Journal of Experimental Sciences 2011, 2(10): 73-77
ISSN: 2218-1768
Available Online: http://jexpsciences.com/

journal of
experimental sciences

Species diversity of birds in mangroves of Uran (Raigad), Navi Mumbai, Maharashtra, West coast of India

Prabhakar R. Pawar*

Veer Wajekar Arts, Science and Commerce College, Mahalan Vibhag, Phunde - 400 702, Uran (Dist. –Raigad), Navi Mumbai, Maharashtra

Abstract

Mangroves are one of the most biologically diverse ecosystems in the world, providing shelter and feeding sites for many animal species. With continuing degradation and destruction of mangroves, there is a critical need to understand the biodiversity of the mangrove ecosystems. Birds are bio-indicators of habitat quality and are sensitive to any subtle changes takes place in the habitat. Monitoring of species diversity is a useful technique for assessing damage to the system and maintenance of good species diversity is a positive management objective. A total of 56 species of birds representing 11 orders, 29 families and 46 genera were recorded from the mangroves of Uran coast. Of the recorded species, 33.93 % belonged to Order Passeriformes, 26.79 % to Ciconiiformes, 8.93 % to Charadriiformes, 7.14 % to Anseriformes, 5.36 % each to Coraciiformes and Falconiformes, 3.57 % each to Columbiformes and Gruiformes and 1.79 % each to Cuculiformes, Pelecaniformes and Psittaciformes. Avifauna of the order Passeriformes is dominant in Uran mangroves and is represented by 11 families, followed by order Ciconiiformes with 5 families. The species diversity comprises 33 residents, 20 winter visitors and 3 occasional visitors. At present, ecological conditions in mangroves of Uran supports moderate density of birds but due to intense industrialization and urbanization, pollution of Uran coast cannot be ignored. Therefore, data presented in this paper can be taken as a base line data.

Keywords: Species diversity, Mangroves, Birds, Uran, Navi Mumbai

INTRODUCTION

Mangrove habitats harbor much of the world's tropical biodiversity and 50% of the world's mangrove forests have been lost as a result of clearing and alteration of coastlines [1]. With continuing degradation and destruction of mangroves, there is a critical need to understand the biodiversity of the mangrove ecosystems [2]. Mangrove vegetation provide a complaint niche for the myriad resident as well as passage migrant aquatic birds, which utilize the system in varying degree from feeding, roosting and breeding [3]. Mangroves serve the birds in different ways. Herons, Storks, raptors and owls use them as nesting sites. Wintering palaeartic waders use them as roosting sites after feeding in the tidal mudflats [4]. Luiz et al. [5] reported that mangrove ecosystems play a significant role in conservation of not only resident species but also migratory and endangered birds. Till now extensive scientific research on ecological aspects of birds in mangroves has been carried out in India [4, 6, 7, 8, 9, 10, 11], however data on species diversity of birds in mangroves of Uran, Navi Mumbai is not available, hence, the present study is undertaken.

MATERIALS AND METHODS

The study area

Geographically, Uran with the population of 23,251 is located along the eastern shore of Mumbai harbour opposite to Coloba. A creek called 'Uran creek / Sheva creek' (Lat. 18^0 50' 20" N and Long. 72^0 57' 5" E) encircles Uran city towards the north side and is continuous with the Panvel creek and Thane creek. Creek namely Dharamtar creek (Lat.18^0 50' 5" N and Long. 72^0 57' 10" E) encircles Uran city towards the south side and is continuous with the Karanja creek and Pen – Khopoli creek. On the west side, Uran is encircled by Arabian Sea (Fig. 1). Both creeks have rocky shore towards the seaward side where as remaining part of the creeks is marshy and of mud flats. Both Uran creek and Dharamtar creek are uniformly deep with 10 meters range and have moderate cover of mangroves with mud flats and low lying marshy areas on their sides. The coastal environment of Uran has been under considerable stress since the onset of industries like Oil and Natural Gas Commission LPG Distillation Plant, Grindwell Norton Ltd., MSEB Gas Turbine Power Station, Bharat Petroleum Corporation Ltd., Jawaharlal Nehru Port Trust (JNPT), Nhava-Seva International Container Terminal (NSICT), Container Freight Stations (CFS) etc. An international port called 'Jawaharlal Nehru Port Trust (JNPT)' was established in 1989 near the Uran creek and supports a variety of maritime activities; as a result, the area of Uran creek became the ground for hectic activities of Container Freight Stations (CFS). These activities affect the ecology of fauna and flora of mangroves. Hence this area has been identified for the ecological assessment.

Email:prpawar1962@rediffmail.com,prabhakar_pawar1962@yahoo.co.in

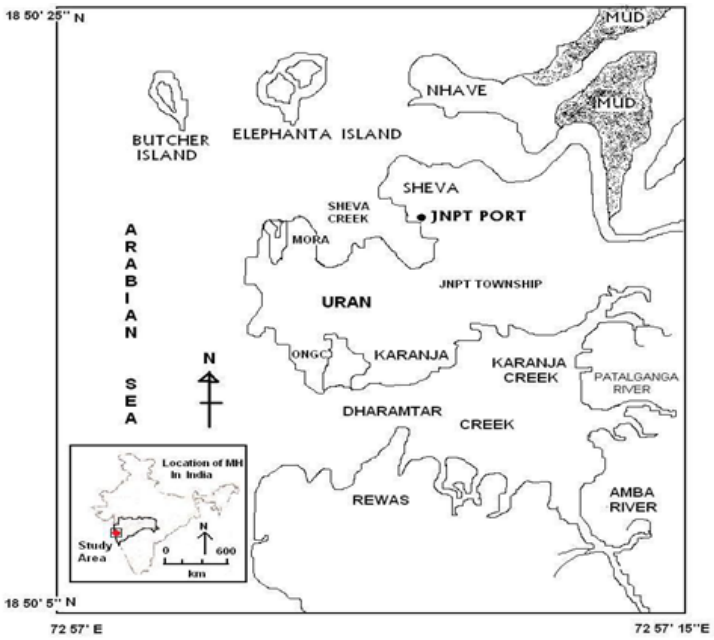

Fig. 1: Genereal map of study area

Species diversity of birds in mangroves

For present investigation, 2 study sites i. e. Sheva Creek and Dharamtar Creek, separated approximately by 10 km were selected along the coastal line of Uran. Observations were made for a period of two years i. e. from April 2009 to March 2011. The study sites were regularly surveyed by systematically walking on fixed routes and the bird population was estimated by direct counting method. Observations were made with the aid of 10 X 50 Olympus binocular and Cannon 1100 D Zoom camera. For correct identification of birds, field guides and books of Ali and Ripley [12], Ali [13] and Manakadan and Pittie [14] were followed.

RESULTS AND DISCUSSION

A total of 56 species of birds representing 11 orders, 29 families and 46 genera were recorded from the mangroves of Uran coast. The recorded species in alphabetical order of families is given in Table 1. Of the recorded species, 33.93 % belonged to Order Passeriformes, 26.79 % to Ciconiiformes, 8.93 % to Charadriiformes, 7.14 % to Anseriformes, 5.36 % each to Coraciiformes and Falconiformes, 3.57 % each to Columbiformes and Gruiformes and 1.79 % each to Cuculiformes, Pelecaniformes and Psittaciformes (Fig. 2). Avifauna of the order Passeriformes is dominant in Uran mangroves and is represented by 11 families, followed by order Ciconiiformes with 5 families. The species diversity of birds in Uran mangroves comprises 33 residents, 20 winter visitors and 3 occasional visitors.

Biodiversity and community structures are now recognized to be important determinants of ecosystem functioning [15]. Monitoring of species diversity is a useful technique for assessing damage to the system and maintenance of good species diversity is a positive management objective [16]. Birds are bio-indicators of habitat quality and are sensitive to any subtle changes in the habitat [17, 18, 19].

Table 1: List of birds recorded in mangroves of Uran (Raigad), Navi Mumbai, Maharashtra.

No.	Order/Family	Binomial Name	Common Name	Status
	Anseriformes			
1	Anatidae	*Anas poecilorhyncha* (Forster)	Spot-billed Duck	W
2		*Anas clypeata* (Linn.)	Northern Shovellar	W
3		*Dendrocygna javanica* (Horsfield)	Lesser whistling-Duck	W
4		*Tadorna ferruginea* (Pallas)	Ruddy Shelduck	W
	Charadriiformes			
5	Jacanidae	*Hydrophasianus chirurgus* (Scopoli)	Pheasant-tailed Jacana	W
6	Laridae	*Larus fuscus* (Linn.)	Lesser black-backed Gull	W
7		*Larus cachinnans* (Pallas)	Yellow-legged Gull	W
8	Scolopacidae	*Limosa limosa* (Linn.)	Black-tailed Godwit	W
9		*Philomachus pugnsr* (Linn.)	Ruff Sandpiper	O
	Ciconiiformes			
10	Threskiornithidae	*Plegadis falcinellus* (Linn.)	Glossy Ibis	O
11		*Platolea leucorodia* (Linn.)	Eurasian Spoonbill	W
12	Phoenicopteridae	*Phoenicopterus ruber* (Linn.)	Greater Flamingo	W
13		*P. minor* (Geoffary Saint -Hiliare)	Lesser Flamingo	W
14	Ciconiidae	*Anastomus oscitans* (Boddaert)	Asian Open-bill Stork	W
15		*Mycteria leucocephala* (Pennant)	Painted Stork	W
16	Charadriidae	*Vanellus indicus* (Boddaert)	Red-wattled Lapwing	R
17		*Himantopus himantopus* (Linn.)	Black-winged Stilt	W
18	Ardeidae	*Ardeola grayii* (Sykes)	Indian Pond Heron	R
19		*Babulcus ibis* (Linn.)	Cattle Egret	R
20		*Ardeola alba* (Linn.)	Large Egret	R
21		*Egretta egretta* (Linn.)	Little Egret	R
22		*Ardea intermedia* (Wagler)	Median Egret	R
23		*Egretta gularis* (Bosc.)	Western Reef Egret	R
24		*Ardea insignis* (Hume)	White-bellied Heron	R
	Columbiformes			

25	Columbidae	*Columba livia* (Gmelin)	Blue Rock Pigeon	R
26		*Streptopelia chinensis* (Scopoli)	Spotted Dove	R
	Coraciiformes			
27	Coraciidae	*Coracias benghalensis* (Linn.)	Indian Roller/Blue Jay	R
28	Meropidae	*Merops orientalis* (Latham)	Green Bee-eater	R
29	Alcedinidae	*Halcyon smyrnensis* (Linn.)	White-breasted Kingfisher	R
	Cuculiformes			
30	Cuculidae	*Centropus sinensis* (Stephens)	Crow Pheasant	R
	Falconiformes			
31	Accipitridae	*Elanus caeruleus* (Desfontaines)	Black-shouldered Kite	W
32		*Milvus migrans* (Boddaert)	Black Kite	R
33		*Haliaststur indus* (Boddaert)	Brahminy Kite	W
	Gruiformes			
34	Rallidae	*Amaurornis phoenicurus* (Pennant)	White-breasted Water hen	R
35		*Porphyrio porphyrio* (Linn.)	Purple-Swamp hen	W
	Passeriformes			
36	Dicruridae	*Dicrurus macrocercus* (Vieillot)	Black Drongo	R
37	Corvidae	*Corvus splendens* (Vieillot)	House Crow	R
38		*Corvus macrorhynchos* (Wagler)	Jungle Crow	R
39	Estrildidae	*Lonchura punctulata* (Linn.)	Scaly-breasted Munia	R
40		*Estrilda amandava* (Linn.)	Red Munia / Avadavat	R
41		*Lonchura malacca* (Linn.)	Black-headed Munia	R
42	Passeridae	*Passer domesticus* (Linn.)	House Sparrow	R
43		*Ploceus phillippinus* (Linn.)	Baya Weaver	R
44		*Sturnus raseus* (Linn.)	Rosy Starling	W
45	Sturnidae	*Acridotherus tristis* (Linn.)	Common Myna	R
46	Pycnonotidae	*Pycnonotus cafer* (Linn.)	Red-vented Bulbul	R
47	Laniidae	*Lanius schach* (Linn.)	Rufous-backed Shrike	R
48	Hirundinidae	*Hirundo rustica* (Linn.)	Common Swallow	R
49	Motacillidae	*Motacilla citreola* (Pallas)	Yellow-headed Wagtail	W
50		*Dendronanthus indicus* (Gmelin)	Forest Wagtail	R
51		*Motacilla alba* (Linn.)	White Wagtail	W
52	Nectariniidae	*Nectarinia zeylonica* (Linn.)	Purple-rumped Sunbird	R
53		*Nectarinia asiatica* (Latham)	Purple Sunbird	R
54	Muscicapidae	*Copsychus saulirus* (Linn.)	Oriental Magpie Robin	R
	Pelecaniformes			
55	Phalacrocoracidae	*Phalacrocorax niger* (Vieillot)	Little Cormorant	R
	Psittaciformes			
56	Psittacidae	*Psittacula krameri* (Scopoli)	Rose-ringed Parakeet	O

R – Resident, W – Winter Migrants, O – Occasional

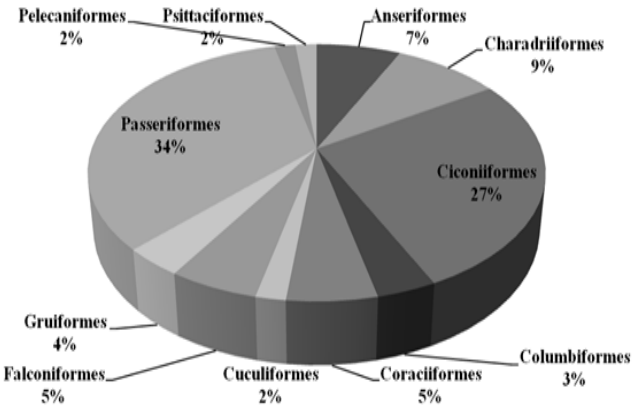

Fig. 2: Percentage representation of bird species in mangroves of Uran (Raigad).

Till now plenty of data is generated on ecological aspects of birds in mangrove in India. Oswin [3] reported 87 species of water birds from the Gulf of Kuchchh mangroves, Gujarat. Verma et al. [10] listed a total of 149 species of birds belonging to 14 orders and 35 families from Mehul Creek, Mumbai. Saravanan et al. [11] reported 14 species belonging to 4 orders and 10 families from Pondicherry

mangroves, South India. Kumar and Gupta [20] recorded 54 species of wetland birds belonging to 36 genera, 15 families and 5 orders around Kurukshetra.

The coastal environment of Uran has been under considerable stress since the onset of other industries and JNPT since 1989. Hectic activities of Container Freight Stations (CFS), urbanization, industrialization and reclamation in the stretch of creek around Uran, result in the loss of mangrove biodiversity. Several incidences of coastal pollution occur because of leakage/discharge of transporting materials along with industrial effluents.

Disposal of domestic wastes and untreated or partially treated industrial effluents in coastal region of Uran, Navi Mumbai have depleted coastal resources, public health risk and loss of coastal and marine biodiversity [21]. Sighting of dead fish surfacing in creeks of Mumbai and Navi Mumbai (Panvel creek, Vashi creek, Belapur creek etc.) is common from last few years affecting the livelihood of fishermen. Dumping of industrial effluents, untreated sewage and unchecked encroachment along the coastal line have resulted in deterioration of water quality and incidences of industrial pollution are common in creeks of Mumbai and Navi Mumbai. Slaughtering of mangroves from Navi Mumbai region due to over exploration, unsustainable demand and reclamation have resulted in destruction of marine life [22, 23, 24, 25].

In conclusion, it is stated that, at present, ecological conditions in mangroves of Uran supports moderate density of birds. Since no earlier reports are available, data presented here can be taken as a baseline data in knowing the status of birds in mangroves of Uran and effect of industrial development on it.

ACKNOWLEDGEMENT

Financial support provided by University Grants Commission, Western Regional Office, Pune is gratefully acknowledged. The author wishes to express deep sense of gratitude to Prof. Dr. B. G. Kulkarni, Director, The Institute of Science, Mumbai for encouragement and support. The author is thankful to The Principal, Veer Wajekar Arts, Science and Commerce College, Phunde (Uran) for healthy cooperation. Special thanks are due to Miss L. S. Patil for the critical reading of the manuscript.

REFERENCES

[1] Duke, N. C., 1992. Mangrove floristic and biogeography. In Robertson A. I. & Alongi D. M. (Eds.), Tropical mangrove ecosystems, (American Geophysical Union, Washington DC), pp. 63 – 100.

[2] Vannucci, M., 2002. Indo-west Pacific mangroves, In Lacerda L. D. (Eds.) Mangrove ecosystems, (Springer, Berlin), pp. 122 – 215.

[3] Oswin, S. D., 2002. Biodiversity and Ecology of the Gulf of Kachchh Mangroves, Gujarat. Procd. Nat. Semi. on Creeks, Estuaries and Mangroves – Pollution and Conservation, Organized by, B. N. B. College of Science, Thane, Mumbai on 28th – 30th Nov 2002, pp 78–83.

[4] Jayson, E. A., 2001. Structure, Composition and Conservation of birds in Mangalavanam Mangroves, Cochin, Kerala. ZOO'S PRINT JOURNAL, 16(5): 471 – 478.

[5] Luiz, A. M. M., R. Krul and V. d. S. Moraes, 2007. Mangrove bird community of Paranagua Bay – Parana, Brazil. Brazilian Archives of Biology and Technology, 50 (1): 1 – 8.

[6] Samant, J. S., 1985. Avifauna of the mangroves around Ratnagiri, Maharashtra. In: The Mangroves. Procd. of the Nat. Symp. on "Biology, Utilization and Conservation of Mangroves, pp. 456 – 466.

[7] Kurup, D. N., 1996. Ecology of the birds of Barathapuzha estuary and survey of the coastal wetlands of Kerala. Final report submitted to Kerala Forest Department, Trivandrum, pp 59.

[8] Sethuraman, A., 2000. Studies on the Avifauna of the coastal Tamil Nadu, India, Ph. D. Thesis, Annamalai University, India, pp 94.

[9] Kathiresan, K., 2000. Flora and Fauna in Mangrove ecosystem: A Manual for Identification Published by Ministry of Environment and Forests, Govt. of India, New Delhi, pp 393.

[10] Verma, A., S. Balachandran, N. Chaturvedi and V. Patil, 2004. A preliminary report on the Biodiversity of Mehul Creek, Mumbai, India with special reference to Avifauna, ZOO'S PRINT JOURNAL, 19(9): 1599 – 1605.

[11] Saravanan, K. R., K. Ilangovan and A. B. Khan, 2008. Floristic and macro faunal diversity of Pondicherry mangroves, South India. Tropical Ecology, 49(1): 91 – 94

[12] Ali, S. and D. Ripley, 1989. A Pictorial guide to the Birds of Indian Subcontinent. Oxford University Press, Bombay.

[13] Ali, S., 1990. The Book of Indian Birds, Oxford University Press, Bombay.

[14] Manakadan, R. and A. Pittie, 2002. Newsletter for Birdwatchers, 42 (3).

[15] Raghukumar, S and A. C. Anil, 2003. Marine biodiversity and ecosystem functioning: A perspective. Curr. Sci., 84(7):884—892.

[16] Mann, K., 1982. Ecology of coastal waters: a system approach, Verkeley: University of California.

[17] Ripley, S. D., 1978. Changes in the bird fauna of a forest area: Simplipal Hills, Mayurbharj District & Dhankanal District, Orissa. J. Bombay Nat. Hist. Society, 75: 570 – 574.

[18] Morrison, M. L., 1986. Bird populations as indicators of environmental change. In Current Ornithology, Vol. 3 (Eds.) R. J. Johnston, Plenum Publishing Corporation, London.

[19] Diamond, A. W. and F. L. Filion, 1987. (Eds.) The Value of Birds. International Council for Bird Preservation, Technical Publication No. 6. Queens University, Kingston, Ontario, Canada.

[20] Kumar, P. and S. K. Gupta, 2009. Diversity and Abundance of Wetland Birds around Kurukshetra, India. Our Nature, 7: 212 – 217.

[21] Zingde, M. D., 1999. Marine environmental status and coastal zone management issues in India. In: *South Asia Regional Workshop on Estuarine modelling and Coastal Zone Management.* A Joint START / LOICZ / IGBP-SL Workshop, 28th –30th April 1999, Colombo, Sri Lanka. pp. 153 – 164.

[22] Inamdar, A. B., R. K. Surendrakumar, M. C. Behera, B. K. H. B. Chauhan and S. Nayak, 2000. Land use mapping of Maharashtra Coastal Regulatory Zone, SAC/RESA/MWRD/CRZ/SN/02/00 (Indian Space Research Organization, Ahmadabad, India), pp 42.

[23] Mukherji, M., 2002. Degradation of Creeks and Mangroves and its impact on Urban environment – A case study of Mumbai. Procd. Nat. Semi. on Creeks, Estuaries and Mangroves –

Pollution and Conservation, Organized by, B. N. B. College of Science, Thane, Mumbai on 28th – 30th November 2002.pp 331 – 333.

[24] Zingde, M. D., 2002. Degradation of Marine habitats and Coastal management framework. Procd. Nat. Semi. on Creeks, Estuaries and Mangroves – Pollution and Conservation, Organized by, B. N. B. College of Science, Thane, Mumbai on 28th – 30th November 2002. pp 3 – 7.

[25] Pawar, Prabhakar R and Kulkarni, Balasaheb G., 2007. Diversity of Macrobenthos in Karanja Creek (Dist. - Raigad), Maharashtra, West coast of India. J. Aqua. Biol., 22(1): 47 – 54.