

COMPARATIVE ANALYSIS OF DIET OF SPOTTED OWLET FROM TWO DIFFERENT LOCATIONS OF MELGHAT TIGER RESERVE, MAHARASHTRA, INDIA

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ABSTRACT

The comparative diet of the Spotted owl Athene brama was studied from two different locations of forest habitat of Melghat Tiger Reserve, Maharashtra India during summer 2014. Regurgitated pellets of this owl were analyzed to understand the dietary composition and to find out the variation in its food habits. The pellet analysis showed that the diet mainly comprised small mammals and insects belonging to the orders Orthoptera and Coleoptera. Shannon's index for both the sites differed indicating difference in food habits.

KEYWORDS – Athene brama, Melghat Tiger Reserve, Owl pellets, Owl prey, Spotted owl.

I. INTRODUCTION

The Spotted Owllet *Athene brama* is a common nocturnal bird distributed throughout Southeast Asia including India [1]. It is found ranging across wide habitats from forest to savanna, shrub land, grassland and desert [2]. It is a carnivorous raptor [3,4]. It adapts to the changing environment both natural and manmade and usually is absent on high mountains [5].

Owls swallow the whole prey and the fleshy portions of the prey eaten are digested. However the undigested fur and bones are regurgitated as pellets [6]. Their ability to digest bone is poor and pellets contain a good skeletal record of the small mammals consumed. Owl pellet analysis is a non invasive means of diet determination. Obtained Information includes different species of prey [7-14], their preference [15-17] and estimates of contributions of prey biomass. Owl pellet analysis also is a useful method for gaining additional insight into small mammal communities and distribution [18-20].

Some studies are done on food preferences from the urban and agricultural [21,22] of the common owllet *Athene brama* [23,24]. Present study encompasses the study of the food preferences of spotted owlets from two different locations from melghat tiger reserve.

II. MATERIALS AND METHODS

Habitat - Melghat Tiger Reserve (MTR), Vidarbha, Maharashtra which lies between 21°29'96"N and 077°12'33.8"E is located at the southern offshoot of Satpuda hill range in Central India also known as the Gawilgarh hill range in Maharashtra. The forest area of MTR is tropical dry deciduous, dominated with teak plantations (*Tectona grandis*).

Site 1 – Kolupur - The roosting site which was on the Teak tree(*Tectona grandis*) at the height of 11 feet, was situated at the geographical location 21°32'00.8" N 77°00'12.3" E. The surrounding habitat was having less dense vegetation. A total of 19 pellets were collected from this site. The pellets were collected during summer 2014.

Site 2 – Dhulghat – The roosting site was located on a Gold mohar (*Delonix regia*) tree which was surrounded by dense vegetation and at the height of 10 feet. The geographical location coordinates were 21°29'53.02" N 76°75'30.58" E. The pellets were collected below the horizontal branch adjoining the roosting site about 1 feet away from the roost. 8 pellets were collected from the site. The pellets were collected in summer 2014.

Pellets were collected, bagged and kept in an oven at 70° for 24 h in order to kill infesting insects and then stored. Later, the pellets were subjected to NaOH treatment and the osteous and chitinous pellet contents were separated and then washed for further identification [25]. Different food remnants like bones, hairs and insect remains were cleaned under a dissecting microscope from a disentangled mass of owl pellets. The cranial bones were used to identify the small mammals upto the species level [26]. The Insect identification relied on chitinous remains, feathers viz. elytra, appendages, wings [27,28].

Prey Biomass - The importance of each prey species is more realistically expressed by bulk rather than by number [29]. The average body weight of each of the mammalian prey was taken into account. [30,31].

Magurran (1988) [32] was followed to assess and compare the diversity in the diet of two owl species by using species richness (S), Shannon's index (H) and Evenness index (E).

III. RESULTS

Kolupur site - The average pellet length of pellets collected from this site was found to be 2.60 ± 0.79 cm and width 1.1 ± 0.2 . The average dry weight of the pellet was found to be 0.560 ± 0.089 gm. The regurgitated pellet consisted of hair, small pieces of vertebrate bones, pieces of insect integuments, insect appendages etc. The following taxa of small mammals viz. *Suncus murinus*, *Mus booduga gray*, *Gollunda ellioti gray*, *Suncus species*, *Mus species*, *Muridae species* could be recorded. The remnants of insects in the pellets of the owl comprised wings, legs, antennae and head. On the basis of these remnants, insects belonging to the orders Coleoptera (Beetles) were recorded from the pellets. (Table 1, Figure 1,2)

Dhulghat site – The average pellet length of pellets collected from this site was found to be 2.29 ± 0.20 cm and width 0.9 ± 0.2 . The average dry weight of the pellet was found to be 0.550 ± 0.032 gm. The regurgitated pellet consisted of hair, small pieces of vertebrate bones, pieces of insect integuments, insect appendages etc. The

following taxa of small mammals viz. *Suncus species*, *Mus booduga gray*, *Mus saxicola elliotte* could be recorded. The remnants of insects in the pellets of the owl comprised wings, legs, antennae and head. On the basis of these remnants, insects belonging to the orders Orthoptera (Grasshoppers), Coleoptera (Beetles) were recorded from the pellets. (Table 1, Figure 3,4)

The Diversity indices showed variability in the food habits in two distinct locations, Shannon's index in kolupur site was found to be slightly more (1.40) than the Dhulghat site (1.29).

TABLE 1- Comparative Picture of Prey Frequencies (%) and biomass (%) consumed by Spotted owlets of two distinct habitats.

Prey Items	Kolupur site		Dhulghat site	
	% Relative Abundance	% Biomass	% Relative Abundance	% Biomass
<i>Suncus murinus</i>	5.26	18.09	-	-
<i>Mus booduga gray</i>	31.57	23.74	12.5	25.47
<i>Suncus etruscus</i>	-	-	-	-
<i>Suncus species</i>	15.78	1.6	37.5	10.48
<i>Mus species</i>	26.31	20.35	-	-
<i>Mus saxicola elliotte</i>			25	64.04
<i>Millardia meltada</i>	-	-	-	-
<i>Muridae family</i>	5.26	9.04	-	-
<i>Gollunda ellioti gray</i>	10.52	27.13	-	-
Coleoptera	100	-	87.5	
Orthoptera	-	-	12.5	

FIGURE 1

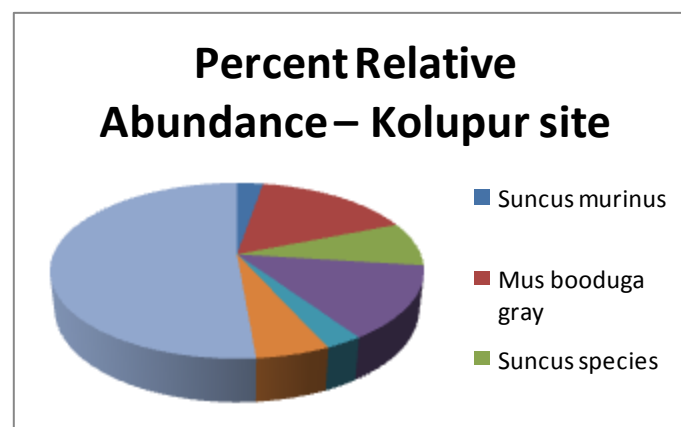


FIGURE 2

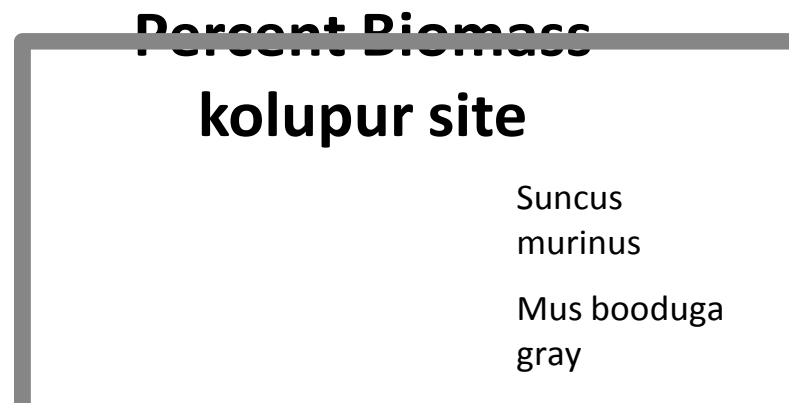


FIGURE 3

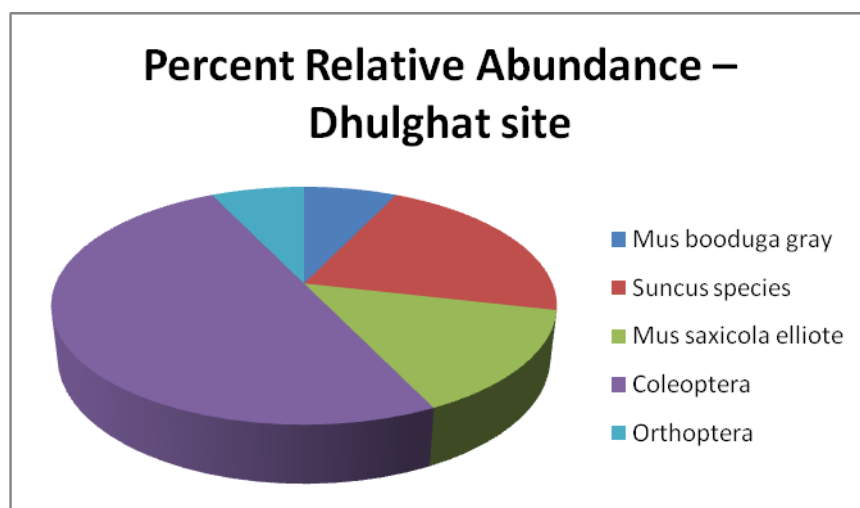


FIGURE 4

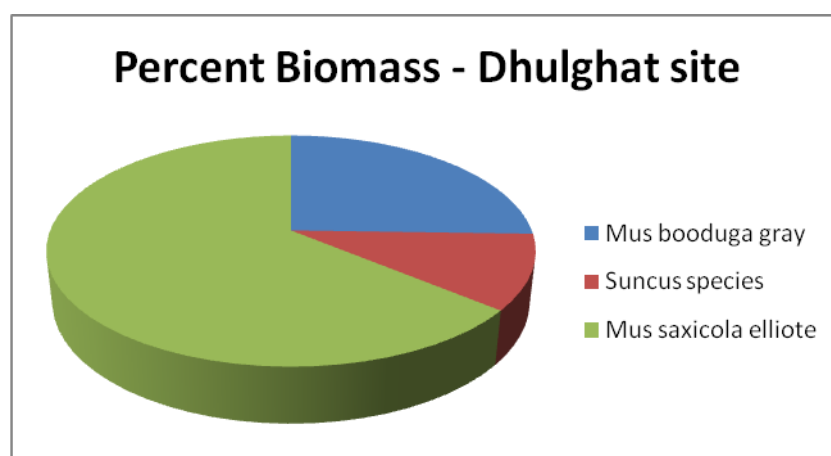
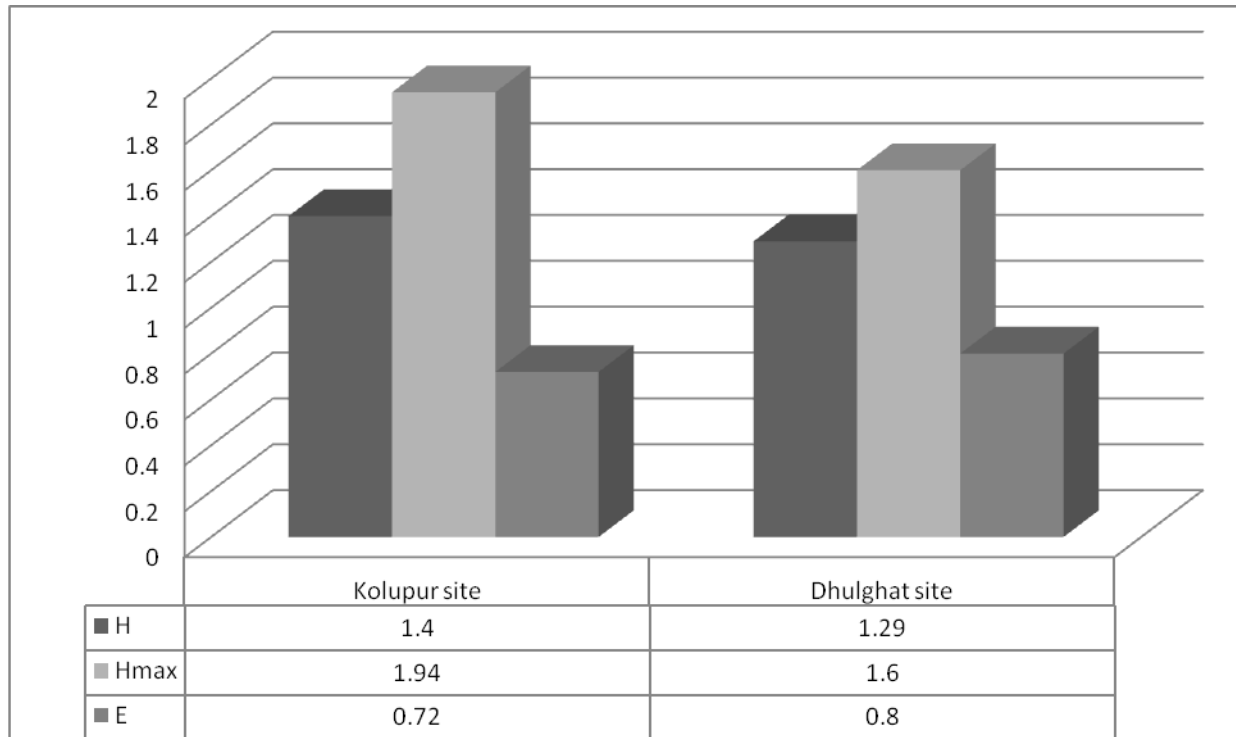


FIGURE 5 - Comparative prey diversity and evenness of two study sites.



(H –Shannon's Index, Hmax - Maximum diversity possible, E - Evenness.)

IV. DISCUSSION

In the present study the average length and width of the pellets of Spotted owl were similar to those reported by Patki *et al.* (2014) [22].

According to Beg *et al.* (1990) [33] spotted owl diet depended mainly on insects and mammals for their food which is in corroboration with the present study. However in the present study we found that the number of small mammals captured as a prey, was more at the Kolupur site (6 Species) as compared to the Dhulghat site (3 species), these changes in the given group of prey in the diet of the owl can be related to the availability of the prey species in the surrounding habitat near the roost site.

Mus budooga gray is the most captured prey species in the Kolupur site where as *Suncus species* is the most captured prey species in the Dhulghat site. The proportion of the mammals in Spotted Owllet diet differed at two sites of which only two species viz. *Mus booduga gray*, *Suncus species* were common. However in a study carried out by Zade *et al.* [34] *Mus musculus* was found to be the most common species in urban habitats.

A huge number of appendages, elytra, mandibles and head of various species of beetles in the pellets were recorded but identification could be done upto the order level due to the unavailability of proper methods and key characters for identification, Muhammad *et al.* [35] also recorded that Coleopterans were found in large proportion among the insect prey which is in corroboration with the present study. Several previous studies have

also confirmed the presence of Coleopteran insects as one of the important food resources of the Spotted owl [36-39].

In the present study all the pellets from the Kolpur site sample showed presence of coleopteran species (percent abundance 100%) whereas in the Dhulghat site , majority of pellets showed coleopterans whereas one pellet showed presence of Orthopteran prey species.

Shannon's index for both the sites differed i.e. 1.40 at kolupur site and 1.29 at dhulghat site. The Shannons index was found to be low at Dhulghat site indicating specialized food habits which may be because of more visibility as the habitat around the dhulghat site was dense forest whereas kolupur site was having less dense vegetation.

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