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Studies on Avifauna of Attappady and Anaikatty, Western Ghats, Southern India

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Abstract
Bird population studies were done using fixed width line transect method. A total of 13 transects were laid for the study, where five were in AHADS plantation sites, five in AHADS biomass sites and three sites are located in Anaikatty A total of 108 species of birds belonging to 36 orders were recorded from the study sites in Attappady and Anaikatty. Of these 47 species were insectivores (42%), 17 species were omnivores (15%), 14 species were frugivores (13%).

Keywords: Avifauna, Attappady, Anaikatty, Western Ghats

1. Introduction
Studies on the structure of bird communities have gained considerable attention over the past five decades (Cody 1974; Wiens 1989) [4, 12]. Several reviews of the vast literature on ecology of bird communities are available (Cody 1974; Perrins and Birkhead, 1983, Keast 1990) [4, 10, 7]. Systematic studies on birds of Indian sub-continent dates back to the 19th century and most of these studies were concerning taxonomy, distribution and natural history (Ali and Ripley 2001) [1]. However ecological information at community level is scanty (John Singh and Joshua, 1994, Pramod 1995, Gokula 1998, Nirmala 2002) [6, 11, 5, 8]. Birds are important components of forest ecosystem playing a major role as pollinators, consumers and dispersers of plant seeds and predators of insects. An understanding of the determinants of bird community structure is extremely important for the practical development of guidelines for the habitat management.

2. Study Area
2.1 The study areas were Attappady and Anaikatty
Attappady is one of the important tribal tracts of Kerala. It is one of the two extensive east sloping plateaus in the Western Ghats, which stretches from Mukkali to Anaikatty and Thazhemully to Muthikulam over an area of 745 km2. Attappady is located at the Middle East portion of Kerala State between 10º 55' and 11º 14' North latitude and between 76º 27' 11" and 76º 48' 8" East longitude stretching over an area of 745 sq. km. Plantation sites are the area planted taken by AHADS (Attappady hills area development society), while biomass sites are the area which have good vegetation and is being protected by AHADS.
Another study area was the mixed dry deciduous forests of Anaikatty hills of Nilgiri Biosphere Reserve, Western Ghats. The area extends from 76 º 39' and 76 º 47' E and from 11º 5' to 11º 31' N Coimbatore.

3. Methodology
Bird population was estimated using variable width line transect method following Bibby *et al* (2000) [2]. Variable-width transect was selected because of its robustness and sampling efficiency, detection of more species and individuals. A kilometer length of thirteen permanent transects were laid and marked at every 10m distance. Of the 13 transects, five are in AHADS plantation sites, five in AHADS biomass sites and three sites are located in Anaikatty. Census was carried out once in a month in each transect, early in the morning half an hour after sunrise. During the census walk, all birds seen or heard in each transect were recorded. This data was used to estimate the relative abundance, species diversity and species richness of birds.

4. Results

Birds were classified into various guilds based on Ali & Ripley (2001) [1]. A total of 108 species of birds belonging to 36 families were recorded from the study sites in Attappady and Anaikatty (Table .1). Of these 47 species were insectivores (42%), 17 species were omnivores (15%), 14 species were frugivores (13%).

Species richness values were 66, 67, 66, 71 and 71 were recorded in the I year, II year, III year, IV year, V year plantation sites respectively. Species richness values were recorded as 91, 90, 91, 95, and 94 respectively in the Ist year, IInd year, IIIrd year, IV year and V year biomass sites. (Table 1) As the plantation sites had only some trees and more saplings, it was less frequented by birds. In the case of biomass sites, as it harbours more trees, shrubs; it could attract more birds. Species richness of birds in three Anaikatty sites includes 96, 103, and 93. The bird survey results clearly show that birds are more in the control sites in Anaikatty as vegetation is dense here. Birds commonly seen in AHADS sites are bulbuls, mynas, barbets and babblers.

Bird species richness and diversity values (Table.1, 2) indicate that the biomass sites (T6-T10) support higher number of bird species. Since these sites are having different life forms with medium sized trees, small trees, shrubs, and climbers and exotic plants such as *Lantana camara* and bird attracting plants like *Premna tomentosa*, *Diospyros montana, Canthium dicoccum Fluggea virosa, Flacourtia indica, Cipadessa baccifera*, *Cassine glauca Ziziphus oenoplia*, *Benkara malabarica Scutia myrtina, Carmona retusa, Breynia rhamnoides* etc support higher number of birds when compared to the plantation (T1 – T5) transects. The control sites T11 – T13 harbor highest diversity of bird species and this is due to undisturbed condition of forests.

47% of the birds in the AHADS plantation sites are insectivores, while only 18% of the birds are frugivores and 14% of the birds are omnivores, 10% of them are nectarivore, 8% of them are granivore, while 2% of the birds were carnivore and 1% was piscivore. (Figure.2) The insectivore community dominated in the AHADS biomass sites also with 44%, while the frugivores were 20%, the omnivore community were 14%, followed by 9% of granivore, while 7% of the birds were nectarivore, 5% of the birds were carnivore and 1% was piscivore. The insectivore community dominated the Anaikatty sites also with 44%, while the frugivorous birds were increased to 22%, the omnivore community were 14%, followed by 9% of granivore, while 7% of the birds were nectarivore, 3% of the birds were carnivore and 1% was piscivore.

Table 2: Species richness of birds in the study area

Transect	# bird species
Plantation site	
1	66
2	67
3	66
4	71
5	86
Biomass site	
6	91
7	90
8	91
9	95
10	94
Reserve forest	
11	96
12	101
13	93

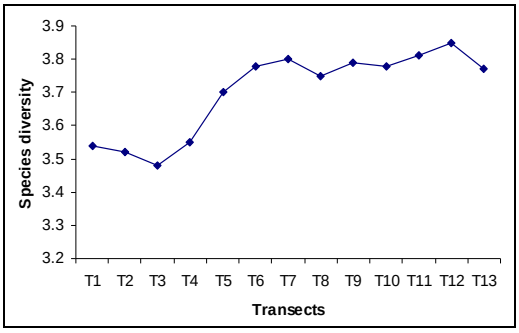

Fig 1: Species diversity of birds in the study area

S. No	Bird Species	Scientific name	Order	Guild	Status
1	Ashy Drongo	*Dicrurus leucophaeus*	Dicururidae	I	LM
2	Ashy Prinia	*Prinia socialis*	Muscicapidae	I	LM
3	Ashy-crowned Finch-lark	*Eremopterix grisea*	Alaudidae	I	R
4	Asian Koel	*Eudynamys scolopacea*	Cuculidae	F	R
5	Asian Palm-swift	*Cypsiurus balasinensis*	Apodidae	I	R
6	Asian Paradise Flycatcher	*Terpsiphone paradisi*	Muscicapidae	I	R
7	Bay-backed Shrike	*Lannius vittatus*	Laniidae	I	R
8	Black Bulbul	*Hypsipetes madagascariensis*	Pycnonotidae	F	LM
9	Black Drongo	*Dicrurus macrocercus*	Dicruridae	I	R
10	Black-headed Oriole	*Oriolus xanthornus*	Oriolidae	O	R
11	Black Kite	*Milvus migrans*	Accipitridae	O	LM
12	Black-winged Kite	*Elanus caeruleus*	Accipitridae	C	LM
13	Black-headed Munia	*Lonchura malacca*	Ploceidae	G	R
14	Blue-winged Parakeet	*Psittacula columboides*	Psittacidae	GF	R
15	Blyth's reed Warbler	*Acrocephalus dumetorum*	Muscicapidae	I	RM
16	Booted Warbler	*Hippolais caligata*	Muscicapidae	I	LM
17	Brahminy Kite	*Haliastur indus*	Accipitridae	C	R
18	Brahminy Myna	*Sturnus pagodarum*	Sturnidae	F	LM
19	Brown Shrike	*Lanius cristatus*	Laniidae	I	M
20	Brown-capped Pigmy Woodpecker	*Dendrocopos nanus*	Picidae	I	LM
21	Bushlark	*Mirafra affinis*	Alaudidae	I	LM
22	Chestnut-headed Bee-eater	*Merops leschenaulti*	Meropidae	I	LM
23	Common Rosefinch	*Carpodacus erythrinus*	Fringillidae	G	M
24	Common Tailorbird	*Orthotomus sutorius*	Muscicapidae	I	R

25	Common Wood Shrike	*Tephrodornis pondicerianus*	Campephagidae	I	R
26	Common Hawk Cuckoo	*Hierococcyx varius*	Cuculidae	I	LM
27	Common Indian Nightjar	*Caprimulgus asiaticus*	Caprimulgidae	I	RM
28	Common Iora	*Aegithina tiphia*	Irenidae	I	R
29	Common Myna	*Acridotheres tristis*	Sturnidae	O	R
30	Coppersmith Barbet	*Megalaima haemacephala*	Capitonidae	F	R
31	Crimson-throated Barbet	*Megalaima rubricapilla*	Capitonidae	F	LM
32	Emerald Dove	*Chalcophaps indica*	Columbidae	GI	LM
33	Forest Eagle Owl	*Bubo nipalensis*	Strigidae	C	LM
34	Forest Wagtail	*Dendronanthus indicus*	Motacillidae	I	RM
35	Franklin's Prinia	*Prinian hodgsonii*	Muscicapidae	I	LM
36	Gold-fronted Chloropsis	*Chloropsis aurifrons*	Irenidae	NI	R
37	Golden Oriole	*Oriolus oriolus*	Oriolidae	O	RM
38	Great Tit	*Parus major*	Paridae	I	LM
39	Greater Coucal	*Centropus sinensis*	Cuculidae	O	R
40	Greenish Leaf Warbler	*Phylloscopus trochilioides*	Muscicapidae	I	M
41	Grey Jungle Fowl	*Gallus sonneratii*	Megapodiidae	O	R
42	Grey Wagtail	*Motacilla cinerea*	Motacillidae	I	R
43	Grey-headed Bulbul	*Pycnonotus priocephalus*	Pycnonotidae	FI	LM
44	Hoopoe	*Upupa epops*	Upupidae	I	R
45	House Crow	*Corvus splendens*	Corvidae	O	R
46	House Swift	*Apus affinis*	Apodidae	I	LM
47	House Sparrow	*Passer domesticus*	Passerinae	G	LM
48	Baya Weaver bird	*Ploceus philippinus*	Ploceidae	G	LM
49	Indian Cuckoo	*Cuculus micropterus*	Cuculidae	I	RM
50	Indian Hanging Parrot	*Loriculus vernalis*	Psittacidae	N	LM
51	Indian Little Brown Dove	*Streptopelia senegalensis*	Columbidae	G	R
52	Indian Peafowl	*Pavo cristatus*	Megapodiidae	O	R
53	Indian Pitta	*Pitta brachyura*	Pittidae	I	RM
54	Purple-rumped Sunbird	*Nectarinia zeylonica*	Nectariniidae	N	R
55	Purple Sunbird	*Nectarinia asiatica*	Nectariniidae	N	R
56	Indian Robin	*Saxicoloides fulicata*	Turdinae	I	R
57	Indian Roller	*Coracias benghalensis*	Coraciidae	C	LM
58	Indian Rufous Babbler	*Turdoides subrufus*	Muscicapidae	F	LM
59	Indian Treepie	*Dendrocitta vagabunda*	Corvidae	O	R
60	Indian White-breasted Kingfisher	*Halcyon smyrnensis*	Alcedinidae	PI	LM
61	Jungle Babbler	*Turdoides striatus*	Muscicapidae	O	R
62	Jungle Bush Quail	*Perdicula asiatica*	Phasianidae	C	LM
63	Jungle Crow	*Corvus macrorhynchos*	Corvidae	O	R
64	Jungle Myna	*Acridotheres fuscus*	Sturnidae	F	R
65	Large Green Barbet	*Megalaima zeylanica*	Capitonidae	F	R
66	Large Pied Wagtail	*Motacilla maderaspatensis*	Motacillidae	I	LM
67	Lesser Golden-backed Woodpecker	*Dinopium javanense*	Picidae	I	R
68	Little Scaly-bellied Green Woodpecker	*Picus xanthopygaeus*	Picidae	I	R
69	Long Tailed Shrike	*Lanius schach*	Laniidae	I	R
70	Loten's Sunbird	*Nectarinia lotenia*	Nectariniidae	N	R
71	Nilgiri Flycatcher	*Eumyias albicaudata*	Muscicapidae	I	LM
72	Oriental Magpie Robin	*Copsychus saularis*	Muscicapidae	I	R
73	Painted Bush-quail	*Perdicula eyrthrorhyncha*	Megapodiidae	O	R
74	Pied Buschat	*Saxicola caprata*	Muscicapidae	I	LM
75	Plain-coloured Flowerpecker	*Dicaeum concolor*	Dicaeidae	NFL	LM
76	Plain Prinia	*Prinia inornata*	Muscicapidae	I	R
77	Pompadour Green Pigeon	*Treron pompadora*	Columbidae	F	R
78	Red-rumped Swallow	*Hirundo daurica*	Hirundinidae	I	RM
79	Red-spur Fowl	*Galloperdix spadicea*	Megapodiidae	O	LM
80	Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	F	R
81	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	F	R
82	Rose-ringed Parakeet	*Psittacula krameri*	Psittacidae	F	LM
83	Rosy Minivet	*Pericrocotus roseus*	Campephagidae	I	R
84	Rufous- bellied Babbler	*Dumetia hyperythra*	Muscicapidae	I	R
85	Rufous-backed Shrike	*Lanius schach*	Muscicapidae	I	LM
86	Scarlet Minivet	*Pericrocotus flammeus*	Campephagidae	I	RM
87	Shikra	*Accipiter badius*	Accipitridae	C	LM
88	Singing Bush-lark	*Mirafra cantillans*	Alaudidae	I	R
89	Small Green-billed Malkoha	*Phaenicophaeus leschenaultii*	Cuculidae	O	R
90	Small Blue Kingfisher	*Alcido atthis*	Alcedinidae	PI	R
91	Small Green Bee-eater	*Merops orientalis*	Meropidae	I	LM
92	Small Green Barbet	*Megalaima viridis*	Capitonidae	F	R

93	Small Minivet	*Pericrocotus cinnamomeus*	Campephagidae	I	LM
94	Small Sunbird	*Nectarinia minima*	Nectariniidae	N	R
95	Indian Blue Rock Pigeon	*Columba livia*	Columbidae	G	R
96	Indian Grey Partridge	*Francolinus pondicerianus*	Megapodiidae	GI	R
97	Spotted Dove	*Streptopelia chinensis*	Columbidae	G	R
98	Spotted Munia	*Lonchura punctulata*	Ploceidae	G	RM
99	Spotted Owlet	*Athene brama*	Strigidae	O	RM
100	Thick-billed Flowerpecker	*Dicaeum agile*	Dicaeidae	FLF	RM
101	Tickell's Flowerpecker	*Dicaeum erythrorhynchos*	Dicaeidae	FLF	RM
102	White-browed Bulbul	*Pycnonotus luteolus*	Pycnonotidae	F	R
103	White-headed Babbler	*Turdoides affinis*	Muscicapidae	O	R
104	White-bellied Drongo	*Dicrurus caerulescens*	Dicruridae	I	RM
105	White-bellied Treepie	*Dendrocitta leucogastra*	Corvidae	I	LM
106	Yellow Wagtail	*Motacilla flava*	Motacillidae	I	RM
107	Yellow-eyed Babbler	*Chrysomma sinense*	Muscicapidae	I	R
108	Yellow-fronted Pied Woodpecker	*Dendrocopos mahrattensis*	Picidae	I	R

5. Discussion and Conclusion

As the study was conducted in disturbed, undisturbed areas, bird diversity was seen more in the undisturbed sites than the disturbed sites. Similar results were seen in the studies carried out by (Nirmala 2002) [8]. Species richness too is highest in undisturbed forest. The difference between undisturbed and disturbed areas in species richness and abundance increased with the species richness of the habitat, mainly because habitat specialists or forest interior species are more sensitive to disturbance (Canterbury *et al*., 2000; Pattanavibool and Dearden, 2002) [3, 9]. In the plantation sites and biomass sites insectivores were recorded more followed by the frugivores. In the anaikatty sites also insectivores were dominant then followed by the frugivores. Fleshy fruit yielding trees must be planted more in the plantation, biomass sites to attract more frugivores and also it will help in the seed dispersal. Conservation measures are needed to maintain good vegetation and hence it naturally increases the bird community.

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