punjab, the species was strongly associated with agricultural landscapes, as observed in its European counterpart, the Little Owl, which avoided densely forested areas (Exo 1992, Manez 1994, Génot et al. 1997, Osieck and Shawyer 1997). All nests in our study were located either on the periphery or in the middle of cultivated fields and the owlets frequently used the same cavity for breeding and for roosting during the nonbreeding season (Roberts 1991). Though most of the nest cavities possessed just one opening, those with more than one opening may have afforded additional advantages by providing opportunity for escaping from potential predators.

The owlet was observed breeding mainly in the spring season in central Punjab (Roberts 1991) when its prey likely is most abundant. The period between April and early May is the harvest time for wheat crops, which cover almost 60% of the total cultivated land. Before harvesting, young rodents start coming out of their burrows for foraging and become more available to predators, such as the Spotted Owlet. During April, rodents emigrate and disperse away from wheat fields before the ripening of wheat. Such dispersal movements probably ensure an abundant food supply for the young of the owlet (Akhtar and Beg 1985, Beg et al. 1990).

Table 2. Egg hatching success for Spotted Owlet, Punjab, Pakistan, 2001—2002.

YEAR	NO. EGGS LAID	NO. EGGS HATCHED	HATCHING SUCCESS (%)
2001	57	45	79
2002	71	57	80
TOTAL	128	102	80

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NIDIFICACIÓN Y HÁBITAT REPRODUCTIVO DE *ATHENE BRAMA* EN PUNJAB, PAKISTÁN

RESUMEN.—Estudiamos el hábitat de nidificación y de reproducción de *Athene brama* en un ecosistema agrícola de la provincia Punjab, Pakistán, desde diciembre de 2000 hasta noviembre de 2002. Veintiuno de 23 nidos se encontraron en huecos de árboles y los dos restantes en grietas de paredes. La puesta de huevos se registró desde la última semana de febrero hasta fines de abril. La eclosión ocurrió desde la última semana de marzo hasta mediados de mayo, y los polluelos salieron del nido desde fines de mayo hasta comienzos de junio. El tamaño de la puesta varió entre 1 y 5 huevos, con un promedio de 3.8±0.2 (EE; $N = 34$ intentos de nidifcación). El tamaño promedio de la nidada fue de 3.3±0.2 (EE; $N = 31$ intentos de nidifcación) y el 91% de los nidos fueron exitosos, produciendo por lo menos un volantón.

[Traducción del equipo editorial]

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