

Diversity and Migratory Status of Birds in the Human Inhabited areas of Thattekkad Bird Sanctuary, Ernakulam Dist., Kerala, India

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Abstract—Thattekkad Bird Sanctuary is the first bird sanctuary in Kerala and is a haven for nature lovers and Bird watchers with a wide variety of flora and fauna. World famous ornithologist Dr. Salim Ali recognized the species richness of this sanctuary and declared it as the richest one he had ever seen. A total of 16,372 birds belonging to 14 orders and 37 families were reported in the present study, carried out in the human inhabited areas of the sanctuary. Family Ardeidae showed highest Relative Diversity (RD) while 14 families showed the least value. Migratory status of birds revealed that 62% were Residents, 13% Residents or Local Migrants (R/LM), 10% Local Migrants(LM), 8% Migrants(M), 6% Resident Migrants(RM) and only 1% was Migrant or Local Migrant(M/LM). Guild status study shows that 31% of birds constitute Insectivores, 30% Omnivores, 19% Carnivores, 5% Nectarivores and 2% Piscivores respectively. Thus major population was dominated by insect feeding birds which help to control and check the population outburst of pests thereby acting as efficient Bio-control agents to the farmers which tend to reduce the application of chemical insecticides and pesticides, improving and maintaining the health of soil as well as all the living organisms depending on it including human-beings.

1. INTRODUCTION

Avifaunal diversity is one of the most important biotic components for any type of ecosystem (Dhindsa & Saini, 1994). Avian fauna acts as an important bio-indicator (Centerbur *et al.* 2000) that assesses different habitats qualitatively as well as quantitatively. Birdlife recorded worldwide over 10,000 different species of birds and India stands at 7th position with 88 threatened bird species over the world (Bird-Life International, 2010). The present study deals avian fauna, Relative Diversity, Migratory and Guild status of birds in the human inhabited areas of Thattekkad Bird Sanctuary.

Thattekkad Bird Sanctuary(TBS) falls between 10° 7' and 11° N latitude and 76° 40' and 76° 45'E longitude. The altitude ranged from 40m to 523m. and TBS is located at Kothamangalam Taluk of Ernakulam District, Kerala state, India and The Sanctuary is having well defined boundaries. Sanctuary covers an area of 25. 16 Sq. Km., out of which 9Sq.

Km come under human inhabited area which lies almost at the foothills of the Western slopes of the Western Ghats. This world famous sanctuary owes much of its fame to the internationally renowned Ornithologist, Dr. Salim Ali.

2. STUDY AREA

The study area selected for the present study is the human inhabited land area within the Thattekkadbird sanctuary cultivated, with diverse kinds of crops, spread in around 9 kms. Six plots of three hectares each were selected for the present study each with different cultivated crops.

3. METHODOLOGY

Direct observation and line-transect methods were involved and observations were made once in a week in the morning hours (8am -10am) for three years (March 2015-April 2018) in the selected six plots on either side of the transect. The Relative Diversity of different families were calculated using the equation.

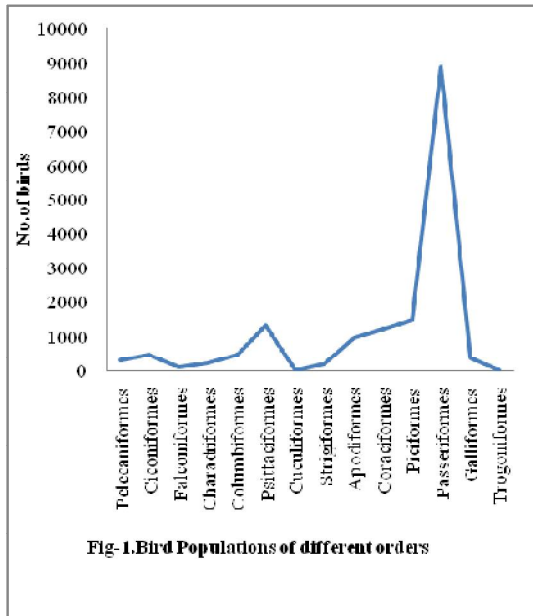
$$\text{Relative diversity (RD)} = \frac{\text{Number of species in a family}}{\text{Total Number of species}} \times 100$$

4. RESULTS AND DISCUSSIONS

4. 1. Status

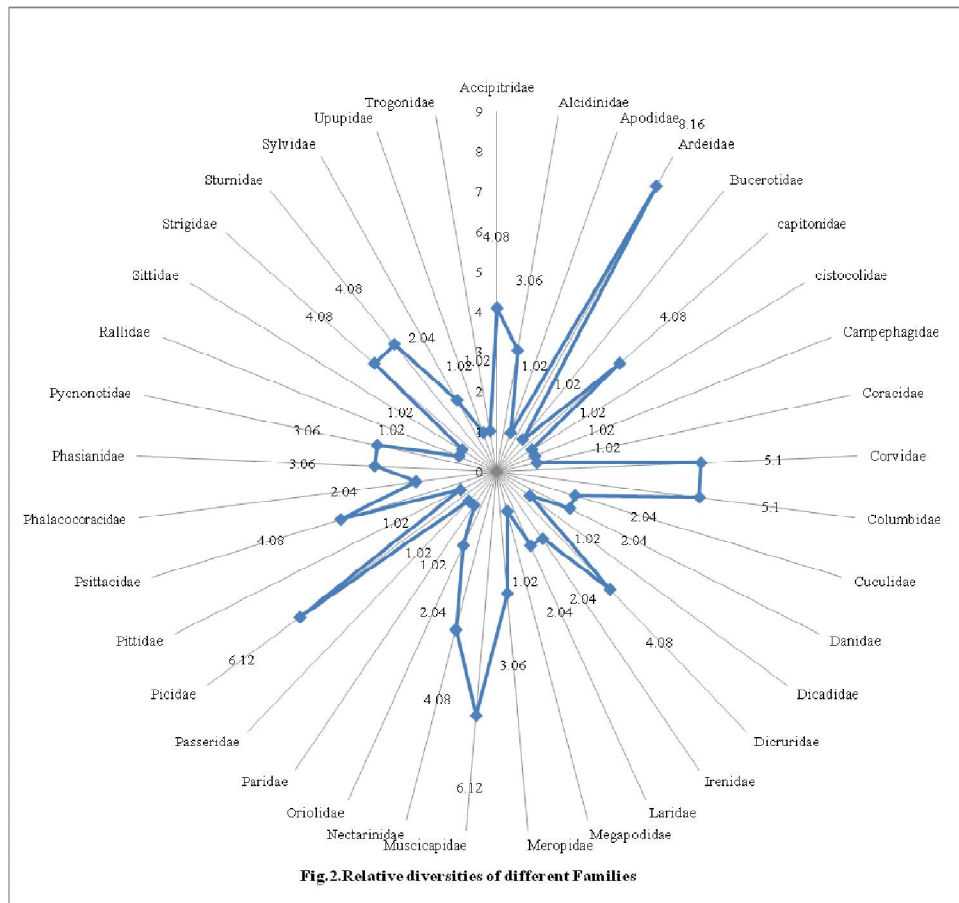
Total about 98 species of birds belonging to 14 orders and 37 families were reported from the study area during the study period. Of these two species were Near Threatened ones like River Tern and Blossom headed Parakeet; while two species come under Vulnerable category (Nilgiri Wood pigeon & Ruby throated bulbul) and the rest 94 species belonged to Least Concern category(IUCN list). 60 species were found to be purely resident forms whereas 6 species were Migratory species which include Greenish reed warbler, Blyth's reedwarbler, Indian pitta, Pea hen, Golden oriole and Ashy drongo and the rest found to be Local Migratory or Resident

Migratory forms. Of the 14 orders, Order Passeriformes occupies more than 50% of birds reported while least by 9 orders as shown in figure. 1



4.2. Relative Diversity (RD)

Relative diversities(RD) of all the 37 families were calculated using the number of species of each family and the total number of species observed using the equation and was depicted(Fig. 2.). It was observed that family Ardeidae had the highest RD value (8. 16), followed by two families Muscipidae & Picidae (6. 12), Corvidae & Columbidae (5. 1), and 7 families with RD value of 4. 08 and least value was represented by the rest 14 families (1. 02).



4. 3. Migratory status

It was observed that 62% of the total observed birds were Residents, 13% were Residents or Local Migrants (R/LM), 10% Local Migrants(LM), 8% Migrants(M), 6% Resident Migrants(RM) and only 1% were Migrant or Local Migrant(M/LM) status(fig. 3). As majority of the birds were residents, they will be present within the habitat in the entire year whereas the migrant birds present in the human inhabited areas of the Thattekkad bird sanctuary is only 8% and so those birds will visit the study area only in the specific months of the year. Only 1% of the observed birds was Migratory or Local migratory, migrate only for a short distance, occupied by a single species of bird ie., Greyheaded Myna.

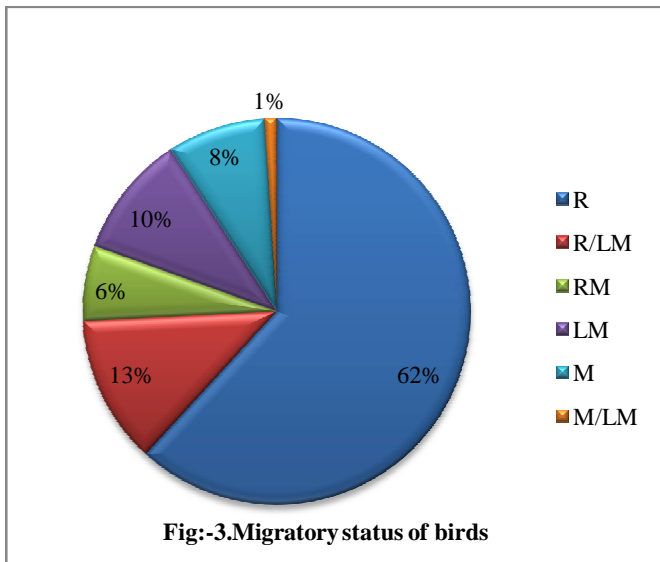


Fig.-3.Migratory status of birds

Ali conducted the first scientific study in Thattekkad Bird Sanctuary, during 1930s and recorded 163 species of birds. Sugathan(1984) conducted ringing camps for a period of four months in and around the sanctuary and conducted bird census and reported 221 species from Thattekkad Bird Sanctuary. Later Sugathan and Aby (1996) reported 270 species of birds from the sanctuary, Of which about 40% were migratory, while the others were resident or local migrants. The study also reported 30 species of water birds.

Karunakaran *et al.*, (2015) made a habitat assessment of Mangalavanam Bird sanctuary, Kerala and reported 95 species of birds belonging to 15 orders and 42 families, out of which 69 species are residents, 13 were Local migrants and the rest were Winter visitors.

4. 4. Feeding guild

Birds feed on different kind of food items, based on which different categories are there. In the present study, The guild status of observed birds revealed that almost 31% of birds were Insectivores, fed on insects and grubs while 30% were Omnivores, fed on insects, worms and other vegetable matter

like nectar, fruit pulp etc. ., 19% of birds belonged to Carnivorous category fed on purely animals, both small and large ones. Nectar fed birds contribute about 5% followed by Picivorous birds (2%) fed on fishes (Fig. 4).

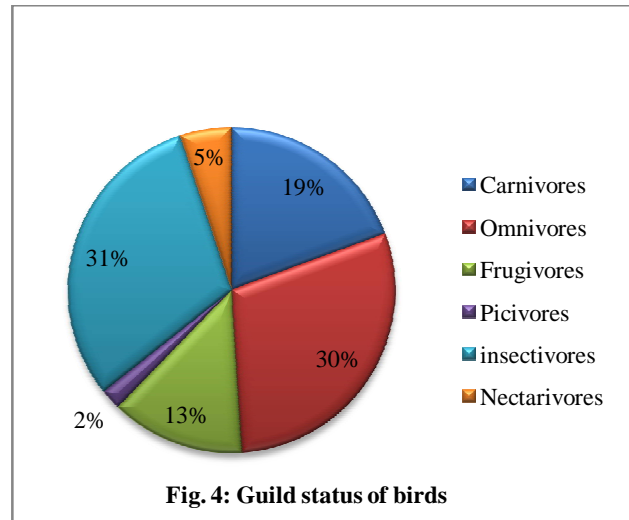


Fig. 4: Guild status of birds

Harisha & Hosetti (2009) studied the diversity and distribution of avifauna of Bhadra Wildlife Sanctuary found the Community structure of the birds was dominated by insectivorous species (49%) and those with mixed diet constituting of fruit, as well as grainy, nectar, and insects were the next ones contributing 25% of the total avifauna, while omnivorous, carnivorous, frugivorous and granivorous contributed 11%, 9%, 3% and 3%, respectively with almost the same dominance as the mixed diet. Saikia and Devi (2011) studied the avifauna of Eastern Himalayan biodiversity Hotspot area of Jeypore Reserve Forest and listed 270 species of birds belonging to 56 families of which 58 species were frugivorous, 34 species omnivorous, 15 species carnivorous, 22 species piscivorous, 5 granivorous and 136 species were insectivorous ones. Of the total birds, 14 species were Globally Threatened and 5 were endemic.

Uthaman (1998) conducted a survey on avian diversity in Eravikulam National Park and reported 94 bird species within the Protected Area. Vinitha. P (2014) studied on the avian diversity of Pampadum Shola National Park and reported a total of 63 species of birds, of which 53 species were residents, 7 were migrants and rest 3 species were Local migrants.

5. CONCLUSION

From the present study, it was clear that out of 98 species observed, family Ardeidae had highest Relative Diversity Index value while seven families showed lowest values of 1.02 each. About 62% of birds reported were resident ones utilizing the habitat entirely and permanently for various life-assisted activities whereas Migrant birds constitute only 8%. The Guild status revealed a higher dominance of Insectivorous

birds, followed by Omnivorous ones which also include insects as their food item, which help us to infer that these birds help to control and check insect population thereby minimize the pests and pathogens of plants and crops, acting as “Bio-control agents”. Agricultural ecosystem provides a concentrated and highly predictable source of food to many birds which include grains, seeds, fruits, green vegetation of the crop plants and grasses, insects, other arthropods and rodents found in the soil, crops and other plants. Birds that feed on harmful insects and other pests from the agro-ecosystem are beneficial to agriculturists. Therefore important predators like insectivorous birds need to be encouraged in the agro-ecosystem by use of appropriate management practices.

Insectivorous birds are ubiquitous, essential components of terrestrial ecosystem which not only have considerable influence on the behavior and ecology of their invertebrate prey, but also modify population dynamics and even evolution of plants through indirect effects. Insectivorous birds act as Natural pest control agents, components of integrated pest management and indicators of healthy agro-ecosystem. Proper awareness and conservation measures should be provided to local people living within the sanctuary regarding the significance of these birds.

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