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Feeding habits and roosting preferences of Indian peafowl (*Pavo Cristatus*) in Ludhiana district (Punjab)

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Abstract

The present study was carried out to assess the feeding habits and roosting preferences of Indian Peafowl (*Pavo cristatus*) at Punjab Agricultural University Campus, Ludhiana (Location I) and Village Baranhara, Ludhiana (Location II) from March 2016 to February 2017. Indian Peafowl had showed preference for plant parts like flowers, leaves and fruits of wide ranging cultivated crops and indigenous trees. It was further recorded that the preference of food items depended upon the local crops, scrub vegetation and uncultivated areas. Roosting was noted on indigenous trees at location I as compared to buildings/ roofs at location II. Indian Peafowl mainly used tree species such as Eucalyptus, Pear, Poplar, Lasura, Amaltas, Peepal, Jamun, Mango, Banyan, Pilkhan, Dhek for roosting. Analysis of feeding habits and roosting preferences will be both for conservation initiatives for Indian Peafowl and to minimize the conflict with farmers.

Keywords: Feeding, Indian Peafowl, roosting, tree species

1. Introduction

The pheasants are group of birds belonging to the Family Phasianidae of the Order Galliformes that includes pheasants, partridges and quails, commonly known as 'game birds' [1]. The Indian Peafowl (*Pavo cristatus*) is the largest among the pheasants. It was declared as the National Bird

of India in 1963 due to its 'Flagship' value found on its glorious position in mythology. The Indian Peafowl belongs to the family Phasianidae and order Galliformes [2]. The Indian Peafowl (*Pavo cristatus*) is resident bird and widely distributed in India [3]. The distribution of Indian Peafowl is almost widespread and quite common in northern India. It is also found in agricultural fields with good vegetation [4]. Indian Peafowl is omnivorous, feeds on everything from grain and green crops to insects, small reptiles and small mammals [5, 6]. They forage in agricultural fields, parks, and forest outskirts in pair or small clusters. Berries and drupes of plants such as Carissa, Lantana, Zizyphus and wild figs (*Ficus*) are apparently favored foods of peafowl [7-9]. Around cultivated areas, Indian Peafowl feed on a wide range of crops such as groundnut, tomato, paddy, chilly and even bananas [10]. Indian Peafowl preferred moist and dry-deciduous forests to live, but they can easily adapt cultivated regions *i.e.* agricultural fields, gardens. They were observed to be both communal and solitary roosters while females were observed to have only communal roosting habits [11]. The height of roost tree, roost height, canopy cover and habitat plays a vital role in choosing the roost trees by Peafowl [11]. Indian Peafowl preferably roost on high, open trees in order to protect themselves from the tree-climbing, night predators. It roosts on trees and also uses tall buildings where trees are scarce [12]. Roosting is a most common process of birds, which lowers the loss of body heat and decreases the risks associated with predators. The roosts of Indian Peafowl gives us lot of management strategies to safe guard the trees in the relevant habitats [13]. On the other hand, the high metabolic rates of birds used during active part of the day are supplemented by rest at other times is referred as roosting. The birds often chose roosting site with regard to thermoregulation and also for safety purpose. In many parts of India, they are protected by religious practices [14]. Therefore, the study was designed to observe feeding habits and roosting preferences of Indian Peafowl, particularly in agricultural areas of Punjab.

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2. Materials and Methods

2.1 Study area

The present study was carried out from March 2016 to February 2017 in the Campus of Punjab Agricultural University, Ludhiana i.e Location I, and village Baranhara (district Ludhiana) i.e Location II. The university is situated in the outskirts of Ludhiana city towards west and lies at latitude of 30°56' N and 247 m above the means sea level. The campus has a large stretch of agricultural fields spread in an area of more than 550 hectares. The village Baranhara is a medium size village located in Ludhiana West of Ludhiana district. The field area is distributed under different categories of crops such as wheat, maize, rice, vegetables, fodder and orchards. In addition, there is a rich diversity of trees in the University and village Baranhara (district Ludhiana). The roosting habits of Indian Peafowl were observed in both the areas. The tree species used by Indian Peafowl for roosting in orchards, scrubby and dense regions of both the study areas were recorded and identified. The point count method was used to record feeding habits of Indian Peafowl^[15]. Monthly and seasonal records of trees species utilized for roosting activity by Indian Peafowl were maintained.

2.2 Statistical Analysis

Mann-Whitney U test was carried out on maximum number of Indian Peafowl roosting per observation on tree types/buildings/houses.

3. Results and discussion

The Indian Peafowl are omnivorous and feed on seeds, insects, fruits, small mammals and reptiles. In the present study, observations on foraging behavior revealed that Indian Peafowl spend more time on feeding on different types of plant matter than the animal matter. Similar observations were recorded by Navaneethakannan^[16]. They were noted to spend maximum time in feeding activity as compared to other activities. They were found to forage in crop fields in pairs or in small clusters during early morning and evening time. It was very surprising to observe that Indian Peafowl preferred the leaves of certain plant species but were rarely found to feed on the flowers of same plant species (Table 1). At Location I, Indian Peafowl were found to feed on the different cereal and fodder crops like wheat, paddy, pearl millet, berseem and were also utilized flowers and leaves of pear. In

the present study, Indian Peafowl were observed to feed on flowers/leaves/fruits of *Brassica campestris* (flowers, leaves), *Trifolium alexandarium* (leaves), *Triticum aestivum* (leaves), *Oryza sativa* (leaves), *Chenopodium album* (Flowers, leaves), *Parthenium hysterophoresus* (flowers, leaves), *Pisum sativum* (flowers, leaves), *Pyrus communis* (leaves, fruit), *Ficus benghalensis* (flowers, fruit), *Ficus rumphii* (flowers, fruit) at location I. At location II, they consumed on a variety of cereal and fodder crops like maize, pearl millet, wheat, paddy and vegetables viz: brinjal, tomato, chillies, carrot, potato, radish. At location II, they foraged on the crops like *Brassica campestris* (flowers, leaves), *Trifolium alexandarium* (leaves), *Triticum aestivum* (leaves), *Oryza sativa* (leaves), *Chenopodium album* (Flowers, leaves), *Ficus rumphii* (flowers, fruit) (Table 1). Similar kinds of observations were also recorded by Chopra^[17]. Yasmin & Yahya also recorded that Indian Peafowl fed on a mixture of seeds, leaves, and wild herbs^[18]. At location I, females were noted spending more time in feeding activity than males. Males spent much more time in feeding than females at location II. They were sighted feeding on small insects at both locations. Flocks of Indian Peafowl were observed to consume different types of invertebrates (mostly insects) and reptiles (Table 2). Feeding and foraging association of Indian Peafowl was noted with 12 bird species which were common at both the said locations. Crow Pheasant, Cattle Egret and Common Myna were recorded during maximum number of their feeding observation with Indian Peafowl as compared to other bird species (Table 3). Johnsingh had mentioned similar findings on feeding association between Indian Peafowl and King Crow^[10]. There was no interaction observed between Indian Peafowl and mammalian species during study period. Johnsingh & Murali reported that Indian Peafowl fed on a wide range of crops such as groundnut, tomato, paddy, chilly and bananas in the cultivated areas^[5]. Berries and drupes of plants such as *Carissa*, *Lantana*, *Zizyphus* and wild figs (*Ficus*) were favored foods of Indian Peafowl^[11]. Our results matched with results published by other workers Sathyanarayana, Johnsingh regarding feeding of Indian Peafowl in different habitat and association with other birds^[6]^[10]. Drisdelle had reported that Indian Peafowl fed on snakes and kept these venomous animals away from human communities^[19]. No such observation was made during our study.

Table 1: Different types of plants and vegetation consumed by Indian Peafowl

	Common name	Scientific name	PAU Campus	Village Baranhara
Crops	Mustard	<i>Brassica campestris</i>	Flowers, leaves	Flowers, leaves
	Paddy	<i>Oryza sativa</i>	Leaves	Leaves
	Berseem	<i>Trifolium alexandarium</i>	Leaves	Leaves
	Wheat	<i>Triticum aestivum</i>	Leaves	Leaves
	Matar	<i>Pisum sativum</i>	Flowers, Leaves	--
Wild Plants	Congress grass	<i>Parthenium hysterophoresus</i>	Flowers, Leaves	--
	Bathu	<i>Chenopodium album</i>	Flowers, leaves	Flowers, leaves
Trees	Bargad	<i>Ficus benghalensis</i>	Flowers, fruit	--
	Pear	<i>Pyrus communis</i>	Fruit, Leaves	--
	Pilkhan	<i>Ficus rumphii</i>	Flowers, fruit	--

Table 2: List of animals consumed by Indian Peafowl

Common name	Order/family
Beetles	Coleoptera
Grass hopper	Orthoptera
Bugs	Hemiptera
Termite	Isoptera
Ant	Hymenoptera
Earthworm	Oligocheata
House worm	Diptera
Garden Lizard	Lacertilia
Small Snake	Ophidia

Table 3: Bird species found in association with Indian Peafowl at feeding site

Common name	Scientific name
Crow Pheasant	<i>Centropus sinensis</i>
Cattle Egret	<i>Bubulcus ibis</i>
Common Myna	<i>Acridotheres tristis</i>
Yellow legged Pigeon	<i>Columba pallidiceps</i>
House Crow	<i>Corvus splendens</i>
Black Ibis	<i>Pseudibis papillosa</i>
Rose ringed Parakeet	<i>Psittacula krameri</i>
Common Babbler	<i>Turdoides caudate</i>
Red-wattled Lapwing	<i>Vanellus indicus</i>
Little brown Dove	<i>Spilopelia senegalensis</i>
Grey Partridge	<i>Perdix perdix</i>
Pond Heron	<i>Ardeola grayii</i>

At location I, the sites preferred by Indian Peafowl were surveyed where they spent maximum time of day and night for roosting. There was maximum diversity of tree type i.e why they preferred tall trees with dense foliage, or thorny trees for roosting. Veeramani reported similar observations that Indian Peafowl preferred dense foliaceous species for roosting [20]. Ali and Ripley had reported that large birds used tall trees and small birds need small trees for roosting [3]. Johansgard mentioned similar results that Indian Peafowl (*Pavo cristatus*) roosted on tall trees [9]. Same observations were given by Bergmann and Johansgard that Indian Peafowl preferred tall trees for roosting [21, 9]. During our observations, Indian Peafowl was found basking in the sun during morning and like resting in shaded areas during the hot afternoon. During night, they roosted on tree tops. It might be related to their safety from predators or the paucity of buildings. Kushwaha and Kumar had given similar observations that Indian Peafowl preferably roosted on high, open trees so that they could get vision from all directions and they generally selected the tallest trees for roosting in order to protect themselves from the tree-climbing, night predators such as the leopard and other cats [22]. Indian Peafowl was noticed resting

under the shades during noon time observations and its behavior differed in the evening observations. It seemed to have preference for open areas in the evening hours. They were found to prefer trees like Kikar, Eucalyptus, Pear, Poplar, Lasura, Amaltas, Peepal, Jamun, Mango, Banyan, Pilkhan, Dhek for roosting (Table 4). All these were stout branched trees which could afford moving space, accommodating their long train feathers as well as could withstand their weight. The roost tree height ranged from 8-23m and the roost height varied between 7-18m. Similar observations were given by Dodia that Indian Peafowl roosted mainly on *Azadiracta indica*, *Ficus bengalensis*, *Eucalyptus* and *Cocos nucifera* in Gujarat state [23]. Ali and Ripley mentioned that Indian Peafowl regularly roosted on the same tree for generations [8]. Different workers had also done detailed work on roosting of Indian Peafowl [13, 24].

At location II, observations revealed that Indian Peafowl preferred rooftops of the residential houses and other buildings (schools, panchayat etc.). Kushwaha and Kumar had given similar observations that Indian Peafowl were seen roosting on buildings during the day time [22]. Majority of males were found to roost in solitary or in single rather than in association with other flock members (Table 4). In the present study, Indian Peafowl were observed roosting in selected locations during their inactive period (i.e., noon and in late evening hours) on dominant tree species (Table 4). During the present study, Indian Peafowl seemed to be communal rooster at location I and solitary rooster at location II. The reasons behind these observations could not be ascertained. It might be related to the undisturbed habitat at location I while location II was primarily of residential area. Roof tops of residential area and official buildings like government schools were preferred roosting sites at location II but no such observation were not recorded at location I. No significant relationship was found between the number of Indian Peafowl / observation at both the said locations. Trivedi had mentioned the similar results on roosting behavior of Indian Peafowl [25].

Table 4: Roosting sites of Indian Peafowl

S. No.	Trees/ Building/ Houses	Scientific name	PAU Campus	Village Baranhara	Approximate Tree height (m)		Approximate Roost height (m)		Maximum number of Indian Peafowl/ observation	
					PAU Campus	Village Baranhara	PAU Campus	Village Baranhara	PAU Campus	Village Baranhara
1	Eucalyptus	<i>Eucalyptus globules</i>	+	+	23.0	20.0	16.0	17.0	6	4
2	Pear	<i>Pyrus communis</i>	+	--	12.0	--	10.0	--	2	--
3	Poplar	<i>Populus populous</i>	+	+	21.0	20.0	17.0	18.0	4	3
4	Lasura	<i>Cordia myxa</i>	+	--	15.0	--	12.0	--	2	--
5	Amaltas	<i>Cassia fistula</i>	+	--	17.0	--	12.0	--	2	--
6	Kikar	<i>Acacia nilotica</i>	+	--	16.0	--	13	--	3	--
7	Banyan tree	<i>Ficus bengalensis</i>	+	--	21.0	--	17.0	--	3	--
8	Peepal	<i>Ficus religiosa</i>	+	+	20.0	20.0	14.0	15.0	5	4
9	Pilkhan	<i>Ficus virens</i>	+	--	17.0	--	13.0	--	4	--
10	Jamun	<i>Syzygium cumini</i>	+	--	18.0	--	16.0	--	1	--
11	Mango	<i>Mangifera indica</i>	+	--	10.0	--	8.0	--	2	--
12	Dhek	<i>Melia azedarach</i>	+	+	8.0	8.0	7.0	7.0	4	2
13	Buildings / houses	--	+	+	15.0	20.0	12.0	18.0	8	8

Z value = +.0606^{NS}

NS= Non-significant

4. Conclusion

It could be concluded that the wide feeding range and diversity in its roosting preferences of Indian Peafowl might have enabled it to occupy different sub habitat types within the agricultural landscape both in villages, semi urban and

semi forest areas of Punjab. Further ecological and behavioral studies should be conducted on Indian Peafowl so as to better understand its ecological niche in formulating its conservation strategies in different niches of agro ecosystem.

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