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Grey Musk Shrew (*Suncus murinus*) a Favorite Prey of Barn Owl (*Tyto alba*) in Calicut, Kerala

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Abstract: ***The Barn Owl (Tyto alba) is a widely distributed resident nocturnal raptor. The pellets of Barn owl were collected and studied from the zoology wing of St. Joseph's college, Calicut, Kerala during April-July 2013. Regurgitated pellets of barn owl were analyzed to understand the dietary composition. The aim of the study is to find out seasonal difference of food preferred by the barn owl, estimating the average size of each pellet to assess the difference in total intake of food during rainy and summer seasons, to compare the amount of bones in each pellet to know the availability of shrew during the rainy and summer season. It was found that the diet comprised of exclusively the rodent Suncus murinus and its consumption among two seasons was not similar.***

Keywords: Barn owl, *Tyto alba*, Grey musk shrew, *Suncus murinus*, pellets, skull, rodent

1. Introduction

Barn owl is a cosmopolitan species found all over the world except Antarctica [9]. There is so many stories, myths, believe and superstitions about barn owl all over the world. This bird is notoriously associated with death, evil spirit and misfortune. This may be due to its horror appearance, call and nocturnal activity.

2. Literature Review

Extensive studies have been conducted on the diet, feeding and nesting habits of barn owl in different parts of the world by various research workers.(C.D.Marti 1972&1974, Alivizators & Gounter 1999, Bose & Guidali 2001, Mushtaq-ul-Hassan *et al.* 2007 a,c, Leonardi & Arte 2006, Margini & Facure 2008, Nadeem *etal* 2012 *)* The available literature on the Indian Barn owl is comparatively less and is confined to feeding behavior and diet composition (Neelanarayanan 2007 a, b, Santhanakrishan *et al.* 2010, Unfortunately, we have little research studies on barn owls of Kerala. (Jayson & Babu 2009).

3. Study Area

The zoology wing of St. Joseph"s College Devagiri, Calicut (N 11° 15' 51.0761" & E 75° 50' 6.8575") selected as the study area during the period of April–July 2013. An adult barn owl has inhabited in the lab for last two years. This area is always free from all other disturbances especially in night time. That may be one of the reasons for selecting this area as its territory by the bird.

4. Materials and Methods

Total 60 pellets were collected in summer and monsoon. The length and width of pellet were first measured using a verniers caliper (with an accuracy of 0.05mm). The samples were then weighed using electronic balance (with accuracy to 0.01g). To identify the food items preferred by barn owl, pellet analysis must be done. Pellets were analyzed following the methods adopted in earlier studies [6]. At the time of analysis each pellet was put in warm water for softening. The pellet materials were carefully opened up using tweezers. During pellet examination skulls, bones, feathers, insect remains were separated out for identification. Collected bones and hairs are examined. To identify the skull present in the pellets, rodents, particularly rats were trapped from the surrounding area, killed and boiled in water. Separated bones and skulls compared with pellet compositions. Mean abundance and standard deviation of different food components in pellet were calculated on an excel sheet and tabulated. Normality of collected data was tested using Jarque-Bera test [11]. Affinity between the size of pellet between two seasons and difference in availability of shrew during the rainy and summer season were assessed with t test.

5. Result

All pellets are compact, hard, oval shape and dark green in color. Skulls, bones, and hairs were embedded into the pellet. There is a significant difference between the size of pellet during two seasons ($t= 4.38$, $P= 0.0001$) and availability of shrew during the rainy and summer season ($t= 5.87$, $P> 0.0001$). The most striking feature of this study is the presence of at least one mammalian (rodent) skull in all 60pellets. Among these, 3 pellets were contained more than one skull that may be depending up on the size of the pellet and the food taken by the barn owl. All the skulls in the 60 pellets were similar in size and structure. These entire skulls were well analyzed and studied. For better identification these skulls were compared with skull of other local rodents trapped from that area such as bandicoot rat (*Bandicoot malabarica*), house rat (*Rattus rattus*) and grey musk shrew (*Suncus murinus*). Skulls in the pellets were exactly matches the skull of grey musk shrew. Pellet skulls were entirely different from the local rodent"s skull in their size and structure. Skulls obtained from all 60 pellets were unique and was found to be the skull of Grey musk shrew (*Suncus murinus*). This particular species is identified with the help of experts. In spite of these skulls and bones, negligible amount of insect remains (order: Coleoptera) were found in some pellets.

Table 1: Mean and Standard deviation of pellets in two seasons

Features of Pellets	Summer	Monsoon
	Mean ± SD	Mean ± SD
Length (mm)	46.8 ± 7.4	42.3 ± 5.0
Width (mm)	32.7 ± 1.7	31.8 ± 5.1
Dry weight (mg)	2696.7 ± 485.7	2068.0 ± 618.7
Weight of bones (mg)	1676.0 ± 408.1	1090.4 ± 363.3
Weight of scat (mg)	1020.7 ± 457.5	977.6 ± 420.1

Plate 1: Skull image of *Suncus murinus*

6. Discussion

The size of the pellets in the study is similar to the previous reports. The t-test results indicate the reduction in shrew availability during monsoon season, in this locality and the absence of alternate food during monsoon season. It means that the consumption of grey musk shrew in the diet of the Barn Owls among two seasons was not similar, and was different. The unavailability of grey musk shrew during monsoon in the study area, inversely affects the weight of pellets and bones in each pellet.

Several investigations on the diet of the Barn Owl in different geographical regions confirmed that small mammals were the main components of the diet [1], [2], [5], [8] & [10]. From this study it has been proved that it prefers only *Suncus murinus* even though the other prey availability was more in this area. It means that *Suncus murinus* may be the favorite food item of barn owl. Previous studies had revealed that diet of the barn owl includes heavy consumption of bats [15] & [23] but very negligible amount had noticed in Madurai, Tamil Nadu [22]. We hadn‟t found any remains of bats in all 60 pellets.

Intake of small birds as the prey had been identified in many reports by various workers, exclusively species of sparrows, finches, starling and thrushes [22]. We couldn‟t found bird remains in the samples. Reptiles and amphibians were absent in every pellets. Arthropod preyed up on are exclusively insects belongs to Coleoptera, Isoptera, Orthoptera and Hymenoptera [8], [20] & [22]. In our study we could have found out certain remains of coleoptera in two pellets.

7. Conclusions

The study was mainly concentrated on the presence of unique skulls of *Suncus murinus* in all 60 pellets. It revealed that Barn owl shows a special preference for our commonest shrew, Grey musk shrew (*Suncus murinus)* which is generally distributed throughout peninsula. From our study it is clear that there is a variation in the diet of these birds depending on the area and availability of food items. In Calicut it feeds exclusively on *Suncus murinus*, even though other species of rodents were common in the campus.

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