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Diet composition of Black Kites (*Milvus migrans*) in Dense urban area of Western Mumbai, Maharashtra.

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Abstract

Throughout the study period from January 2014 to January 2015 in Ismail Yusuf College Campus spread in area of 54 acres , 34 species of birds were observed . Diet composition of Black Kite constituted rodents, squirrels, fishes, insects, amphibians, reptiles, smaller birds and insects such as grasshoppers as well as pieces of bread collected from residential area. Black Kites gathered in flocks around bush fire in the campus and eagerly pounce on small animals as these flee the flames. Just below the nesting site chicken feathers, fish scales and chelates of crabs were found in the dry palletes.

This information may serve as baseline data for long-term monitoring of the black kites in the study area, particularly with rapid urbanization. These findings might also be useful for exploring feeding behaviour of black kites in many different urban habitats.

Keywords: - Black kite, diet composition, feeding behavior, Ismail Yusuf College campus, base line data.

Introduction

The black kite (*Milvus migrans*) is one of the most successful raptors in the world, with a large distribution range occupying diverse habitats that range from completely natural to intensely urban landscapes. This Indian subspecies is widely distributed and large populations are found in urban areas where they roost communally and often forage on offal from fish and meat markets, slaughter houses and

garbage dumps [1,2]. Causes of population decline of raptors like *Milvus migrans* include anthropogenic activities, habitat degradation, development process, water pollution, agricultural pesticides, associated runoff, hunting by humans and carcass poisoning [3].

A community in an ecosystem is not just a haphazard grouping of animals and plants which live independent of each other but is of characteristic taxonomic composition with definite trophic relationship and metabolic pattern. Two third of Endangered species of birds (66%) have declining population while small proportions are stable or fluctuating or increasing owing to conservation effects. However for 16% there is currently no known population because there has been no recent researches. Another 15 species may already be extinct in the wild, but this has not yet been confirmed and further researches are required [4].

Ecology of raptors with reference to breeding, nesting, feeding and habitat etc. has been extensively studied in India by various authors, Viz. Naoroji [5] studied on Birds of prey of the Indian subcontinent. Mahabal and Bastawade [6] studied Population ecology and communal roosting behaviour of Pariah Kite, Milvus migrans govinda in Pune of Maharashtra. Some intensive studies on raptors has taken abroad, Joseph [7] studied Behaviour and age class structure of wintering Northern bald eagles in Western Utah. Koga et al, [8] studied Breeding ecology of the Black-eared Kite, Milvus migrans lineatus in the Nagasaki Peninsula of Japan

In Europe Black kite is currently classified as vulnerable, because of its large-scale decline. However, it is clear that the conservation community in Asia and globally has to face up the reality of tackling the direct and indirect causes of decline in raptor population.

Besides conservation, there are other good reasons to monitor raptors [9]. As top predators, raptors are often the first species to be affected by a range of environmental pressures, such as changes in food and habitat availability and quality, prey populations, pollutants and human disturbance.

The aim of the present study was to collect information on diet composition of Black Kites in selected study area which will prove useful as base line data for long term monitoring .

Materials and method

The survey regarding diet composition of Black Kites was conducted in the campus of Govt. of Maharashtra's Ismail Yusuf college situated in urban and dense populated Jogeshwari region of Western Mumbai of Maharashtra State, India (19.13334°N 72.854022°E) . The site is provided with lust green canopy of Palm trees (Borassus *flabellifer*), Hundreds of years old Ficus trees (Ficus *bengalensis*) and other species of trees spread in area of 54 acres (220.000m^2) which are utilized by the birds as a roosting and nesting site. On the East of the campus lies the Western Exepress Highway always busy with heavy traffic. On Western side lies the Local Railway Station having fish market and mutton market nearby. South and North of the campus is surrounded by the dense populated residential area (Fig.1).

The study area was visited on weekly basis for a period of one year from January 2014 to January 2015 by the authors accompanied by bird enthusiasts in morning hours when the avian activity is optimum. Binoculars (Olympus 8X40) were used for observing and collecting the data on the feeding activities of Black Kites. Local enthusiasts vis+iting the campus daily for morning walk were interviewed regarding feeding activities of Black Kites . Revised edition of Grimmett *et.al*[10,11] and Salim Ali [12,13] was followed for the identification, nomenclature and information on species distribution and habitat preferred by avifauna .
In order to get idea of food items collected by the birds , pellets were collected from below roost trees and favored perches . Hunting activities were captured and recorded in sequence by photographic camera . For each kite, hour, location, and habitat over which the individual was flying was recorded . As the study was noninvasive type, all observations were done by keeping a long and safe distance without handling the birds, eggs and siblings.

Table 1 : List of avifauna observed in I.Y.College Campus ,Mumbai Maharashtra		
Sr. No	**Common Name**	**Zoological Name**
1	White Throated Kingfisher	*Halcyon smyrnensis*
2	Black Drongo	*Dicrurus macrocercus*
3	Cattle Egret	*Bubulcus ibis*
4	Ashy Prinia	*Prinia socialis*
5	Alexandrine Parakeel	*Psittacula eupatria*
6	Oriental magpie Robin	*Copsychus saularis*
7	Ashy Prinia	*Prinia socialis*
8	Indian Robin	*Saxicoloides fulicata*
9	Greater Coucal	*Centropus sinensis*
10	Red Vented Bulbul	*Pycnonotus cafer*
11	Small Green Bee Eater	*Merops orientalis*
12	Asian Koel	*Eudynamys scolopacea*
13	Purple Rumped Sunbird	*Nectarinia zeylonica*
14	Black Kite	*Milvus migrans*
15	Shikra	*Accipiter badius*
16	Spotted Owlet	*Athene brama*
17	Coppersmith Barbet	*Megalaima haemacephala*
18	Asian Paradise Fly cather	*Terpsiphone paradisi*
19	Rose Ringed Parakeet	*Psittacula krameri*
20	Blue Rock Pigeon	*Columba livia*
21	Asian Palm Swift	*Cypsiurus balasiensis*
22	Fantail Flycatcher	*Rhipidura albiscapa*
23	Scaly Breasted Munia	*Lonchura punctulata*
24	Common Chittchaff	*Phylloscopus collybita*
25	Wire tailed Swallow	*Hirundo smithii*
26	House Sparrow	*Passer domesticus*
27	Purple Sunbird	*Nectarinia asiatica*
28	Greenish Leaf Warbler	*Phylloscopus trochiloides*
29	Blyth's reed warbler	*Acrocephalus dumetorum*
30	Common Myna	*Acridotheres tristis*
31	Ashy Drongo	*Dicrurus leucophaeus*
32	Tickell's blue Flycatcher	*Cyornis tickelliae*
33	India Golden Oriole	*Oriolus oriolus*
34	House Crow	*Corvus splendens*

Table 2 : Food items preferred by Black Kite in and around I.Y.College Campus , Mumbai Maharashtra		
Sr No.	**Food Item**	**Observation Site**
1	Lizards, Frogs, Squirrel, grasshoppers ,live animals , insects fleeing from bush fire	Inside the campus of an area of 54 acres .
2	Rodents, piece of bread, dead fish	Outside the campus on highway side and residential area.
3	Mammalian bones , meat chunks, dead fish, Chilate of crab	Outside the campus in fish market and mutton market side .
4	chicken feather, fish scales, hair, Chilate of crab and pieces of bones	Palletes collected from the nesting site under the nesting tree.

Fig. 1: Map of Mumbai city showing location of study area

Result and Discussion

Throughout the study period from January 2014 to January 2015 in Ismail Yusuf College Campus , 34 species of birds were observed in and around I.Y. College campus (Table 1). Focus was to study feeding activities of Black Kites in and outside the campus. The activity of Black Kites was observed once a week . Observations were made from elevated sites only in good visibility. For the sake of convenience study area was divided in segments such as

(1) observation site inside the campus of an area of 54 acres where the birds nests .

(2) observation site outside the campus on highway side and residential area. Dumping grounds located near human settlements were an essential source of its food.

(3) observation site outside the campus in nearby fish market and mutton market side

(4) Just below the nesting site under the tree.

During observations outside the campus in an open habitat the Kite was seen patroling the highway , a

busy road segment picking up carrion of animals run over by vehicles. Kites were seen up to 2.5 km away from their nest.

In the absence of the reference samples the pellets of Black Kites could not be analysed to detail. All pellets were collected and only large sized , visible and identifiable prey remains were identified . However, the gross examination of the pellets and the prey remains gave important information regarding the difference in the diet spectrum of the breeding and non-breeding roosting birds [14]

During the study period Black Kites showed a wide range of feeding habits. In addition to being scavengers on the dump sites and streets, these birds have an important niche in the urban ecosystem as predators [15]. During the study, the bird were observed preying on rodents, squirrels, fishes, insects, amphibians, reptiles and birds of smaller size as well as and insects such as grasshoppers [15,3] .

During one observation Black Kites gathered in flocks around bush fire in the campus and eagerly pounce on small animals as these flee the flames. Both live and dead (carrion) prey was eaten. They are attracted to smoke and fires ,often gather and soar above watching for flushed prey. [16]

In some cases , chunks of meat , parts of dead fish and chelates of crabs in the beak of the birds carrying from a nearby mutton market and fish market and dead rodents collected from highway side while pieces of bread collected from residential area side was observed. They are opportunist hunters and have been known to take birds, bats, household refuse and carrion [17] (Table 2) .

As scavengers, black kites have been recorded in large numbers on waste accumulations generated by human activities, including rubbish dumps, markets, fishing-ports and abattoirs all over their world range [18]. Their highly gregarious and opportunistic foraging behavior leads them to eat the most abundant and available prey ,especially slow-moving and injured animals as well as food obtained by scavenging [19,20] .

Just below the nesting site chicken feathers ,fish scales , hairs and small pieces of bones were found in the dry palletes . Although the analysis of pellets gives a good insight to what the birds eat, it is mostly the representation of the undigested remains (Sergio and Boto 1999). Our findings are well in agreement with the observations of [21] .

Scavengers and large birds of prey are very sensitive, because they require large expanses of preserved habitat and do not easily coexist with humans. Once exposed to a threat, their populations are slow to recover and remain vulnerable for a long time, even after the immediate reason for the decline is eliminated. However, some threats are specifically important for this group of birds, because being on the top of the food chain makes them particularly vulnerable.

Conclusion

This information may serve as baseline data for long-term monitoring of the black kites in the study area, particularly with reference to rapid urbanization . These findings might also be useful for exploring feeding behaviour of black kites in many different urban habitats.

Conflicts of interest: The authors stated that no conflicts of interest.

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