



Research Paper

**ORNITHOFAUNA OF POKKALI WETLANDS OF ERNAKULAM DISTRICT
KERALA, SOUTH INDIA**

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Abstract

The pokkali wetlands lie between 10° 01' 53" – 10° 4' 21" N latitude; 76° 14' 25.7" – 76° 16' 46" E longitude, with an extend of 4050 hectare spread over Trichur, Alappuzha and Ernakulam district, Kerala state. Ornithofauna of pokkali fields of Ernakulam District, Kerala was studied from May 2006 to April 2009. A total of 119 species of birds belonging to 18 orders and 45 families were recorded during the study. Among these 84 species were residents, 35 species were migrants. Among the migrants 30 species were transcontinental migrants and five were local migrants. Three near threatened species namely Spot billed Pelican (*Pelecanus philippensis*), Darter (*Anhinga melanogaster*) and Oriental White Ibis (*Threskiornis melanocephalus*) were recorded.

Key words: pokkali, wetland, avifauna, migrants, ecofriendly farming.

INTRODUCTION

In physical geography, a wetland is an environment at the interphase between truly terrestrial ecosystems and truly aquatic systems making them different from each other yet highly dependent on both [1]. Wetlands are areas where dry land meets or is saturated by water and are characterised by the presence of water dependent species of plants and animals.

Wetlands are among the most productive life support systems in the world and are of immense socio-economic and ecological importance to mankind [2]. The entire area of wetland in the world is estimated up to 7-10 million km² which is somewhat 5-8% of the total land surface of the earth. Wetlands are the important bird habitats, which they use for breeding, nesting and rearing young ones.

The wetland loss has been responsible for bringing to the verge of extinction of countless species of animals and plants, which would be of great potential value as genetic resources, medicine and other industrial uses (Report of International Course on Wetland Conservation and Management).

The major wetland area identified in Ernakulam district is the Vembanad wetland, which covers an area of 790 km² and comprising of about 490 km² of paddy fields, 300 km² of garden land. Vembanad wetland system is fed by five rivers and is the largest estuarine system in western coastal wetland system. The Vembanad supports more than 20,000 waterfowls during winter months. 91 species of resident birds and 50 species of migratory birds are found in the kole area. The birds come from different regions and stay here for breeding and feeding. The wetland also supports vulnerable species like Spot billed Pelican (*Pelecanus philippensis*)

Pokkali is a unique variety of rice that is cultivated in an organic way in coastal areas and it is one of the most eco friendly farming practices in the world. There is no need of chemical pesticide and a fertilizer for high yield. This method which has been passed down from generation to generation relies on the symbiotic nature of prawn and rice. The organically grown pokkali is famous for its peculiar taste and its high protein content and has several medicinal properties. Pokkali is a tall, saline resistant rice variety largely cultivated in coastal areas of Ernakulam district [3].

STUDY AREA

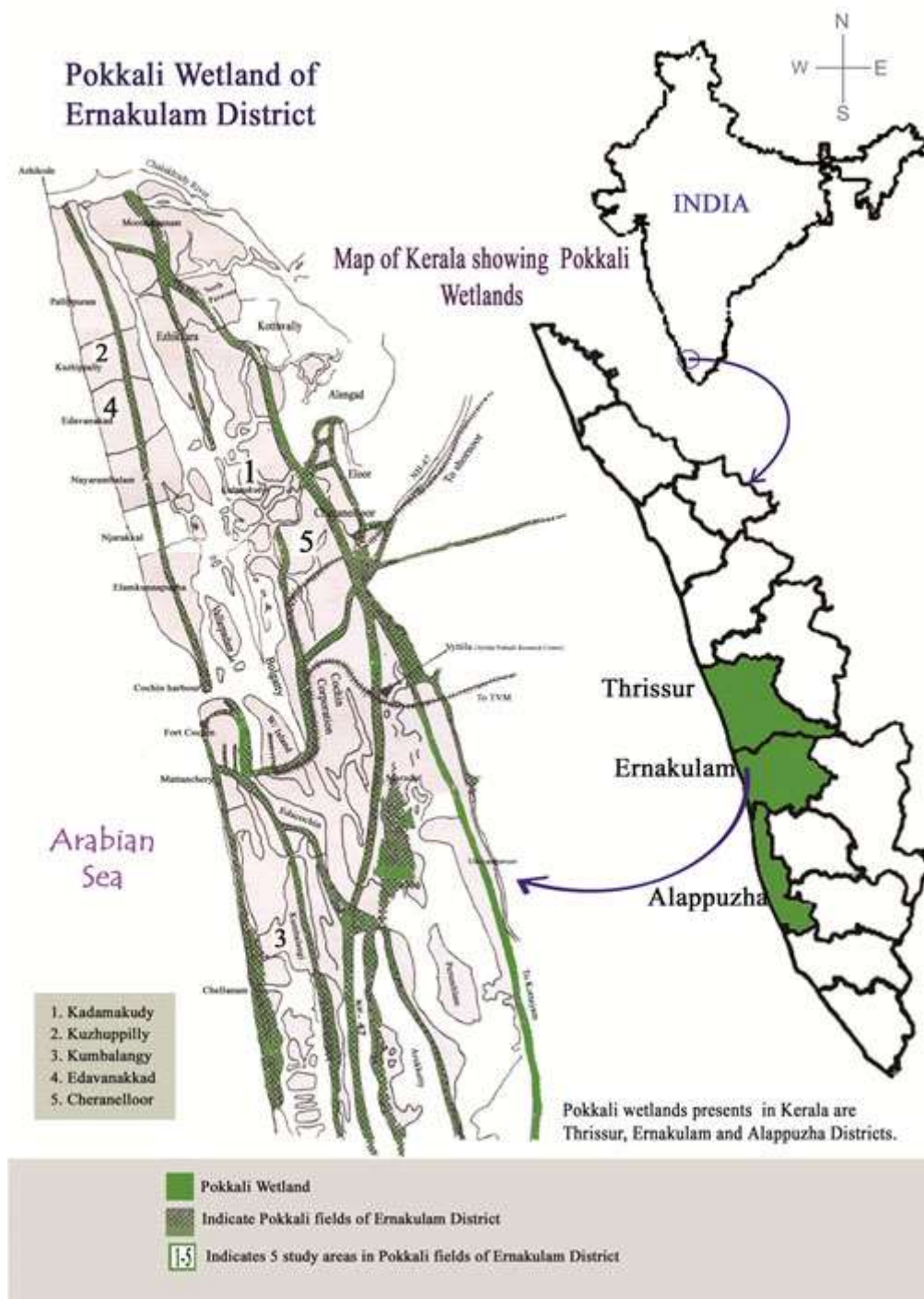
The pokkali wetland area of Ernakulam district is about 4050 ha. Pokkali field in Ernakulam district is divided into 8 blocks namely Nedumbassery, North Paravoor, Aluva, Kalamassery, Trippunithura, Mulamthuruthy, Vytilla and Njarakkal. For the present study pokkali fields namely Kadamakudy, Kuzhuppilly, Kumbalangy and Edavanakad were selected. Among these Kadamakudy study area of Kalamassery block was selected for intensive study. Apart from this, one abandoned pokkali area (Cheranelloor) was selected and studied to compare the bird fauna during 2008-09. The details regarding the study area are as follows (Fig1).

METHODOLOGY

Birds were studied based on direct observation method. Point count and line transect method were also followed and five intensive study areas were selected for detailed observations. Bird population was estimated by total count method. Birds were identified with the help of different field guides [4,] using Bushnell (7x35mm) binoculars. Five intensive study sites of 5 hectares each were identified and selected in each of the five study areas namely Kadamakudy, Kuzhuppilly, Kumbalangy, Edavanakad and Cheranelloor (abandoned pokkali wetland) on the basis of representation of different pokkali fields of different areas of Ernakulam District.

RESULT AND DISCUSSION

A total of 119 species of birds were recorded from the pokkali wetland (including abandoned pokkali wetland) during the study period ie from June 2006 – May 2009. These birds belonged to 18 orders and 45 families. Among the 119 species recorded, 84 species were residents, 35 species were migrants. Maximum represented species belonged to family *Passeriformes* followed by *Charadriiformes*. The least represented families were *Podicipedidae*, *Pandionidae* and *Pelecanidae* etc. *Little Egret*, *Little Cormorant*, *Whiskered Tern*, *Large Egret*, *Median Egret*, *Baya Weaver*, *Indian Pond Heron*, *Indian Purple Moorhen*, *House Crow*, *House Swallow*, *Common Sandpiper*, *Little Tern*, *Brahminy Kite*, *Purple Heron*, *Grey Heron*, *Grey-headed Starling*, *Little-ringed Plover* were the abundant species in the pokkali wetland. Three near threatened species namely *Spot billed Pelican* (*Pelycanus philippensis*), *Darter* (*Anhinga melanogaster*) and *Oriental White Ibis* (*Threskiornis melanocephalus*) were recorded.



(Source: Pokkali Research centre Vyttila).

Fig 1. Pokkali wetland area of Ernakulam District

In Pokkali wetland three major seasons namely paddy cultivation season (5 months) prawn culture season (5 months) and a transient period (of about 60 days duration) were noticed. Transient season is not considered as a definite culture/cultivation season but is included as transient period as the flora and fauna of this season was peculiar. Pokkali wetland is important for bird due to its habitat diversity, food resources, ecofriendly farming practices, lesser disturbances etc.

Table: 1. Check List of birds recorded from the Pokkali wetland study area during 2006-09

	Common Name	Scientific name	S	A	Presence in the study area
Order: Podicipediformes					
Family: Podicipedidae					
1	Little Grebe	<i>Tachybaptus ruficollis capensis</i>	R	C	1,2
Order: Pelecaniformes					
Family: Pelecanidae					
2	Spot-billed Pelican	<i>Pelecanus philippensis</i>	M	OC	1
Family: Phalacrocoracidae					
3	Great Cormorant	<i>Phalacrocorax carbo</i>	R	C	1
4	Indian Shag	<i>Phalacrocorax fuscicollis</i>	R	C	1
5	Little Cormorant	<i>Phalacrocorax niger</i>	R	A	1,2,3,4,5,
Order: Suliformes					
Family: Anhingidae					
6	Oriental Darter	<i>Anhinga melanogaster</i>	R	C	1,2,3,4
Order: Ciconiiformes					
Family: Ardeidae					
7	Large Egret	<i>Casmerodius albus</i>	R	A	1,2,3,4,5
8	Purple Heron	<i>Ardea Purpurea</i>	R	A	1,2,3,4,5,
9	Grey Heron	<i>Ardea cinerea</i>	LM	A	1,2,3,4,5
10	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	R	UC	1
11	Indian Pond Heron	<i>Ardeola grayii</i>	R	A	1,2,3,4,5
12	Cattle Egret	<i>Bubulcus ibis</i>	R	C	1,2,3,4,5
13	Median Egret	<i>Mesophoyx intermedia</i>	R	A	1,2,3,4,5
14	Little Egret	<i>Egretta garzetta</i>	R	A	1,2,3,4,5
15	Yellow Bittern	<i>Ixobrychus sinensis</i>	R	Ra	1,
16	Black Bittern	<i>Dupetor flavicollis</i>	R	UC	1
Family: Ciconiidae					
17	Asian Openbilled Storks	<i>Anastomus oscitans</i>	LM	O	1
Family: Threskiornithidae					
18	Oriental white Ibis	<i>Threskiornis melanocephalus</i>	R	C	1
Order: Anseriformes					
Family: Anatidae					
19	Lesser whistling Duck	<i>Dendrocygna javanica</i>	R	C	1
20	Common Teal	<i>Anas crecca</i>	M	UC	1
Order: Falconiformes					
Family: Accipitridae					
21	Black Kite	<i>Milvus migrans</i>	R	C	1,2,3,4,5
22	Shikra	<i>Accipiter badius</i>	R	UC	1
23	Brahminy Kite	<i>Haliastur lindus</i>	R	A	1,2,3,4,5
24	Western Marsh Harrier	<i>Circus aeruginosus</i>	M	UC	1

Order: Accipitriformes					
Family: Pandionidae					
25	Osprey	<i>Pandion haliaetus</i>	M	R	1
Order: Galliformes					
Family: Phasianidae					
26	Common Quail	<i>Coturnix coturnix</i>	M	R	1
Order: Gruiformes					
Family: Rallidae					
27	Slaty-legged Crake	<i>Rallina eurizonoides</i>	R	UC	1
28	White-breasted Waterhen	<i>Amaurornis phoenicurus.</i>	R	C	1,2,3,4,5
29	Common Moorhen	<i>Gallinula chloropus</i>	R	UC	1
30	Purple Moorhen	<i>Porphyrio porphyrio</i>	R	A	1,2,3,4,5
31	Common Coot	<i>Fulica atra</i>	R	UC	1
32	Watercock	<i>Gallicrex cinerea</i>	R	Ra	1
Order: Charadriiformes					
Family: Jacanidae					
33	Bronze-winged Jacana	<i>Metopidius indicus</i>	R	UC	1
34	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	R	UC	1
Family: Dromadidae					
35	Crab-Plover	<i>Dromas ardeola</i>	M	Ra	1
Family: Charadriidae					
36	Red-wattled Lapwing	<i>Vanellus indicus</i>	R	C	1,2,3,4,5
37	Grey-headed Lapwing	<i>Vanellus cinereus</i>	M	Ra	1
38	Kentish Plover	<i>Charadrius alexandrines</i>	M	C	1
39	Pacific Golden-Plover	<i>Pluvialis fulva</i>	M	C	1
40	Lesser sand Plover	<i>Charadrius mongolus</i>	M	C	1
41	Little Ringed Plover	<i>Charadrius dubius</i>	M	A	1
42	Grey Plover	<i>Pluvialis squatarola</i>	M	C	1

Family: Scolopacidae					
43	Common Redshank	<i>Tringa tetanus</i>	M	UC	1
44	Marsh Sand Piper	<i>Tringa stagnatilis</i>	M	C	1,2,4
45	Common Green Shank	<i>Tringa nebularia</i>	M	UC	1
46	Wood Sand Piper	<i>Tringa glareola</i>	M	C	1,2,3
47	Little Stint	<i>Calidris minuta</i>	M	C	1
48	Curlew Sand Piper	<i>Calidris ferruginea</i>	M	C	1
49	Dunlin	<i>Calidris alpine</i>	M	C	1
50	Sanderling	<i>Calidris alba</i>	M	C	1
51	Common Sand Piper	<i>Actitis hypoleucos</i>	M	A	1,2,3,4,5
Family: Coraciidae					
52	Indian Roller	<i>Coracias benghalensis</i>	R	O	1

Family: Upupidae					
53	<i>Common Hoopoe</i>	<i>Upupa epops</i>	R	O	1
Family: Picidae					
54	<i>Golden-backed Woodpecker</i>	<i>Dinopium benghalense</i>	R	C	1,2,3,5
Family: Artamidae					
55	<i>Ashy Wood Swallow</i>	<i>Artamus fuscus</i>	R	C	1,5
Family: Recurvirostidae					
56	<i>Black-winged Stilt</i>	<i>Himantopus himantopus</i>	R	C	1,2,3,4,5
Family: Laridae					
57	<i>Whiskered Tern</i>	<i>Chlidonias hybridus</i>	M	A	1,2,3,4,5
58	<i>River Tern</i>	<i>Sterna aurantia</i>	R	UC	1
59	<i>Little Tern</i>	<i>Sterna albifrons</i>	M	A	1,2,3,4
60	<i>Common Tern</i>	<i>Sterna hirundo</i>	M	O	3
61	<i>Brown-headed Gull</i>	<i>Larus brunnicephalus</i>	M	C	1,3,4
Order: Columbiformes					
Family: Columbidae					
62	<i>Blue Rock Pigeon</i>	<i>Columba livia</i>	R	C	1,2,4,5
63	<i>Oriental Turtle Dove</i>	<i>Streptopelia Orientalismeena</i>	R	UC	1
Order: Psittaciformes					
Family: Psittacidae					
64	<i>Rose-ringed Parakeets</i>	<i>Psittacula krameri</i>	R	C	1,2,3,4,5
65	<i>Blue-winged Parakeet</i>	<i>Psittacula columboides</i>	R	C	1
Order: Cuculiformes					
Family: Cuculidae					
66	<i>Common Cuckoo</i>	<i>Cuculus canorus</i>	R	UC	1,3,4,5
67	<i>Indian Cuckoo</i>	<i>Cuculus micropterus</i>	R	UC	1,2,4,5
68	<i>Asian Koel</i>	<i>Eudynamys scolopaceus</i>	R	UC	1,5
69	<i>Greater Coucal</i>	<i>Centropus sinensis</i>	R	UC	1,2,3,4,5
Order: Strigiformes					
Family: Strigidae					
70	<i>Barn Owls</i>	<i>Tyto alba</i>	R	Ra	1
71	<i>Collared Scops Owl</i>	<i>Otus lettia</i>	R	UC	5
72	<i>Eurasian scops Owl</i>	<i>Otus scops</i>	R	Ra	5
73	<i>Spotted Owlet</i>	<i>Athene brama</i>	R	Ra	5
74	<i>Mottled Wood Owl</i>	<i>Strix ocellata</i>	R	Ra	5
Order: Apodiformes					
Family: Apodidae					
75	<i>Asian palm Swift</i>	<i>Cypsiurus balasiensis</i>	R	C	1,3,4,5
76	<i>House Swift</i>	<i>Apus affinis</i>	R	C	1
Order: Coraciformes					
Family: Alcedinidae					

77	<i>Small Blue Kingfisher</i>	<i>Alcedo atthis</i>	R	C	1,2,3,4,5
78	<i>Stork-billed Kingfisher</i>	<i>Halcyon capensis</i>	R	UC	1
79	<i>White-breasted Kingfisher</i>	<i>Halcyon smyrnensis</i>	R	C	1,2,3,4,5
80	<i>Black-capped Kingfisher</i>	<i>Halcyon pileata</i>	R	Ra	1
81	<i>Lesser pied Kingfisher</i>	<i>Ceryle rudis</i>	R	UC	1
Family: Meropidae					
82	<i>Small green Bee-eater</i>	<i>Merops orientalis</i>	R	C	1,2,3,4,5
83	<i>Blue-tailed Bee-eater</i>	<i>Merops philippinus</i>	LM	C	1,3,5
Order: Piciformes					
Family: Capitonidae					
84	<i>White-cheeked Barbet</i>	<i>Megalaima viridis</i>	R	UC	1,2,4,5
Order: Passeriformes					
Family: Hirundinidae					
85	<i>House Swallow</i>	<i>Hirundo tahitica</i>	R	A	1,2,3,4,5
86	<i>Wire-tailed Swallows</i>	<i>Hirundo smithii</i>	R	UC	1,3
Family: Oriolidae					
87	<i>Eurasian golden Oriole</i>	<i>Oriolus oriolus</i>	R	Ra	1,5
88	<i>Black-headed Oriole</i>	<i>Oriolus xanthornus</i>	M	Ra	5
Family: Sturnidae					
89	<i>Common Myna</i>	<i>Acridotheres tristis</i>	R	C	1,2,3,4,5
90	<i>Grey-headed Starling</i>	<i>Sturnus malabaricus</i>	LM	A	1,5
Family: Dicruridae					
91	<i>Black Drongo</i>	<i>Dicrurus macrocercus</i>	R	UC	1,4,5
92	<i>Ashy Drongo</i>	<i>Dicrurus leucophaeus</i>	R	UC	1
93	<i>Greater Racket-tailed Drongo</i>	<i>Dicrurus paradiseus</i>	R	UC	1,5
Family: Motacillidae					
94	<i>Yellow Wagtail</i>	<i>Motacilla flava</i>	M	C	1
95	<i>Citrine Wagtail</i>	<i>Motacilla citreola</i>	M	UC	1
96	<i>Forest Wagtail</i>	<i>Dendronanthus indicus</i>	M	UC	5
Family: Pycnonotidae					
97	<i>Red-vented Bulbul</i>	<i>Pycnonotus cafer</i>	R	UC	1,5
98	<i>Red-whiskered Bulbul</i>	<i>Pycnonotus jocosus</i>	R	UC	1,5
Family: Monarchidae					
99	<i>Asian Paradise Flycatcher</i>	<i>Terpsiphone paradise</i>	LM	UC	5
Family: Muscicapidae					
100	<i>Indian Robin</i>	<i>Saxicoloides fulicatus</i>	R	C	1,5
101	<i>Oriental Magpie-Robin</i>	<i>Copsychus saularis</i>	R	Ra	1
102	<i>Pied Bushchat</i>	<i>Saxicola caprata</i>	R	O	4
Family: Timaliidae					

103	<i>White-headed Babbler</i>	<i>Turdoides affinis</i>	R	Ra	1,5
104	<i>Jungle Babbler</i>	<i>Turdoides striata</i>	R	UC	1,5
105	<i>Ashy Prinia</i>	<i>Prinia socialis</i>	R	C	1
106	<i>Plain Prinia</i>	<i>Prinia inornata</i>	R	C	1,2,3,4,5
107	<i>Franklin's Prinia</i>	<i>Prinia hodgsonii</i>	R	UC	1,5
108	<i>Common Tailorbird</i>	<i>Orthotomus sutorius</i>	R	UC	1,5
Family: Sylviidae					
109	<i>Streaked - fantail Warbler</i>	<i>Cisticola juncidis</i>	R	Ra	1
110	<i>Thick-billed Warbler</i>	<i>Acrocephalus aedon</i>	M	Ra	1
Family: Nectariniidae					
111	<i>Purple-rumped Sunbird</i>	<i>Leptocoma zeylonica</i>	R	UC	1,5
112	<i>Loten's Sunbird</i>	<i>Cinnyris lotenius</i>	R	UC	1,2,3,4,5
Family: Estrilidae					
113	<i>Black-headed Munia</i>	<i>Lonchura Malacca</i>	R	UC	1
Family: Passeridae					
114	<i>House Sparrow</i>	<i>Passer domesticus</i>	R	UC	1,3,4,5
Family: Ploceidae					
115	<i>Streaked Weaver</i>	<i>Ploceus manyar</i>	R	C	1
116	<i>Baya Weaver</i>	<i>Ploceus philippinus</i>	R	A	1,2,3,4,5
Family: Corvidae					
117	<i>Indian tree-Pie</i>	<i>Dendrocitta vagabunda</i>	R	UC	1,2,3,4,5
118	<i>House Crow</i>	<i>Corvus splendens</i>	R	A	1,2,3,4,5
119	<i>Jungle Crow</i>	<i>Corvus macrorhynchos</i>	R	UC	1,2,3,4,5

R- resident M- migrant. Study areas 1. Kadamakudy, 2. Kumbalangy, 3. Kuzhuppilly, 4. Edavanakad, 5. Cheranelloor A- abundant (≥ 1000) C- common (100-1000) UC - uncommon (10-99), O- occasionally sighted (2-9) Ra- rare, S- Status A- Abundance

A total of 310 wetland birds were reported from India [5]. Out of these 242 birds were water birds belonging to 31 families the rest 68 species were wetland dependent and associated birds belonging to 16 families. Among the wetland birds recorded in India, 20 % of water birds (50) belonging to 13 families and 19 % of wetland dependent and associated species (14) belonging to seven families were noticed in pokkali wetland. It was noticed that in pokkali wetland the population of water birds of family Ardeidae showed more than 1% of South Asian Population Estimate (as compared to Vembanad and Kole wetlands in Kerala). Among the family Ardeidae, maximum South Asian Population was represented by Large Egret (27 %) followed by Median Egret (24 %), Little Egret (18 %), Grey Heron (3 %) and Purple Heron (2 %). The water birds like Little Cormorant belonging to the family Phalacrocoracidae crossed 6 % of South Asian Population and the globally threatened Darter (family: Anhingidae) crossed 4% South Asian population in pokkali wetland. Globally threatened Oriental White Ibis (family: Threskiornithidae) crossed 3 % of South Asian Population and Whiskered Tern (family: Laridae) crossed 10 % of South Asian Population in the pokkali wetland.

A total of 225 taxa of birds belonging to 15 orders and 59 families were identified from Kuttanad wetland, Kerala. Though Kuttanad is a wetland dominated area, 52.5 % birds recorded belongs to non wetland category. Most of these land birds were seen at the eastern boundaries of Kuttanad, where Kuttanad wetland meets midland area of Kerala. Hence high number of species were reported from that area

and could be due to edge effect. Among the birds recorded 38 % constitutes migrants and 38 % residents. Wetland and Wetland dependent birds formed major portion of these migrants [6].

Hundred and nineteen (119) bird species belonging to 89 genera, 45 families and 18 orders were recorded from the pokkali wetland during the study period. Among them 84 species were residents and 35 species were migrants. Maximum represented species belonged to family Ardeidae (with 11 species) followed by Scolopacidae (9), Charadriidae, Rallidae, and Accipitridae (6) and Laridae with only five species. The least represented families were Podicipedidae and Pelecanidae (one species each) etc. Among the different study areas maximum number of bird species were reported from the intensive study area, Kadamakudy (with 111 species) followed by Edavanakad (41), Kuzhuppilly (40) and Kumbalangy (31 species). (A total of 58 species were recorded from Cheranelloor area - an abandoned Pokkali wetland). Kadamakudy study site was having maximum area when compared to other study sites.

According to [7], 153 globally threatened bird species occur in India. Three vulnerable bird species like Indian- spotted Eagle, Great- spotted Eagle and Houbara Bustard and nine species of near threatened birds like Painted Stork, Black headed Ibis, Spot billed Pelican, Darter, Cinereous Vulture, Pallid Harrier, Black -tailed Godwit, Eurasian Curlew and Black- bellied Tern were recorded in Kole wetlands [8].

Ten globally threatened species were also recorded from Kuttanad wetland area, Kerala [9]. Species such as Ferruginous Pochard, Painted Stork, Oriental White Ibis, Spot- billed Pelican, Oriental Darter, Greater- grey headed Fish Eagle, Black- tailed Godwit, Eurasian Curlew and European Roller were listed in the near threatened category. Greater eagle was listed under vulnerable category.

In the present study it was noticed that the Pokkali wetland, supported 3 near threatened bird species like Oriental White Ibis (*Threskiornis melanocephalus*), Oriental Darter (*Anhinga melanogaster*) and Spot- billed Pelican (*Pelecanus philippensis*). All these near threatened bird species were less common in India.

Cochin Natural Society and Asian Water fowl Census (AWC) made a survey of water birds at Devaswom paadam in Varapuzha, Ernakulam district during February 2011 [10]. A total of 52 species of birds were counted during the survey and the total number of birds counted was 1299. A total of 41 species of birds were reported from Kadamakudy pokkali wetland area in the one day survey. [10] reported that the most abundant birds noticed in the survey were Whiskered Tern (442) followed by Little Cormorant (40) and Pond Heron (34). In the present study 111 bird species were recorded from intensive study site of Kadamakudy area alone, during 2006-09. The most abundant birds noticed were Little Egret (33681), Whiskered Tern (29591), Large Egret (20557), Median Egret (18386), Baya Weaver (14324), Indian Pond Heron (10885), Purple Moorhen (9063), Grey Heron (1849), Grey headed Starling (1570) and Little Ringed Plover (1080). Birds like Gull billed Tern, Grey Wagtail, Blyths Reed Warbler etc recorded during the survey conducted by [10] were not recorded during the present study and all the other birds were recorded during the present study. 82 species of birds recorded during the present study were not reported in the one day survey by [10]. The birds that were not reported in the one day survey include birds like Wagtails, Pelican, White ibis, Weavers and Munias, Sunbirds, Warblers, Babblers, Bulbul, Barbets, Bee eaters, Swift, Cuckoo, River tern, Little tern, Brown headed gull, Roller, Shore birds, Waders, Jacanas, Teal, Bittern etc.

Apart from the survey conducted by [10] other studies related to the avifauna of pokkali wetland in Ernakulam is not available. The present study conducted during

2006-09 is considered as the first study conducted in pokkali wetland area related to avifauna.

Maximum number of birds were noticed in the pokkali wetland during prawn culture season than paddy cultivation season. This may be due to the presence of exposed mudflat with enormous macro benthos, availability of plenty of fishes and the presence of suitable physico chemical factors like temperature, depth, pH, salinity etc during the prawn culture season. The abundance of birds was less during paddy cultivation season and may be due to heavy rain during June-July months and other activities and disturbances associated with paddy cultivation.

The diversity and richness of birds were maximum in the pokkali wetland during transient period (November-December). This may be due to arrival of migratory birds, availability of mosaic micro site like open water with optimum water level for diving birds like Grebe, Cormorants, Darter etc. The habitat also provided perching sites for insectivorous birds like Prinias, Weavers, Munias and Swallows. Easy availability of fish fries during this season also attracted piscivorous birds to the habitat.

Pokkali wetlands may be considered as an ideal habitat for migratory and resident birds, especially for the transcontinental migrants as the region supported 20% wetland birds in India and 61 % water birds in Kerala. Among the wetland birds recorded in India 20% of water birds (50 - species belonging to thirteen families) and 19 % wetland dependent and associated birds (14 – species belonging to seven families) were noticed in Pokkali wetland. This wetland also supported near threatened bird species like Oriental Darter, Oriental White Ibis and Spot billed Pelican which were reported from the well known wetlands like Chilika, Pulicat lake, Vembanad wetland and Kole wetlands.

CONCLUSION

Pokkali wetlands showed high species richness, abundance and density of wetland birds due to the peculiarities of its habitats. Pokkali wetland is the only area where unique, organic, ecofriendly symbiotic traditional (Rotational- GIS Qualified pokkali rice /Prawn culture) farming practices followed in the country. As the Pokkali wetlands are serving as “stepping stone” for the transcontinental migrants, urgent measures are needed to protect this unique wetland ecosystem for the conservation of water birds especially transcontinental migrants. Since the cultivation procedure adopted in the habitat is unique, farmers and local people should be given an awareness to conserve the wetland for pokkali rice/prawn culture and also the migratory and local birds.

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