

Preliminary checklist of avifauna species of Veliyathunadu, Kerala

Aamina Ismail¹, Revathy, S.^{2*} and Seema, K.²

¹School of Industrial Fisheries, Lakeside Campus,

Cochin University of Science and Technology, Kerala, India: 682016

²Department of Zoology, St. Xavier's College for Women, Aluva, Kerala, India: 683101

*E.mail: revathy@stxaviersaluva.ac.in

ABSTRACT

Birds are the most attractive population of all wildlife groups. They possess great intrinsic interest. They are widely recognized as valuable indicators of the quantity and quality of wildlife. Birds are a critical part of our ecological system. The conservation of bird diversity is crucial for its continued existence of the planet's diversity. For ecologists, they are an essential tool for assessing the health of the environment. This study assessed the species composition, species richness, evenness and species diversity of avifauna in the wetland habitat of Veliyathunadu, a village located in the Karumalloor Grama Panchayat of Paravur Taluk in Ernakulam District, Kerala, India. The study period was from June 15, 2019 to February 29, 2020. Transect walk, point transect, Bray-Curtis analysis and direct observation methods were deployed for the birds' survey. Continuous observations were made regarding their movements, song, feeding habits and size. Call notes of the birds were carefully observed for identification. A total of 24 transect walks were carried out to observe the birds in the study area. A total of 53 species of birds were identified, belonging to 29 families. Among them, 45 species were common, 5 were winter species, and 3 were uncommon. Ardeidae, Corvidae, Threskiornithidae, Tringinae, Passeridae and Psittacidae were the dominant families observed in the study area and the remaining families surveyed were uniformly distributed. A greater number of bird species were observed during the migratory season. The study reveals that Veliyathunadu shows rich species diversity, richness and evenness of birds; hence, maximum care should be taken to conserve this habitat.

ARTICLE HISTORY

Received on: 29-12-2022

Revised on: 27-03-2023

Accepted on: 14-04-2023

KEYWORDS

Birds, Conservation, Diversity, Species richness, Wetland

1. Introduction

Wetlands are areas of marsh, ponds, and swamps, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salty, including areas of marine water, the depth of which at low tides does not exceed six meters (Anon., 1991). Birds play an important role in a wetland ecosystem and use wetlands for breeding and nesting as a source of drinking water for feeding and resting (Balapure et al., 2012). The wetlands in the Ernakulam district provide wetland birds with a favourable environment, hence sustaining their population. From the district's wetland areas more wetland-dependent birds were observed in the year 2023 compared to previous years. As part of the Asian Waterbird Census-2023, the birders of Kochi observed 111 species. Volunteers counted 7,653 individual birds in 2023, a significant rise above the 4,391 and 4,939 birds counted in 2022 and 2021, respectively (The Hindu, 2023). In the district of Trivandrum, The Asian Waterbird Census (AWC) 2023 has documented a 65% rise in waterbirds in Thiruvananthapuram district, although a slight dip in the count of species was noted. Species including the Bronze-winged Jacanas and Oriental Darters were seen in Akkulam wetlands. Whimbrels, Common Greenshank, Common Redshank, and Asian Openbills were the highlights from Kadinamkulam wetlands, Shore birds such as Great Crested Terns, Greater and Lesser Sand Plovers, Kentish Plovers and Western Reef Herons were sighted in the Poovar estuary, Pacific Golden Plover, Western Yellow Wagtail, White Wagtail, Painted Stork, Eurasian Spoonbill, Wood Sandpiper and Grey-headed Lapwing from Punchakkari-Vellayani wetland complex. However, the populations of some migratory waterbirds, especially duck species visiting the Alappuzha region of Kerala, are falling (ENVIS, 2023). The density, diversity,

and richness of avian fauna are affected by any change in physical, chemical and biological factors. Veliyathunadu, being a wetland area, most people are engaged in paddy cultivation and community activities like fisheries. This draws a lot of attention of birds towards here and a great spotting of birds also. The study in the area was mainly focused on the avifauna diversity, its population abundance and species richness. Migratory species of the area were also studied and the man-animal conflicts in the area were given much importance during the study.

2. Materials and Methods

2.1 Study area

Veliyathunad is a village located at 10.13° N, 76.32° E in ward number 7 and 8 in Karumalloor Gramapanchayath of Paravur taluk of Ernakulam district in Kerala (Fig. 1). The climate is tropical and has significant rainfall in most months, a short dry season. The average temperature varies with a maximum of 35 °C and a minimum of 18 °C. About 3331mm of precipitation falls annually. The village is drained by the river Periyar and its proximity makes it a wetland habitat. The study area covers about 4 ½ acres of land, which is wholly used for paddy cultivation. Since the village is located 12.6km away from Paravur city, it is quiet and silent, and a variety of birds can be seen easily, indirectly promoting bird diversity.

2.2 Methodology

The study was conducted from June 2019 to February 2020. Line transect, point count method and opportunistic observation were adopted for studying the avian diversity and population abundance. The birds were classified into common, winter visitor and uncommon based on their percentage of occurrence and checklists were prepared. The birds were observed mainly in the early morning and



Fig. 1. Area of Study Veliyathunadu Kerala

evening. Continuous observations were made regarding their movements, song, feeding habits and size. Birds were identified using standard field guides, reference books (Grimmet et al., 2011; Ali, 2012) and binoculars (10×50 M) for observing birds’ features. The collected data was promptly uploaded to the online database eBird. The data was analysed and tabulated. The number of taxa S, the total number of individuals (n), Dominance (1-Simpson index), Simpson index (1-D), and Shannon Weiner index (H’) were calculated using PAST Statistical software (PAST version 4.0). The following techniques were used during bird watching: -

- a) Transect method: Transect is a path along which one counts and records the occurrence of an individual for studying. A straight line walk covering 3 km, within the time span of 2-3 hr was carried out (Buckland et al., 2001; Gibbons & Gregory 2006). A total of 24 transect walks were carried out to observe the birds in the study area.
- b) Point count method: A point count consists of standing at a predetermined location, usually along the roadside, and counting all birds seen or heard during a set period. Birds were individually counted in the case of small flocks, and the block count method was employed in the case of a large flock (Bibby et al., 2000; Buckland et al., 2001)
- c) Opportunistic observation: Casual observations were made whenever possible. Identifying a bird can be a challenging process. Birds are active, energetic animals. Quick eye spotting is required to get possible details in a short span of time (Munson et al., 2010).

3. Results

In all, 53 species of birds belonging to 11 orders and 29 families (Table 1) have so far been recorded from the study area during the study conducted from June 2019 to February 2020. Out of these 45 species were common (85%), 5 species were winter visitors (9%) and 3 were uncommon (6%) (Fig. 2). The winter visitors were Wood sandpiper (*Tringa glareola*), Common sandpiper (*Actitis hypoleucos*), Black-winged stilt (*Himantopus himantopus*), Indian golden oriole (*Oriolus xanthornus*), and Barn swallow (*Hirundo rustica*). The highest species richness was recorded for the family Corvidae, followed by Passeridae, but the maximum bird density was found in the Ardeidae family, followed by Corvidae. The minimum number of bird species was

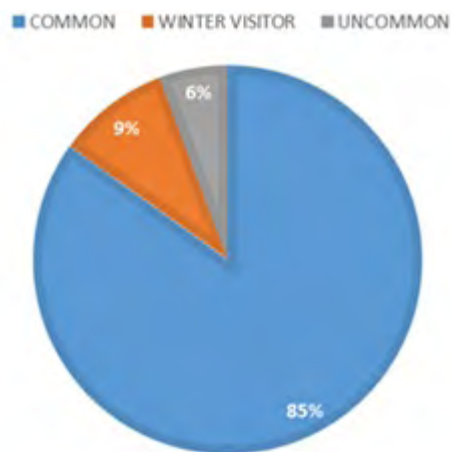


Fig. 2. Percentage distribution of birds observed in the study area Veliyathunadu Kerala

Table 1. Checklist of birds recorded during the study from Veliyathunadu, Kerala

Sl.No:	Family	Common name	Scientific name	Status
		Order Anseriformes		
1	Dendrocygnidae	Lesser whistling duck	<i>Dendrocygna javanica</i>	Common
		Order Bucerotiformes		
2	Picidae	Black rumped flameback	<i>Dinopium benghalense</i>	Common
3	Megalaimidae	White cheeked barbet	<i>Psilopogon viridis</i>	Common
		Order Coraciiformes		
4	Coraciidae	Indian roller	<i>Coracias benghalensis</i>	Uncommon
5	Halcyonidae	White throated kingfisher	<i>Halcyon smyrnensis</i>	Common
6	Meropidae	Blue tailed bee-eater	<i>Merops philippinus</i>	Common
			<i>Merops leschenaulti</i>	Common
		Order Cuculiformes		
7	Cuculidae	Asian koel	<i>Eudynamys scolopaceus</i>	Common
8	Centropodidae	Greater coucal	<i>Centropus sinensis</i>	Common
		Order Psittaciformes		
9	Psittacidae	Rose-ringed parakeet	<i>Psittacula krameri</i>	Common
		Order Galliformes		
10	Columbidae	Rock pigeon (feral pigeon)	<i>Columba livia</i>	Common
			<i>Ducula aenea</i>	Uncommon
		Order Gruiformes		
11	Rallidae	White-breasted waterhen	<i>Amaurornis phoenicurus</i>	Common
		Order Charadriiformes		
12	Scolopacidae	Wood sandpiper	<i>Tringa glareola</i>	Winter visitor
			<i>Actitis hypoleucos</i>	Winter visitor
13	Glareolidae	Black winged stilt	<i>Himantopus himantopus</i>	Winter visitor
		Order Accipitriformes		
14	Accipitridae	Brahminy kite	<i>Haliastur indus</i>	Common
		Order Pelecaniformes		
15	Ciconiidae	Asian openbill	<i>Anastomus oscitans</i>	Common
16	Charadriinae	Red-wattled lapwing	<i>Vanellus indicus</i>	Common
17	Phalacrocoracidae	Little cormorant	<i>Microcarbo niger</i>	Common
18	Ardeidae	Little egret	<i>Egretta garzetta</i>	Common
			<i>Mesophox intermedia</i>	Common
			<i>Bubulcus ibis</i>	Common
			<i>Ardea purpurea</i>	Uncommon
			<i>Ardeola grayii</i>	Common
19	Threskiornithidae	Black-headed ibis	<i>Threskiornis melanocephalus</i>	Common
		Order Passeriformes		
20	Corvidae	House crow	<i>Corvus splendens</i>	Common
			<i>Artamus fuscus</i>	Common
			<i>Oriolus kundoo</i>	Winter visitor
			<i>Oriolus xanthornus</i>	Common
			<i>Dicrurus macrocercus</i>	Common
			<i>Dicrurus paradiseus</i>	Common
			<i>Dendrocitta vagabunda</i>	Common
21	Nectariniidae	Purple rumped sunbird	<i>Nectarini zeylonica</i>	Common
			<i>Nectarinia lotenia</i>	Common
			Sunbird sp.	Common
22	Passeridae	Western yellow wagtail	<i>Motacilla flava</i>	Common
			<i>Ploceus philippinus</i>	Common
			<i>Lonchura malacca</i>	Common
			<i>Lonchura striata</i>	Common
			<i>Passer domesticus</i>	Common
			Wagtail sp.	Common
23	Cisticolidae	Zitting cisticola	<i>Cisticola juncidis</i>	Common
			<i>Prinia inornata</i>	Common
24	Sylviidae	Jungle babbler	<i>Turdoides striatus</i>	Common
			<i>Orthotomus sutorius</i>	Common
25	Alaudidae	Lark sp.		Common
26	Muscicapidae	Oriental magpie robin	<i>Copsychus saularis</i>	Common
27	Sturnidae	Common myna	<i>Acridotheres tristis</i>	Common
			<i>Acridotheres fuscus</i>	Common
28	Hirundinidae	Barn swallow	<i>Hirundo rustica</i>	Winter visitor
29	Pycnonotidae	Red-vented bulbul	<i>Pycnonotus jocosus</i>	Common
			<i>Pycnonotus cafer</i>	Common

Table 2. Diversity indices in various months birds observed in the study area Veliyathunadu Kerala

	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
Shannon_H	21	20	18	15	22	22	20	23	23
Evenness_e^H/ S	6	5	5	3	5	4	3	4	5
Richness	18	21	15	22	19	30	25	32	30

observed during August (15) and the maximum in January (32). A slight reduction in bird species was seen during the monsoon (June – October). More bird species were observed from October to March, the migratory season in Kerala, but the density was less.

Hence, the diversity and richness are almost equal in the monsoon season; they vary only by a minor difference. As in Table 2, we can see that in June, diversity is 21, and richness is 18. In July, diversity is 20 and richness 21; similarly, the variation is similar in the following months, i.e., August and September. But in the post-monsoon, we can see the hike in richness and gradual reduction in evenness, i.e., in November to January, the highest recorded richness is 32, but the evenness is gradually being reduced. The diversity during post-monsoon has shown some hike that. In the month of January and February, the diversity recorded was the maximum, 23.

4. Discussion

The overall study shows that the total number of birds sighted each month showed a significant difference. One factor influencing the abundance is detectability. Seasonal differences, i.e., detectability, are common for most bird species (Emlen, 1971). These differences result from changes in weather and habitat structure. Increasing foliage density decreased the visibility of birds. In the study area, during the harvest months of paddy (June, August, October, and December), the number of birds sighted was very lower (Fig. 3). Most of the birds, like Indian pond heron, Black-headed ibis, White-breasted waterhen, Egrets, Asian openbills were recorded very less. The bushy foliage hindered observing birds, and indirectly, they provided an adaptive mechanism for

birds. Rainfall also had some influence on detectability. Species richness in an area depends on food availability, climate, evolutionary history and predation pressure. Species richness and diversity indices showed high during the post-monsoon season, i.e., October to March, the migratory season in Kerala. This may be the reason for the high richness and diversity in the study area during those months.

Diversity indices are extensively used in environmental monitoring and conservation. They are dependent on two factors: species richness and evenness. By looking into each month, we can see that evenness is almost at the same level, i.e., between 3-6. This shows that species are uniformly represented in the study area (Fig. 4). The data recorded from the study area was compared with the previous data of the study area and it was strikingly found that the species richness was higher when compared to their abundance. According to Usher (1986), diversity is the most frequently adopted criterion for the evaluation of conservation schemes. Diversity indices are directly correlated with the stability of the ecosystem and will be high in biologically controlled systems. Hence, the evaluation of Veliyathunadu shows rich and undisturbed species diversity, richness and evenness of birds.

5. Conclusion

Wetlands are natural ecosystems that are crucial for preserving ecological balance. They serve us in a variety of ways. However, years of unchecked encroachment have caused many wetlands to deteriorate. In the present study, 53 species of birds belonging to 11 orders and 29 families have so far been recorded from the study area during the

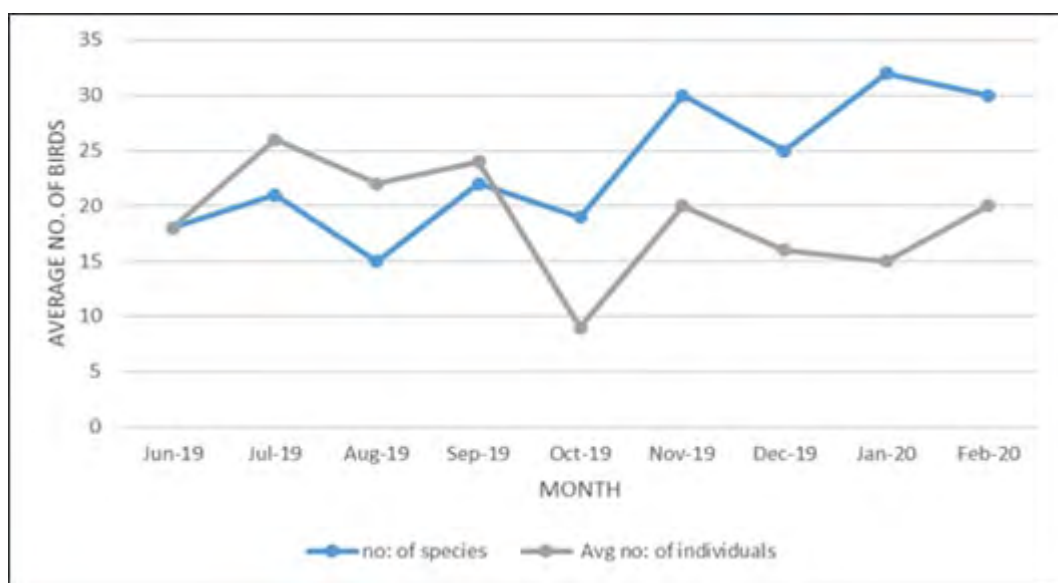


Fig. 3. Graph showing monthly variation in the distribution of birds in the study area Veliyathunadu, Kerala

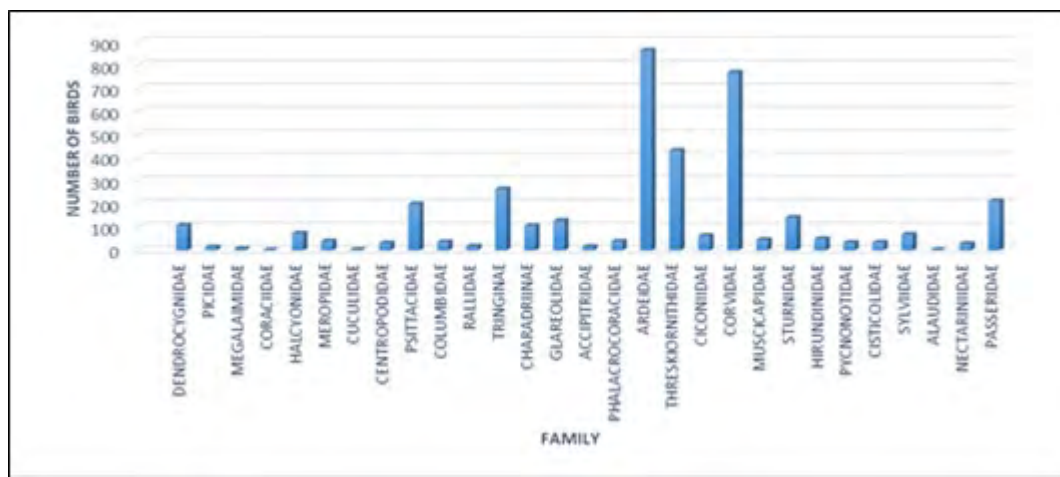


Fig. 4. The average number of birds observed in the study area Veliyathunadu Kerala

study conducted from June 2019 to February 2020. Out of these 45 species were common (85%), 5 species were winter visitors (9%) and 3 were uncommon (6%). Farmers should be made aware of the significance of wetlands and associated bird species and regular studies must be done in the area.

6. References

- Ali.S. 1969. The birds Of Kerala. Bombay: Oxford University Press. p.444
- Ali.S. 2012. *The Book Of Indian Birds*. Bombay Natural History Society Oxford, p. 120
- Ali.S, & Ripley, S. 1983. In *A Pictorial Guide to the Birds of Indian Sub-continent*. Mumbai: Oxford University Press.p.177
- Anon. 1971. *Ramsar Convention, The Final Act of the International Conference on the Conservation of Wetlands and Waterfowl*. IUCN Bulletin 2.
- Anon. 1992. *Birds of Kole Wetlands: A Survey report I*. Nature and Education Society Trichur (NEST) in collaboration with Kerala Forest Research Institute and Kerala Forest Department.
- Anon. 1993. *Birds of Kole Wetlands: A Survey Report II*. Nature and Education Society Trichur (NEST) in collaboration with Kerala Forest Research Institute and Kerala Forest Department.
- Basheer, A. A. 1990. In *Some Observations On The Birds of Silent Valley National Park*. Ornithological Society of India.p. 131-136.
- Bibby, C.J.; Burgess, N.D.; Hill, D.A.; Mustoe, S. 2000. Bird census techniques. 2nd edition. Academic Press, London. 302 p.
- Buckland, S.T.; Anderson, D.R.; Burnham, K.P.; Laake, J.L.; Borchers, D.L.; Thomas, L. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, Oxford. 432 p.
- Ehrlich, Dobkin, & Wheye, 1988: *Birders's Handbook*. p.5-25.
- ENVIS. 2023. Available online at <https://scstsenvis.nic.in/index2.aspx?slid=8039&sublinkid=2415&langid=1&mid=4>. [Accessed on 31August 2023].
- Gibbons, D.W.; Gregory, R.D. 2006. Birds. In Sutherland, W.J. (Ed.): *Ecological census techniques: a handbook*. 2nd edition. Cambridge University Press, Cambridge. 336 p.
- Grimmet.R, Inskipp.C, & Inskipp.T. (2000). *Birds of the Indian Subcontinent*. London: Oxford University Press.p.16-23 .
- Jayson, E. 2001. Structure, Composition and Conservation of Birds in Mangalavanam Grooves. *Zoo's Print Journal*, 16(5):471-478.
- Jayson, E. 2002. *Ecology of Wetland Birds in the Kole Lands Of Kerala*. Kerala Forest Research Institute Research Report,2002.
- Jonathan, K. K. 1989. *Beginners Guide Field Ornithology*. The Director, Zoological Survey of India.
- Kotpal, R. 1985. *The Birds*. Rastogi Publications, India, pp.10-35.
- Kuruvilla, K. A. 2016. A Study on the Avifauna of Palakkal Kole Wetland, Thrissur: A Ramsar site of South-India. *International Jopurnal of Zoological Research*, p.16,19.
- Munson, M.A., Caruana, R., Fink, D., Hochachka, W.M., Iliff, M., Rosenberg, K.V., Sheldon, D., Sullivan, B.L., Wood, C., Kelling, S., 2010. A method for measuring the relative information content of data from different monitoring protocols. *Methods Ecol. Evol.* 1, 263–273.
- M.P.Prajith, S. D. (2015). Diversity of birds in Kuniyan Wetland Ecosystem, Northern kerala, India. *National Workshop on Wetland Biodiversity: Conservation and management*. Nameer, P. 1994. *Birds of Parambikulam Wildlife Sanctuary-Survey Report*. KAU and Kerala Forest Department.
- Nameer, P. 2001. *Richness of Avifauna in the Sholas of Munnar, Idukki District*. Kerala Forest Research Institute, Peechi.p365-391
- Neelakantan, K. 1996. *Keralathile Pakshikal*. Kottayam: Kerala Sahithya Academy, Trissur, 55pp.
- The Hindu.2023. Available online at <https://www.thehindu.com/news/national/kerala/ernakulam-soars-in-waterbird-count/article66397809.ece> [Accessed on 31August 2023].
- Xavier, 2014, Pampadum Shola National Park. (2009).
- Yahya, H.S.A. (1988). Habitat Preference of Birds In The Periyar Tiger Reserve, Kerala. *Indian Journal Of Forestry*, Vol.12(4). 288-295

