



Assessment of Avian Biodiversity in Peruvannamuzhi Forest, Kozhikode (Kerala)

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ABSTRACT: Anthropogenic activities in the forest landscapes influences the floral and faunal communities which resulted the affected ecosystem biodiversity. In Kozhikode district, the moist deciduous region Peruvannamuzhi forest is a part of Malabar wildlife sanctuary. Based on point count sampling (PCS) method, during spring migratory bird season the survey was conducted at 20 different sampling stations between 2017 to 2019 (March and April). Forty different avian species were observed during the study period which belongs to Passeriformes, Columbiformes, Coraciiformes, Pelecaniformes, Piciformes, Galliformes, Apodiformes, Bucerotiformes, Psittaciformes, Trogoniformes and Accipitriformes families. Among the 40 bird species, 30 species belong to least concern (LC) status and one species *Ocyrceros griseus* belongs to vulnerable IUCN status. In future, the species richness and diversity index is to be studied.

Keywords: Peruvannamuzhi forest, Avian biodiversity, IUCN, point count sampling method.

INTRODUCTION

Avian population has a central role in ecosystem functioning and ecosystem services. Aquatic and terrestrial birds are considered as the bioindicators of the ecosystem which significantly representing the health status of the environment. They are essential for the ecosystem integrity by maintaining the various other species population. Forest and farmland environment requires birds as either pest controller or pollinating agents. Eventually it has pivotal role as notable pollinators and seed dispersal agents (Mulwa *et al.*, 2012; Whelan *et al.*, 2008).

Birds are uricotelic which excretes uric acid as a nitrogenous waste which played a vital role in soil formation and environmental nutrient cycle. Restoration and recolonization of the affected ecosystem are the major function of the avian species (Sekercioglu 2006; Şekerciöğlü *et al.*, 2004). (Lundberg *et al.*, 2003) reported the energy transformation either within or among the ecosystem, the avian species act as a mobile line especially for the energy transfer, ecosystem function and resilience.

According to the last decade report, the deforestation has increased exponentially (FAO 2012) especially in the tropical forest where the diversity of flora and fauna is rich (Hansen *et al.*, 2013; Asner *et al.*, 2009). Due to the urbanisation especially expansion of agricultural farms or lands in the forest regions, creates more pressure for the wild species to flourish which resulted in the more pressure among the floral and faunal species (Dobrovolski *et al.*, 2011; Tilman *et al.*, 2001).

The natural habitats of the animals are greatly converted into pastoral and cultivable lands which pose a serious threat to the native wild species (Gibbs *et al.*, 2010; Laurance *et al.*, 2014).

For the conservation of forests from any kind of anthropogenic activities, the formation of protected areas (PAs) or reserve forest areas (FRAs) is the most conventional tool to reduce the further loss of biodiversity (Jones *et al.*, 2018; Gray *et al.*, 2016; Geldmann *et al.*, 2013). Long and short term impacts of anthropogenic activities on the diversity patterns of forest are studied by species richness and community structure which are the most relevant tool for the biodiversity conservation process (Tchoumbou *et al.*, 2020; Rovero *et al.*, 2020).

For effective strategies about the analysis of habitat based reduced species richness and also patterns of focal taxa or species group especially on the endangered species. Sodhi *et al.* (2008) reported the reduced percentages of frugivores and insectivores birds resulted in the significant increased percentage of granivores which resulted in the forest fragmentation and modification. This condition would devastating the role of seed dispersal demand by avian species, trees and herbivores colonization in the various regions or zones of the forest (Rocha *et al.*, 2015; Tschamtker *et al.*, 2008).

Based on the available literature, the studies regarding the chronic logging activities of human in the forest and their selective avian species destruction are remaining unclear. Thus, our study is aimed to enumerating the avian varieties in protected forest which was

extensively exploited for anthropogenic activities. In specific, our study was focused about the identification of different avian fauna in the Peruvannamuzhi forest during spring and migratory season in 2017 to 2019.

MATERIAL AND METHODS

Study area: Peruvannamoozhy or Peruvannamuzhi belongs to Kozhikode district (Kerala, India). The study area is Rich with fauna and flora as well as it forms a part of Malabar wildlife sanctuary. The Average summer and winter temperature are 35°C (95°F) and 18°C (64°F).

Avifauna survey: Based on point count sampling (PCS) method, during spring migratory bird season the survey was conducted between 2017 to 2019 (March and April). In Peruvannamuzhi forest, 20 different sampling stations were finalized by a random starting point. Systematic sampling sites of 200meters apart from each station were followed (Hill and Hamer 2004). Bird count at each point was conducted twice (once for each sampling month) and each count session lasted for 10 min. Bird watching and counting was done in the morning (7.00 to 10.30am) (Wells 1999). Based on the local field guide and previous literatures in this zone, the birds were identified, classified and sorted

(Jeyarajasingam 2012; Wells 2010; Billerman *et al.*, 2020; Robson 2011). The identified birds are classified and tabulated. The IUCN status of the bird species also studied.

RESULTS AND DISCUSSION

Forty different species such as *Dicrurus leucophaeus*, *Muscicapa dauurica*, *Chalcophaps indica*, *Oriolus xanthornus*, *Merops philippinus*, *Dicrurus macrocercus*, *Muscicapa muttui*, *Bubulcus ibis*, *Psilopogon haemacephalus*, *Leptocoma minima*, *Rubigula gularis*, *Chloropsis aurifrons*, *Chrysocolaptes guttacristatus*, *Dicrurus paradiseus*, *Gallus sonneratii*, *Treron affinis*, *Terpsiphone paradise*, *Aerodramus unicolor*, *Argya striata*, *Corvus macrorhynchos*, *Ocyrceros griseus*, *Psittacula columboides*, *Sturnia blythii*, *Harpactes fasciatus*, *Myophonus horsfieldii*, *Tephrodornis sylvicola*, *Dicaeum concolor*, *Zoothera citrina*, *Pericrocotus flammeus*, *Psittacula cyanocephala*, *Leptocoma zeylonica*, *Cecropis daurica*, *Pycnonotus jocosus*, *Dendrocitta vagabunda*, *Accipiter badius*, *Gracula indica*, *Loriculus vernalis*, *Psilopogon viridis*, *Dendrocitta leucogastra* and *Iole indica* were observed in the study area (Fig. 1.).



Fig. 1. A) Orange Minivet, B) Red whiskered bulbul, C) White cheeked barbet, D) Bronzed Drongo, E) Malabar Grey hornbill, F) Southern Hill Mynah, G) Jungle Babbler, H) Yellow browed bulbul, I) Large billed Crow, J) Greater Racket Tailed Drongo.

The birds were belongs to Passeriformes, Columbiformes, Coraciiiformes, Pelecaniformes, Piciformes, Galliformes, Apodiformes, Bucerotiformes, Psittaciformes, Trogoniformes and Accipitiformes

families. Among the identified 40 bird species, one species *Ocyrceros griseus* belongs to vulnerable IUCN status and all the other belongs to least concern (LC)

status. Birds were identified and their family, order and biological classification were mentioned in Table 1. In Kenaboi state, the avian biodiversity was identified with 112 species (Ramli *et al.*, 2009). In Malaysia, southern peninsular region has primary rainforests has high avian biodiversity due to their thick vegetation with rich ecosystem and less logging activities (Pehet *et al.*, 2005). These results evidenced the effect of logging in the forest resulted in the altered or disturbed avian biodiversity with altered species richness. Undetermined

logging in forest regions leads to the habitat loss and finally altered forest inhabitants. In comparison with primary rainforest (undisturbed), the logging activities of the forest resulted in the significant reduction avian biodiversity upto 25%. Among the observed 22 avian species, *Dicaeum trigonostigma* (Orange-bellied Flower pecker) and *Mixornis gularis* (Pin-striped Tit-babbler) were the forest edge species which were able to tolerate human activities in their ecosystem (Ramli *et al.*, 2009).

Table 1: List of birds observed in Moist deciduous Forest, Peruvannamuzhi during 2017-2019.

Common name of the Bird	Order	Family	Binomial name	No. of observation	IUCN status
Ashy Drongo	Passeriformes	Dicruridae	<i>Dicrurus leucophaeus</i>	12	LC
Asian Brown Flycatcher	Passeriformes	Muscicapidae	<i>Muscicapa dauurica</i>	9	LC
Asian Emerald dove	Columbiformes	Columbidae	<i>Chalcophaps indica</i>	11	LC
Black-hooded oriole	Passeriformes	Oriolidae	<i>Oriolus xanthornus</i>	10	LC
Blue-tailed Bee-eater	Coraciiformes	Meropidae	<i>Merops philippinus</i>	9	LC
Bronzed Drongo	Passeriformes	Dicruridae	<i>Dicrurus macrocercus</i>	34	LC
Brown-breasted Flycatcher	Passeriformes	Muscicapidae	<i>Muscicapa muttui</i>	12	LC
Cattle Egret	Pelecaniformes	Ardeidae	<i>Bubulcus ibis</i>	24	LC
Coppersmith Barbet	Piciformes	Megalaimidae	<i>Psilopogon haemacephalus</i>	10	LC
Crimson backed sunbird	Passeriformes	Nectariniidae	<i>Leptocoma minima</i>	14	LC
Flame-throated bulbul	Passeriformes	Pycnonotidae	<i>Rubigula gularis</i>	20	LC
Golden-fronted Leafbird	Passeriformes	Chloropseidae	<i>Chloropsis aurifrons</i>	26	LC
Greater Flameback	Piciformes	Picidae	<i>Chrysocolaptes guttacristatus</i>	18	LC
Greater Racket Tailed Drongo	Passeriformes	Dicruridae	<i>Dicrurus paradiseus</i>	63	LC
Grey Junglefowl	Galliformes	Phasianidae	<i>Gallus sonneratii</i>	10	LC
Grey-fronted Green Pigeon	Columbiformes	Columbidae	<i>Treron affinis</i>	9	LC
Indian Paradise-Flycatcher	Passeriformes	Monarchidae	<i>Terpsiphone paradise</i>	10	LC
Indian-Swiftlet	Apodiformes	Apodidae	<i>Aerodramus unicolor</i>	20	LC
Jungle Babbler	Passeriformes	Leiothrichidae	<i>Argya striata</i>	50	LC
Large billed Crow	Passeriformes	Corvidae	<i>Corvus macrorhynchos</i>	59	LC
Malabar Grey hornbill	Bucerotiformes	Bucerotidae	<i>Ocyrceros griseus</i>	43	VU
Malabar Parakeet	Psittaciformes	Psittaculidae	<i>Psittacula columboides</i>	17	LC
Malabar starling	Passeriformes	Sturnidae	<i>Sturnia blythii</i>	9	LC
Malabar Trogon	Trogoniformes	Trogonidae	<i>Harpactes fasciatus</i>	10	LC
Malabar Whistling thrush	Passeriformes	Muscicapidae	<i>Myophonus horsfieldii</i>	15	LC
Malabar Wooshrike	Passeriformes	Vangidae	<i>Tephrodornis sylvicola</i>	9	LC
Nilgiri Flowerpecker	Passeriformes	Dicaeidae	<i>Dicaeum concolor</i>	11	LC
Orange headed Thrush	Passeriformes	Turdidae	<i>Zoothera citrina</i>	14	LC
Orange Minivet	Passeriformes	Campephagidae	<i>Pericrocotus flammeus</i>	29	LC
Plum headed Parakeet	Psittaciformes	Psittaculidae	<i>Psittacula cyanocephala</i>	10	LC
Purple-rumped sunbird	Passeriformes	Nectariniidae	<i>Leptocoma zeylonica</i>	9	LC
Red rumped Swallow	Passeriformes	Hirundinidae	<i>Cecropis daurica</i>	9	LC
Red whiskered bulbul	Passeriformes	Pycnonotidae	<i>Pycnonotus jocosus</i>	32	LC
Rufous Treepie	Passeriformes	Corvidae	<i>Dendrocitta vagabunda</i>	10	LC
Shikra	Accipitriformes	Accipitridae	<i>Accipiter badius</i>	9	LC
Southern Hill Mynah	Passeriformes	Sturnidae	<i>Gracula indica</i>	46	LC
Vernal Hanging-Parrot	Psittaciformes	Psittaculidae	<i>Loriculus vernalis</i>	11	LC
White cheeked barbet	Piciformes	Megalaimidae	<i>Psilopogon viridis</i>	33	LC
White-bellied Treepie	Passeriformes	Corvidae	<i>Dendrocitta leucogastra</i>	10	LC
Yellow browed bulbul	Passeriformes	Pycnonotidae	<i>Iole indica</i>	51	LC

CONCLUSIONS AND FUTURE SCOPE

Our study tabulated the types of birds observed in the moist deciduous forest, Peruvannamuzhi during 2017-2019. Based on the sampling, the local diversification of avian species and its conservation status were also identified. This kind of studies in novel regions helps to develop sustainable conservation strategies and ecological balance.

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Conflict of interest. None.

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