

VOLUME 10 ISSUE 1 2024

ISSN 2454 – 3055



**INTERNATIONAL
JOURNAL OF
ZOOLOGICAL
INVESTIGATIONS**

*Forum for Biological and
Environmental Sciences*

Published by Saran Publications, India



International Journal of Zoological Investigations

Contents available at Journals Home Page: www.ijzi.net

Editor-in-Chief: Prof. Ajai Kumar Srivastav

Published by: Saran Publications, Gorakhpur, India



ISSN: 2454-3055

Avifaunal Diversity of Jamdulwadi Island Village, Dist. Sindhudurg, Maharashtra, India

Prabhu Nilima S.^{1*} and Meshram Leena N.²

¹Department of Zoology, Chikitsak Samuha's S.S. and L.S. Patkar College of Arts and Science; and V.P. Varde College of Commerce and Economics, Goregaon (West), Mumbai 400102, Maharashtra, India

²Department of Zoology, Mahatma Phule Arts, Science and Commerce College, Panvel, Raigad, Navi Mumbai 410 206, Maharashtra, India

*Corresponding Author

Received: 22nd December, 2023; Accepted: 1st February, 2024; Published online: 4th February, 2024

<https://doi.org/10.33745/ijzi.2024.v10i01.015>

Abstract: In the present study, species diversity, status of population, and food preferences were assessed for coastal birds from Jamdulwadi Island Village, Dist. - Sindhudurg, Maharashtra, India. Birds were surveyed in different localities for one year (from January 2022 to December 2022). A total of 31 species of birds representing 10 orders, 20 families and 30 genera were recorded in the present study. Number of species of birds distributed in each family revealed that 11 species belongs to family Passeriformes, 5 species to Pelecaniformes, 3 species each to Accipitriformes and Coraciiformes, 2 species each to Charadriiformes, Columbiformes, and Cuculiformes. Families such as Anseriformes, Bucerotiformes, and Suliformes were represented by 1 species each. Avifauna of the order Passeriformes was found to be dominant in Jamdulwadi village and is represented by 10 families, 10 genera and 11 species. Conservation of the habitat and landscape diversity, protection of the mangrove ecosystem and associated floral diversity, well planned coastal tourism, and infrastructural development will improve the further conservation of birds along the Jamdulwadi village near Achara River Estuary. Since no earlier reports are available, data presented here can be taken as a baseline data in knowing the status of birds of Jamdulwadi village near Achara River Estuary, Dist. Sindhudurg.

Keywords: Achara estuary, Avifauna, Ecological importance, Jamdulwadi, Mangroves, Sindhudurg, Species diversity

Citation: Prabhu Nilima S. and Meshram Leena N.: Avifaunal diversity of Jamdulwadi Island Village, Dist. Sindhudurg, Maharashtra, India. Intern. J. Zool. Invest. 10(1): 122-129, 2024.

<https://doi.org/10.33745/ijzi.2024.v10i01.015>



This is an Open Access Article licensed under a Creative Commons License: Attribution 4.0 International (CC-BY). It allows unrestricted use of articles in any medium, reproduction and distribution by providing adequate credit to the author (s) and the source of publication.

Introduction

Mangroves provide food, shelter, and breeding sites to aquatic animals and birds and also protect the coast from tidal waves and wind destructions

(Mohd-Azlan, 2010; Chougule and Sapkale, 2020). Mangrove ecosystem can be utilized for feeding, roosting and breeding by both the resident and

migrant aquatic birds. Mangroves are also important in the conservation of resident, migratory and endangered birds (Wilson, 2006; Pawar, 2011; Salahuddin *et al.*, 2021).

Worldwide, the biodiversity is massively reduced due to rapid degradation of ecosystems by the human activities. This results in the decline and extinction of populations of many bird species. Reduction in number of population disrupts vital ecosystem processes and services such as decomposition, soil formation, pest control, pollination, and seed dispersal. On-going reduction in bird abundance and species richness are likely to have ecological consequences ranging from the spread of disease, loss of agricultural pests, plant extinctions and trophic cascades (Sekercioglu, 2006).

Maurice *et al.* (2020) stated that birds are excellent bio-indicators of the effects of urbanization on ecosystems and are key species of different ecosystems. They are important in maintaining ecosystems and supporting biodiversity such as regulating disease vectors, biomass recycling and reduce levels of disposable wastes. Birds also act as pollinators and scavengers controlling insects, pests and primary and tertiary consumers in the food chain (Johnson and Hackett, 2015; Pawar *et al.*, 2020).

Clouth and Hay (1989) stated that, of all the animals, birds have been used by the human beings for feeding, communication, pollinating plants, and decorate the home, etc. They are important in controlling agricultural pests such as rodents and support the food chain. Industrial developments and anthropological effects have degraded habitats and caused the natural balance to deteriorate, affecting many bird species.

According to Rao *et al.* (2019) unregulated tourism and associated developments, sand mining, stray dogs and conversion of laterite grasslands are the major threats to the coastal avifauna. Given the significance of birds for conservation planning and environmental assessments, there is a need for a better ecological

understanding of the role of avian community structure in conservation decision-making. Also, they should be included in evaluation studies for overall biodiversity conservation (Kushwaha and Kulkarni, 2013).

Birds are one of the most essential components to maintain the stabilization of the ecosystem and show general responses of wildlife to human disturbances, climate changes, and ecosystem changes. They have a role in the processing of a dynamic ecosystem in mangrove areas. Birds can release nutrients into the water column through their feces and food waste, therefore they play an important role in the food chain especially in mass and energy fluxes (Cita and Budiman, 2019).

Bopinwar *et al.* (2012) documented that estimation of local densities of avifauna helps to understand the abundances of various species of other organisms. Birds are often used as monitors of pollutants to indicate possible impacts of industrial interference in the ecosystems. An assemblage of large number and diverse bird species is an indication of less species competition due to diverse niche requirements. Further, population of birds is a sensitive indicator of pollution in both terrestrial and aquatic ecosystem (Mhatre *et al.*, 2013).

Deng and Yimam (2020) reported that the ecosystem services provided by birds are further categorized as marketable and nonmarketable values depending on their monetization process. Conserving and maintaining healthy birds population and their habitats would preserve diverse ecosystem services by benefiting many different living species and finally human wellbeing. Birds play a very important role in ecosystems and contribute to all four types of ecosystem services, namely provisioning, regulating, cultural, and supporting (Mariyappan *et al.*, 2023).

Chaudhari-Pachpande and Pejaver (2016) noted that birds are an important component of the mangrove ecosystem and their occurrence and

distribution help to understand the overall picture of the wetland habitat. Most of the birds have specific habitat requirements from season to season, a loss of which may lead to their extinction. Habitat destruction is considered as one of the main reason for such a decrease in bird species population (Sinnarkar *et al.*, 2013).

Literature review suggests that barring few reports (Chougule and Sapkale, 2020; Rao *et al.*, 2019), meagre information is available on species diversity of birds from various localities of Sindhudurg District. Hence, the present study was undertaken to assess the avifauna from Jamdulwadi Island Village of Sindhudurg District, Maharashtra, India.

Materials and Methods

Study Area:

Geographically, Achara River Estuary (16° 11' 56.36992" N, 73° 25' 56.21658" E to 16° 12' 56.89885" N, 73° 27' 11.91925" E) is a major estuary located in the Malvan Tahsil of the Sindhudurg District, Konkan region of Maharashtra, India. The estuary is resourceful with finfish and shell-fish fishery resources and supports the livelihood of the nearby coastal community. Thick mangrove vegetation on the banks of the estuary supports the diverse species of fauna and flora.

Jamdulwadi (16° 12' 3.33818" N, 73° 26' 19.73202" E to 16° 12' 20.55422" N, 73° 26' 28.24142" E) (Fig. 1) is a small island village in Malvan Tahsil in Sindhudurg District of Maharashtra State, India. It is located 18 km towards west from District headquarters Oros, and 382 km from State capital Mumbai. Jamdulwadi is surrounded by Kankavali and Kudal Tahsil towards East, Vengurle Tahsil towards the South, and Deogad Tahsil towards North. Devgarh, Sawantwadi, Mapusa, Panaji are the nearby Cities to Jamdulwadi. It covers geographical area of 56.45 Sq Km hectares and is situated about 26 km away from Malvan and 49 km away from District headquarter. Average temperature recorded is

28.3 °C with 65% as average humidity and north-west winds with 4.64 mt/sec.

Study Location:

This study was carried out for the period of one year (from January 2022 to December 2022). Selected sites were visited during dawn and dusk hours, one day in each month and 4 h were spent at each site at both times (total day time was 8 h). The study sites were regularly surveyed by systematically walking on fixed routes and the bird population in different habitats was estimated by direct count (physical count and calls or voices) and indirect (nests, carcasses) observations. Data on birds was collected by observations with naked eyes and with the aid of 10X50 Olympus Binocular. Birds were photographed using Cannon 1100 D Zoom camera. For correct identification of birds, field guides and books of Ali and Ripley (1987), Ali (1996), Woodcock (1998), and Grimmett *et al.* (2011) were followed.

Results and Discussion

A total of 31 species of birds representing 10 orders, 20 families and 30 genera were recorded from from Jamdulwadi village near Achara River Estuary, Dist. Sindhudurg. The recorded species in alphabetical order of families is given in Tables 1 and 2. The percentage representation of recorded avifaunal species from Jamdulwadi village is represented in Figure 2. Of the recorded species, avifauna of the order Passeriformes is found to be dominant in Jamdulwadi village and is represented by 10 families, 10 genera and 11 species.

Number of species of birds distributed in each family revealed that 11 species belongs to family Passeriformes, 5 species to Pelecaniformes, 3 species each to Accipitriformes and Coraciiformes, 2 species each to Charadriiformes, Columbiformes, and Cuculiformes. Families such as Anseriformes, Bucerotiformes, and Suliformes were represented by 1 species each.

Biodiversity and community structures are now recognized to be important determinants of

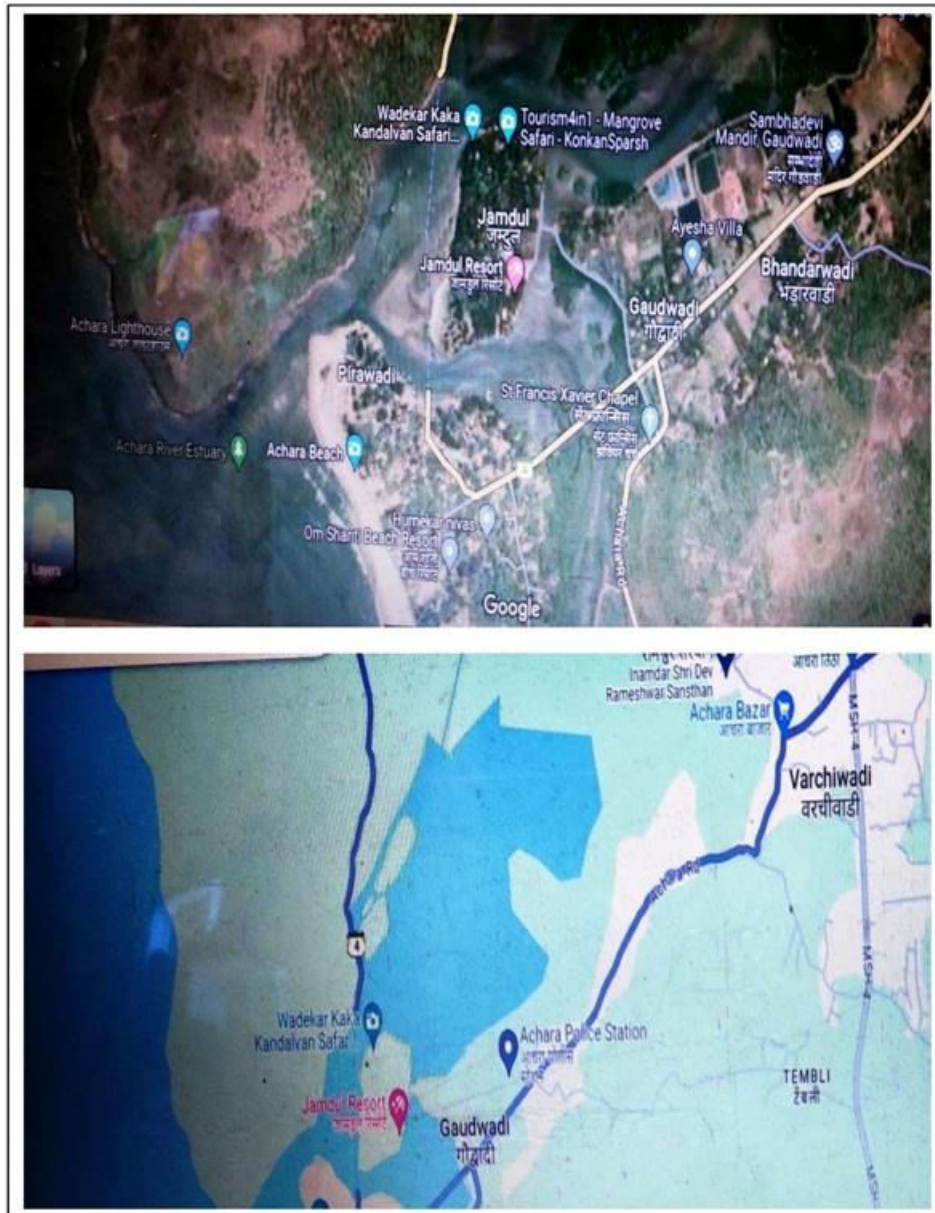


Fig. 1: Location map of study area representing Jamdulwadi Island Village (Source: Google Maps).

ecosystem functioning. 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. Assessment of species diversity of birds indicates the habitat quality and birds are sensitive to any subtle changes in the habitat (Pawar, 2011).

Kadam and Dhar (2017) reported that, threats like use of chemical pesticides, fertilizers and

occasional hunting by tribals pose a serious threat to fruit and nectar feeding birds. Further, waders and coastal birds face the problems like pollution and dumping of wastes. Also, the mangroves are under threat due to illegal land encroachment, land filling and waste dumping. Coastal land is being reclaimed and encroached over for construction purpose. The coastal area available for birds' activity is reduced and this deprives them of their feeding ground (Kurve, 2017).

Table 1: Preliminary checklist of birds recorded from Jamdulwadi village near Achara River Estuary, Dist. Sindhudurg (C - Common, VC - Very Common, RA - Rare, OC - Occasionally, P - Piscivorous, I - Insectivorous, F - Frugivorous, G - Granivorous, O - Omnivorous, C - Carnivorous, H - Herbivorous)

No.	Order	Family	Scientific Name	Common Name	Population Status	Food Preferences
1	Accipitriformes	Accipitridae	<i>Haliastur indus</i> (Boddaert, 1783)	Brahminy kite	OC	C
2			<i>Milvus migrans</i> (Boddaert, 1783)	Black kite	C	C
3			<i>Nisaetus cirrhatus</i> (Gmelin, JF, 1788)	Crested hawk eagle	RA	C
4	Anseriformes	Anatidae	<i>Anser anser domesticus</i> (Linnaeus, 1758)	Domestic Geese	C	H
5	Bucerotiformes	Bucerotidae	<i>Anthracoseros coronatus</i> (Boddaert, 1783)	Malabar pied hornbill	C	C, I, F
6	Charadriiformes	Charadriidae	<i>Vanellus indicus</i> (Boddaert, 1783)	Red wattled lapwing	C	I
7	Columbiformes	Columbidae	<i>Columba livia</i> (Gmelin, 1789)	Rock dove	VC	F,G
8			<i>Spilopelia chinensis</i> (Scopoli, 1786)	Spotted dove	C	F,G
9	Coraciiformes	Alcedinidae	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	White throated kingfisher	VC	P
10			<i>Alcedo atthis</i> (Linnaeus, 1758)	Small blue kingfisher	C	P
11		Meropidae	<i>Merops orientalis</i> (Latham, 1801)	Green Bea-eater	VC	I
12	Cuculiformes	Cuculidae	<i>Eudynamus scolopaceus</i> (Linnaeus, 1758)	Asian koel	C	F
13			<i>Centropus sinensis</i> (Stephens, 1815)	Greater Coucal	C	F
14	Passeriformes	Cisticolidae	<i>Prinia inornata</i> (Sykes, 1832)	Plain prinia	C	I
15		Corvidae	<i>Corvus splendens</i> (Vieillot, 1817)	House crow	VC	O
16			<i>Corvus macrorhynchos</i> (Wagler, 1827)	Jungle crow	VC	O
17		Dicruridae	<i>Dicrurus macrocercus</i> (Vieillot, 1817)	Black drongo	C	O
18		Muscicapidae	<i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental magpie robin	VC	I
19		Nectariniidae	<i>Cinnyris asiaticus</i> (Latham, 1790)	Purple sunbird	RA	I, F
20		Oriolidae	<i>Oriolus kundoo</i> (Sykes, 1832)	Indian golden oriole	OC	F, I
21		Passeridae	<i>Passer domesticus</i> (Linnaeus, 1758)	House sparrow	C	I, G
22		Ploceidae	<i>Ploceus philippinus</i> (Linnaeus, 1766)	Baya weaver	OC	G
23		Pycnonotidae	<i>Pycnonotus jocosus</i> (Linnaeus, 1758)	Red whiskered bulbul	VC	F
24			<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Red vented bulbul	VC	F
25		Sturnidae	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Common myna	VC	I, C, F
26	Pelecaniformes	Ardeidae	<i>Egretta garzetta</i> (Linnaeus, 1766)	Little egret	C	P
27			<i>Bubulcus ibis</i> (Linnaeus, 1766)	Cattle egret	VC	P
28			<i>Ardeola grayii</i> (Sykes, 1832)	Indian pond heron	VC	P
29			<i>Casmerodius albus</i> (Linnaeus, 1758)	Great egret	RA	P
30			<i>Mesophoyx intermedia</i> (Wagler, 1827)	Intermediate egret	C	P
31	Suliformes	Phalacrocoracidae	<i>Microcarbo niger</i> (Vieillot, 1817)	Little cormorant	OC	P

Table 2: Orders representing number of families, genera, and species of birds recorded from Jamdulwadi village Dist. Sindhudurg

S. No.	Order	Families	Genera	Species
1	Accipitriformes	1	3	3
2	Anseriformes	1	1	1
3	Bucerotiformes	1	1	1
4	Charadriiformes	1	2	2
5	Columbiformes	1	2	2
6	Coraciiformes	2	3	3
7	Cuculiformes	1	2	2
8	Passeriformes	10	10	11
9	Pelecaniformes	1	5	5
10	Suliformes	1	1	1
	10	20	30	31

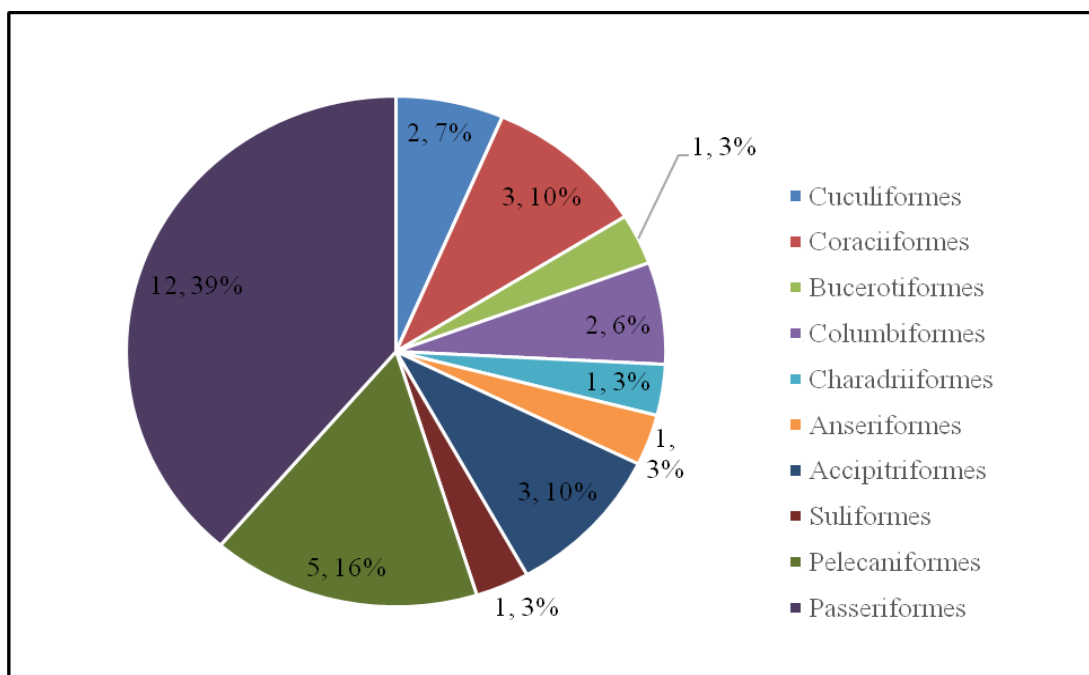


Fig. 2: Percentage representation of avifaunal species recorded from Jamdulwadi village near Achara River Estuary, Dist. Sindhudurg.

According to Bhawe *et al.* (2022), birds have area and species-specific pattern of distribution with respect to the availability of food of their interest. The faunal diversity of birds is affected by domestic and industrial pollution in the coastal region. Therefore, long-term annual bird observation studies are required for more confirmative distribution pattern and species-specific results. Construction of homestays, unregulated tourism in coastal areas, and conversion of natural habitats to meet increasing tourism are the major threats to the coastal

avifauna (Rao *et al.*, 2019).

Cita and Budiman (2019) stated that differences in diversity of bird species in mangrove area were associated with the habitat heterogeneity and vegetation structure. Further, mangrove habitats act as a stable ecosystem for the life cycles of birds. Results of the present study are in agreement with the findings on species diversity of birds by Bopinwar *et al.* (2012) in ecological niches of Western Ghats in Maharashtra, Sinnarkar *et al.* (2013) in Mahim

Bay, Mumbai, and Chaudhari-Pachpande and Pejaver (2016) in Thane Creek, Maharashtra.

At present, ecological conditions of Jamdulwadi village Dist. Sindhudurg 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 Jamdulwadi village near Achara River Estuary, Dist. Sindhudurg and effect of coastal tourism and infrastructural development on it.

Conclusion

Results of the present study showed that conservation of the habitat and landscape diversity in the coastal area will help in better management of the species diversity of birds in the coastal area. Protection of the mangrove ecosystem and associated floral diversity, well planned coastal tourism, and infrastructural development will also improve the further conservation of birds along the Jamdulwadi village near Achara River Estuary, Dist. Sindhudurg.

Acknowledgements

First author extends deep sense of gratitude to the Rashtriya Uchchatar Shiksha Abhiyan (RUSA) and Authorities of Chikitsak Samuha's S. S. and L. S. Patkar College of Arts and Science, and V. P. Varde College of Commerce and Economics, Goregaon (West), Mumbai, Maharashtra, India. Authors are also thankful to family members and relatives for their encouragement and support during the present study.

References

- Ali S. (1996) *The Book of Indian Birds*. Oxford university Press, New Delhi, pp. 466.
- Ali S and Ripley SD. (1987) *Compact handbook of the birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka*. Oxford University Press, Delhi, pp. 890.
- Bhave S, Prathamesh G, Janice V, Sonia B, Tripathi A, Athalye RP, Azeez PA, Shirish SM, Mahendiran M and Goldin Q. (2022) Species diversity and distribution pattern of avifauna from Thane creek, Maharashtra, India. *Asian J Conserv Biol*. 11(2): 207–217.
- Bopinwar SS, Meshram DB, Bharati Minakshi T, Paunekar WN and Ghosh TK. (2012) Diversity of birds in some ecological niches of Western Ghats in Maharashtra (India). *Res Rev BioSci*. 6(9): 231-239.
- Chaudhari-Pachpande S and Pejaver MK. (2016) A preliminary study on the birds of Thane Creek, Maharashtra, India. *J Threatened Taxa* 8(5): 8797–8803.
- Chougule VA and Sapkale JB. (2020) Detecting changes and health status of mangrove forest in Achara estuary, Maharashtra using remote sensing and GIS. *Sustainability Agrit Food Environ Res*. 8(3): 219-228.
- Cita KD and Budiman MAK. (2019) Bird diversity and its association in mangrove habitats of Teluk Bintuni Regency, West Papua. *IOP Conf. Series: Earth and Environmental Science* 394 (2019) 012006 IOP Publishing doi:10.1088/1755-1315/394/1/012006.
- Clouth MN and Hay JR. (1989) The importance of birds as browsers, pollinators and seed dispersers in New Zealand Forest. *New Zealand J Ecol*. 12(Supplement): 27-33.
- Deng GT and Yimam IA. (2020) Ecosystem roles of birds: A review on birds' conservation insight. *Int J Zoo Animal Biol*. 3(4): 000236.
- Grimmett R, Inskipp C and Inskipp T. (2011) *Birds of the Indian subcontinent*. 2nd edn., Oxford University Press, New Delhi, pp. 480.
- Johnson MD and Steven CH. (2015) *Why Birds Matter Economically Values, Markets, and Policies*. University of Chicago Press, pp. 24-48.
- Kadam SS and Avadhesh SD. (2017) Status and diversity of avian fauna in and around Bordi region, west coast of India. *Int Res J Biol Sci*. 6(5): 15-18.
- Kurve PN. (2017) Habitat dependent avifaunal diversity along the coastline of Raigad district, (M.S.), India. *Int J Fauna Biol Stud*. 4(2): 1-6.
- Kushwaha SC and Kulkarni Neelima S. (2013) Bird diversity of Betawade, Thane, a Natural urban habitat. *Nat Conf on Biodiversity: Status and Challenges in Conservation - 'FAVEO' 2013*. ISBN: 978-81-923628-1-6, pp. 39-46.
- Mariyappan M, Meena R, Sarathkumar V, Alfred DJ, Dinesh GK, Kumaravel S, Maheshwaran K and Mangayarkarsi S. (2023) Ecological role and ecosystem services of birds: A review. *Int J Environ Climate Change* 13(6): 76-87.
- Maurice ME, Fuashi NA, Mbua RL, Mendzen NS, Okon OA and Ayamba NS. (2020) The environmental influence on the social activity of birds in Buea University Campus, Southwest Region, Cameroon. *Interdiscipl J Environ Sci Edu*. 16: e02210.

- Mhatre K, Gurjarpadhye P, Naik A and Kulkarni N. (2013) Diversity of avifauna of Nigade in Raigad, Konkan, India: A case for conservation. Nat Conf on Biodiversity: Status and Challenges in Conservation - 'FAVEO' 2013. ISBN : 978-81-923628-1-6. pp. 28-33.
- Mohd-Azlan J. (2010) Community Ecology of Mangrove Birds. Thesis submitted for the degree of Doctor of Philosophy of the Charles Darwin University, pp. 216.
- Pawar Prabhakar R. (2011) Species diversity of birds in mangroves of Uran (Raigad), Navi Mumbai, Maharashtra, West coast of India. J Exp Sci. 2(10): 73-77.
- Pawar Prabhakar R, Rokade AG, Supnekar SP, Meshram Leena N and Pawar NB. (2020) Anthropogenic impact on species diversity and distribution of birds from coastal region of Panvel, Navi Mumbai, India. Intern J Zool Invest. 6(2): 260-271,
- Rao GB, Babu S, Quadros G and Anoop V. (2019) Bird diversity in the coastal talukas of Sindhudurg District, Maharashtra, India. J Threatened Taxa 11(9): 14166-14186.
- Salahuddin MAA, Rohayani IS and Candri DA. (2021) Species diversity of birds as bioindicators for mangroves damage at Special Economic Zones (SEZ) Mandalika in Central of Lombok, Indonesia. 4th Int Conf on Bioscience and Biotechnology IOP Conf. Series: Earth and Environmental Science 913 (2021) 012058 IOP Publishing. doi:10.1088/1755-1315/913/1/012058.
- Sekercioglu CH. (2006) Ecological significance of bird populations. In: Old World Flycatchers to Old World Warblers. Handbook of the Birds of the World. Bird Life International, (eds.) Hoyo Josep, Andrew Elliott and David Christie, Lynx Edicions, pp. 15-34.
- Sinnarkar K, Abhay S H, Rishikesh SD and Kamath V. (2013) Avian diversity in Mahim Bay, Mumbai. Nat. Conf. on Biodiversity: Status and Challenges in Conservation - 'FAVEO' 2013. ISBN: 978-81-923628-1-6, pp. 25-27.
- Wilson KJ. (2006) Survey of birds in mangrove, river mouth and coastal habitats in Sarawak. Assessment of their role in monitoring the health of mangrove and coastal ecosystems and a search for the critically endangered silvery pigeon. Lincoln University Wildlife Management Report No. 41. ISBN 978-0-86476-183-5, pp. 19.
- Woodcock MW. (1998) Collins handguide to the birds of the Indian Sub-continent. William Collins Sons Co. Ltd. London.