

Decadal changes and additions to birds of Pondicherry University, Puducherry, India

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Abstract

Species richness, and seasonal variation of birds were studied in Pondicherry University campus between February 2014 and February 2015. The data from the fall migration season of 2014 were compared with data from 2004 to understand the decadal changes in the bird diversity of the campus. A total of 96 species were recorded during the course of the study, of which 23 are new records for the university campus. Species richness varied considerably across the sampling duration, was highest during the fall migration season (78 species), and lowest during breeding season (54 species). Comparison of data, to understand the decadal changes in avifauna, revealed that 20 species, which were reported earlier from the campus, were not recorded during the present study.

Introduction

Pondicherry University (30.07°N, 80.23°E), established in 1987, comprising a 319 ha campus, has transformed over the years from a degraded scrubland to a highly managed habitat. Located between Kaliveli Lake, an Important Bird and Biodiversity Area, and the afforested lands of Auroville, the campus, which has witnessed a continuous stream of developmental activities,

including afforestation activities by the horticulture department of the university, now supports many resident, and migratory species of birds in its mosaic of habitats: degraded scrub jungle, grasslands, eroded ravines, plantations, and a waste water pond (Fig. 1). The tradition of bird-watching in Pondicherry University has a long history, with roots going back to 1988 when the first batch of the erstwhile Sàlim Ali School of Ecology took up a rigorous

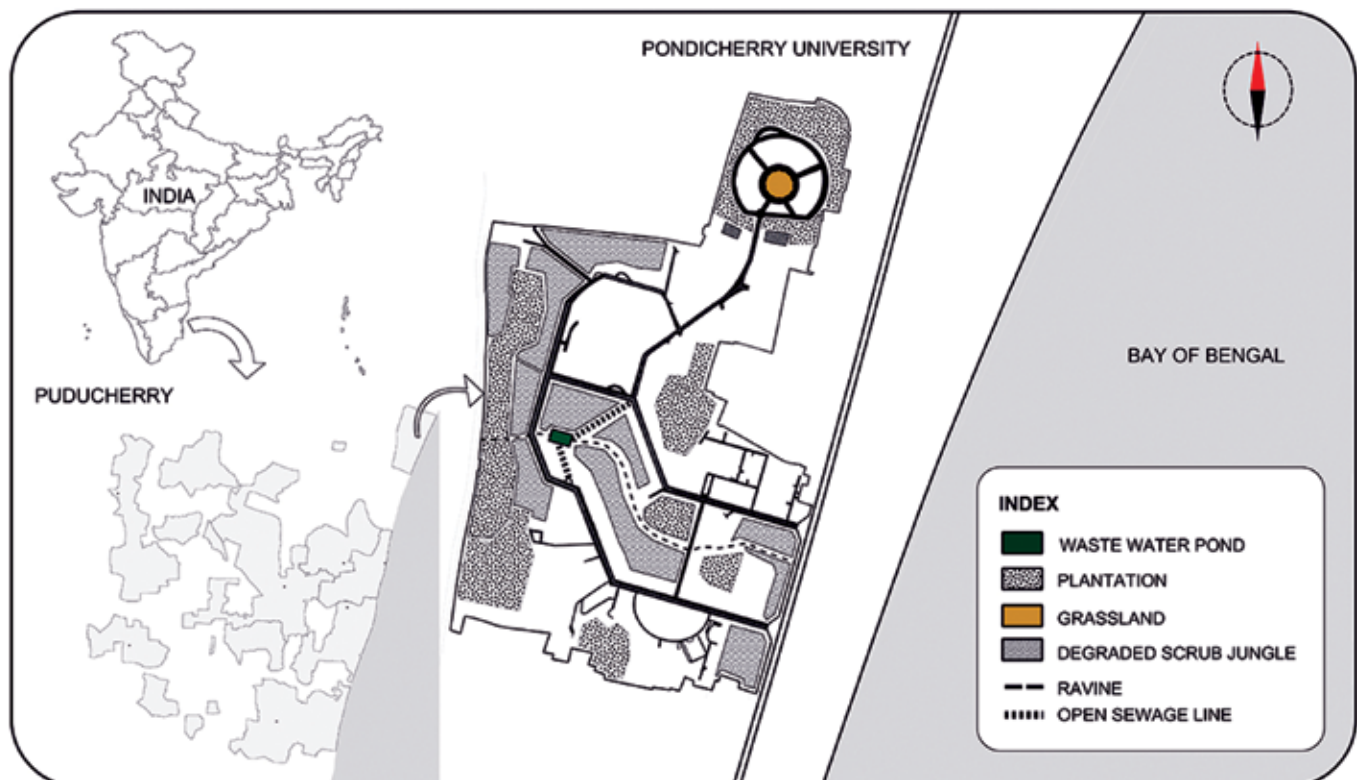


Fig 1. Pondicherry University and its various habitat types.

bird monitoring project between September and November 1988 (Santharam *et al.* 1988). Since then, bird monitoring projects have been a part of the curriculum of the Department of Ecology and Environmental Sciences, which was primarily under the supervision of Prof. Priya Davidar. Subramanean & Davidar (2004) published a report on the changes in the avifauna of the university campus over a period of 15 years.

In this study, we present results of a year-long monitoring programme of bird diversity in the Pondicherry University's campus, and record decadal changes in bird species richness, comparing it with the data of Subramanean & Davidar (2004). By this comparative evaluation, we also identified species, which have either disappeared, or colonised the campus over 25 years, and attempt to assess the seasonal variation of species. We have also attempted to present a comprehensive checklist of birds of the university's campus by including all observations over the past 25 years.

Methodology

Sampling of birds was carried out at monthly intervals from February 2014 to February 2015, during morning, and evening, using 12 line transects of 150 m each laid across the campus. During the survey, lists of species were maintained while walking the transect, which included species recorded in flight, and species detected and identified by their calls. Data so acquired were periodically uploaded on eBird (<http://ebird.org>) under a single hotspot for Pondicherry University (<http://ebird.org/ebird/hotspot/L1889373>). The entire sampling period was divided into four seasons, namely, spring migration (March–May), breeding season (June–July), fall migration (August–November), and winter (December–February). Seasonal variation in the number of species observed throughout the year was derived from the data obtained. Checklists from the present study were compared with those from Santharam *et al.* (1988), and Subramanean & Davidar (2004) to identify species that were either not recorded,

Table 1. Additions to birds of Pondicherry University Campus compared with Subramanean & Davidar (2004)

Sl. No	Species	Notes
1	Indian Peafowl <i>Pavo cristatus</i>	07 September 2014, a single adult male was observed at the north-western end of the horticulture plantation.
2	Rain Quail <i>Coturnix coromandelica</i>	13 March 2014, a pair was observed emerging out of the scrub in the horticulture plantation. The species was identified based on the male's plumage, which had typical black breast patch and black streaking on the sides, broad and white supercilium, and dark brown back.
3	Little Grebe <i>Tachybaptus ruficollis</i>	21 July 2014, four adults were observed in the waste-water pond.
4	Indian House Swift <i>Apus affinis</i>	09 October 2014, a flock of 16 was observed in the horticulture plantation. The species was identified by its characteristic white throat and rump. Single record during the study period.
5	Blue-faced Malkoha <i>Phaenicophaeus viridirostris</i>	26 February 2014, a single individual was observed in the scrub jungle adjoining the horticulture plantation. Species recorded every month throughout the study period.
6	Chestnut-winged Cuckoo <i>Clamator coromandus</i>	13 March 2014, two individuals observed in the horticulture plantation. 27 October 2014, one individual was observed feeding on a caterpillar. The sightings are from the spring, and fall migration seasons respectively. Previous unreported photographic record by Dr. S. Murali on 16 February 2011.
7	White-breasted Waterhen <i>Amaurornis phoenicurus</i>	21 July 2014, two individuals were observed foraging on the banks of the waste-water pond.
8	Common Moorhen <i>Gallinula chloropus</i>	21 July 2014, a single individual observed wading in the waste-water pond. 08 September 2014 six birds observed along with nest building activity.
9	Asian Openbill <i>Anastomus oscitans</i>	08 April 2014, two individuals observed roosting on a dry <i>Delonix regia</i> tree in the scrub jungle. Previously reported by Santharam <i>et al.</i> (1988) in an unpublished report.
10	Indian Pond-Heron <i>Ardeola grayii</i>	08 April 2014, a single individual was observed roosting on an <i>Accacia auriculiformis</i> tree in the horticulture plantation. Previously reported by Santharam <i>et al.</i> (1988).
11	Cattle Egret <i>Bubulcus ibis</i>	13 March 2014, a single individual observed in the scrub jungle adjoining the horticulture plantation. Previously reported by Santharam <i>et al.</i> (1988).
12	Intermediate Egret <i>Ardea intermedia</i>	18 October 2014, a single individual was observed foraging at the banks of the waste-water pond
13	Little Egret <i>Egretta garzetta</i>	08 April 2014, single individual was observed foraging at the banks of the waste-water. Previously reported by Santharam <i>et al.</i> (1988).
14	Little Cormorant <i>Microcarbo niger</i>	13 March 2014, a single individual observed flying above the horticulture garden. 08 September 2014, two individuals observed in the waste-water pond.
15	Crested Serpent Eagle <i>Spilornis cheela</i>	12 February 2014, a single individual was observed soaring above the Thiruvalluvar Stadium, identified by its prominent dark trailing edge to the wings behind broad white band, two distinct broad black tail bands, and characteristic call. 13 March 2014, a single individual observed perching on an abandoned electricity pole.
16	White-bellied Sea Eagle <i>Haliaeetus leucogaster</i>	23 February 2015, a single individual was observed soaring towards the eastern end of the campus.
17	Common Barn Owl <i>Tyto alba</i>	02 May 2014, a single individual incidentally observed perching on the water tank of Valmiki Boy's Hostel at 2345 hrs.
18	Collared Scops Owl <i>Otus bakkamoena</i>	15 March 2014, two individuals observed roosting in a thorny bush. Well established resident in the campus and seems to maintain territories, since most of the individuals were observed at the same general locations throughout the year. Previous unreported record by Seshadri K S, who photographed a single individual on 16 October 2009.
19	White-rumped Munia <i>Lonchura striata</i>	12 July 2014, two individuals observed in the scrub jungle adjoining the horticulture plantation.
20	Black-headed Munia <i>L. malacca</i>	14 November 2014, two individuals observed on transect along the main campus road. Previous unreported record by Dr. S. Murali in 2011.
22	Zitting Cisticola <i>Cisticola juncidis</i>	21 March 2014, a single individual observed among the grasses in the scrub jungle adjoining the horticulture plantation. The individual was detected by its call. Its crown had black streaks, indicating that it was a non-breeding bird.
22	Asian Brown Flycatcher <i>Muscicapa dauurica</i>	22 September 2014, observed three individuals at different locations along the transect in the horticulture garden. Previously reported by Santharam <i>et al.</i> (1988).
23	Orange-headed Thrush <i>Geokichla citrina</i>	15 March 2014, a single individual observed sulking within a dense thorny bush. 02 May 2014, a single individual observed perching on the stump of a chopped <i>Acacia</i> sp. tree. Both of these observations fell within the spring migration season. The next sighting of this species was on 25 October 2014 which falls in the fall migration season.

or added by the present study to the university campus' list. Field identifications of birds were based on (Grimmett *et al.* 2011); nomenclature follows Praveen *et al.* (2014).

Results

Addition to birds of Pondicherry University campus

A total of 94 species were recorded during the course of the study (February 2014 to February 2015) during which we documented 23 species, which were not recorded from the university campus by Subramanean & Davidar (2004) (Table 1). With this study the total number of species recorded from Pondicherry university campus in the past 25 years stands at 126 (Appendix).

Seasonal variation of species richness

Species richness varied considerably across the sampling duration (Fig. 2). It was higher during spring-, and fall migration in comparison to the breeding season, and winter, as expected. Many winter, and passage migrants like Chestnut-winged Cuckoo, Indian Pitta *Pitta brachyura*, Brown Shrike *Lanius cristatus*, Blyth's Reed-Warbler *Acrocephalus dumetorum*, Greenish Warbler *Seicercus trochiloides*, Rosy Starling *Pastor roseus*, and Orange-headed Thrush were observed during the spring migration. During breeding season, nesting, and breeding of Grey Francolin *Francolinus pondicerianus*, Yellow-wattled Lapwing *Vanellus malabaricus*, Red-wattled Lapwing *V. indicus*, and Oriental Magpie-Robin *Copsychus saularis* were recorded. Two migrants, Pallid Harrier *Circus macrourus* (last sighting on 23 July 2014) and Alpine Swift *Tachymarptis melba* (last sighting on 2 August 2014), which presumably left late, were recorded in the breeding season. Species richness in fall migration was boosted by the arrival of various winter, and passage migrants like Alpine Swift, Chestnut-winged Cuckoo, Common Cuckoo *Cuculus canorus*, Booted Eagle *Hieraetus pennatus*, Indian Pitta, Brown Shrike, Forest Wagtail *Dendronanthus indicus*, Greenish Warbler, Asian Brown Flycatcher, and Orange-headed Thrush; the nomadic Black-headed Cuckooshrike *Coracina melanoptera* was also recorded. On 14 October 2014 a high count of 14 Indian Paradise-flycatcher *Terpsiphone paradisi* was made. We observed individuals of this species entering into the campus from the western end at multiple locations throughout the transect in the horticulture plantation. Upon completing collection of data for the day, a wider search led us to record 33 individuals of this species. We observed both, the white and brown morph males, males with no tail streamers, and females. Surprisingly, on the next day, only six individuals were noted at the same area. The nominate peninsular race of Indian Paradise-flycatcher is known to migrate to Sri Lanka in winter (Rasmussen & Anderton 2005), and this observation probably captures the passage migration of this species. Some of these migrant species observed during fall migration, like Brown Shrike, Greenish Warbler, and Asian Brown Flycatcher, stayed back in the campus, and were also reported during winter. Other migrant species of birds which arrived during winter were Ashy Drongo *Dicrurus leucophaeus*, and Blyth's Reed-Warbler.

Decadal changes in the avifauna of Pondicherry University campus

92 species had been reported from the campus till 2003, with the highest number of species recorded in 1988, when 77 species were documented during the fall migration season, which

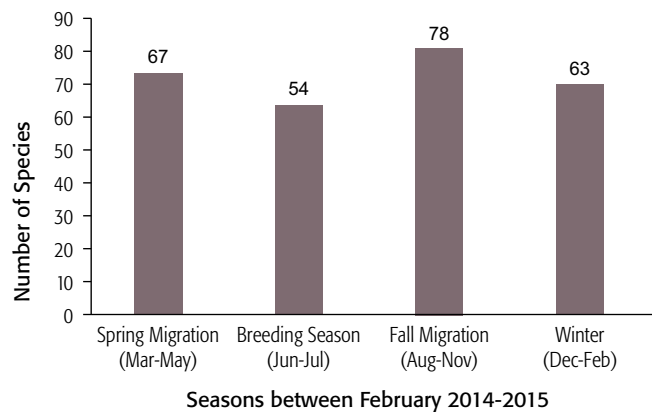


Fig. 2. Seasonal variation in bird species richness in Pondicherry University between February 2014 and February 2015.

Table 2. List of species reported by Subramanean & Davidar (2004) not observed in present study

Sl. No	Species	Last Record
1	Pied Cuckoo <i>Clamator jacobinus</i>	1992
2	Montagu's Harrier <i>Circus pygargus</i>	1989
3	Common Buzzard <i>Buteo buteo</i>	2002
4	Brown Hawk Owl <i>Ninox scutulata</i>	1988
5	Blue-tailed Bee-eater <i>Merops philippinus</i>	1998
6	Common Kestrel <i>Falco tinnunculus</i>	1992
7	Eurasian Hobby <i>F. subbuteo</i>	1988
8	Plum-headed Parakeet <i>Psittacula cyanocephala</i>	1989
9	White-bellied Drongo <i>Dicrurus caeruleus</i>	1989
10	Long-tailed Shrike <i>Lanius schach</i>	2003
11	Great Grey Shrike <i>L. excubitor</i>	1989
12	Indian Silverbill <i>Euodice malabarica</i>	2003
13	Scaly-breasted Munia <i>Lonchura punctulata</i>	1988
14	Yellow-throated Sparrow <i>Gymnoris xanthocolis</i>	2003
15	Indian Bushlark <i>Mirafra erythroptera</i>	1998
16	Grey-breasted Prinia <i>Prinia hodgsonii</i>	1998
17	Red-rumped Swallow <i>Cecropis daurica</i>	1992
18	Lesser Whitethroat <i>Curruca curruca</i>	1989
19	Taiga Flycatcher <i>Ficedula albicilla</i>	1989
20	Black Redstart <i>Phoenicurus ochruros</i>	1988

was considered the high point of avian species richness prior to development of the university campus (Subramanean & Davidar 2004). Santharam *et al.* (1988) had documented 92 species between February and November 1988. In the present study we have recorded a total of 96 species between February 2014 and February 2015, while 78 species were documented during the fall migration season. Twenty species, which were reported earlier by Subramanean & Davidar (2004), were not recorded during the present study (Table 2). It would be important to note that each year, for the past 25 years, birds have been recorded by observers with different levels of expertise, and hence the accuracy and coverage may not be consistent.

Discussion

As per the gazette records of the eighteenth century French administration, the region where the campus of Pondicherry University is presently located was once thickly forested with shrubs (Yamunan 2010). This would have been part of the now rare forest type known as the Tropical Dry Evergreen Forest, which is at present patchily distributed along the Coromandel-Circar (East Coast of India) region (Parthasarathy & Karthikeyan 1997). Remnants of this forest type exist as sacred groves, the nearest to the university being Puthupet sacred grove in Villupuram District (12.12°N, 71.85°E), 05 km away. As per the gazette, after the

Anglo-Carnatic War in 1781 the French cut down many trees from the forested regions of Kalapet to rebuild Puducherry town, which degraded the ecosystem of this region, converting it into an overgrazed scrubland over the years (Yamunan 2010). With the establishment of the university the pressures of grazing, and other human activities like collection of firewood, decreased over time. However, the development of the campus, and the reforestation programmes taken up by the horticulture department led to modification of the ecosystem, resulting in a mosaic of habitats forming within the campus. This may have reduced the area available for the erstwhile resident species, leading to a decrease in their numbers, while the existence of other habitat types led to other species colonising the campus. The best example of such colonisation is the establishment of the waste-water pond situated at the centre of the campus behind the current women's hostel. Out of the 21 new records, seven are from this waste-water pond. The establishment of the Silver Jubilee Campus has given rise to a vast grassland, which has become a breeding ground for Yellow-wattled Lapwing, and Jerdon's Bushlark.

On the other hand, active management of plantations, including repeated ploughing of soil by tractors, and applications of weedicides, seem to have negatively affected species like the Grey Francolin, Eurasian Thick-knee *Burhinus oedicnemus*, Barred Buttonquail *Turnix suscitator*, and Indian Nightjar *Caprimulgus asiaticus*. Perhaps the most affected species in the campus has been the Indian Eagle Owl *Bubo bengalensis*. The development activities on the campus have caused the once intact ravines, which carried clear flowing water being converted into eroded nullas carrying sewage and waste water from the student's hostels and mess towards the waste-water pond, and then out into the Bay of Bengal. This was once an active breeding ground of the Indian Eagle Owl. Since the early 1990s students of the Department of Ecology and Environmental Sciences have documented its breeding; last documented, perhaps, in 2010 (Seshadri 2013). Now the Indian Eagle Owl does not breed at this location any more. During the present study we sighted it only twice, near the western boundary of the campus.

Even though the university has a rich tradition of bird-watching, and monitoring, with data from over 25 years, this has not been able to influence the direction of campus development activity, the plantation programs, nor the plantation maintenance techniques of the horticulture department. The present rate of unplanned development in Pondicherry University will only lead to the disappearance of the remaining patches of scrub jungle, grasslands, and ravines. This will be detrimental to avifaunal richness by leading to local disappearance of species dependent on those habitats. The best way forward would be for the university management to consult, and implement recommendations of experts from the Department of Ecology and Environmental Sciences before carrying out any developmental activity. A solution has to be found to address the issue of waste water being pumped into the ravines, which are an unique habitat for many faunal species. The horticulture department should limit, and ultimately stop using weedicides in existing plantations and gardens. It should plant indigenous trees, specific to this habitat, in place of monocultures of *Acacia*, *Eucalyptus* and cashew *Anacardium occidentale*. It is also recommended that the horticulture department stop clearing existing patches of scrub jungle, which are excellent habitats for many species of birds.

Long term bird monitoring programs are strong tools that help capture changes in bird populations in response to natural and anthropogenic change in the landscape. Campuses of

educational institutions, and other organizations, are the best laboratories for such studies. As more and more individuals, or groups, take up long term bird monitoring projects it will become easier to understand the response of bird populations to human-induced changes in the environment, and this will help in devising management strategies for protecting bio-diverse areas within urban environments in the future.

Acknowledgements

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Ibisbill in Ladakh by Kokay Szabolcs (see inside front cover for details).

Appendix: Birds recorded over 25 years at Pondicherry University

Sl. No	Species	Present Study (February 2014–2015)	Santharam et al. 1988	Fall Migration (August–November) Subramanean & Davidar (2004)							Present study 2014
				1988	1989	1991	1992	1998	2002	2003	
1	Northern Pintail <i>Anas acuta</i>	-	+	-	-	-	-	-	-	-	-
2	Indian Peafowl <i>Pavo cristatus</i>	-	-	-	-	-	-	-	-	-	+
3	Grey Francolin <i>Francolinus pondicerianus</i>	+	+	+	+	+	+	+	+	+	+
4	Little Grebe <i>Tachybaptus ruficollis</i>	+	-	-	-	-	-	-	-	-	+
5	Rock Pigeon <i>Columba livia</i>	+	+	+	+	+	-	+	+	-	+
6	Eurasian Collared-Dove <i>Streptopelia decaocto</i>	+	-	-	-	+	-	-	-	-	+
7	Spotted Dove <i>Streptopelia chinensis</i>	+	+	+	+	+	+	+	+	-	+
8	Orange-breasted Green Pigeon <i>Treeron bicinctus</i>	+	-	-	-	-	-	-	-	-	-
9	Indian Nightjar <i>Caprimulgus asiaticus</i>	-	+	+	-	-	-	+	-	+	+
10	Asian Palm-Swift <i>Cypsiurus balasiensis</i>	+	+	+	+	+	+	+	+	+	+
11	Alpine Swift <i>Tachymarptis melba</i>	+	+	+	-	-	-	-	-	-	+
12	Indian House Swift <i>Apus affinis</i>	+	-	-	-	-	-	-	-	-	+
13	Greater Coucal <i>Centropus sinensis</i>	+	+	+	-	-	+	+	+	+	+
14	Blue-faced Malkoha <i>Phaenicophaeus viridirostris</i>	+	-	-	-	-	-	-	-	-	+
15	Pied Cuckoo <i>Clamator jacobinus</i>	+	+	+	+	-	+	-	-	-	-
16	Chestnut-winged Cuckoo <i>Clamator coromandus</i>	-	-	-	-	-	-	-	-	-	+
17	Asian Koel <i>Eudynamis scolopaceus</i>	+	+	+	-	+	+	+	+	+	+
18	Grey-bellied Cuckoo <i>Cacomantis passerinus</i>	+	+	+	+	-	-	-	-	+	+
19	Common Hawk-Cuckoo <i>Hieroccyx varius</i>	+	+	+	+	+	+	+	+	+	+
20	Common Cuckoo <i>Cuculus canorus</i>	+	+	+	-	-	-	-	-	-	+
21	White-breasted Waterhen <i>Amauromis phoenicurus</i>	+	-	-	-	-	-	-	-	-	+
22	Common Moorhen <i>Gallinula chloropus</i>	+	-	-	-	-	-	-	-	-	+
23	Asian Openbill <i>Anastomus oscitans</i>	+	+	-	-	-	-	-	-	-	-
24	Black-crowned Night Heron <i>Nycticorax nycticorax</i>	+	+	-	-	-	-	-	-	-	-
25	Indian Pond-Heron <i>Ardeola grayii</i>	-	+	-	-	-	-	-	-	-	+
26	Grey Heron <i>Ardea cinerea</i>	+	+	-	-	-	-	-	-	-	-
27	Cattle Egret <i>Bubulcus ibis</i>	+	+	-	-	-	-	-	-	-	-
28	Great Egret <i>Ardea alba</i>	+	+	-	-	-	-	-	-	-	-
29	Intermediate Egret <i>Ardea intermedia</i>	-	-	-	-	-	-	-	-	-	+
30	Little Egret <i>Egretta garzetta</i>	+	+	-	-	-	-	-	-	-	+
31	Little Cormorant <i>Microcarbo niger</i>	+	-	-	-	-	-	-	-	-	+
32	Eurasian Thick-knee <i>Burhinus oedicnemus</i>	+	+	+	+	-	-	-	-	-	+
33	Pacific Golden Plover <i>Pluvialis fulva</i>	+	+	-	-	-	-	-	-	-	-
34	Little Ringed Plover <i>Charadrius dubius</i>	-	+	-	-	-	-	-	-	-	-
35	Green Sandpiper <i>Tringa ochropus</i>	-	+	-	-	-	-	-	-	-	-
36	Yellow-wattled Lapwing <i>Vanellus malabaricus</i>	-	+	+	+	-	-	+	-	+	+
37	Red-wattled Lapwing <i>Vanellus indicus</i>	+	-	+	+	+	+	+	+	+	+
38	Barred Buttonquail <i>Turnix suscitator</i>	+	+	+	+	-	-	-	-	+	+
39	Gull-billed Tern <i>Gelochelidon nilotica</i>	+	+	-	-	-	-	-	-	-	-
40	Whiskered Tern <i>Chlidonias hybrida</i>	-	+	-	-	-	-	-	-	-	-
41	Black-winged Kite <i>Elanus caeruleus</i>	-	-	-	-	+	-	+	-	-	+
42	Oriental Honey Buzzard <i>Pernis ptilorhynchus</i>	+	-	-	-	-	-	-	-	-	-
43	Crested Serpent Eagle <i>Spilornis cheela</i>	+	-	-	-	-	-	-	-	-	-
44	Booted Eagle <i>Hieraetus pennatus</i>	+	+	+	-	-	-	-	-	-	+
45	Western Marsh Harrier <i>Circus aeruginosus</i>	+	+	-	-	-	-	-	-	-	-
46	Pallid Harrier <i>Circus macrourus</i>	-	+	+	+	-	-	-	-	-	-
47	Montagu's Harrier <i>Circus pygargus</i>	+	-	+	+	-	-	-	-	-	-
48	Shikra <i>Accipiter badius</i>	-	+	+	+	+	+	+	+	+	+
49	Brahminy Kite <i>Haliastur indus</i>	+	+	+	+	+	+	+	+	-	+
50	Black Kite <i>Milvus migrans</i>	+	+	+	+	+	+	+	+	-	+
51	White-eyed Buzzard <i>Butastur teesa</i>	+	+	+	+	-	-	-	-	-	-
52	Common Buzzard <i>Buteo buteo</i>	+	-	-	-	-	-	+	+	-	-
53	Common Barn Owl <i>Tyto alba</i>	-	-	-	-	-	-	-	-	-	-
54	Brown Hawk Owl <i>Ninox scutulata</i>	+	+	+	-	-	-	-	-	-	+
55	Spotted Owlet <i>Athene brama</i>	-	+	+	-	-	-	+	+	+	+
56	Collared Scops Owl <i>Otus bakkamoena</i>	+	-	-	-	-	-	-	-	-	+
57	Indian Eagle Owl <i>Bubo bengalensis</i>	+	+	+	-	-	+	+	+	-	+
58	Common Hoopoe <i>Upupa epops</i>	+	+	+	+	+	+	+	+	+	+
59	Lesser Golden-backed Woodpecker <i>Dinopium benghalense</i>	+	+	+	+	+	+	+	-	+	+
60	Coppersmith Barbet <i>Psilopogon haemacephalus</i>	+	+	+	-	+	+	+	-	+	+
61	Green Bee-eater <i>Merops orientalis</i>	+	+	+	+	+	+	+	+	+	+
62	Blue-tailed Bee-eater <i>Merops philippinus</i>	+	+	+	+	+	+	+	+	-	-
63	Indian Roller <i>Coracias benghalensis</i>	-	+	+	+	+	+	+	+	+	+
64	Common Kingfisher <i>Alcedo atthis</i>	+	-	-	-	-	-	+	-	-	+
65	White-throated Kingfisher <i>Halcyon smyrnensis</i>	+	+	+	+	+	+	+	+	+	+
66	Common Kestrel <i>Falco tinnunculus</i>	+	+	+	+	+	+	-	-	-	-
67	Eurasian Hobby <i>Falco subbuteo</i>	-	+	+	-	-	-	-	-	-	-
68	Plum-headed Parakeet <i>Psittacula cyanocephala</i>	-	-	-	+	-	-	-	-	-	-

Appendix: Birds recorded over 25 years at Pondicherry University

Sl. No	Species	Present Study (February 2014–2015)	Santharam <i>et al.</i> 1988	Fall Migration (August–November) Subramanean & Davidar (2004)							Present study 2014
				1988	1989	1991	1992	1998	2002	2003	
69	Rose-ringed Parakeet <i>Psittacula krameri</i>	-	+	+	+	+	+	+	+	-	+
70	Indian Pitta <i>Pitta brachyura</i>	+	+	+	-	-	-	+	-	+	+
71	Small Minivet <i>Pericrocotus cinnamomeus</i>	+	+	+	-	-	-	+	-	+	+
72	Black-headed Cuckoo-shrike <i>Coracina melanoptera</i>	+	+	+	+	-	+	+	-	-	+
73	Indian Golden Oriole <i>Oriolus kundoo</i>	+	+	+	+	-	-	+	-	+	+
74	Ashy Woodswallow <i>Artamus fuscus</i>	+	+	+	+	+	+	+	+	+	+
75	Common Woodshrike <i>Tephrodornis pondicerianus</i>	+	+	+	+	+	+	+	-	-	+
76	Common Iora <i>Aegithina tiphia</i>	+	+	+	+	+	+	+	-	+	+
77	Black Drongo <i>Dicrurus macrocercus</i>	+	+	+	+	+	+	+	+	+	+
78	Ashy Drongo <i>Dicrurus leucophaeus</i>	+	+	+	-	-	-	-	-	-	-
79	White-bellied Drongo <i>Dicrurus caerulescens</i>	+	-	-	+	-	-	-	+	+	-
80	Brown Shrike <i>Lanius cristatus</i>	-	+	+	+	-	-	-	+	-	+
81	Bay-backed Shrike <i>Lanius vittatus</i>	+	+	+	+	-	-	-	-	-	-
82	Long-tailed Shrike <i>Lanius schach</i>	+	-	-	+	+	-	+	-	+	-
83	Great Grey Shrike <i>Lanius excubitor</i>	-	-	-	+	-	-	-	-	-	-
84	Rufous Treepie <i>Dendrocitta vagabunda</i>	-	+	+	+	+	+	+	+	+	+
85	House Crow <i>Corvus splendens</i>	+	+	+	+	+	+	+	+	+	+
86	Large-billed Crow <i>Corvus macrorhynchos</i>	+	+	+	+	+	+	+	+	+	+
87	Indian Paradise-flycatcher <i>Terpsiphone paradisi</i>	+	-	-	+	+	+	+	+	+	+
88	Pale-billed Flowerpecker <i>Dicaeum erythrorhynchos</i>	+	+	+	-	+	-	+	+	+	+
89	Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	+	+	+	+	+	+	+	+	+	+
90	Purple Sunbird <i>Cinnyris asiaticus</i>	+	+	+	+	-	-	+	-	+	+
91	Loten's Sunbird <i>Cinnyris lotenius</i>	+	+	+	+	+	-	+	-	+	+
92	Baya Weaver <i>Ploceus philippinus</i>	+	+	+	+	+	+	+	-	+	+
93	Indian Silverbill <i>Euodice malabarica</i>	+	+	+	-	+	-	-	-	+	-
94	White-rumped Munia <i>Lonchura striata</i>	-	-	-	-	-	-	-	-	-	+
95	Scaly-breasted Munia <i>Lonchura punctulata</i>	+	-	-	-	-	-	-	-	-	-
96	Black-headed Munia <i>Lonchura malacca</i>	-	-	-	-	-	-	-	-	-	+
97	Yellow-throated Sparrow <i>Gymnoris xanthocollis</i>	+	+	+	-	+	-	-	-	+	-
98	Forest Wagtail <i>Dendronanthus indicus</i>	-	+	+	+	-	-	-	-	+	-
99	Paddy-field Pipit <i>Anthus rufulus</i>	+	+	+	+	+	+	+	+	-	-
100	White-browed Wagtail <i>Motacilla maderaspatensis</i>	+	+	+	+	+	+	+	+	+	+
101	Ashy-crowned Sparrow-Lark <i>Eremopterix griseus</i>	+	+	+	+	-	+	+	-	-	-
102	Indian Bushlark <i>Mirafra erythroptera</i>	-	-	-	+	-	-	+	-	-	-
103	Jerdon's Bushlark <i>Mirafra affinis</i>	+	+	+	-	+	+	-	-	-	+
104	Zitting Cisticola <i>Cisticola juncidis</i>	+	-	-	-	-	-	-	-	-	-
105	Grey-breasted Prinia <i>Prinia hodgsonii</i>	+	-	-	-	+	+	-	-	-	-
106	Ashy Prinia <i>Prinia socialis</i>	-	-	-	+	-	+	-	-	+	-
107	Plain Prinia <i>Prinia inornata</i>	+	+	+	+	-	-	-	-	-	-
108	Common Tailorbird <i>Orthotomus sutorius</i>	+	+	+	+	+	+	+	-	+	+
109	Blyth's Reed Warbler <i>Acrocephalus dumetorum</i>	+	+	+	-	-	-	-	-	-	-
110	Red-rumped Swallow <i>Cecropis daurica</i>	+	+	+	-	-	+	-	-	-	-
111	Barn Swallow <i>Hirundo rustica</i>	-	+	+	+	+	+	+	+	+	+
112	Red-vented Bulbul <i>Pycnonotus cafer</i>	+	+	+	+	+	+	+	+	+	+
113	White-browed Bulbul <i>Pycnonotus luteolus</i>	+	+	+	+	+	+	+	+	+	+
114	Greenish Leaf Warbler <i>Seicercus trochiloides</i>	+	+	+	+	+	+	+	-	-	+
115	Lesser Whitethroat <i>Curruca curruca</i>	+	+	+	-	-	-	-	-	-	-
116	Common Babbler <i>Argya caudata</i>	-	-	-	-	+	+	-	-	-	-
117	Yellow-billed Babbler <i>Turdoides affinis</i>	-	+	+	+	+	+	+	+	+	+
118	Rosy Starling <i>Pastor roseus</i>	+	+	+	-	-	-	+	-	-	-
119	Brahminy Starling <i>Sturnia pagodarum</i>	+	+	+	+	+	+	+	+	+	+
120	Common Myna <i>Acridotheres tristis</i>	+	+	+	+	+	+	+	+	+	+
121	Indian Robin <i>Saxicoloides fulicatus</i>	+	+	+	+	+	+	+	+	+	+
122	Oriental Magpie-Robin <i>Copsychus saularis</i>	+	+	+	-	-	-	+	-	+	+
123	Asian Brown Flycatcher <i>Muscicapa dauurica</i>	+	+	+	-	-	-	-	-	-	+
124	Taiga Flycatcher <i>Ficedula albicilla</i>	+	-	-	+	-	-	-	-	-	-
125	Black Redstart <i>Phoenicurus ochruros</i>	-	+	+	-	-	-	-	-	-	-
126	Orange-headed Thrush <i>Geokichla citrina</i>	-	-	-	-	-	-	-	-	-	+
	Total	94	92	77	59	48	46	59	39	49	78

With the compliments of

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