The Pharma Innovation Journal 2022; 11(12): 1599-1613

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(12): 1599-1613

www.thepharmajournal.com
Received: 15-09-2022
Accepted: 19-10-2022

Keerthika Murugan
UG Student, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Logadharsini Vijayendran
UG Student, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Lusiya Mary Thangaraj
UG Student, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Mathialagan Mariyappan
Assistant Professor, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Archana Arunachalam
Assistant Professor, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Meena Rajendran
Assistant Professor, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu -630 306, India

Kumaravel Solaimuthu
Assistant Professor, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Corresponding Author:
Mathialagan Mariyappan
Assistant Professor, Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu, India

Studies on diversity and distribution of avifauna in Sethu Bhaskara agricultural college and research foundation, Karaikudi, Tamil Nadu

Keerthika Murugan, Logadharsini Vijayendran, Lusiya Mary Thangaraj, Mathialagan Mariyappan, Archana Arunachalam, Meena Rajendran and Kumaravel Solaimuthu

Abstract
A total number of 80 bird species belonging to 39 families and 17 orders has been recorded in the survey carried out from April 2022 to July 2022. Among the 17 orders Passeriformes (35.8%) is a dominant group consists of 14 species. All the birds recorded in the study area were categorized into 6 ecological groups based on their feeding habits namely, Insectivorous dominate in species strength (40.0%) followed by Omnivorous (21.25%), Carnivorous (13.75%), Granivorous (10.0%), Frugivorous (6.25%), Piscivorous (5.0%) and Nectarivorous (3.75%). Based on migratory and conservational status data results revealed that among the 80 bird species 56 species (70.0%) belong to resident (R), 11 species (13.25%) belong to resident (local) migrant (RM), 13 species (16.25%) belong to migrant (M) and 75 species (93.75%) were belong to least concern (LC). The results of Relative diversity (RD) index showed that Columbidae (8.75%) was the dominant family in the study area.

Keywords: *Avifauna*, columbidae, insectivores, passeriformes, SBAC & RF-Karaikudi

1. Introduction
Birds play significant role in the ecosystem by being part of the food web, act as pollinators, scavengers, predators, pest, seed dispersing agent and ecosystem engineers (Balasubramanyam and Imran Khan, 2016) [5]. Birds are the important groups of species for the conservation of biodiversity and also the indicator of minor changes in biodiversity (Jhenkhar *et al*., 2016) [13]. Birds are considered good bio-indicators of environmental quality, degree of pollution in terrestrial and aquatic ecosystem and are frequently being used to monitor environmental and ecosystem health (Canterbury *et al*., 2000) [7]. Birds are playing an important role in maintaining the ecological balance. When birds are dependent on the habitat functioning in specific ways, the population trends of birds can tell us about how well the ecosystem is functioning (Durairaj *et al*., 2017) [9]. According to an estimate 1,369 bird species have been recorded in India and 11,162 species found in world-wide over 15.0% of the world bird fauna are found in India. Out of 1,369 species recorded in India, 83 species are endemic, 3 species are breeding endemic and 105 species are globally threatened (Bird Life International, 2022) [6]. Study on avifaunal diversity is an essential tool which acts as important indicator to evaluate different habitats both qualitatively and quantitatively. Global diversity of birds is decreasing due to anthropogenic activities and climate change. Intensive use of chemical fertilizers, domestic and industrial effulents, agricultural runoffs, degradation of wetlands, agricultural expansion, overgrazing of the grasslands and urbanization leading to deforestation and pesticide as a part of the agriculture activities have played havoc on the traditional farming system and thus affecting birds, other wildlife as well as human beings (Grimmett *et al*., 2011) [10]. Organochlorine and organophosphate pesticides are widely used in crop cultivation. In the assessment of International Union for Conservation of Nature (IUCN) red list several species of birds are considered to be threatened globally out of which 93 are from India (Bird Life International, 2022) [6]. To safeguard global species diversity has emerged out as one of the significant issues today (Hu *et al*., 2011) [12]. Thereafter no such records of the avifaunal studies have found in this study area. With this above background this work was taken with the following main objectives to make an inventory of the avifauna in Sethu Bhaskara Agricultural College and Research Foundation (SBAC & RF), Karaikudi so as to generate a baseline data for future studies.

2. Materials and Methods

2.1 Study area

To study avifauna diversity at Karaikudi in Sethu Bhaskara Agricultural College and Research Foundation (SBAC & RF), Kalam Kavi Gramam, Visalayankottai, Sivagangai district observations were conducted from April 2022 to July 2022 (Figure 1). The college is situated between 9o51'13.3" N latitude and 78º 44'44.6'N longitude, average rainfall and temperature ranging from 603-800 mm and 29 °C-41 °C.

Fig 1: Map showing location of the study area and satellite view of SBAC & RF, Karaikudi, and Tamil Nadu

2.2 Study Method

For the purpose of birding, the campus 234 acres was mapped into two types of habitats i.e, College area and Farm area. The college area is nestled with administration block, undergraduate block, laboratory block, ground, mess, hostels, college entrance area, sports ground and barren lands. The entire campus is criss crossed with good networks of roads which is tree lined. College area is harbors a lot of plant species and the total college area is 77.9 acre. Artificial Canals, artificial fish ponds and standing water in the college fields are special specialties in roadside of the college campus, farm area and additionally surrounding the backside of college area, there is a river called bambar which provide good source for bird's reproduction and migratory birds. Farm area is primarily an agricultural area mainly paddy with agro forestry, organic farming area, medicinal plants and horticultural plants. Farm area is divided into six blocks, namely, A1- 14 acre, A2- 25 acre, B1-22 acre, B2- 39.10 acre, C1- 11 acre, C2-11 acre, additionally Animal husbandry (20 acre) and waste land (uncultivated land) 45 acre (Figure 2). The total farm area is 156.10 acre.

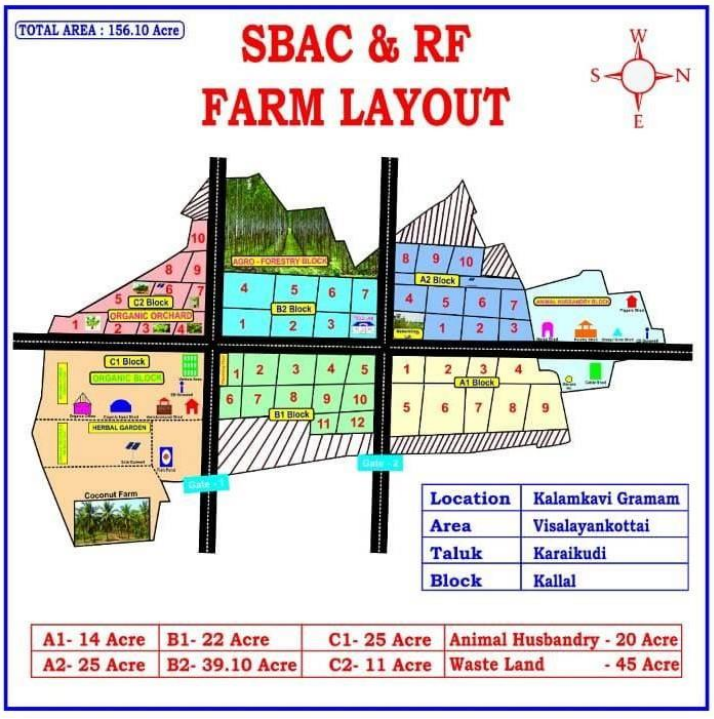


Fig 2: Farm Layout of SBAC & RF, Karaikudi, Tamil Nadu

Birds were counted during this study by direct count and total count methods (Urfi *et al*., 2005) [23]. In direct count method was suitable for selected and all visible birds were counted. Another method is total count was used wherever possible by Walking around the site sides. According to Sutherland (2006) [22], Point count method is most efficient method of estimating bird's avian diversity. This method used to observes at one point of fixed time and recording the seen by the observers and the distance of the zone around 50 m to 1oo m. The birds were counted by using direct count method and documented the identified species. Observations were made thrice a day in the early morning, afternoon and late evening. The birds were counted 6.00 am to 7.30 am in morning, 12.30 pm to 1.00 pm in afternoon and 5.00 pm to 6.00 pm in evening in all the days. Photography was done by using Nikon Digital Camera D3500 and with canon 70-300 mm lenses. Birds were identified with the help of field guides and articles (Ali, 2017) [1]. The specimens were observed with patience and compared with the plates given in the books. Identifications were also done with the help of websites, mobile applications, articles and experts. Based on the frequency of field observation, abundance of birds was categorized as Very Common (VC), Common (C) Occasional (O) and Rare (RR). The birds were categorized based on the migratory status into resident (R), winter migrant (WM), local migrant (LM), Considering the feeding guides, the birds were also classified into 6 categories on the basis of their food habits such as Herbivorus (HV), Piscivorus (PV), Omnivorus (OV), Insectivorus (IV), Frugivorus (FV) and Carnivorus (CV) following Ali and Ripley (1987) [2]. Based on the conservation (IUCN-International Union for Conservation of Nature) status the birds were classified into 3 categories such as Least Concern (LC), Nearly Threatened (NT) and Critically Endangered (CE) (Bird life International, 2022) [6].

2.3 Statistical analysis

Species diversity index were calculated to compare the species diversity among habitat types, various types of total species diversity indexes including Shannon-Weiner species diversity index (H') (Shannon and Wiener, 1949) [20], Evenness index (E) (Simpson, 1949) [21] and percentage occurrence of family and species were calculated by the following formulae (Wells, 2007) [24];

2.3.1 Shannon–Wiener diversity index (H')

$$H' = -\sum_{i=1}^{s} pi \ln pi$$

Where,
Pi= proportion of the species ith species in the total sample.
H'= species richness(S) in the community and their evenness in abundance.

2.3.2 Evenness index or Smith and Wilson's index (E)

E= /LogeS

Where, = value of the Simpson's diversity index.
S=species richness of the respective habitat.

The following formula used for calculating the percentage of occurrence in families. Percentage of occurrence also stated as Relative Abundance.

$$\text{Relative Abundance} = \frac{\text{Total number of individuals present in an order of bird}}{\text{Total number of bird individuals found in our entire study area}} \times 100$$

3. Results and Discussion

3.1 Diversity of Avifauna

The result revealed that, 80 bird species belonging to 17orders and 39 families were recorded in the study area (Table 1; Plate 1). The majority of birds from order Passeriformes including 14 families (35.8%) consist of maximum representation with 27 species. Another two dominant orders are Coraciiformes and Charadriiformes including 3 families (7.69%) consist of 6 & 5 species and the least represented orders (2.56%)% Anseriformes and Gruiformes including 1 family consist of 3 species are documented in the campus (Table 2). Similarly, Mathialagan *et al*. (2022) [16] reported that 34 species belonging to 26 families and 12 orders which are documented in Sugarcane research station at Sirugamani at Tiruchirappalli. In our study area the rich bird diversity is due to more plant diversity which is more provided food as well as nesting and breeding sites. The considerable number of trees in fallow land, river bank, many wooded tree species, shrub, bushy type stumpy vegetation and boundary of agricultural fields accommodates large number of bird population. Paddy is the main crop of the study area and is cultivated round the year (Mariappan *et al*. 2013) [15]. The paddy fields which are cultivated with well waters attract birds considerably. There are several factors that influence changes in bird populations such as availability of food, location of nesting sites, availability of nesting materials, introduced diseases, introduced and invasive flora, predators, competitiors (Rajesh *et al*., 2021) [18] and also habitat loss, environmental changes (Anula, 2015) [3]. However habitat loss is considered atop among the others. Habitat heterogenecity, climatic conditions rainfall, vegetation cover are the factors that govern the composition density abundance and diversity of the avifauna (Lorenzon *et al*., 2016) [14]. At this stage educational institution like SBAC&RF, Karaikudi with natural vegetation's serves as a good habitat for the bird community. The bird composition of a site depends on the vegetation structure. Existences of trees, bushes, creepers are very important to them (Harisha and Hosetti, 2009) [11]. Unavoidable situations caused disturbances to the avifauna of the college campus. The main problem was the loss of habitat due to activities which favour human beings. Birds are sensitive to the local landscape and changes in the vegetation pattern can greatly affect the population of birds in an area. The species distribution in the other study areas will also be higher, unless the area is not disturbed due to anthropogenic activities. The birds are friends of humans as they providing important ecosystem service such as pollination and seed dispersal, destroy lot of harmful insects, mosquitoes and from the environment (Sekercioglu, 2012) [19]. Among the total 39 families 19 families are represented by one species (1.25%), 5 families are represented by two species (2.50%), 9 families are represented three species (3.75%), 5 families are represented by four species (5.0%) and only one dominant family is represented by 7 species (8.75%) i.e., Columbidae (Figure 3)

Table 2: Percentage occurrence of observed bird species order in SBAC & RF Campus

Order	Total number of family	Total number of species	Percentage occurrence
Passeriformes	14.0	27.0	35.8%
Charadriiformes	3.0	5.0	7.69%
Pelecaniformes	2.0	7.0	5.12%
Ciconiiformes	1.0	1.0	2.56%
Galliformes	2.0	5.0	5.12%
Bucerotiformes	1.0	1.0	2.56%
Piciformes	2.0	2.0	5.12%
Accipitriformes	1.0	4.0	2.56%
Coraciiformes	3.0	6.0	7.69%
Anseriformes	1.0	3.0	2.56%
Columbiformes	1.0	7.0	2.56%
Suliformes	2.0	2.0	5.12%
Gruiformes	1.0	3.0	2.56%
Psittaciformes	1.0	1.0	2.56%
Apodiformes	1.0	1.0	2.56%
Strigiformes	1.0	1.0	2.56%
Cuculiformes	2.0	4.0	5.12%

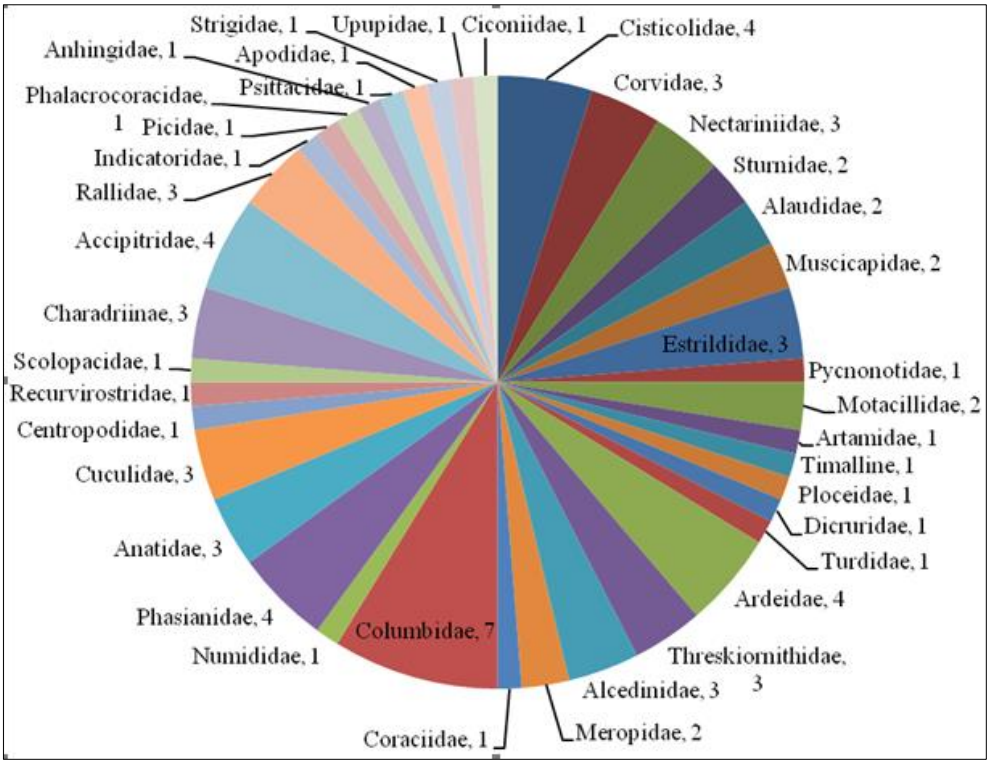


Fig 3: Diversity of observed bird species families in SBAC & RF Campus

3.2 Status on Feeding Guilds of Avifauna

The observations on feeding guilds showed that the highest number of birds totally 32 species (40.0%) were Insectivorous (Table 1). Other than the insectivorous 17 species (21.25%) are Omnivorous, 11 species (13.75%) are Carnivorous, 8 species (10.0%) are Granivorous, 5 species (6.25%) are Frugivorous and 3 species (3.75%) are Nectarivorous and 4 species (5.0%) of Piscivorous. It is evident from this study, that Insectivorous and Omnivorous birds constitute majority of the bird community in the study area. Passeriformes are largest order and dominant avian group today because Passeriformes have great diversity of feeding adaption. Most of them are insectivorous. The reason behind is rich vegetation, organic farming and agricultural area more in our campus makes a hope for more insect population. The presence of less number of frugivorous, grainivorus, nectarivorus and piscivorous birds is due to the absence of fruiting trees, grain at milking and harvesting stage, nectar producing plants and low water level in artificial fish ponds during the study period. Hence the birds are attracted to the nearby areas which are fully loaded with fruiting tree and other food diets which birds required. The high numbers of Omnivorous birds were recorded in our study due to the residential area (Hostel and mess) along the periphery thorn forest. Based on this comparison Insectivorous are dominant group birds in the agricultural land feed mostly insects. Such birds are useful to control insects in various crops (Asokan *et al*., 2009) [4].

3.3 Residential Status of Avifauna

The data on residential status revealed that among 80 bird species 56 species were (13.75%) belong to resident (R) (Table 1). 11 species (70.0%) belong to resident (local) migrant (RM), 13 species (16.25%) belong to migrant (M). In

our study plenty of residents as well as few migrant are found here because of adequate food and shelter and also vegetation. Birds are migrated from the place to place in the search of favourable condition and food. Migration of birds was due to the fluctuation in climatic condition. The major threats observed in the study area were encroachments for buildings, settlements and human disturbances

3.4 Abundance Status of Avifauna

Based on abundance (Frequency of sightings) status results indicated that 26 species (32.5%) were found very common (VC), 38 species (47.5%) are found common (C), 14 species (17.5%) are occasional (O), 2 species (2.5%) are rare (R) and they are Black-rumped flameback (lesser golden-backed woodpecker), Red naped ibis were recorded in our campus (Table 1). Categorizing the birds into very common, common and rare, this will help to understand the structure of bird population. This explains the bird population structure of the campus. More complex vegetation structure is associated with greater diversity. The agricultural fields surrounding orchard, garden, probably provided shelter and suitable foraging grounds for the land birds (Mariappan *et al*., 2013) [15]. Irrigation canals, fish ponds and paddy fields provided different food sources like fish, crustaceans, invertebrates, water plants which further added to the diversity of wet land birds.

3.5 Conservational Status of Avifauna

Based on conservational status data results was revealed that 75 species (93.75%) were belong to least concern (LC) and 4 species (5.0%) were belong to near threatened (NT) and 1 species (1.25%) belong to critically endangered (CE) (Table 1). Though all the species of the campus comes under least concern category according to red list, there is a pressing need of prompt steps to conserve the bird population. To maintain a viable population, conservation measures are needed. Habitat selection plays a prominent role in bringing variations in the distribution of avifauna. The food resources roosting and nesting grounds for local and migratory species might influence their diversity and distribution (Paracuelloe, 2006) [17]. There were several factors that influence change in bird population such as rainfall, vegetation and availability of food (Rajesh *et al*., 2021) [18].

3.6 Diversity Indices of Avifauna

The calculated diversity indices among habitat types results was revealed that laboratory block has the highest value of Shannon- Wiener index (H') = 0.341 and the least value of H is calculated in B1 block, College entrance and Under Graduate blocks (H' = 0.1231) (Table 3). Similarly, Evenness index (E) was also found to be the highest in laboratory block (E = 0.179) and least found in B1 block College entrance and Under Graduate blocks (E = 0.064).

3.7 Monthly Wise Diversity of Avifauna

Monthly variation in the diversity of birds during the study period was more in June (51.8%) and May (21.3%) as there was optimum water storage availability of food increased vegetation, and the arrival of migratory birds (Figure 4). The minimum was recorded in April (6.02%) this might be reason for end of the April month only the study was initiated and July (16.8%) due to heavy rain increased flow of water non-availability of foods. Towards the end of winter, February to march most of the migratory birds started moving and also the water level started decreasing in wetlands, river and fish ponds, which are possible reasons for less sighting frequency. Various studies reported that water level and the bird abundance are inter-related the same phenomenon is reported from the current study to Colwell and Taft (2000) [8]. The minimum diversity recorded from July to April due to non-availability of food. Many of the birds were displaced during this season and spread and the neighbouring areas of agricultural activities which form their feeding ground. Some birds find their breeding ground elsewhere in this season. During rainy season the water level was observed as raised and the stagnation of water lasted for longer periods and this might be the reason for observation of large number of birds in the month of June followed by May month.

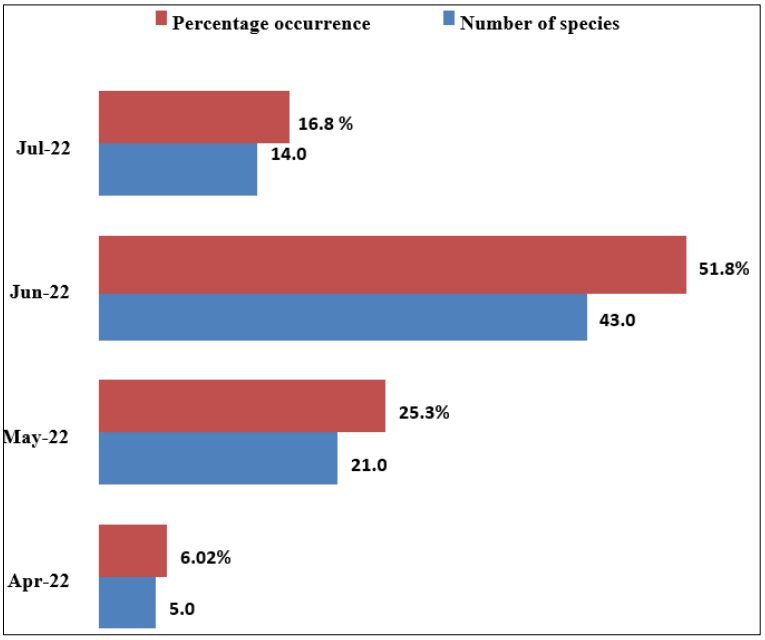


Fig 4: month-wise distribution of observed bird species

3.8 Block Wise Diversity of Avifauna

Block-wise birds percentage distribution results was revealed that Laboratory block shows highest percentage (23.75%) followed by cattle shed area (12.50%) and lowest percentage recorded in B1 block, college entrance and undergraduate (3.75%) (Table 3).The laboratory block consists of 19 species. This may due to Pambar river bank were passed behind the laboratory block and artificial fish ponds present in the campus which serves as reservoir for bird breeding, nesting site and reproduction. The possible reason behind the increase in diversity and monthly species richness of birds could be the temperature variation, climatic change and flora around the area. The species richness was recorded high in the study area. This was probably the study area has more deciduous and jungle which may support high food availability. The lowest bird diversity were recorded in the college entrance and undergraduate area, administration block and mess area might be due to constant human activity, the presence of vehicle parking area which was subjected to maximum movements of heavy vehicle round the clock. Though this area had a maximum human interference, it supported 3.75% of bird's species. It clearly indicates that the birds preferred site laboratory block in the study area. This may due to less disturbance, high water retention and availability of food. This may due to the presence of large uniform area of open lands along with trees and bushes, less human activity and presence of thickets in the region.

Table 3: Block-wise percentage occurrence and diversity indices of bird species

Block	Total number of birds	Percentage occurrence	Shannon-Weiner Index (H')	Evenness Index(E)
A1	4.0	5.0%	0.149	0.07
A2	6.0	7.50%	0.194	0.102
B1	3.0	3.75%	0.1231	0.064
B2	8.0	10.0%	0.23	0.121
C1	9.0	11.25%	0.245	0.128
C2	4.0	5.0%	0.149	0.078
Laboratory block	19.	23.75%	0.341	0.179
Flori Forest	6.0	7.50%	0.195	0.102
College Entrance	3.0	3.75%	0.1231	0.064
Undergraduate area	3.0	3.75%	0.1231	0.064
Cattle shed area	10.0	12.50%	0.259	0.136
Mess area	5.0	6.25%	0.173	0.09

Table 1: Systematic Checklist of observed birds in Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu

S. No	Order	Family	Common name	Scientific name	Vernacular name (Tamil Name)	Feeding Guild	Residential Status	Abundance	IUCN Status
1.	Passeriformes	Cisticolidae	Ashy prinia	*Prinia socialis*	Saambal Kathirkuruvi	IV	R	C	LC
			Grey breasted prinia	*Prinia hodgsonii*	Velirsambal Kathirkuruvi	IV	RM	C	LC
			Chirping cisticola	*Cisticola pipiens*	Kathirkuruvi	OV	R	C	LC
			Common tailor bird	Orthotomus sutorius	Thaiyal Sittu	IV	R	C	LC
		Corvidae	Jungle crow	*Corvus macrorhynchos*	Andang Kakkai	OV	R	VC	LC
			Indian Treepie	*Dendrocitta vagabunda*	Vaal Kakkai	IV	R	C	LC
			House crow	*Corvus splendens*	Kakkai	OV	R	VC	LC
		Nectariniidae	Purple Sunbird	*Nectarinia asiatica*	Ootha Theyn Chittu	NV	R	C	LC
			Pale billed flower pecker	*Dicaeum erythroynchos*	Poonkothi	NV	R	VC	LC
			Sun bird	*Nectarinia asiatica*	Thensittu	NV	R	VC	LC
		Sturnidae	Brahminy starling	*Sturnia pagodarum*	Kondai Myna	OV	R	O	LC
			Common myna	*Acridothere stristis*	Naganavaai	OV	R	VC	LC
		Alaudidae	Fawn colored lark	*Calendulauda africanoides*	Sambal Thalaivanampaadi	OV	R	C	LC
			Horsfield's bush lark	*Mirafra javanica*	Vanampaadi	OV	M	C	LC
		Muscicapidae	Indian robin	*Saxicokoides fulicatus*	Karunchittu	IV	R	C	LC
			Pied bush chat	*Saxicola caprata*	Karuppu Vellai Puthar Chittu	IV	R	C	LC
		Estrildidae	Indian Silverbill (White throated munia)	*Lonchura malabarica*	Venthondai Sillai	GV	R	C	LC
			Spotted munia	*Lonchurapunctulata*	Pulli Chillai	GV	R	C	LC
			Black headed Munia	*Lonchura malacca*	Karuthalai Chillai	GV	R	C	LC
		Pycnonotidae	Redvented bulbul	*Pycnonotus cafer*	Chinnaan	GV	R	C	LC
		Motacillidae	Largepied wagtail	*Motacilla maderaspatensis*	Karuppu Velai Vaallati	IV	R	VC	LC
			Paddy field pipit	*Anthus rufulus*	Vayal Nettai	IV	R	C	LC

					Kaali				
		Artamidae	Ashy wood swallow	*Artamus fuscus*	Sambalthakaivilan	OV	M	C	LC
		Timallidae	White headed babbler	*Turdoides affinis*	Venthalai Silamban	IV	R	VC	LC
		Ploceidae	Baya weaver	*Ploceus philippinus*	Tookkanang Kuruvi	GV	R	C	LC
		Dicruridae	Black drongo	*Dicrurus macrocercus*	Karung Karichaan	IV	R	VC	LC
		Turdidae	Brown backed solitaire	*Myadestes occidentalis*	-	FV	RM	C	LC
2.	Pelecaniformes	Ardeidae	Great Egret	*Casmerodius albus*	Kokku	CV	R	C	LC
			Indian pond heron	*Ardeola grayii*	Madaiyaan	CV	R	VC	LC
			White bellied heron	*Ardea insignis*	VellaivayitruKokku	CV	R	C	CE
			Black crowned night heron	*Nycticorax*	Erakkokku	CV	R	O	LC
		Threskiornithidae	Glossy ibis	*Plegadis falcinellus*	Arrival Mookan	PV	RM	O	LC
			Red naped ibis	*Pseudibis papillosa*	Senkaluthu Mookan	IV	R	R	LC
			Ibis	*Cercibis oxycera*	Mookan	IV	M	O	LC
3.	Coraciiformes	Alcedinidae	Common kingfisher (smallblue)	*Alcedo atthis*	Siraal Meenkothi	IV	RM	VC	NT
			Blue eared kingfisher	*Alcedo meninting*	Nilakathu Meenkothi	IV	RM	VC	NT
			White breasted kingfisher	*Halcyon smyrnenis*	Venmarbu Meenkothi	PV	R	VC	NT
		Meropidae	Blue tailed beef eater	*Merops philippinus*	Neelavaal Panchuruttan	IV	RM	C	LC
			Green beef eater	*Merops orientalis*	Pachai Panchuruttan	IV	RM	C	LC
		Coraciidae	Indian roller	*Coracias benghalensis*	Panangadai	IV	R	VC	LC
4.	Colmbiformes	Columbidae	Laughing dove	*Spilopelia senegalensis*	Poora	OV	R	C	LC
			Domestic pigeon	*Columba liviadomestica*	Valupooraa	GV	R	C	LC
			Black imperial pigeon	*Ducula melanochora*	Manthipooraa	FV	R	C	LC
			Eurasian collared dove	*Streptopelia decaocto*	Sambalpura	GV	R	C	LC
			Spotted dove	*Streptopelia chinensis*	Pullip Pura	GV	R	C	LC
			Feral pigeons	*Columba livia rustica*	Kattupooraa	GV	R	C	LC
			Rock pigeon	*Columba livia*	Madapooraa	GV	R	C	LC
5.	Galliformes	Numididae	Helmeted guinea fowl	*Numida meleagris*	Kinnikoli	OV	R	VC	LC
		Phasianidae	Indian peahen (Female) and peacock (Male)	*Pavo cristatus*	Neela Mayil	OV	R	VC	LC
			Turkey hen	*Meleagris gallopavo*	Vaankoli	CV	R	VC	LC
			Red jungle fowl – Male and Female	*Gallus galls domestics*	Kolli	OV	R	VC	LC
			Grey francolin	*Francolius pondicerianus*	Kowdhari	IV	R	VC	LC
6.	Anseriformes	Anatidae	Domestic goose	*Anser anser domesticus*	Vaathu	OV	R	C	LC
			Muscovy duck	*Cairina moschata*	ManilaVaathu	OV	R	C	LC
			Domestic duck	*Anas platyrhynchos domesticus*	Vaathu	OV	R	VC	LC
7.	Cuculiformes	Cuculidae	Asiankoel (Female and Male)	*Eudynamys scolopaceus*	Kuyil,Kokilam	FV	R	C	LC
			Small green billed malkoha	*Phaenicophaeus viridirostris*	Pachaivayan	OV	RM	O	LC
			Pied crested cuckoo	*Clamator jacobinus*	Sudalaikuyil	IV	RM	O	LC
		Centropodidae	Greater coucal	*Centropus sinensis*	Shenbagam	OV	R	VC	LC
8.	Charadriiformes	Recurvirostridae	Black winged stilt	*Himantopus himantopus*	Nedungaal Ullan	IV	R	O	LC
		Scolopacidae	Wood sandpiper	*Tring aglareola*	Pori Ullan	IV	M	O	LC
		Charadriidae	Red watteld lapwing	*Venellus indicus*	Sivappu Mooku Aalkatti	IV	R	VC	LC
			Yellow wattled lapwing	*Vanalleus malarbaricus*	Manjal Mooku Aalkatti	IV	R	C	LC

			Little ringed plover	*Charadius dubius*	Pattaani Uppukkothi	IV	RM	C	LC
9.	Accipitriformes	Accipitridae	Long legged buzzard	*Buteo rufinus*	Nilakaalvairi	CV	R	C	LC
			White eyed buzzard	*Butastur teesa*	Vellaikannvairi	CV	R	C	LC
			Shikra	*Accipiter badius*	Valluru	CV	R	C	LC
			Black shouldered kites	*Elanus ceucurus*	Ovanam	CV	R	VC	LC
10.	Gruiformes	Rallidae	White breasted waterhen	*Amaurorni sphoenicurus*	Kambul Koli	IV	R	O	LC
			Purples wamphen	*Porphyrio porphyria*	Neelathzhalai Koli	IV	M	O	LC
			Common moorhen	*Gallinula chloropus*	Thaazhaikozhi	IV	RM	O	LC
11.	Piciformes	Indicatoridae	Lesser honey guide	*Indicator minor*	-	IV	R	VC	LC
		Picidae	Lessergolden-backed woodpecker	*Dinopium benghalense*	Ponmuthugu Maramkothi	IV	R	R	LC
12.	Suliformes	Phalacrocoracidae	Little cormorant	*Phalacrocorax niger*	Chinna Neerkaagam	PV	RM	O	LC
		Anhingidae	Darter	*Anhinga melanogaster*	Pambu Thara	PV	RM	O	LC
13.	Psittaciformes	Psittacidae	Rose ringed parakeet	*Psittacula krameri*	Senthaar Pynkilli	FV	R	VC	LC
14.	Apodiformes	Apodidae	Indian swiftlet	*Callocolia unicolor*	Uzhavaran	IV	R	C	LC
15.	Strigiformes	Strigidae	Spotted owlet	*Athene brama*	Pulli Aandhai	CV	R	VC	NT
16.	Bucerotiformes	Upupidae	Common hoopoe	*Upupa epops*	Kondalaathi	IV	RM	VC	LC
17.	Ciconiiformes	Ciconiidae	Asianopenbill or Asian open billstork	*Anastomus oscitans*	Nathaikutthinaarai	CV	M	O	LC

Note: Residential status: R-Resident, M-Migrant, and RM-Resident
Migrant Abundance: C-Common, VC-Very common, O-Occasional
Conservation (IUCN) Status: LC-Least Concern, CE-Critically Endangered, NT-Nearly Threatned
Feeding Guild: IV-Insectivorous, CV-Carnivorous, FV-Frugivorous, PV-Piscivorous, GV-Granivorous, FV-Frugivorous, NV Nectarivorous


Ashy prinia


Grey breasted prinia

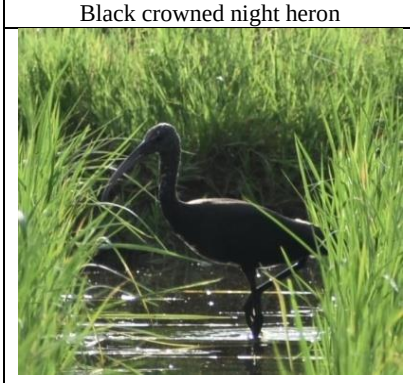

Chirping cisticola

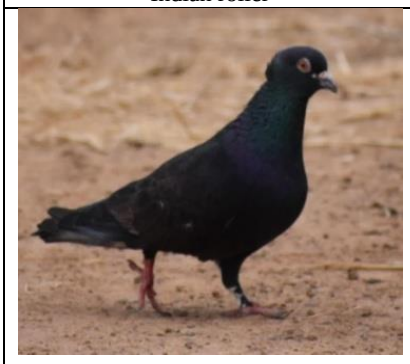
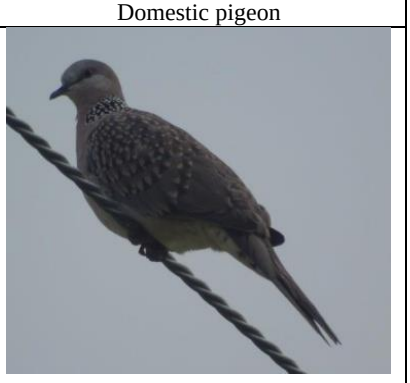

Common tailor bird


Jungle crow


Indian treepie

		
House crow	Purple sunbird	Pale billed flower pecker
		
Sunbird	Brahminy starling	Common myna
		
Fawn colored lark	Horsfield’s bush lark	Indian robin
		
Peid bush chat	Indian silver bill	Scaly breasted munia
		
Black headed munia	Red vented bulbul	Large paid wagtail

		
Paddy field pipet	Ashy wood swallow	White headed babbler
		
Baya weever	Black drongo	Brown packed solitaire
		
Great Egret	Indian pond heron	White billed heron
		
Black crowned night heron	Glossy ibis	Red naped ibis
		
Ibis	Common kingfisher	Blue earned kingfisher

		
White breasted kingfisher	Blue tailed bee eater	Green bee eater
		
Indian roller	Laughing dove	Domestic pigeon
		
Black imperial pigeon	Eurasian collared dove	Spotted dove
		
Feral pigeon	Rock pigeon	Helmeted guinea fowl
		
Indian peahen (Male)	Indian peacock (Female)	Turkey hen

		
Red jungle fowl-Male	Jungle fowl (Female)	Grey francolin
		
Domestic goose	Muscovy duck	Domestic duck
		
Asian koel (Female)	Asian koel (Male)	Small green billed molkoha
		
Pied crested cuckoo	Greater coucal	Black winged stilt
		
Wood sand piper	Red wattled lapwing	Yellow watteled lapwing

		
Little ringplover	Long legged buzzard	White eyed buzzard
		
Shikra	Black shouldered kite	White breasted waterhen
		
Purples wamphen	Common moorhen	Lesser honey guide
		
Lesser golden packed woodpecker	Little cormorant	Darter
		
Rose ringed parakeet	Indian swiftlet	Spotted owlet

Common hoopoe

Asian open bill

Plate1: Birds observed in Sethu Bhaskara Agricultural College and Research Foundation, Karaikudi, Tamil Nadu

4. Conclusions

Sethu Bhaskara Agricultural College and Research Foundation campus supports a fair diversity of birds. The present study provides baseline data for monitoring bird's diversity in the college. This study creates awareness on documenting birds in other educational institutions. This information will be help in future for species specific work on avifauna and for launching conservation strategies. Although there are natural vegetation, artificial canal, artificial fish ponds and cultivated crops in the college as habitat for birds of this region, conservation measures are immense need for their future survival. During short period of time we have recorded 80 numbers of species in the campus. If this research will continue throughout the year means it will give fruitful results, this may be helpful to ornithologist, conservation biologist and environmental scientist for further studies.

5. Acknowledgment

The authors are highly thankful to our Chairman and Principal, Dr. Sethu Kumanan, and Dr. K. Karunanithi, SBAC&RF for meticulous support throughout our study period. Also thanks to our friend Mr. J. A. Valanarasu for Assisted in taking photographs by providing photographic equipment.

6. Declarations

Authors do not have any conflict of interest regarding the experiment.

7. References

1. Ali S. The Book of Indian birds, 13th revised edition. Oxford University press, New Delhi; c2017. p. 326.
2. Ali S, Ripley SD. Handbook of the Birds of India and Pakistan. Oxford University Press, New Delhi; c1987.
3. Anula J. Studies on the status of the Birds in habituating, Sirpur Lake Indore, MP, with reference to the changing environment. Research Journal of Recent Sciences. 2015;4:18-21.
4. Asokan S, Ali AMS, Manikannan R. Diet of three insectivorous birds in Nagapattinam district, Tamil Nadu, India-A Preliminary study. Journal of Threatened Taxa. 2009;1(6):327-330.
5. Balasubramanyam VV, Imran Khan YD. Avian fauna of proposed wind power project area at Chillavaripalli and Ellutla reserve forests. Journal of Entomology and Zoology Studies. 2016;4(6):722-728.
6. Bird Life International. Threatened Birds of the World. Http://www.birdlife.org; 1 December 2022.
7. Canterbury GE, Martin TE, Petit DR, Petit, LJ, Bradford DF. Bird communities and habitat as ecological indicators of forest condition in regional monitoring. Conservation Biology. 2000;14(2):544-558.
8. Colwell MA, Taft OW. Water bird communities in managed wetlands of varying water depth. Water birds. 2000;23:1121-1133.
9. Durairaj P, Maniarasan U, Nagarajan N. Study on Avifaunal Diversity from Thiruthalaiyur Lake Tiruchirapalli Forest Division, Tamil Nadu. IOSR Journal of Environmental Science Toxicology and Food Technology. 2017;11(12): 67-71.
10. Grimmet R, Inskipp C, Inskipp T. Birds of the Indian Subcontinent. 2nd ed. Oxford University Press and Christopher Helm, London; c2011. p. 528.
11. Harisha MN, Hosetti BB. Diversity and distribution of avifauna of Lakkavalli range forest, Bhadra wildlife sanctuary, western ghat, India. Ecoprint: An International Journal of Ecology. 2009;16:21-27.
12. Hu J, Jiang Z, Zhang C. Bird diversity and the conservation value of a new Ramsar site: Guandong Haifeng Wetlands, China. Integrative Zoology. 2011;6:266-278.
13. Jhenkar M, Jadeyegowda M, Kushalappa CG, Ramesh MN, Sathish BN. Bird diversity across different vegetation types in kodagu, Central Western Ghats, India. International Journalof Zoology. 2016;6(3):25-36.
14. Lorenzon RE, Beltzer AH, Olguin PF, Ronchi-Virgolini AI. Habitat heterogenecity drives bird species richness, nestedness and habitat selection by individual species in fluvial wetlands of Parana River, Argentina. Austral ecology. 2016;41:829-841.
15. Mariappan N, Kalfan BKA, Krishnakumar S. Assessment of bird population in different habitat of agricultural ecosystem. International Journal of Research in Environmental Science. 2013;1(11):306-316.
16. Mathialagan M, Ajithkumar R, Meena R, Manimozhi Selvi V, Mohan S, Tamilselvan N. Avifaunal diversity of sugarcane research station, Sirugamani, Tiruchirappalli, Tamil Nadu. Journal of Entomology and Zoology Studies. 2022;10(4):109-116.
17. Paracuelloes M. How can habitat selection affect the use of a wetland complex by waterbird?. Biodiversity and Conservation. 2006;15:4569.
18. Rajesh M, Gangadharan A, Kishore R, Ganapathi S. Avian Diversity in Manjamalai Sacred Grove, Madurai District, Tamil Nadu, India. Journal of Science and Tecnology. 2021;6(4):110-122.

19. Sekercioglu CH. Bird functional diversity and ecosystem services in tropical forest, agro forests and agricultural areas. Journal of Ornithology. 2012;153(S1):153-161.
20. Shannon CE, Weaver. The mathematical Theory of communication. Urbana University, Illinois press; c1949. p. 117.
21. Simpson EH. Measurement of diversity. Nature 1949;163:688.
22. Sutherland WJ. Ecological census techniques a handbook, Coimbatore University, New York; c2006. p. 432.
23. Urfi AJ. Counting birds in India: Methodologies and Trends. Current Science. 2005;89(12):1997-2003.
24. Wells DR. The birds of the Thai-Malay Peninsula. Passerines. Christopher Helm London, UK; c2007.