Research Paper

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A Preliminary Study on Owls of Visakhapatnam and Elemental Characterization of Owl's Feathers

Environment

KEYWORDS : ecological study, screening, elemental analysis, vegetation, urbanisation, deforestation, preliminary study.

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ABSTRACT

The objective of this study was to carry out an ecological study of the Owls found in Visakhapatnam and screening of their feathers for any sort of elemental analysis. Visakhapatnam remains one of the few studied areas in this field although previous studies were carried out regarding Avifauna in 2009. Visakhapatnam is a city with a moderate climate zone containing the hills of Eastern Ghats that not only have caves and cavities but also supports a wide variety of vegetation types that is preferred by the Owls for their survival. But at the same time, urbanisation, deforestation, pollution and the port activities are increasing tremendously as a result of which the survival of these birds might be threatened and also depict the entry of toxicants into our environment. This was a preliminary level study but much more work remains to be done using owls as biomonitors of environmental contamination.

INTRODUCTION

India is a country with one of the richest biodiversities in this world. It is home to numerous well-known large mammals, including the Asian Elephant, Royal Bengal Tiger, Asiatic Lion, Leopard and Indian Rhinoceros. These large mammals are important for wildlife tourism in India, and have catered the needs of several national parks and wildlife sanctuaries It is also home to the Striped Hyaena, Water Buffalo, Nilgai, Gaur and several endemic species. Many smaller animals such as the Macaques, Langurs and Mongoose species are especially well known due to their ability to live close to or inside urban areas.

Apart from animals, even birds of India are widespread over the vast India sub-continent. A few birds considered to be extinct have been rediscovered an example being the Jerdon's Courser. And also not to forget, the Forest Owlet (Athene blewitti) which was rediscovered after 113 years of its extinction (Rasmussen and King 1998). The Indian Peacock (Pavo cristatus) is the national bird of India. While some of the animals and bird stand as icons of India, many others are disrespected, neglected and sometimes even killed.

One such example is Owls of India which are disrespected in many places and considered as a symbol of bad luck. Following a myth, they are even brutally killed or sacrificed by tantriks during auspicious occasion of Diwali in order to bring good luck in certain families. While some consider this nocturnal bird to be associated with bad omen and misfortune, it is often engrained in culture and worshipped by others and is associated with deities specially Goddess Laxmi.

Visakhapatnam is a city with a moderate climate and temperature zone which supports mixed deciduous vegetation and shrubs and five major forest types like Tropical Dry Deciduous, Tropical Thorn, Tropical Moist Deciduous, Tropical Dry Evergreen and Littoral and Swamp Forests are preferred by the Owls.

SCOPE OF THE STUDY:-

Previously very limited studies were made at Visakhapatnam. The scope of this study is to study the ecology of Owls in both captive and wild & carry out screening of their feathers.

METHODOLGY:-

Determination of Wet weight

Feather samples (0.2-1mg) were washed with tap water, distilled water and acetone thrice and placed in polypropylene vials and weighed.

Determination of Dry weight

Feather samples (0.2-1mg) were washed with tap water, distilled water and acetone thrice, oven dried for 48 hours at 60°and placed in polypropylene vials and weighed.

Acid Digestion of feathers

Feather sample (0.2^{-1}mg) were cut & weighed and placed in Teflon beakers containing 30ml of conc. Nitric Acid (HNO_3) and left overnight for pre-digestion. Following day, samples were finally digested by heating the mixture at mild temperature until the volume of the mixture was reduced from 30ml to 20ml. After obtaining a transparent liquid, 10ml of Hydrogen Peroxide (H_2O_2) was added for degradation of organic matter present in the sample. The ratio of HNO_3:H_2O_2 maintained was 3:1.

The contents were then transferred to 250ml volumetric flask for further studies and then spectrophotometric analysis was carried out to determine concentration of few elements (Iron, Chromium).

RESULTS

Ecological Study:-

Visakhapatnam is known to contain four to five species of Owls namely Rock Eagle Owl (Bubo bengalensis), Collared Scoops Owl (Otus bakkamoena), Mottled Wood Owl (Strix Ocellata), Spotted Owlet (Athene brama), Barn Owl (Tyto alba)

Basis of identification of Owls:

The basis of identification of the Owls was based on their morphological character, size, range/habitat, voice.

The following Owls were observed at Visakhapatnam on the basis of the above is listed as the following:

TABLE 1 : Types of Owls observed

S. No	Type	Scientific Name	Family	Conservation Status
1	Eagle Owl	Bubo bubo	Strigidae	Least concerned but decreasing trend
2	Barn Owl	Tyto alba	Tytonidae	Least concerned but decreasing trend Species listed for Global Conservation
3	Spotted Owlet	Athene brama	Strigidae	Least concerned

Source: IUCN and www.eol.org

Analytical Studies:

The studying of elemental characterization of Owl feathers were taken up and amount of few elements were determined in their feathers namely Iron (Fe^{2+}) and Chromium (Cr^{6+}). The feathers that were taken up for analysis included the primaries and few tail feathers:-

TABLE 2: Concentration of elements found

Owl	Feather	Iron (in µg/g)	Chromium (in µg/g)
Bengal Eagle Owl	Primaries	0.51 ± 8.5	0.55 ± 9.1
Barn Owl	Primaries,	0.55 ± 9.1	0.51 ± 8.5
Mottled Wood Owl	Primaries, tail feathers	0.75 ± 12.5	0.45 ± 7.5

The elemental characterization of the feathers were carried out and during this process the concentration of the elements (Fe2+ and Cr6+) as listed above was found out to be of very negligible amount. Thus, it can be said that the amount of these elements falls under negligible levels but can be an indication for future magnification.

Visakhapatnam is a city where day by day, port activities are increasing multifold. Various activities are carried out in the port like loading and unloading of materials and handling of Iron goods etc. This might be a possible reason for heavy metals entering into the environment which can be harmful to both aquatic and terrestrial life forms after it starts accumulating in the food chain.

CONCLUSION:-

Steps that needs to be taken for Owl Conservation:-

As a matter of fact, the wildlife species and biodiversity is facing a major threat due to human activities. Afforestation program can be of great help if plenty of lush green trees are planted which can restore the missing habitat and nesting site of Owls. Bringing back of nesting sites will improve breeding to a great level.

Creating public awareness is another major factor as people still believe in myths and kill Owls.

Designing and setting up Owl Nesting Boxes in trees can be very useful and is a very necessary step to conserve them. Nesting boxes can attract Owls and they can be set up in gardens, croplands, agricultural fields too. Owls play a very important role in the environment by preying on rodents and hence the burden of toxic chemicals and pesticides in our environment can get highly reduced if Owl Nesting Boxes are set up.

FIGURE 1: Spotted Owlet observed & photographed at Hill Range of Visakhapatnam

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