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Avifauna along the agro ecosystem of Tholayavattam and its environs, Kanyakumari district, Tamil Nadu

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Abstract
Bird variety is required to maintain ecological equilibrium; hence birds are used as markers of ecosystem health. For six months, the avifauna of Tholayavattam 8° 16′ 50″ N, 77° 10′ 43″ E, a small hamlet in Kanyakumari District, Tamilnadu, where the Institutional Campus is located, and its immediate surrounding environment were studied. Ponds, pools, channels, and streams abound in the study region, as do various cultivated and wild trees and bushes. Thirty two bird species from 22 families and 11 orders were spotted. The majority of them are long-term inhabitants, but handfuls are visitors from other areas of India. In the study area, passerine birds (Order Passeriformes) were the most numerous, largest, and most distinctive family of birds. Among the total species observed, 26 (81%) species are widespread resident, 4 (13%) species are resident and only 2 (6%) species are winter visitors.

Keywords: avifauna, diversity, birds, passerines, agro ecosystem, Tholayavattam

Introduction

Biodiversity is all the different kinds of lifefind in one area, the variety of animals, plants, fungi, and even microorganisms like bacteria that make up natural world (Rajendran *et al.*, 2014)[15]. Each of these species and organisms work together in ecosystems, to maintain balance and support life. Birds form an important component of ecosystem (Rahul *et al*., 2014) [14] as a part of food web, as potential pollinators and bio indicators (Rudra *et al*., 2013) [16]. Birds are one of indicators of the environment health and wealth (Dendup *et al*., 2021) [4]. Small land birds in particular are found to be potential indicators, for marking the presence of other unrelated taxa and they are also indicators of environmental changes. They are included in evaluation studies for overall biodiversity conservation (Gregory *et al*. 2004; Kati and Sekercioglu, 2006) [7, 10]. Bird species are essential to maintain ecological balance. Birds occupy various levels in the trophic webs. They help maintain sustainable population levels of their prey and predator species. Many birds play an important role in plant reproduction through their services as pollinators or seed dispersers (Godley, 1979) [6].

Some birds are considered as keystone species and their presence in the environment affects others indirectly. Temple (1977) [21] reported about the extinction of Dodo bird, *Raphus cucullatus* (Linnaeus), a keystone species in Mauritius Island affecting the reproduction of dodo tree, *Sideroxylon grandiflorum* (A.DC.), as the seeds of the plant have to be processed in the digestive tract of the Dodo bird for their germination. Some species of birds have relationship with humans. The insectivorous birds act as natural pest control agents and exclusion of insectivorous birds resulted in a significant increase in insect pests and consequent plant damage (Sekercioglu *et al*., 2004) [18].

India is country of diversity of plants and animals (Wanjari *et al*., 2013) [22]. The forests play a key role in maintaining a wide range of delicate relationship with nature and its ecosystem (Khaleel *et al*., 2014) [11]. The Indian subcontinent contains vast biogeographic region. Out of more than 9,990 birds of the world, the Indian subcontinent contains about 1,340 species of birds which contribute more than 15% of the world's bird species (Anula, 2015) [2]. India is represented by a wide array of faunal species. 1,200 of birds are recorded from the country. The faunal diversity of the State includes 454 species of birds. In Kanyakumari district, about 250 bird species have been identified, including 53 migratory species, twelve endemic species, and four threatened species (Balachandran, 1998) [3].

At the convergence of the Indian Ocean, Bay of Bengal, and Arabian Sea, Kanyakumari District is located at the southernmost tip of the Indian Peninsula. It is the state of Tamil Nadu's smallest district. It covers 1672 square kilometres, comprising 1629 square kilometres of rural land and 43 square kilometres of urban land. The district, which is located at the foot of the Western Ghats and has a high level of biological diversity and endemism, is one of the world's eight "hottest hotspots" of biological diversity. The district stands out among Tamil Nadu's other districts due to its geographical location. It has a 68-kilometer shoreline. Though it is a small district, it is notable for its huge green stretches of rice fields, lush woods, coconut trees, and mineral sands. The district is located between the eastern longitudes of 770 15' and 770 36' and the northern latitudes of 80 03' and 80 35'. The mountainous belt and foothill regions, smiling valleys and low-lying fertile plains, table lands, and coastal belt are the four natural regions of Kanyakumari district. The forest covers approximately 650 square kilometres. It accounts for 38% of the District's geographical area, compared to 15% for the state. This district has a total of 54,155 hectares of forest area available, which is ideal for species cultivation. The district receives 1400 mm of rain each year on average. The weather is pleasant, with temperatures ranging from 75.7 to 98.7

degrees Fahrenheit. It is quite beneficial to growers. The district has a favourable agroclimatic condition that permits the production of a wide range of crops. The proximity of the equator, as well as topography and other climate variables, encourage the cultivation of a wide range of crops (Kanyakumari District Statistical Handbook, 2016) [9].

Agneswari *et al.* (2019) [1] observed 20 species of birds in Suchindrum pond, Kanyakumari. Wetland birds of Kanyakumari were documented by Sridharan and Gupta (2006) [19].

The study area Tholayavattam, is located in Vilavancode Taluk of Kanyakumari District in Tamilnadu. The study area consists of plantations of paddy, coconut, banana, farmlands of different species of plants including fruiting trees, shrubs, herbs and weeds which are homeland for insects and fresh water bodies like ponds, small pools, canals, channels, streams and salt water bodies like estuary and sea.. The study area's bird variety has never been documented previously.

Materials and Methods

For six months, the avifauna of Tholayavattam, 8° 16′ 50″ N, 77° 10′ 43″ E, a small hamlet in Killiyoor Block, where the Institutional Campus is located, and its immediate surroundings were observed. Ponds, pools, channels, and streams abound in the study region, as do various cultivated and wild trees and bushes. Common birds of the study area were observed from August 2019 to January 2020. The identification of the bird species was done using keys available for passerine birds. The survey was carried out in the morning and evening hours. Binoculars were used to observe the birds, and Canon EOS R7 camera was used to photograph them.

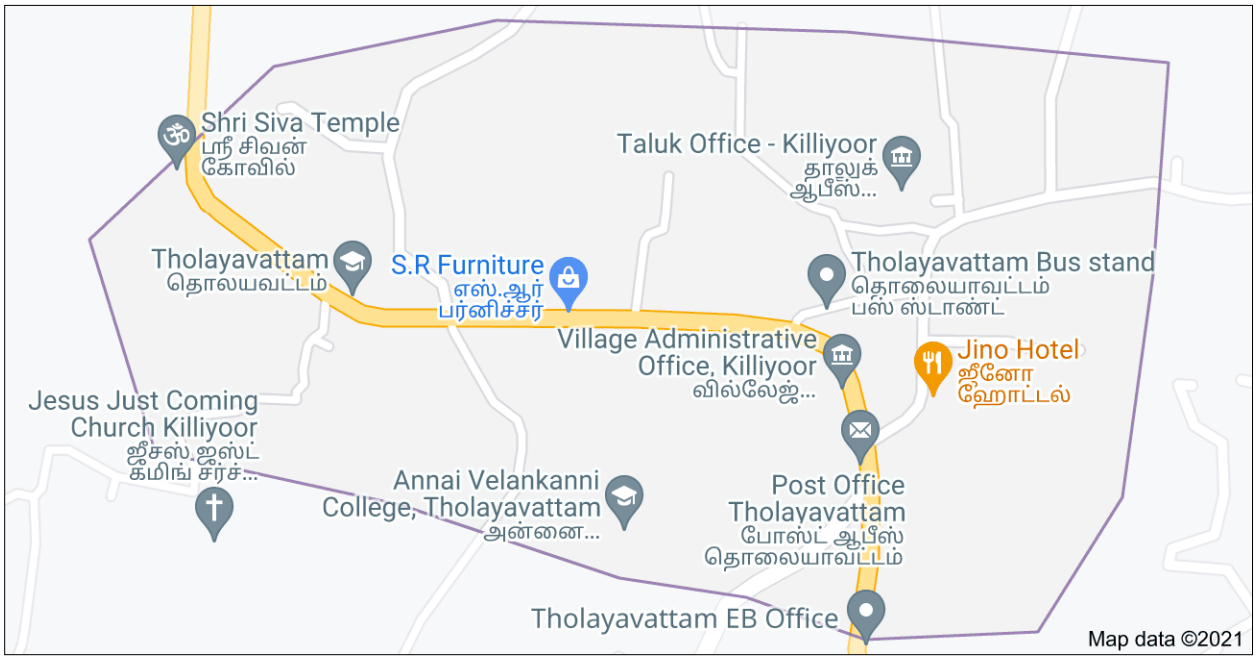

Fig 1

Results

A total of thirty two species of birds were observed in the study area, belonging to 29 genera, 21 families and 13 orders in the study area (Table 1). According to IUCN red list, 100% species were listed as least concern (LC) (Fig. 1). Maximum number of species belong to Passeriformes (41%) commonly called Passerine birds (known as perching birds) namely, Yellow billed babbler, Rufous treepie, House crow, Sunbirds, Asian paradise flycatcher, Robins, Orioles, Myna, Drongos and House sparrow. It is followed by Pelecaniformes with 4 species (13%) and Acciptriformes with 3 species (10%) of birds (Fig. 2). Among the total species observed, 26 (81%) species are widespread resident, 4 (13%) species are resident and only 2(6%) species are winter visitors (Fig. 3). In the present study two winter visitors were observed namely, Asian Paradise Flycatcher (*Terpsiphone paradise)* and Indian Golden Oriole *(Oriolus oriolus kundoo).*

Table 1: List of birds along with their taxonomic position, Zoological nomenclature, diet, habitat status of residency and IUCN status are given in the table.

Sl. No.	Common Name	Order	Family	Zoological Name	Diet	Status of Residency	IUCN Status
1.	Cattle egret	Pelecaniformes	Ardeidae	*Bubulcus ibis* (Linneaus)	insects	Widespread resident	LC
2.	Indian Pond Heron	Pelecaniformes	Ardeidae	*Ardeola grayii*(Sykes)	Fishes and small fresh water invertebrates	Widespread resident	LC
3.	Striated Heron	Pelecaniformes	Ardeidae	*Butroides striata* (L.)	Aquatic prey	Widespread resident	LC
4.	Shikra	Accipitriformes	Accipitridae	*Accipiter badius* (Gmelin)	Mammals, birds, reptiles, fish, crabs, and insects	Widespread resident	LC
5.	Black kite	Accipitriformes	Accipitridae	*Milvus migrans* (Boddaert)	Mammals, birds, reptiles, fish, crabs, and insects	Widespread resident	LC

6.	Brahminy kite	Accipitriformes	Accipitridae	*Haliastur indicus* (Boddaert)	Mammals, birds, reptiles, fish, crabs, and insects	Widespread resident	LC
7.	Asian Koel	Cuculiformes	Cuculidae	*Eudynamys scolopaceus* (L.)	insects	Widespread resident	LC
8.	Southern Coucal	Cuculiformes	Cuculidae	*Centropus sinesis parroti* (Stephens)	grasshoppers, beetles, caterpillars, field mice, lizards, snakes, large insects, snail, mice, bird's eggs	Resident	LC
9.	Lesser goldenback woodpecker	Piciformes	Picidae	*Dinopium benghalense* (L.)	Termites, ants, pupae of wood boring beetles	Widespread resident	LC
10.	Yellow billed babbler	Passeriformes	Timaliidae	*Turdoides affinis* (Jerdon)	Insects, grains, nectar and berries	Resident	LC
11.	Rufoustreepie	Passeriformes	Corvidae	*Dendrocitta vagabunda* (Latham)	insects and other small invertebrates, eggs, grain and fruits	Widespread resident	LC
12.	House crow	Passeriformes	Corvidae	*Corvu ssplendens* (Vieillot)	small reptiles, mammals, insects and other small invertebrates, eggs, nestlings, grain and fruits	Widespread resident	LC
13.	Loten's Sunbird	Passeriformes	Nectarinidae	*Cinnyris lotentia* (L.)	nectar	Resident	LC
14.	Purple sunbird	Passeriformes	Nectarinidae	*C. asiaticus* (Latham)	nectar	Widespread resident	LC
15.	Asian paradise flycatcher	Passeriformes	Monarchidae	*Terpsiphone paradisi* (L.)	insects	Winter visitor	LC
16.	Oriental magpie robin	Passeriformes	Muscicapidae	*Copsychus saularis* (L.)	Insects and fruits	Widespread resident	LC
17.	Indian robin	Passeriformes	Muscicapidae	*Saxicoloides fulicatus* (L.)	Insects and fruits	Widespread resident	LC
18.	Indian golden oriole	Passeriformes	Oriolidae	*Oriolus oriolus kundoo* (Sykes)	Insects and fruits	Winter visitor	LC
19.	Black hooded oriole	Passeriformes	Oriolidae	*O. xanthornus* (L.)	Insects and fruits	Widespread resident	LC
20.	Common myna	Passeriformes	Sturnidae	*Acridotheres tristis* (L.)	Insects and fruits	Widespread resident	LC
21.	Black drongo	Passeriformes	Dicruridae	*Dicrurus macrocercus* (Vieillot)	insects	Widespread resident	LC
22.	House sparrow	Passeriformes	Passeridae	*Passer domesticus* (L.)	seeds	Widespread resident	LC
23.	Yellow wattled lapwing	Charadriiformes	Charadriidae	*Vanellus malabaricus* (Boddaert)	invertebrates	Resident	LC
24.	Red wattled lapwing	Charadriiformes	Charadriidae	*V. indicus* (Boddaert)	invertebrates	Widespread Resident	LC
25.	Indian Peafowl	Galliformes	Phasianidae	*Pavo cristatus* (L.)	Seeds, fruits, buds, roots and leaves	Widespread Resident	LC
26.	Spotted owlet	Strigiformes	Strigidae	*Athene brama* (Temminck)	Small animals and invertebrates	Widespread Resident	LC
27.	Spotted dove	Columbiformes	Columbidae	*Stigmatopelia chinensis* (Scopoli)	Seeds, fruits, buds, and leaves	Widespread Resident	LC
28.	Common pigeon or rock dove	Columbiformes	Columbidae	*Columba livia* (Gmelin)	Seeds, fruits, buds, and leaves	Widespread Resident	LC
29.	Common Kingfisher	Coraciformes	Alcedinidae	*Alcedo atthis* (L.)	Fish, tadpoles and invertebrates	Widespread Resident	LC
30.	Indian cormorant	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax fuscicolis* (Stephens)	fish	Widespread Resident	LC
31.	Rose ringed parakeet or Ring necked parakeet	Psittaciformes	Psittaculidae	*Psittacula krameri* (Scopoli)	Fruits, seeds, buds, nectar and pollen	Widespread Resident	LC
32.	Brown Headed Barbet	Piciformes	Megalaimidae	*Psilopogon zeylanicus* (Gmelin)	fruits	Widespread Resident	LC

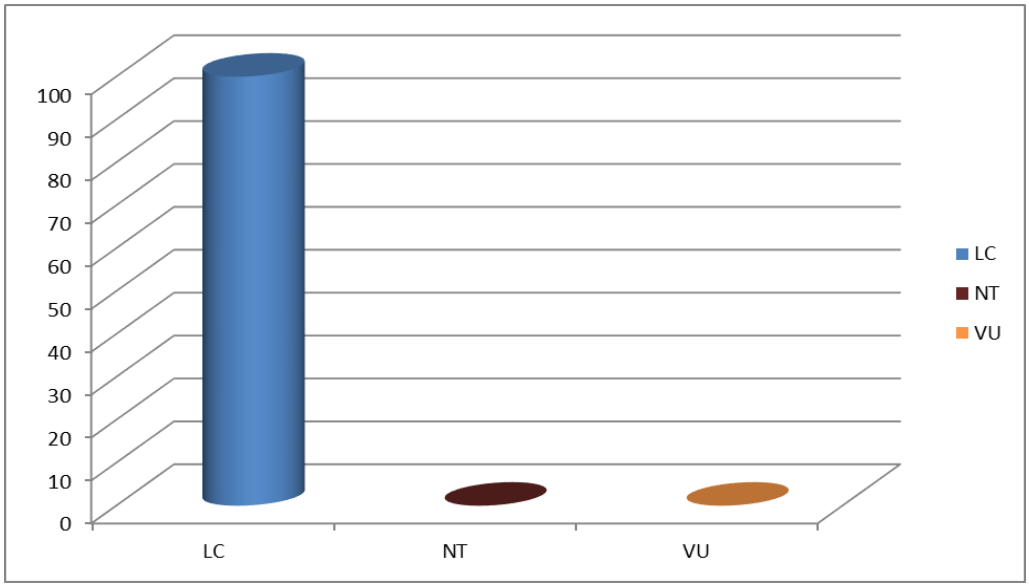

Fig 2: IUCN Status of Birds in the Study Area. LC – Least Conern; VU – Vulnerable; NT- Near Threatened

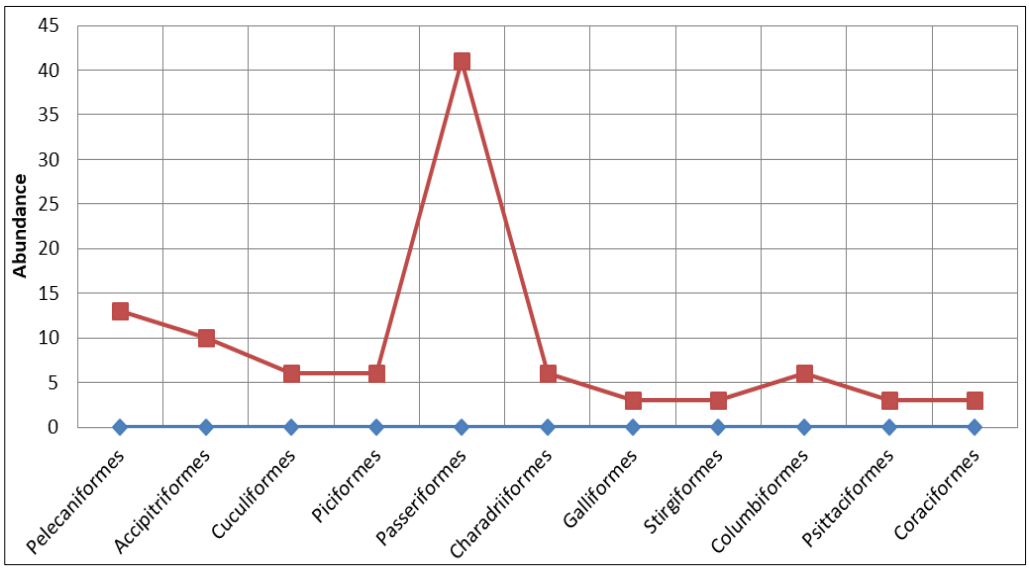

Fig 3: Species abundance in order wise in the study area

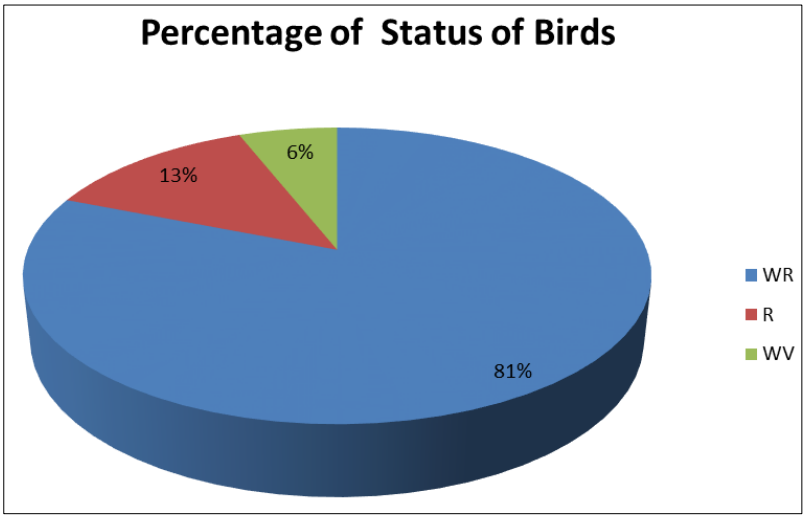

Fig 4: Status of birds in the study area. WR-Widespread Resident; R-Resident; WV-Winter Visitor

Discussion

Birds from 19 different families were seen in the study region. The Ardidae and Phalacrocoracidae families of birds eat primarily fish and tiny aquatic invertebrates, while the Accipitridae family of birds is carnivorous, eating mammals, small birds, reptiles, fish, amphibians, crabs, and molluscs. Small animals and invertebrates are eaten by the Charadridae, Cuculidae, Strigidae, and Alcedinidae families of birds. Picidae, Dicruridae, Oriolidae, Monarchidae, and Muscicapidae are insectivorous bird families. The Nectarinidae family of birds feeds mostly on nectar. The Corvidae and Sturnidae families of birds are omnivores, while the Passeridae, Columbidae, Megalaimidae and Psittaculidae families of birds subsist on fruits, seeds, and buds. Seeds, fruits, buds, roots, and leaves are common foods for Phasianidae family birds (Grimmett *et al*., 2013)[8]. The research area's abundance of Passeriformes is attributed to climatic factors, food availability, and nesting facilities. In the saltpan of Rajakkamangalam in Kanyamumari district, the major orders Pelecaniformes and Passeriformes are represented by 19 families (Prasanth, 2020)[13].The Passeriformes are the largest order of birds and one of the most diverse groups of terrestrial animals (Gill and Donsker, 2015) [5]. Inland species residing near human habitations, plantations, and gardens made up the majority of the birds seen in the village (Grimmett *et al*., 2013)[8]. The terrestrial ecosystem is rich in bird diversity, providing avian life with a suitable habitat, as well as good availability and climatic conditions (Mehmood *et al.*, 2018) [12].

The availability of various types of food contributes to the diversity of birds in the study area, which supports Tanveer *et al*. (2002) [20] findings that various types of foods directly or indirectly benefit the avian fauna, particularly Passeriformes. The study region impounds with small fresh water bodies and an estuary at Thengapattinam of the Arabian Sea, and the Kanyakumari district consists of a diversity of flora due to the prevalence of forest area, and it consists of many wild plants, shrubs, and herbs that serve as a home for insects. As a result, just a few Accipitridae birds were found in the study area. Sekercioglu (2006) [17] stated that birds occupy a wide range of ecological positions. While some birds are generalists, others are highly specialised in their habitat or food requirements. Even within a single habitat, such as a forest, the niches occupied by different species of birds vary, with some species feeding in the forest canopy, others beneath the canopy, and still others on the forest floor. Forest birds may be insectivores, frugivores, and nectarivores.

Conclusion

Kanyakumari district is a home for a variety of birds. The favourable climate encourages birds to make their home here. The quantity of different species of birds in a given location is determined by the availability of habitat facilities. Food, shelter, and breeding habitat give a safe haven for a wide range of species in the study area. Nonetheless, manmade activities such as mountain quarrying, monoculture, habitat degradation and fragmentation and deforestation pose a threat to bird diversity around the study area. Hence, the protection of birds is inevitable to maintain the ecological balance.

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