Comparative studies on avian communal Roosts and Roosting behavior from suburban habitat of Vaijapur (MS) India

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ABSTRACT

Although a number of accounts of Indian birds make incidental references to the roosting behaviour, no systematic account of this phenomenon has as yet been presented. In fact, the various published accounts of communal roosting are all based on example selected to illustrate a particular point there is no any account which deals with the avifauna of any region as whole. Thus, the local area of Vaijapur (MS) seeking for the through study of communal roosting for the avifauna. During study period from July 2004 to June 2007 explored local area and located communal roosts of 12 different birds species like *Acridotheres tristis, Corvus splenddens, Pavo cristatus*, *Egreta garzetta*, *Psittacula krameri*, *Columba livia*, *Sturnus roses, Apus affinis*, *Turdoides caudatus, Streptopelia decaocto, Sturnus pagodarum* and *Hirundo rustica* from the area through continuous observations found that these divergent food habits and habitation birds assembled together and formed antipredatory mixed roosts.

Key words: Roosts, roosting behavior, companion species, habitat, food habit, resident status.

INTRODUCTION

Vaijapur City is located at 19°55'N 74°44'E/19.92°N 74.73°E. It is situated on the Narangi River. Vaijapur is located 514m (1,666 ft) above sea level on the western margin of the Deccan plateau. Vaijapur It is bordered by the Nashik districts to the west, Kannad tehsil to the north, Gangapur tehsil to the east, and Ahmednagar districts to the south. Vaijapur is the headquarters of Vaijapur tehsil and also known as the Gateway of Marathwada.

Most of the birds arrived at their nocturnal roosts around sunset and left around sunrise. During late afternoon and early evening, we were therefore able to determine the locations of roosts observing the flight paths of birds by following the general directions of their movements. We recorded birds roosting near human habitation, roadside roosts, in the field and around wetlands. The visits provided data on group sizes, species present at roosts, roosts characteristics and timing of the birds arrive to and departure from the roosts. At most of the times, our direct line-of-sight was perpendicular to the flight paths of birds arriving into or departing from roosts, 1.5 hr before sunset and 0.5 hr before sunrises. These data provide quantitative description of arrival and departure of birds including group size, species composition and timing of arrival and departure. The observations on time of awakening, movements near the roosts and the time of departure of the first bird and of all the successively departing birds up to the last bird were made in the morning during successive few min intervals roughly between 05.30 and 07.30 hrs. These observations were carried out fortnightly at one communal roost of each species from the local area. For confirmation, we repeated pre-roosting and post-roosting behavioral observations of birds of the area. We also followed systematic account of communal roosting of birds (Gadgil and Ali, 1975), but with sequencial number as in the checklist of local area.

MATERIALS AND METHODS

Our study based on the methods described by Gadgil and Ali, 1975. They provided summary of communal roosting habits of some of the common species of Indian birds as-

a) Whether the habit of communal roosting is constant through out the year or seasonal.
b) Whether, when formed, the communal roost is small in size, medium, large or enormous.
c) Whether the roost includes members of only one species or mixed.
d) If the species associates with the other species in forming a mixed communal roost, then the sequential number of the species it occurs with the mixed roosts.

Roosts location

During study period altogether we located 7 roosts of Indian common myna *Acridotheres tristis,* 7 of House crow *Corvus splenddens*, 4 of Indian peafowl *Pavo cristatus*, 6 of Little egret *Egreta garzetta*, 5 of Rose-ringed parakeet *Psittacula krameri*, 3 of Blue rock pigeon *Columba livia*, 3 of Rosy starling *Sturnus roses*, 2 of House swift *Apus affinis*, roosts of common babbler *Turdoides caudatus* in large numbers and single isolated roosts of Eurasian collard-dove *Streptopelia decaocto,* Brahminy myna *Sturnus pagodarum*, House swallow *Hirundo rustica*.

This communal roosting account is restricted to a few of those species observed in local area and it was based on our field study during three year study period from July 2004 to June 2007.

1) Indian Peafowl Pavo cristatus
(a) C; (b) S; (c) P; (d) –
2) Rose-ringed Parakeet Psittacula krameri
(a) C; (b) S; (c) X; (d) 95
3) House Swift Apus affinis
(a) C; (b) L; (c) P; (d) -
4) Blue rock Pigeon Columba livia
(a) C; (b) S-L; (c) P; (d) -
5) Eurasian collard Dove Streptopelia decaocta
(a) C; (b) S; (c) X; (d) 40
6) Little egret Egreta garzetta
(a) C; (b) S; (c) X; (d) 60, 64
7) House Crow Corvus splendens
(a) C; (b) M-L; (c) X; (d) 82, 95
8.) Common Myna Acridotheres tristis
(a) C; (b) M-L; (c) X; (d) 81, 82, 96, 105
9.) Brahminy Myna Sturnus pagodarum
(a) Z; (b) S; (c) X; (d) 95
10.) Rosy Starling Sturnus rosesus
(a) Z; (b) M; (c) P; (d) –
11.) House Swallow Hirundo rustica
(a) Z; (b) E; (c) P; (d) –
12.) Common Babbler Turdoides caudatus
(a) C; (b) S; (c) P; (d) –

RESULTS AND DISCUSSION

As per our field studies it was generally observed that all birds showed a characteristics behaviour pattern at the roosting whether it is pure or mixed. This systematic account of bird species which roost communally included with diverse habit and habitats (Table 1). Such divergent food habits and habitation birds assembled together and formed mixed roosts. Such mixed roosts included mostly resident as well as resident migratory and local migratory birds in less numbers. It included birds, which were purely granivorous, carnivorous, scavengers and omnivorous. Which were commonly found in various habitats including human habitation (urbanized), cultivation, little or thin forests, countryside, scrub and shrubs, marshes, shallow water and open grasslands. It was also seen that birds of similar habits differs in the communal roosting place (Table 1).

Generally all birds show characteristic behaviour pattern at the roosting whether it is pure or mixed. Rose ringed parakeet *Psittacula krameri* – Parakeet approached towards roosts in pair or small groups. They make sound in the fly way towards roosts. All birds follows same flyway and aggegates at the roosts, accompanied by *Acridotheres tristis, Columba livia* and *Sreptopelia senegalensis*.

But Doves, Pigeons used independent nest at the same locality. Around sunrise parakeet were early arisers and flies on a nearest tree such as mango, and after some time depart towards feeding arena.

Eurasian collard Dove *streptopelia decaocto*– Observation on this birds showed that around 1-2 hrs before sunset, these birds assembled together on the trees like Babul with little brown dove *streptopelia senegalensis*.

Little Egret *Egreta garzetta*- Roosts of the *Egreta garzetta* were on such trees, surrounded by water on all sides, mostly on babul, or the branches of a large tree over hanging water, such as chinch. These trees were also used by Cattle Egret *Bubulcus ibis*, grey heron *Ardea cinerea*.

House Crow *Corvus Splendens*– This bird was mostly found countryside and human habitation, where they made their communal roost with common myna *A. tristis*, Jungle crow *C. macrorhynchos*.

Table 1: Constant mixed roosting companions of selected birds of local area at their locations.

Communal rooster and companion species	Habitat	Food habit	Resident status	Roost No.						
				1	2	3	4	5	6	7
1) Rose–ringed Parakeet *Psittacula krameri*										
Acridotheres tristis	I,II,II,IV,V	O	R	P	P	-	-	P	-	-
Columba livia	I, II, IV,V	O	R	-	P	P	P	-	-	-
2) Eurasian collard Dove *Streptopelia decaocto*										
Streptopelia enegalensis	I,II,III	G	R	P	-	-	-	-	-	-
3) Little Egret *Egretta garzetta*										
Ardea cinerea	VI,VII	C	RM	-	-	P	P	P	P	-
Bulbulcus ibis	II,VI	C	RM	P	P	P	P	P	P	-
4) House Crow *Corvus splendens*										
C.macrorhynchos	IV, V	C	R	P	P	P	P	-	P	P
Acridotheres tristis	I,II,III,IV,V	O	R	P	-	P	P	P	P	-
5) Common myna *Acridotheres tristis*										
Corvus splendens	V	S	R	P	-	P	P	P	P	P
Sturnus pagodarum	II,V	O	LM	P	P	-	-	P	-	P
Pycnonotus cafer	II,III	O	R	-	P	P	P	-	-	P
6) Brahminy Myna ***Sturnus pagodarum***										
Acridotheres tristis	I,II,III,IV,V	O	R	P	-	-	-	-	-	-

Common Myna *Acridotheres tristis* - As per our observations at 7 different roosts, Common Myna also approaches towards roosts either in pairs or in small group around the time of sunset when number of arriving myna increases vocalize loudly till they finally rest for the night. This resting accompainied by Brahminy Myna *Sturnus pagodarum* and Red-vented Bulbul *Pycnonotus cafer* for few hours*,* and permanently by House Crow *Corvus splendens.* After the period of rest, they slowly become active in the early morning by vocalizing and vacate the roost around the time of sunrise in small groups to various directions for day activities. This roosts of Common Myna included companions of different habit and habitats. Therefore there was not too much competition for food and territory, such roosts provides protection against enemies. Brahminy Myna *Sturnus pagodarum*- Only one mixed temporary roost of Brahminy myna *S. pagodaram* observed with Common myna *A. tristis* during afternoon on a tree. Besides we also observed isolated pure roost of Rosy starling *Sturnus rosesus*, which was seasonal, with medium size, Blue rock Pigeon *columba livia* with constant, large roost ; Indian Peafowl *Pavo cristatus* showed constant, small roost at 4 locations, roost of *Hirundo rustica* was seasonal with enormous individuals constant, large roosts of *Appus affinis* and many such isolated pure roosts of Common Babbler *Turdoides caudatus*.

Communal roosting is a behaviour that occurs in diverse orders and families (Gadgil and Ali 1975), but is has been of particular interest to ornithologists (Eiserer, 1984; Mahabal and Vaidya, 1989, Mahabal and Bastwade, 1991). Numerous studies have investigated avian communal roosting in order to identify its ecological function and aid in the management of bird species that community affect or are affected by humans. Descriptive studies have been carried out on times of entrance to and departure from roost (Mahabal, 1992). Numerous studies have investigated avian communal roosting in order to identify its ecological function and aid in the management of bird species that commonly affect or are affected by humans.

Descriptive studies focused on times of arrival and departure from roosts (Krantz and Gauthreaus, 1975; Post, 1982; Mahabal and Vaidya, 1989; Verma, 2006). Preferred roosts characterists, and site fidelity (Eiserer, 1984; Engel and Young, 1992; Gorenzel and Salmon, 1992; 1995), other studies have sought ultimate explations for communal roosting, examining the benefits of foraging (Gochfield and Burger, 1982; Caccamise and Morrison 1986, Morrison and Caccamise, 1990; Richner and Heeb, 1995; Mahabal 1997), predator avoidance (Ludwing and Rowe, 1990; Wrong and Dixon, 1991; Lima, 1995; Mahabal, 1997), and thermoregulation (Eiserer 1984 and Mahabal, 1997).

In the study area, Rose ringed parakeet *Psittacula krameri*, Eurasian collard Dove *Streptopelia decaocto*, Little Egret *Egreta garzetta,* Common Myna *Acridotheres tristis,* House Crow *Corvus splendens* were abundant. These birds slept in communal noctural roosts at different location in the study area. These birds were found in different habitats and with different feeding habits.

Such communal roositng habit of birds of diverse order and families and with the diversity of habit and habitat summarized by Gadgil and Ali (1975); Allen and Young (1982); Eiserer (1984).

Avian communal roosting has received a great deal of attention, another common grouping behaviour, closely associated with these roosts such as feeding efficiency, antipredatory function, population regulation and social significance (Mahabal and Vaidya, 1989; Mahabal, 1993 a and b). Many activities associated with communal roosting have been a popular subject studied (Khera and Kalsi, 1986; Mahabal, 1990; Kyle *et al*., 2003; Verma, 2006) such as the studies on flock structure, directional route, population fluctuations, preroosting gathering and communal displays, diurnal rhythms in the awakening and roosting activities, intra- and interspecific assemblages during day and night, mixed roosting and the social behaviour in number of avian species. Many species of diurnally active bird's, congragate in larger groups at night, than during their principle daytime activity period (Allen and Young 1982, Eiserer 1984). The resulting nocturnal roosting aggregations vary in species composition from single species to multi-species groups (Gadgil 1972; Eiserer, 1984). In addition, the degree to which given roosting locations are repeatedly used varies, ranging from traditional locations that remain unchanged through time, to highly variable locations chosen a new each night (Eiserer, 1984).

Present investigation remarked isolated pure roosts of Rosy Starling *Sturnus rosesus*, which was seasonal, medium; Blue rock pigeon *Columba livia* which was constant large; Indian Peafowl *Pavo cristatus* constant and small; House Swallow *Hirundo rustica* seasonal, enormous; and common Babbler Turdoides caudatus constant and small at various locations in the study areas which showed similarity as summaried by Gadgil and Ali (1975).

Various other workers studied communal roosts of different birds, Earned Dove *Zenaida auriculata* (Lord and Yunes, 1986); *Acridotheres tristis* (Mahabal and Vaidya, 1989; Mahabal, 1993a and b) in different ways. In the study area *A. tristis* made communal roost mostly with house crow, Brahminy Myna and *Pycnonotus cafer* as observed by Mahabal and Bastawde (1991) remarked with more than 30 species; whereas Gadgil and Ali (1975) remarked the roosts of *A. tristis* with only Rose-ringed parkeet *Psittacula krameri* and House crow *Corvus splendens*.

Gadgil and Ali (1975) noted isolated pure roosts of Ring Dove Streptopelia decaocto, which were constant and small; and Brahminy myna *Sturnus pagodarum* constant throughout year with small to medium size roost. Whereas in the present study area these roost were mixed roost. Ring Dove *S. decaocto* made mixed roost with little brown Dove *S. senegalensis* and it was also permanent and small. While Brahminy Myna *S. pagodurum* formed mixed roosts with *Acridotheres tristis* but it was seasonal or temporary and small.

Some workers have been discussed the causes and significance of communal and mixed roost of birds. The most notable being that, the causes may differ for the origin versus maintenance of nocturnal aggregation behaviour (Eiserer, 1984; Weatherhead, 1983). Further more, the causes of aggregation may be multiple and may differ among areas of habitat, much as the reasons for joining communal roosts may differ among individuals (Weatherhead, 1983). Khera and Kalsi (1986), pointed out that the Bank Myna and associated species at mixed roost respond readily to each other's alarm call, which is an efficient antipredator mechanism.

Other studies have sought ultimate explanations for communal roosting, examined the benefits of foraging and predator avoidance (Wright, 1996; Wagner, 1993; Lord and Yunes, 1986; Rawley, 1986; Raffaele, *et al*., 1998). One of the most characteristics features of large number of bird species is their habit of living in aggregations of many individuals (Wallace, 1959). A number of bird species of diverse orders and families and with a diversity of habits and habitats roosts together for at least a part of the year. In a few cases such social roosting may be a simple consequence of paucity of suitable roosting sites forcing the birds to crowd together. However, in majority of cases of communal roosting the birds associate together through some social attraction and do not disperse even if alternative roosting sites are available. Some of these social groups merely comprise feeding or migratory flocks which remain together outside the roosting time as well (Gadgil and Ali, 1975).

Like wise in the present investigation various communal and mixed roosting associations have developed a system of antipredatory warning signals, during study period it was observed when we or any predator approached to roost these birds particularly made alarm calls, as result various other associates get warned.

LITERATURE CITED

Allen HL and Young LS, 1982. *An annotated bibliography of avian communal roosting*. Washington State Game Dept, Olympia, Washington

Caccamise DF and Morrison DW, 1986. Avian communal roosting: implications of diurnal activity centers. *Am. Nat.,* **128**: 191-198.

Eiserer L, 1984. Communnal roosting in birds. *Bird Behav*., **5**: 61-80

Engel KA and Young LS, 1992. Movements and habitat use by common ravens from roost sites in south western Idaho. *J. Wildl Manage*, **56**: 596-602.

Gadgil M, 1972. The function of communal roosts: relevance of mixed roosls. *Ibis.*, **114**: 531-533.

Gadgil M and Salim Ali, 1975. Communal roosting habits of Indian birds. *J BNHS.,* **72**(3): 716-727.

Gochfield M and Burger J, 1982. Feeding and enhancement by social attraction in the Sandwich Tern. *Behav. Eco. Sociobiol.,* **10**: 15-17.

Gorenzel WP and Salmon TP, 1992. Urban crow roosts in california. *Proc. Vertebr. Pest conf.,* **15**: 97-102.

Gorenzel WP and Salmon TP, 1995. Characteristics of American crow urban roosts in california. *J. Wildl. Manage,* **59**: 638-645.

Khera S and Kalsi RS, 1986. Waking and roosting behaviour of the Bank Myna Acridotheres ginginianus in Chandigarh and surrounding areas. *Pavo*., **24**(1/2): 55-68.

Krantz PE and Gauthreaux SA, 1975. Solar radiation light intensity and roosting behaviour in birds. Ibis **87**: 91-95.

Kyle E, Harms and J R Eberhard, 2003. Roosting behaviour of the Brown-throwted Parakeet Aratinga pertinax and roost locations on four southen caribbean islands. *Ornithologia Neotropical*, **14**: 79-89.

Lima SL, 1995. Back to the basics of anti-predatory vigilance: the group-size effect. *Anim. Behav*., **49**: 11-20

Lord RD and Yunes F, 1986. Colonial breeding of the earned dove Zenaida auriculata in north western Venezuela. *Vida Silvestre Neotrop*., **1**: 62-67

Ludwig D and Rowe L, 1990. Life history strategies for energy gain and predator avoidance under time constraints. *Am Nat*., **135**: 686-707

Mahabal A, 1990. Spatial and temporal fluctuations in the population of Common Myna *Acridotheres tristis* (Linn) in and around Indian city. *J. BNHS.,* **87**: 392-398

Mahabal A, 1992. Diurnal Intra-and interspecific assemblages of Indian Mynas. *Biovigyanam*, **18**(2): 116-118

Mahabal A, 1993 a. Seasonal changes in the flocking behaviour of Indian Myna *Acridotheres tristis* (linn). *Biovigyanam*. **19**(1): 55-64

Mahabal A, 1993 b. Communal display behaviour of Indian Myna *Acridotheres tristis* (Linn). *Pavo.,* **31** (1 and 2):45-54.

Mahabal A, 1997. Communaal roosting in Common Myna *Acridotheres tristis* and its functional significance. J BNHS 94 342-349.

Mahabal A and Bastawde DB, 1991. Mixed roosting associates of Indian Myna *Acridotheres tristis* in Pune city, India. *Pavo,* **29**(1 and 2): 23-32.

Mahabal A and Vaidya VG, 1989. Diurnal rhythms and seasonal changes in the roosting behaviour of Indian Myna *Acridotheres tristis* (Linn). *Proc Indian Acad sci (Anim sci),* **98**(3): 199-209.

Morrison DW and Caccamise DF, 1990. Comparison of roost use by three species of communal roost mates. *Condor.*, **92**: 405-412.

Post W, 1982. Why do grey kingbirds roost communally? *Bird Behav*., **4**: 46-49.

Raffaele HJ, Wiley O, Garrido A, Keith and J Raffale, 1998. A guide to the birds of the West Indies. Princeton Uni Press, Princeton, New Jersey.

Rawley I and Chapman G, 1986. Cross-fostering, imprinting and learning in two sympatric species of Cockatoo. *Behaviour*., **96**: 1-16

Richner H and Heeb P, 1995. Communal life: honest signalling and the recruitment centre hypothesis. *Behav, Ecol.,* **7**: 115-119

Verma A, 2006. Preliminany observations on the ecology of Harriers (circus sp) roosting at Hessarghata, North Bangalore in Karnataka, South India with special reference to Eurasian Marsh Harrier *Circus aeruginosus*. *Ind Forester,* **132**(3): 337-344.

Wagner RH, 1993. The pursuit of extra pair copulation by female birds: a new hypothesis of colony formation. *J. Theor. Biol.,* **163**: 333-346.

Wallace GJ, 1959. An introduction to ornithology. 3rd eds The Macmillion Company. NewYork

Weatherhead P, 1983. Two principal strategies in avian communal roosts. *Ameri. Nat.,* **121**: 237-243.

Wright TF, 1996. Regional dialects in the contact call of a parrot. *Proc. R. Soc. Lond Ser. B. Biol. Sci.,* **263**: 867-872.

Wrona FJ and Dixon RWJ, 1991. Group size and predation risk: a field analysis of encounter and dilution effects. Am. Nat., **137**: 186-201.

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