DIET OF SHORT-EARED OWL *ASIO FLAMMEUS* (PONTOPIDDAN, 1763) WINTERING IN ROLLAPADU WILDLIFE SANCTUARY AND ITS VICINITY IN ANDHRA PRADESH, INDIA

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ABSTRACT

Pellets of Short-eared Owl *Asio flammeus* wintering in the grasslands of Rollapadu Wildlife Sanctuary and its vicinity in Andhra Pradesh, India were analysed. Birds constituted the major prey followed by mammals and invertebrates both in terms of percentage of occurrence (82%) and biomass consumed (87%), indicating that the species is an opportunistic feeder, taking prey in proportion to their availability. A total of 13 species contributed to the diet, 276 prey individuals totaling 4,522g in biomass were found.

KEYWORDS

Andhra Pradesh, *Asio flammeus*, diet, Rollapadu WLS, Short-eared Owl

The Short-eared Owl *Asio flammeus* (Pontopiddan, 1763) is a winter migrant - seen from September/October to March/April in the Indian subcontinent (Ali & Ripley, 2001; Grimmett *et al*., 1998). Short-eared Owls breed across subarctic and temperate Eurasia and North America, and on the grasslands of South America and some islands including Hawaii, the Galapagos, the Falkland Islands, Cuba, Puerto Rico, Borneo and the Philippines. Eurasian birds winter in the Mediterranean region of Europe, northern Africa, and southern Asia to Malaysia (Holt & Leasure, 1993). In India it is found practically throughout the country affecting open, undulating grasslands with scattered scrub, sparsely scrubbed hillsides, tall grasslands on the margins of *jheels* and also in semi desert (Ali & Ripley, 2001). The food habits of the Short-eared Owl wintering in India has not been studied so far, and according to Ali & Ripley (2001) the species feeds on field rats and mice, small birds, grasshoppers, locusts, beetles, etc. This paper reports the aspects of diet of Short-eared Owl as determined by pellet analysis found at the roost in Rollapadu Wildlife Sanctuary and its vicinity in Kurnool district, Andhra Pradesh.

In India, dietary studies of owls had been sporadically conducted and studies on commoner species pertain to that of Spotted Owlet *Athene brama* (Kumar, 1985; Jadhav & Parasharya, 2003; Ramanujam & Verzhutskii, 2004), Eagle Owl *Bubo bubo benghalensis* (Ramanujam, 2000, 2001, 2004, 2006), Barn Owl *Tyto alba* (Kanakasabai *et al*., 1998; Neelanarayan *et al*., 1998; Neelanarayan & Kanakasabai, 2003) and Collared Scops Owl *Otus bakkamoena* (Verzhutskii & Ramanujam, 2002).

STUDY AREA

Rollapadu Wildlife Sanctuary is located 18km southeast of Nandikotkur (15°58'N & 78°18'E) town in Kurnool district of Andhra Pradesh. The sanctuary is a grassland habitat surrounded by crop fields and lies between the Nallamala and the Erramala Hills at an altitude of 200m. The terrain is generally undulating with predominately poor red soil. The region is semi arid with an average annual rainfall of 668mm received from both southwest and northeast monsoon. Summer (March to May) peaks at 42°C and winter (November to February) is mild at 17°C. Declared as a protected area in 1982, the wildlife sanctuary covers an area of 9.37km² and consists of grazing and disturbance free grassland enclosures that are surrounded by cattle proof trench-cum-mound boundaries separating them from the surrounding crop fields. The grazed grasslands are characterized by short grass (<30cm high) dominated by *Chrysopogon fulvus*, *Heteropogon contortus* and *Melanocenchrus jacquemontii*. The ungrazed grasslands (enclosures) have tall grass (>60cm high) with good ground cover dominated by *Heteropogon contortus*, *Chrysopogon fulvus*, and *Eremopogon foveolatus*. *Sehima nervosum* (>100cm high) – the climax grassland species of gravely soil of these areas (Dadbadghoa & Shankarnarayan, 1973), has formed pure stands in patches in some area of the enclosures. *Carissa spinarum*, *Cassia auriculata*, *Cassia fistula*, *Phoenix sylvestris* and *Ziziyphus mauritiana* dominate the scrubland that dots the grassland habitat especially near the seasonal streams, fringe of the villages and uncultivated revenue lands. The crop fields, fallow lands and grassland stretches surrounding these protected enclosures are essentially similar in their character and harbour similar floral composition but with some tree elements (Srinivasulu & Srinivasulu, 2004).

MATERIALS AND METHODS

While documenting small mammals in the Kurnool grassland, we gathered strigid (*Athene brama* and *Asio flammeus*) pellets to determine the presence and diversity of small mammals. Pellets were gathered from three sites - first site within Rollapadu WLS (where three individuals roosted) and two other sites outside the Sanctuary in Jalakanoor grassland areas (where a total of 5 individuals roosted), during the winters of 2000-2001 and 2001-2002. The owls roosted either on ground in the shade of *Phoenix sylvestris* or on its lower branches near nullahs at all the sites. The pellets were collected on a weekly basis during the first year and opportunistically during the second year. A slightly modified technique of pellet analysis described by Errington (1930) was followed. The collected pellets were air dried to a constant weight and prior to analysis were soaked in NaOH solution and sieved through a screen mesh to separate bones. The solution was again subjected to sieving to separate smaller components. All bones and other identifiable parts were separated and used for species identification and quantification. Insects were identified

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Table 1. Diet of Short-eared Owl* Asio flammeus *wintering in grasslands of Kurnool district, Andhra Pradesh

	Species	Number of pellets with the species	Total no. of prey found	Percent frequency of prey	Approximate wt. of prey (in g)	Total biomass contributed(in g)
	Mammals					
1.	Soft-furred Metad *Millardia meltada*	5	7	3.08	23	161
2.	Mouse *Mus* sp.	4	15	6.60	16	240
3.	Indian Gerbil *Tatera indica*	2	4	1.76	25	100
	Birds					
4.	Oriental Skylark *Alauda gulgula*	4	11	4.84	21	231
5.	Indian Robin *Saxicoloides fulicata*	3	7	3.08	20	140
6.	Common Stonechat *Saxicola torquata*	2	4	1.76	22	88
7.	Greater Short-Toed Lark *Calandrella brachydactyla*	118	154	67.84	20	3080
8.	Pied Bushchat *Saxicola caprata*	3	5	2.20	22	110
9.	Unidentified passeriformes	5	15	6.60	20	300
	Reptiles					
10.	Unidentified reptiles	2	2	0.88	10	20
	Invertebrates					
11.	Orthoptera	5	27	11.89	1	27
12.	Coleoptera	7	9	3.96	1	9
13.	Arachnida (Unknown spiders)	3	16	7.04	1	16
	Total	**163**	**276**			**4522**

Number of preyed species - 13; Maximum number of prey per pellet - 5; Average prey per pellet - 1.79±0.086; Average meal - 29.32g; Average wt. of prey consumed - 16.38g

following Mani (1990), birds were identified following Ali & Ripley (1987) and also by comparing their beak parts, claws and feathers with those in the collection of Natural History Museum of Osmania University, Hyderabad, and rodents were identified basing on their skull structure following Agrawal (2000).

Results and Discussion

Analysis of 163 pellets of *Asio flammeus* revealed the presence of 276 prey individuals of 13 prey species (including unidentified elements). Average prey per pellet was found to be 1.79±0.086 (Mean±SE). Prey totalling a biomass of 4,522g was consumed giving an average meal of 29.32g (Table 1). Birds constituted about 87% of the biomass and were followed by mammals (11.39% of the biomass consumed), invertebrates (1.18% of the biomass consumed) and reptiles (0.45% of the biomass consumed).

Unlike earlier studies that revealed that the Short-eared Owl consumed more rodents, especially microtines (Synder & Hope, 1938; Terres & Jameson, 1943; Weller *et al*., 1955; Clark, 1972, 1975; Colvin & Spauldin, 1983; Wiebe, 1991; Machniak & Feldhamer, 1993), the owls at Kurnool grasslands fed more on birds than small mammals (Cahn & Kemp, 1930).

The diet of the predator is governed by the availability of the prey species. Owls in their natural range have been known to show some fair degree in terms of prey selection, but on wintering grounds or during breeding have been reported to take prey opportunistically, in relation to availability (Clark, 1975; Bertolino *et al*., 2001). Poor results of rodent trapping exercises in the vicinity of wintering roosts in the present study area indicates that the wintering Short-eared Owl in Kurnool grasslands consistently fed upon prey available.

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