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Avifaunal diversity in Dharmapuri Forest Division, Tamil Nadu, India.

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Abstract

A preliminary survey of avifauna was carried out in the Dharmapuri Forest Division, Tamil nadu, India. Totally 109 species belonging to various foraging guilds were recorded. Six of those species are listed in Schedule I of Wildlife Protection Act 1972, India. Based on the findings conservation recommendations are given.

Key words: Avifauna, Diversity, Dharmapuri, Frugivores, Nesting fees, Nectarivores

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INTRODUCTION

Recording of avian diversity is one of the ways to assess conservation importance of an area. Birds are one among the bioindicators of a healthy Forest Division. Vegetation characteristics such as flowering plants, fruit bearing bees and nesting bees are major factors that attract birds to an area. With this view, a preliminary survey of birds was carried out in the Dharmapuri Forest Division, Tamil Nadu, India.

STUDY AREA

Dharmapuri is an inland district of Tamil Nadu, India, which lies along the tri-junction of Karnataka, Andhra Pradesh and Tamil Nadu States,India. It is mainly an undulating rugged terrain in the middle, surrounded by hill ranges, on the north and northwest the Mysore plateau, on the east Javadi hill range, and on the south Chitteri and Shevaroy hill ranges. The main rivers flowing through the district are Pambar, Ponnaiyar and Chinnar rivers. The Cauvery River flows along the South-western boundary of the district. The soil in the forest region is stony and gravelly excepting for the presence of alluvium to a limited extent on the banks of the major streams and rivers in their lower reaches. Hence, the prevailing locality factors in the forest division are not conducive to warrant the growth of luxuriant vegetation. A few of the regular reserved forests occurred in the division, especially in Dharmapuri range *via* Parigam, Thoppur, Kalappambadi, etc.,

Dharmapuri forest division is situated in the north western portion of the state lying between latitudes N 11 ^{0} 47′ and 12 ^{0} 53′ and longitudes E 77 ^{0} 28′ and 78 ^{0} 45′ (Fig. 1). It has a total area of 9619 km^2 which is divided into three taluks. The forests of this region form part of Eastern Ghats. The altitude ranges from 380 to 1395 m above mean sea level. Guttirayan is the highest peak in the mountain range (1395.10 m above msl). River Cauvery bounds it on the west and is joined by the Sanatkumarnadi, which flows through the North-western portion of the district. The climate of this region is mainly tropic and the region receives maximum rainfall from southwest monsoon. The mean annual atmospheric temperature is 26.37 ^{o}C. Dharmapuri

Fig. 1. Study Area with location of transects laid for the survey.

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Forest Division consists of four forest ranges i.e. Dharmapuri, Pennagaram, Palacode and Hogenakkal.

METHODS AND MATERIALS

Line transect method was applied for recording the birdlife communities in the study area as mentioned by Bibby *et al*. (1992), Collar et al. 1994 and Sutherland (1996).Totally 33 one kilometer transects were laid in four forest ranges namely, Palacode (n=9), Hogenakkal (n=5), Dharmapuri (n=11) and Pennagaram (n=8). The length and numbers of one kilometer transects were selected based on topography, vegetation physiognomy and the availability of the area. Survey was conducted in randomly selected transect lines both in morning and evening for 30 days. Based on the visibility of the researcher the search was done on both sides with the help of 10x50 m field binoculars from transect.. The identification of birds were done by using Ali and Ripley (1989),Grimmett *et al*. (1998) and Balasubramanian and Vijayan (2004) .

Bird Community

During the survey, a total of 109 bird species were recorded while feeding the fruits, nectar, insect etc., (Table 1). Among these, 20 bird species were water birds and the remaining 88 bird species were terrestrial. Twelve bird species were frugivorous (11%) and among the remaining 97 birds that belonged to other feeding guilds, 4 species were nectarivore (4%), 12 species were grainivores (11%), 64 species were

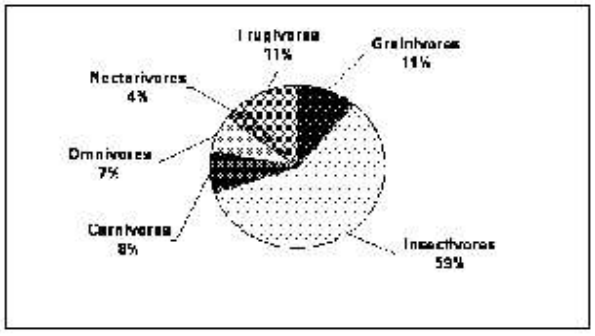

Fig.2. Guild-wise status of bird community in the study area

insectivores (59%) , 9 species were carnivores (8%) and 8 species were omnivores 7% (Fig 2).

Pollinator birds

The nectar feeding birds recorded were Purple-rumped Sunbird, Purple Sunbird, Loten's Sunbird and Tickell'sFlowepecker. These birds are expected to play a major role in the pollination of their nectar yielding plants in the study area.

Seed dispersing birds

A total of 14 species of fruit-eating birds were recorded in eight plant species. Except the parakeets, all other species are likely to disperse the seeds, as parakeets usually digest the seeds and hence they are considered as seed predators. Bulbuls, Mynas, Indian Grey Hornbill and starlings were found to be the major frugivores in the study area. A total of 10 bird species visited *Ficus benghalensis* with Red-vented Bulbul, Common Myna and Asian Koel being the most frequent visitors. Eight species visited the fleshy fruit *Azadirachta indica* and Red-vented Bulbul, White-browed Bulbul, Common Myna and Indian Grey Hornbill were the most frequent visitors. Indian Grey Hornbill bird species are the major seed dispersal agent in the Hogenakkal forest area. *Syzygiumcuminii*attracted 4 species of birds among which Red-vented Bulbul, Common Myna and Asian Koel formed the most frequent visitors. The number of birds species recorded in the small fruits *of Fluggea leucopyrous* were 5 and the most frequent visitors were Red-vented Bulbul, White-browed Bulbul, Red-whiskered Bulbul and Common Myna. Red-vented Bulbul and Asian Koel birds were that visited *Zyziphus trinervia*. Exotic plant *Lantana camara* attracted 8 bird species that included Bulbuls, Mynas and Starlings. These species are expected to play an important role in seed dispersal in the study area.

Nesting trees

Seven plant species were recorded as bird nesting trees in entire forest division. These plant species include *Acacia nilotica, Acacia leucophloea, Acacia ferruginea, Acacia ferneesiana, Prosopis juliflora, Albizia amara* and*Randia deumatorum*. Birds such as Baya weaver and Munia were constructed their nests in *Acacia ferneesiana* and *Prosopis j uliflora,* respectively in the Thoppur forest area. In *Acacia leucophloea*, sunbird nests were recorded at Palacode Range. Bulbuls are constructed their nest on *Acacia sp.* throughout the forest division, whereas the Jungle Myna's nests were recorded on concrete wall cavities of railway bridge in Thoppur forest area. Some birds such as barbets, woodpeckers, starlings, hornbill, parakeets and roller constructed their nests on top of tree cavities. *Melia dubia, Syzygium cumini, Albizia amara, Albizzia lebbeck, Tamarindus indica* and *Ficus* spp, in the study area.

Maximum richness of bird species was observed in Pennagaran forest range with 101 species followed by Hogenakkal (n=95). Lowest values of Evenness of birds were observed in Dharmapuri forest range. The evenness values of other three ranges following more or less same values. The maximum diversity values, both Shannon-Weiner and Hill's diversity were observed in Pennagaran range followed by Hogenakkal (Table 2)

Table 1. List of birds recorded in the Dharmapuri Forest Division

S. No.	Common Name	Zoological Name	Family	Schedule of Wildlife Protection Act, 1972
1	Ashy Prinia	*Priniasocialis*	**Sylviinae**	IV
2	Ashy-Crowned Sparrow-Lark	*Eremopterixgrisea*		IV
3	Asian Koel	*Eudynamysscolopacea*		IV
4	Baya Weaver Bird	*Ploceusphilippinus*	**Ploceinae**	IV
5	Baybacked Shrike	*Laniusschach*	**Laniidae**	IV
6	Black Drongo	*Dicrurusmacrocercus*	**Dicruridae**	IV
7	Black Kite	*Milvusmigrans*		I
8	Black-headed Munia	*Lonchuramalacca*	**Estrildidae**	IV
9	Black-headed Oriole	*Oriolusxanthornus*	**Oriolidae**	IV
10	Black-Shouldered Kite	*Elanuscaeruleus*		IV
11	Blue Rock Pigeon	*Columba livia*	**Columbidae**	IV
12	Blue-bearded bee-eater	*Nyctyornisathertoni*		IV
13	Brahminy Kite	*Haliastur Indus*	**Accipitridae**	I
14	Brahminy Starling	*Sturuspagodarum*	**Sturnidae**	IV
15	Brainfever bird	*Hierococcyxvarius*		IV
16	Bush Lark	*Mirafraassamica*	**Alaudidae**	IV
17	Cattle Egret	*Bubulcus ibis*		IV
18	Chestnut-headed bee-eater	*Merops leschenaultia*		IV
19	Common Babbler	*Turdoidescaudatus*	**Timaliinae**	IV
20	Common Buttonquail	*Turnixsylvatica*	**Turnicidae**	IV
21	Common Indian Nightjar	*Caprimulgusasiaticus*	**Caprimulgidae**	IV
22	Common Myna	*Acridotherestristis*		IV
23	Common Peafowl	*Pavocristatus*		I
24	Common Sandpiper	*Tringaglareola*	**Scolopacidae**	IV
25	Common Woodshrike	*Tephrodornispondicerianus*		IV
26	Copper-smith Barbet	*Megalaimahaemacephala*	**Capitonidae**	IV
27	Crested Tree-swift	*Hemiprocnecoronata*	**Apodidae**	IV
28	Cuckoo	*Cuculuscanorus*	**Cuculidae**	IV
29	Darter	*Anhinga melanogaster*	**Anhingidae**	IV
30	Emerald Dove	*Chalcophapsindica*		IV
31	Forest Eagle-Owl	*Bubo bubo*		IV
32	Forest Wagtail	*Motacillaindica*		IV
33	Franklin's wren-warbler	*Priniahodgsonii*		IV
34	Golden Oriole	*Oriolusoriolus*		IV
35	Gold-fronted Chloropsis	*Chloropsisaurifrons*		IV
36	Greater Coucal	*Centropussinensis*		IV
37	Grey Francolin	*Francolinuspondicherianus*		IV
38	Grey Jungle fowl	*Gallus sonneratii*		IV
39	Hen Harrier	*Circus macrourus*		IV
40	Hoopoe	*Upupaepops*	**Upupidae**	IV

S. No.	Common Name	Zoological Name	Family	Schedule of Wildlife Protection Act, 1972
41	House Crow	*Corvus splendens*		IV
42	House Sparrow	*Passer domesticus*	**Passerinae**	IV
43	House Swift	*Apu saffinis*		IV
44	three toed Woodpecker	*Dinopium javanense*	**Picidae**	IV
45	Indian Grey Hornbill	*Ocycerosbirostris*	**Bucerotidae**	I
46	Indian Robin	*Saxicoloides fulicata*	**Turdinae**	IV
47	Indian Roller	*Coracias benghalensis*	**Coraciidae**	IV
48	Iora	*Aegithina tiphia*	**Irenidae**	IV
49	Jungle Babbler	*Turdoides striatus*		IV
50	Jungle bush-Quail	*Perdicula asiatica*	**Phasianidae**	IV
51	Jungle Crow	*Corvus macrorhynchos*		IV
52	Jungle Myna	*Acridotheres fuscus*		IV
53	Kestrel	*Falco tinnunculus*	**Falconidae**	IV
54	Large Cormorant	*Phalacrocorax carbo*	**Phalacrocoracidae**	IV
55	Large Cuckoo-Shrike	*Coracina melanoptera*	**Campephagidae**	IV
56	Malkoha	*Phaenico phaeustristis*		IV
57	Large Pied Wagtail	*Motacilla maderaspatenis*	**Motacillidae**	IV
58	Little Cormorant	*Phalacrocorax niger*		IV
59	Little Egret	*Egretta garzetta*		IV
60	Little Grebe	*Tachybaptu sruficollis*	**Podicipedidae**	IV
61	Loten's Sunbird	*Nectarinia lotenia*		IV
62	Magpie Robin	*Copsychus saularis*		IV
63	Median Egret	*Mesophoyx intermedia*		IV
64	Mottled Wood Owl	*Strix leptogrammica*		IV
65	Night Heron	*Nycticorax nycticorax*		IV
66	Oriental Turtle-Dove	*Streptopelia orientalis*		IV
67	Paradise Flycatcher	*Terpsiphone paradisi*	**Monarchinae**	IV
68	Pied Buschat	*Saxico lacaprata*		IV
69	Pied Crested Cuckoo	*Clamator jacobinus*		IV
70	Pied Kingfisher	*Ceryle rudis*		IV
71	Plain Prinia	*Priniai ornata*		IV
72	Pond-Heron	*Ardeo labacchus*	**Ardeidae**	IV
73	Purple Sunbird	*Nectarinia minima*	**Nectariniidae**	IV
74	Purple-rumped Sunbird	*Nectarinia zeylanica*		IV
75	Raven	*Corvus corax*		IV
76	Red turtle Dove	*Streptopelia tranquebarica*		IV
77	Red-vented Bulbul	*Pycnonotus cafer*	**Pycnonotidae**	IV
78	Red-wattled lapwing	*Vanellus indicus*	**Charadriidae**	IV
79	Red-whiskered Bulbul	*Pycnonotus jocosus*		IV
80	Rose-ringed Parakeet	*Psittacula krameri*	**Psittacidae**	IV

S. No.	Common Name	Zoological Name	Family	Schedule of Wildlife Protection Act, 1972
81	Ruddy Kingfisher	*Halcyon coromanda*		IV
82	Scarlet Minivet	*Pericrocotus flammeus*		IV
83	Shikra	*Accipiter badius*		I
84	Small blue Kingfisher	*Alcedo meninting*	**Alcedinidae**	IV
85	Small Green bee-eater	*Merops orientalis*	**Meropidae**	IV
86	Small Green-billed Malkoha	*Phaenicophaeus viridirostris*		IV
87	Small Minivet	*Pericrocotus cinnamomeus*		IV
88	Small Yellow-Naped Woodpecker	*Picus xanthopygaeus*		IV
89	Small-green Barbet	*Megalaima viridis*		IV
90	Spotted Babbler	*Pellorneum ruficeps*		IV
91	Spotted Dove	*Streptopelia chinensis*		IV
92	Spotted Munia	*Lonchura punctulata*		IV
93	Spotted Owlet	*Athene brama*	**Strigidae**	IV
94	Swallow	*Hirundo rustica*	**Hirundinidae**	IV
95	Tailorbird	*Orthotomus sutorius*		IV
96	Thickbellied Flowerpecker	*Dicaeum agile*		IV
97	Tickell's Blue Flycatcher	*Muscica patickelliae*	**Muscicapinae**	IV
98	Tickell's Flowerpecker	*Dicaeum erythrorhynchos*	**Dicaeidae**	IV
99	Treepie	*Dendrocitta vagabunda*	**Corvidae**	IV
100	White Wagtail	*Motacilla alba*		IV
101	White-bellied Drongo	*Dicrucus caerulescens*		IV
102	White-breasted Kingfisher	*Halcyon smyrnensis*		IV
103	Whitebreasted Waterhen	*Amaurornis phoenicurus*	**Rallidae**	IV
104	White-browed Bulbul	*Pycnonotus luteolus*		IV
105	White-browed Fantail Flycatcher	*Rhipidura aureola*		IV
106	White-headed Babbler	*Turdoides affinis*		IV
107	White-rumped Shama	*Copsychus malabaricus*		IV
108	Yellow Wagtail	*Motacilla flava*		IV
109	Yellow-eyed Babbler	*Chrysomma sinense*		IV

Bird-attracting plants

A total of 12 plant species were found to be most attractive to birds (Table 3). Among the 12 species, maximum number of birds visited the fruits of *Ficus benghalensis, Ficus microcarpa, Lantana camara, Azadirachta indica*, followed by *Fluggea leucopyrous, Syzygium cumini and Ficus religiosa*.

Conservation Recommendations of Avifauna

Eventhough it was the first comprehensive bird survey in Dhrampuri forest division, it yielded very impressive results. Present survey recorded six species listed under schedule I Wildlife Protection Act 1972. Based on our study, the following conservation recommendations are given.

❖Major forest type in Dhrampuri Forest Division is scrub and mixed dry deciduous. Due to lack of fruiting species, the avifaunal diversity is less in this division.

Table 2. Bird's diversity in DharmapuriForest Division

Locality	Species Richness	Shannon-Weiner Diversity	Hill's Diversity	Evenness
Pennagaram	101	4.1007	60.3825	0.8885
Hogenakkal	95	4.0346	56.5203	0.886
Palakode	88	3.9445	51.6505	0.881
Dharmapuri	84	3.7843	44.0049	0.8541

Hence, large number of bird attracting plant species can be planted in the forest area by various programmes Tamil Nadu Afforestatio Programme (TAP), National Afforestation Programme (NAP), Social forestry,) for attracting avifauna. The following native tree species are suggested for planting.

1. *Ficus* spp.
2. *Ixora arborea*
3. *Ziziphusmauritiana*
4. *Vitex altissima*
5. *Canthiumdicoccum*
6. *Gmelina arborea*
7. *Brideliaretusa*
8. *Grewiatiliifolia*
9. *Azadirachta indica*
10. *Drypetes roxburghii*
11. *Pterocarpus* spp.
12. *Syzygium cumini*
13. *Schleichera oleosa*
14. *Diospyros montana*

❖Indian Grey Hornbill (*Ocycerosbirostis*) is recorded along the banks of river Cauvery at the area. Since, it is the key stone species for forest regeneration its food and nesting trees have to be maintained for this species along river Cauvery and its environs. The following species are the preferred food and nesting trees of Indian Grey Hornbill are suggested for planting.

1. *Terminalia arjuna*
2. *T. bellirica*
3. *Melia dubia*
4. *Mangifera indica*
5. *Syzygium*s pp.
6. *Ficus* spp.
7. *Drypetes roxburghii*
8. *Disopyros montana*
9. *Vitex altissima*
10. *Azadirachta indica*

❖River Cauvery is the only perennial water body for water birds in this division. Hence, the diversity of water birds is very less. The fishing activities and recreational coracle riding are the major threat for water birds of tourism zone in Hogenakkal range. These activities have to be minimized to increase water bird population in this region.

❖Alternative water bodies such as ponds and lakes may be created inside the forest area for sustainability of water birds in Hogenakkal region, which attracts the water birds from other regions, as will.

❖The available data on avifauna in Dharmapuri Forest Division is inadequate. Hence, thorough scientific study and documentation has to be made to conserve them.

❖A data base on avifauna found in Dharmapuri Forest Division can be created and maintained by the Forest Department to conserve them.

Table 3. Bird attracting plants during the study period in the study area

S. No.	Name of the plant	Habit	Visitors recorded
1	*Ficus benghalensis*	Tree	8
2	*Ficus microcarpa*	Tree	8
3	*Azadirachta indica*	Tree	8
4	*Lantana camara*	Shrub	8
5	*Fluggea leucopyrus*	Shrub	5
6	*Syzygium cumini*	Tree	4
7	*Ficus religiosa*	Tree	3
8	*Zyziphus trinervia*	Tree	3
9	*Ficus religiosa*	Tree	3
10	*Solanum pubescens*	Shrub	3
11	*Toddalia asiatica*	Straggler	3
12	*Ziziphus oenoplia*	Straggler	3

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