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Diversity and distribution of shore birds in Tuticorin coastal area of Gulf of Mannar

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ABSTRACT

The coastal wetlands of India are important for a large number of migratory water birds. However, despite the wealth of these habitats in India, few studies have considered the diverse communities of water birds they support. This study, carried out during 2010-2011 focused on the Tuticorin District coastal zone of South east coast of India. We studied the diversity of the avian fauna that occurs in this region of Gulf of Mannar. Charadriforimes is the largest order that gives many bird species and Phoenicopteriformes is the least order that contributes only Greater Flamingo. Limosa limosa, Caldris minuta are the common birds from the family Scolopacidae.

Keywords: Falconiformes, Ardeidae, Caspian Tern, Crab plover

INTRODUCTION

Birds are warm-blooded vertebrate animals that have feathers. Most birds release an oil that keeps the feathers waterproof. Bird bones are hollow and air-filled, yet strong. Feathers and light bones allow most birds the freedom of flight, a type of movement not shared by most other vertebrate animals. We studied the coastal birds of Tuticorin that live in or near the water and those that eat primarily aquatic animals. These include birds that live in the wetland areas of our coast; the marshes, swamps, beaches and open water. Most of the birds that live in marshes and swamps feed at the water's edge or hide in thick grasses. Wetland stocks assemblage of large number of migratory and resident species of birds as it has high dietary value as well as productivity [1, 2, 3]. Ali and Ripley [23] reported that 273 species of birds in India can be considered as waterfowls, i.e. birds depend on wetland ecosystem. These birds use wetland habitats either entirely or during certain part of their life [5].

However, birds can influence various mode of life in the wetland ecosystem. The bird congregations are affected by various factors such as food availability, area of wetland [3] and abiotic changes in the wetlands [6, 7]. In a wetland ecosystem biotic factors are mostly dependent on the seasons and hydrology [8]. Thus, wetlands being integrated systems are affected by the changes in the key physical as well as chemical parameters of hydrosphere at the catchment scale. These in turn affect the wetland dependent communities as well as the ecosystem attributes such as species richness, its distribution and density [9]. Ultimately these changes alter the corresponding food web structures at the primary and secondary production levels [10]. Thus, the physical and chemical properties of freshwater body are characteristics of the climatic, geochemical, geomorphological as well as pollution conditions prevailing in the drainage basin and the underlying aquifer [11].

Many coastal tree nesting birds are using mangroves for their extensive breeding activity. Limited information is available on the birds associated with mangroves in India, except a few studies like 53 species from Bay Islands

[12], 24 migratory species from Sunderbans [13] and 166 species from Bhitarkanika mangroves [14]. These characteristics with natural or manmade changes determine the quality of water. Thus, wetlands are highly complex ecosystems due to various interactions between the components like water, soil, biosphere and atmosphere [15].

Lalmohan [16, 17] carried out the avian studies in the Gulf of Mannar Biosphere Reserve. A detailed attempt was made by BNHS (Bombay Natural History Society) under bird ringing program from 1985 to 1988 at Manadapam and neighboring Islands. Coastal birds perform the role in the coastal ecosystem both as primary and tertiary consumers cum predators to retain the ecological balance. At distances ranging from 5-8 km from the mainland, the Gulf of Mannar has a chain of islands running roughly parallel to the coast. These islands are mainly of coral origin probably of the nature of fringing reefs. Among the Islands Manali Island, Hare Island, and Dhanuskodi Lagoon of Rameshwaram are the major bird congregation areas along the Gulf of Mannar [18]. It supported overall 50,000 coastal birds (waders, terns and other wading birds) including 13,000 flamingos during 1980s [19] and it ranks third as an important wintering ground for Greater Flamingos *Phoenocopterus ruber* along the East Coast. The previous studies have not included some of the avifaunal species. So this study researches current diversity of birds in detailed in Tuticorin region of Gulf of Mannar and detailed.

MATERIALS AND METHODS

Thoothukudi district is situated in the extreme South-Eastern corner of Tamil Nadu and it is bound in the east and southeast by the Gulf of Mannar. The study area is lined up with the Tuticorin group of Islands of Gulf of Mannar namely, Van Island, Koswari Island, Vilanguchalli Island and Karaichalli Island [20]. The total area of the district is 4621 km² [21]. We carried out the study through the entire coastal area of this district. Biweekly inspection to the study areas was made for the period of one year (2010-2011) and an average of 4 weeks was accounted for a month. Binoculars (Olympus) and high zoom camera (Sony HX 100V) were used for bird watching and identification. The birds were classified based on referring the key books [22, 23]. Bird population was observed and documented every week end in the early morning from 5.00 a.m to 9.00 a.m and evening from 4.00 p.m to 6.30 p.m. The present study was focused on the avifaunal diversity in the Tuticorin coastal region of Gulf of Mannar.

RESULTS AND DISCUSSION

During the present study, 80 species of shorebirds were observed at the coastal zones of Tuticorin District. They belong to 6 orders and 15 families. The order Charadriformes holds 52 bird species and it is the largest order that contributes more birds from the study area. The family Scolopacidae, shared 26 no of birds. The coastal birds prefer island habitats than the mainland in GOMBR [19]. Charadriforimes is the largest order that gives many bird species and Phoenicopteriformes is the least order that contributes only Greater Flamingo (Tab 1). Moreover, the availability of feeding grounds such as muddy flats, sandy also determines the abundance of birds. Among the feeding grounds, the abundance of benthic fauna is higher in muddy flats than other types namely sandy and sediments. The Gulf of Mannar, which has supposed to become globally significant because of its unique biological diversity, came to lime light primarily due to constant exploitation of its flora and fauna. Next to the point calimere on the southeast coast of India, the GoMB (Gulf of Mannar Biosphere) has been recognized for its ability to attract a large seasonal aquatic bird population of over 50000 [19]. Pelagic birds were also occasionally recorded by people inhabiting in the villages along the coastal belts in Tuticorin district.

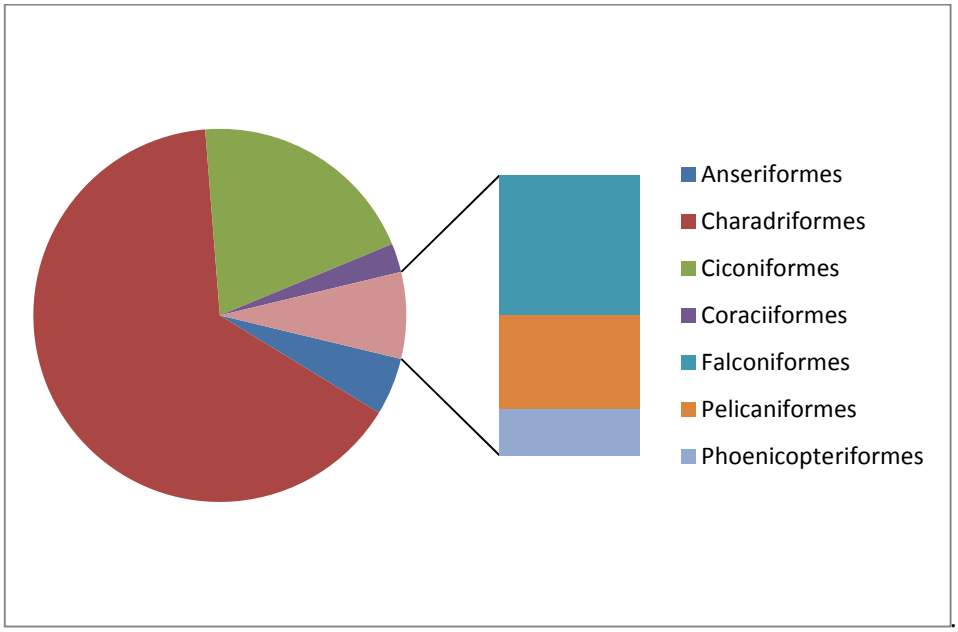
The family wise sharing of bird distribution has evaluated in figure 1. In east coast of India, due to the degradation of wetlands habitats, populations of various water bird species are dwindling in their traditional wintering sites. One of the greatest threats to the sustainability of the coastal wetlands and the survival of the flora and fauna, which depend on this unique habitat, is human disturbance to the shoreline. In India, due to the degradation of wetlands habitats, populations of various water bird species are dwindling in their traditional overwintering sites [18]. The decline in Greater Flamingo numbers was well pronounced since 1990s, as the numbers between 2000 and 2007 never exceeded 5500. However, the peak numbers are seen only for a short duration of two months (January - February). Among the migratory water bird groups, the decline in numbers for waders is drastic and worldwide which varied from 60 to 80% for most of the species during the last three decades. The similar kind of decline also reported from the major wetlands like Point Calimere, Gulf of Mannar and Pulicat [18]. The continuation of salt based industries and disruptions caused by fishermen have changed the habitats and are the main elements for bird extinction.

Table 1. List of Shore birds reported from the study area

S.No	Order	Family	Common Name	Scientific Name
1	**Anseriformes**	Anatidae	Northern shoveler	*Anas clypeata*
2			Eurasian Teal	*Anas crecca*
3			Garganey	*Anas querquedula*
4			Northern pintail	*Anas acuta*
5	**Charadriformes**	Haematopodidae	Eurasian Oystercatcher	*Haematopus ostralegus*
6			Grey plover	*Pluvialis squatarola*
7			Common Ringed Plover	*Charadrius hiaticula*
8			Little Ringed Plover	*Charadrius dubius*
9			Kentish plover	*Charadrius alexandrinus*
10			Lesser Sand Plover	*Charadrius mongolus*
11			Greater Sand Plover	*Charadrius leschenaultii*
12			Yellow-wattled Lapwing	*Vanellus malabaricus*
13			Red-wattled Lapwing	*Vanellus indicus*
14		Scolopacidae	Pin-tailed Snipe	*Gallinago stenura*
15			Common Snipe	*Gallinago gallinago*
16			Black-tailed Godwit	*Limosa limosa*
17			Bar-tailed Godwit	*Limosa lapponica*
18			Whimbrel	*Numenius phaeopus*
19			Eurasian Curlew	*Numenius arquata*
20			Spotted Redshank	*Tringa erythropus*
21			Common Redshank	*Tringa totanus*
22			Marsh Sandpiper	*Tringa stagnatilis*
23			Common Greenshank	*Tringa nebularia*
24			Green Sandpiper	*Tringa ochropus*
25			Wood Sandpiper	*Tringa glareola*
26			Terek Sandpiper	*Xenus cinereus*
27			Common Sandpiper	*Actitis hypoleucos*
28			Ruddy Turnstone	*Arenaria interpres*
29			Asian Dowitcher	*Limnodromus semipalmatus*
30			Great Knot	*Calidris tenuirostris*
31			Red Knot	*Calidris canutus*
32			Sanderling	*Calidris alba*
33			Little Stint	*Calidris minuta*
34			Red-necked Stint	*Calidris ruficollis*
35			Temminck's Stint	*Calidris temminckii*
36			Long-toed Stint	*Calidris subminuta*
37			Dunlin	*Calidris alpina*
38			Curlew Sandpiper	*Calidris ferruginea*
39			Broad-billed Sandpiper	*Limicola falcinellus*
40		Recurvirostridae	Black-winged Stilt or Common Stilt	*Himantopus himantopus*
41			Pied Avocet	*Recurvirostra avosetta*
42		Dromadidae	Crab Plover	*Dromas ardeola*
43		Burhinidae	Stone Curlew or Eurasian Stone-curlew	*Burhinus oedicnemus*
44			Beach Stone-curlew	*Esacus giganteus*
45		Laridae	Heuglin's Gull or Siberian Gull	*Larus heuglini*
46			Pallas's Gull or Great Black-headed Gull	*Ichthyaetus ichthyaetus*
47			Brown-headed Gull	*Chroicocephalus brunnicephalus*
48			Black-headed Gull	*Chroicocephalus ridibundus*
49			Gull-billed Tern	*Gelochelidon nilotica*
50			Caspian Tern	*Hydroprogne caspia*
51			Indian River Tern or River Tern	*Sterna aurantia*
52			Lesser Crested Tern	*Thalasseus bengalensis*
53			Greater Crested Tern	*Thalasseus bergii*
54			Common Tern	*Sterna hirundo*
55			Little Tern	*Sternula albifrons*
56			Whiskered Tern	*Chlidonias hybridus*
57	**Ciconiformes**	Ardeidae	Little egret	*Egretta garzetta*
58			Western reef egret	*Egretta gularis*
59			Grey heron	*Ardea cinerea*
60			Large egret	*Casmerodius albus*
61			Median egret	*Mesophoyx intermedia*
62			Cattle egret	*Bulbulcus ibis*
63			Indian pond heron	*Ardeols grayii*

64			Little green heron	*Butorides striatus*
65			Black crowned night heron	*Nycticorax nycticorax*
66			Yellow bittern	*Ixobrychus sinensis*
67		Ciconiidae	Painted stork	*Mycteria leucocephala*
68			Asian openbill stork	*Anastomus oscitans*
69		Threskiornithidae	Glossy ibis	*Plegadis falcinellus*
70			Oriental white ibis	*Threskiornis melanocephalus*
71			Black ibis	*Pseudibis papillosa*
72			Eurasian spoonbill	*Platalea leucorodia*
73	**Coraciiformes**	Alcedinidae	White throated Kingfisher	*Halcyon smyrnensis*
74			Pied Kingfisher	*Ceryle rudis*
75	**Falconiformes**	Accipitridae	Black kite	*Milvus migrans*
76			Brahminy kite	*Haliastur indus*
77			White bellied sea eagle	*Haliaeetus leucogaster*
78	**Pelicaniformes**	Pelecanidae	Spot billed pelican	*Pelecanus philippensis*
79		Phalacrocoracidae	Little cormorant	*Phalacrocorax niger*
80	**Phoenicopteriformes**	Phoenicopteridae	Greater flamingo	*Phoenicopterus roseus*

Figure 1. Shows the bird species diversity illustrated based on order



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