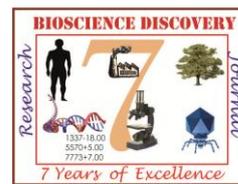


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Research Article



Avifaunal diversity from Khairbandha Lake in Gondia district, Maharashtra State, India

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Abstract

The avifaunal diversity of Khairbandha lake was studied from February 2014 to January 2016 based on visual encounter surveys. The Khairbandha lake is located at Khalbanda having abundant food availability and rich aquatic vegetation that harbors a variety of birds. Now a days the anthropogenic activities and the environmental changes happening regularly affects the seasonal biodiversity. Total eighty six species including water birds and land birds were recorded belonging to different 33 families during the study period. Out of eighty six species, 56 species were residents (65%), 23 species were winter visitors (27%), 02 species were summer visitors (2%) and 05 species were passage visitors (6%). The maximum species were sighted during the winter season followed by summer and monsoon season respectively. Out of eighty six species, 39 species were very common, 16 species were common, 14 species were uncommon, 13 species were occasional and 04 species were rare for this site. Anatidae family with 15 species to be the most dominant family in the reservoir throughout the study period.

INTRODUCTION

Birds, nearly everyone enjoys the beauty of their forms and coloring, the vivacity of their movement, the buoyancy of their flight and sweetness of their songs. Birds are excellent model organisms for understanding key issues in ecology, animal behaviour, evolutionary biology and conservation (Urfi, 2011). Birds are among the nature's most beautiful animal and undoubtedly, bird habitat particularly within the lake areas seems to be strongly influenced by climatic changes and immediate human impact. Freshwater lakes one of the important types of wetlands, play a vital role in the economics of their respective regions, especially with reference to agriculture, fishing, livestock maintenance and drinking water facilities of the adjacent areas. The geographic location of a wetland

may determine how and when birds will use it or use adjacent habitat (Manikannan, 2011). Local people used the wetlands for various purposes for their livelihood, fishing being most common activity. Anthropogenic factors cause the degradation of wetland ecosystem which leads to the destruction of habitat of water birds (Manakadan *et al.*, 2011).

The abundance of avifauna indicates the healthy status of lakes owing the availability of water, safe habitat and food sources for both adults and nestlings, and essential nesting/roosting sites in and around the lakes are important for the occurrence and abundance of aquatic bird populations (Joshi, 2012). Diversity of the avifauna is one of the most important ecological indicators to evaluate the quality of habitats. Now days, avifaunal diversity has been decreasing

due to the destruction of natural habitats and human disturbances (Bhadja and Vaghela, 2013). Every water body provides an ideal location as a stopover site to the ducks and waders while its surrounding area to the arboreal migrants like waders. The excessive growth of macrophytes in water bodies caused serious problems to water quality, food resources and availability of exposed wetland and shorelines for roosting of ducks and geese (Joshi, 2014). The occurrence of a variety of organisms reflects the biological diversity of that particular expanse. The decline in avian species due to the loss of habitat by reclamation of land for construction purposes and also due to reduction of nesting sites (Lad and Patil, 2015).

Birds are essential animal group of an ecosystem and maintain the trophic level. They play a functional role in the ecosystem as potential pollinators and scavengers, and are rightly called as bioindicators. Natural ecosystems have been overexploited and even destroyed by the rapidly increasing activities and industries. When consequent environmental changes exceeded the tolerance limit of species habitat change also become ultimate cause for long term changes in the bird distribution. Very considerable studies on the avifaunal diversity from freshwater bodies of India have been carried out by some researchers. It has been recorded that the region of Vidarbha from Maharashtra State is lagging behind the bird studies with respect to various reservoirs. Therefore, the detail study on the avifauna of Khairbandha lake from Gondia district is important which should be to conserve the biodiversity and environment. Thus, the present investigation reveals to compile a document of avifaunal diversity from Khairbandha lake to create the awareness for their conservation.

MATERIALS AND METHODS

Study Area

Gondia is known as the district of lakes as there are many water bodies including lakes and reservoirs present in the district. Apart from this there are many large dams such as Itiyadoh, Shirpur, Pujaritola, Kalisarad as well as smaller dams, reservoirs or lakes at Chorkhamara, Bodalkasa, Navegaon, Shrungarbandh, Khairbandha and other small lakes in the district. The Khairbandha lake lies at the geographic coordinates of 21°28'30"N latitude and 80°03'45"E longitudes. Khairbandha reservoir is situated 13 km away from Adani thermal power station on North-East side in Gondia district, Maharashtra State.

This reservoir locally called as Khairbandha lake, and have the total area of 425 hectares. There are different villages very close to the lake that is Chidiyatola, Zadutola, Khatitola and Pardibandha surrounding the area of this lake. The water of this lake is primarily used for washing, bathing, fishing activities, irrigation purposes and for other activities by the villagers. This lake harbors a number of aquatic weeds in the submerged as well as floating state on which thrive a large number of aquatic organisms. Apart from this, periphery is covered with bushes and trees which provide suitable habitat for the birds. Due to the abundant food available throughout the year in this area in the form of crustaceans, insects, molluscs, amphibians and even fruits which attracts a variety of birds.

Survey of the site

The bird survey was conducted from February 2014 to January 2016 to examine the avifauna from the Khairbandha lake. A visual encounter survey was conducted (Crump and Scott, 1994; Manley *et al.*, 2005; Joshi, 2014) for direct count of the birds by walking along the bank of the lake (Rajashékara and Venkatesha, 2010). Weekly visits to the site were made for two years and an average of 4 weeks was accounted for a month (Wanjari, 2012). The observation of the birds was carried out at early morning and evening hours by using field binocular (Olympus 10×50) during the day time depending on the light conditions (Namgail *et al.*, 2009). The stationary and double counting methods also adopted wherever necessary (Gregory *et al.*, 2004). After detection, specimens were photographed by Nikon camera and identified with the help of keys and methods suggested by Ali (2002), Grimmitt *et al.* (2011) and Manakadan *et al.* (2011). The scientific names, common names, family sequence and IUCN status were ascertained as per BirdLife international (2013 version 6) and Grimmitt *et al.* (2011).

The residential local status of the bird species was categorized on the basis of the observations and have been assigned strictly with reference to the study area on the basis of presence or absence method as followed by Thakur *et al.* (2010); Koli (2014); Shekhawat and Bhatnagar (2014) as (R – Resident, WV – Winter Visitor, SV – Summer Visitor, PV – Passage Visitor). The data recorded in each survey was analyzed for assessing the abundance status of the bird species on the basis of the percent frequency (encounter rates) of sightings as followed the techniques developed by Kasambe and Wadatkar (2007), Kasambe and Sani (2009),

Tak *et al.* (2010) and Priyanka (2012). (Vc – Very Common: 75-100%, C – Common: 50-74%, Uc – Uncommon: 25-49%, O – Occasional: 5-24% and Rr – Rare: <5%).

RESULTS AND DISCUSSION

During the present investigation, 86 bird species including water birds and land birds were recorded from Khairbandha lake belonging to 33 families (Table 1). Out of eighty six species, 56 species were residents (65%), 23 species were winter visitors (27%), 02 species were summer visitors (2%) and 05 species were passage visitors (6%). As per IUCN

status (2013), 83 species were least concern and 03 species were near threatened. The maximum species were sighted during the winter season followed by summer and monsoon season respectively. Out of eighty six bird species, 39 species were very common, 16 species were common, 14 species were uncommon, 13 species were occasional and 04 species were rare for this site. Anatidae was the dominant family with 15 species followed by the families Ardeidae and Scolopacidae with 07 and 06 species respectively.

Table 1: Systematic list of Bird species at Khairbandha lake in Gondia district, Maharashtra State, India (Feb. 2014 to Jan. 2016)

Family	Sr No	Scientific Names	Common Names	Residential Status #	Abundance
1) Anatidae	1	<i>Dendrocygna javanica</i> *	Lesser Whistling-duck	SV	Uc
	2	<i>Anser anser</i> *	Greylag Goose	PV	Rr
	3	<i>Anser indicus</i> *	Bar-headed Goose	WV	O
	4	<i>Sarkidiornis melanotos</i> *	Comb Duck	PV	Rr
	5	<i>Tadorna ferruginea</i> *	Ruddy Shelduck	WV	Uc
	6	<i>Nettapus coromandelianus</i> *	Cotton Pygmy-goose	R	Vc
	7	<i>Anas strepera</i> *	Gadwall	WV	O
	8	<i>Anas platyrhynchos</i> *	Mallard	PV	Rr
	9	<i>Anas poecilorhyncha</i> *	Western Spot-billed Duck	R	C
	10	<i>Anas acuta</i> *	Northern Pintail	WV	Uc
	11	<i>Anas crecca</i> *	Common Teal	WV	O
	12	<i>Netta rufina</i> *	Red-crested Pochard	WV	Uc
	13	<i>Aythya ferina</i> *	Common Pochard	WV	Uc
	14	<i>Aythya nyroca</i> **	Ferruginous Duck	PV	O
	15	<i>Aythya fuligula</i> *	Tufted Duck	WV	O
2) Podicipedidae	16	<i>Tachybaptus ruficollis</i> *	Little Grebe	R	C
3) Ciconiidae	17	<i>Mycteria leucocephala</i> **	Painted Stork	WV	O
	18	<i>Anastomus oscitans</i> *	Asian Openbill	R	Vc
	19	<i>Ciconia nigra</i> *	Black Stork	WV	O
	20	<i>Ciconia episcopus</i> *	Woolly-necked Stork	WV	O
4) Threskiornithidae	21	<i>Threskiornis melanocephalus</i> **	Black-headed Ibis	SV	Uc
	22	<i>Pseudibis papillosa</i> *	Red-naped Ibis	R	Vc
5) Ardeidae	23	<i>Ardeola grayii</i> *	Indian Pond Heron	R	Vc
	24	<i>Ardea cinerea</i> *	Grey Heron	WV	O

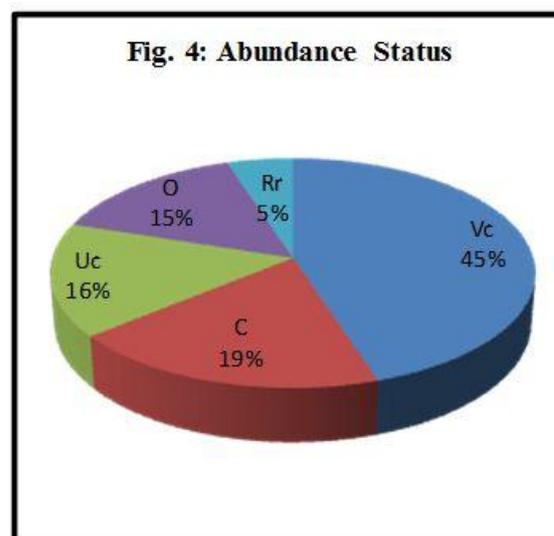
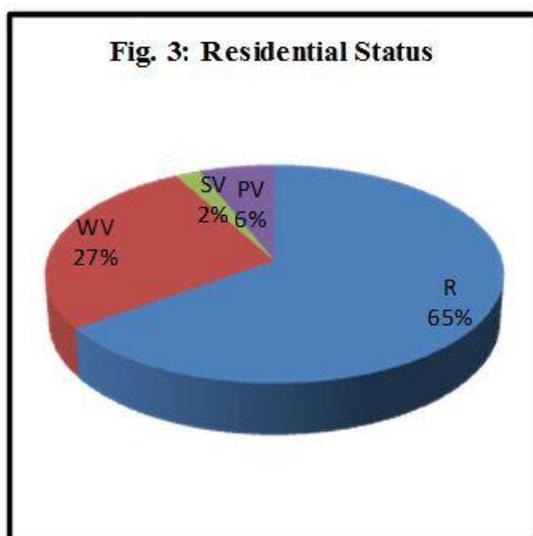
	25	<i>Ardea purpurea*</i>	Purple Heron	R	C
	26	<i>Bubulcus ibis*</i>	Cattle Egret	R	Vc
	27	<i>Casmerodius albus*</i>	Great Egret	R	Vc
	28	<i>Mesophoyx intermedia*</i>	Intermediate Egret	WV	Uc
	29	<i>Egretta garzetta*</i>	Little Egret	R	Vc
6)Phalacrocoracidae	30	<i>Phalacrocorax niger*</i>	Little Cormorant	R	Vc
	31	<i>Phalacrocorax fuscicollis*</i>	Indian Cormorant	WV	O
7) Rallidae	32	<i>Porphyrio porphyrio*</i>	Purple Swamphen	R	Vc
	33	<i>Gallinula chloropus*</i>	Common Moorhen	R	Vc
	34	<i>Fulica atra*</i>	Common Coot	WV	Uc
8) Recurvirostridae	35	<i>Himantopus himantopus*</i>	Black-winged Stilt	R	C
9) Charadriidae	36	<i>Vanellus indicus*</i>	Red-wattled Lapwing	R	Vc
	37	<i>Pluvialis fulva*</i>	Pacific Golden Plover	PV	Rr
	38	<i>Charadrius dubius*</i>	Little Ringed Plover	R	Vc
10) Jacanidae	39	<i>Hydrophasianus chirurgus*</i>	Pheasant-tailed Jacana	R	C
	40	<i>Metopidius indicus*</i>	Bronze-winged Jacana	R	C
11) Scolopacidae	41	<i>Gallinago gallinago*</i>	Common Snipe	WV	Uc
	42	<i>Tringa stagnatilis*</i>	Marsh Sandpiper	WV	Uc
	43	<i>Tringa nebularia*</i>	Common Greenshank	WV	O
	44	<i>Tringa glareola*</i>	Wood Sandpiper	WV	C
	45	<i>Actitis hypoleucos*</i>	Common Sandpiper	WV	Uc
	46	<i>Calidris temminckii*</i>	Temminck's Stint	WV	O
12) Columbidae	47	<i>Columba livia*</i>	Rock Pigeon	R	Vc
	48	<i>Streptopelia decaocto*</i>	Eurasian Collared Dove	R	Vc
	49	<i>Stigmatopelia chinensis*</i>	Spotted Dove	R	Vc
	50	<i>Stigmatopelia senegalensis*</i>	Laughing Dove	R	Vc
13) Psittacidae	51	<i>Psittacula krameri*</i>	Rose-ringed Parakeet	R	Vc
	52	<i>Psittacula cyanocephala*</i>	Plum-headed Parakeet	R	O
14) Cuculidae	53	<i>Centropus sinensis*</i>	Greater Coucal	R	Vc
15) Coraciidae	54	<i>Coracias benghalensis*</i>	Indian Roller	R	Vc
16) Alcedinidae	55	<i>Halcyon smyrnensis*</i>	White-throated Kingfisher	R	C
	56	<i>Alcedo atthis*</i>	Common Kingfisher	R	Vc
	57	<i>Ceryle rudis*</i>	Pied Kingfisher	R	Vc
17) Meropidae	58	<i>Merops orientalis*</i>	Little Green Bee-eater	R	Vc

18) Upupidae	59	<i>Upupa epops</i> *	Common Hoopoe	R	Vc
19) Picidae	60	<i>Dinopium benghalense</i> *	Black-rumped Flameback	R	C
	61	<i>Chrysocolaptes festivus</i> *	White-naped Woodpecker	R	Vc
20) Oriolidae	62	<i>Oriolus oriolus</i> *	Eurasian Golden Oriole	R	C
21) Dicruridae	63	<i>Dicrurus macrocercus</i> *	Black Drongo	R	Vc
22) Corvidae	64	<i>Dendrocitta vagabunda</i> *	Rufous Treepie	R	Vc
	65	<i>Corvus culminatus</i> *	Indian Jungle Crow	R	Vc
	66	<i>Corvus splendens</i> *	House Crow	R	Vc
23) Alaudidae	67	<i>Ammomanes phoenicura</i> *	Rufous tailed lark	R	Vc
	68	<i>Eremopterix griseus</i> *	Ashy-crowned Sparrow Lark	R	Vc
24) Pycnonotidae	69	<i>Pycnonotus cafer</i> *	Red-vented Bulbul	R	Vc
25) Timaliidae	70	<i>Turdoides malcolmi</i> *	Large Grey Babbler	R	Uc
	71	<i>Turdoides striata</i> *	Jungle Babbler	R	Vc
26) Zosteropidae	72	<i>Zosterops palpebrosus</i> *	Oriental White-eye	R	C
27) Sturnidae	73	<i>Acridotheres tristis</i> *	Common Myna	R	Vc
	74	<i>Sturnus contra</i> *	Asian Pied Starling	R	Vc
	75	<i>Temenuchus pagodarum</i> *	Brahminy Starling	R	Vc
28) Muscipidae	76	<i>Copsychus saularis</i> *	Oriental Magpie Robin	R	C
	77	<i>Saxicoloides fulicatus</i> *	Indian Robin	R	Vc
29) Nectariniidae	78	<i>Nectarinia asiatica</i> *	Purple Sunbird	R	C
30) Passeridae	79	<i>Passer domesticus</i> *	House Sparrow	R	Vc
31) Ploceidae	80	<i>Ploceus philippinus</i> *	Baya Weaver	R	C
32) Estrildidae	81	<i>Lonchura punctulata</i> *	Scaly-breasted Munia	R	C
	82	<i>Lonchura malacca</i> *	Black-headed Munia	R	C
33) Motacillidae	83	<i>Motacilla flava</i> *	Yellow Wagtail	WV	Uc
	84	<i>Motacilla alba</i> *	White Wagtail	WV	Uc
	85	<i>Motacilla maderaspatensis</i> *	White-browed Wagtail	R	Vc
	86	<i>Anthus rufulus</i> *	Paddyfield Pipit	R	Vc

Koli (2014); Shekhawat and Bhatnagar (2014): R - Resident, WV - Winter visitor, SV - Summer visitor, PV - Passage visitor.

¤ Kasambe and Wadatkar (2007); Kasambe and Sani (2009); Tak *et al.* (2010); Priyanka (2012): Rr - Rare (<5%), O - Occasional (5-24%), Uc - Uncommon (25-49%), C - Common (50-74%), Vc - Very common (75-100%).

* BirdLife International (2013): * LC - Least concern, ** NT - Near threatened.



Related work done by many researchers such as Kumar (2006) recorded Ardeidae to be the most dominant family in Bharathpuzha river basin in Kerala, Surana *et al.* (2007) recorded Anatidae to be the most dominant family in Chimdi lake Nepal, Kasambe and Wadatkar (2007) recorded 78 species from Pohara-Malkhed forest reservoir of Amravati district, Kedar *et al.* (2008) recorded 74 species from two freshwater lakes of Washim district, Kukade *et al.* (2011) recorded 68 species from Chhatri lake of Amravati district, Wanjari (2012) reported 72 species from Nagpur city, Bhadja and Vaghela (2013) recorded 40 species from reservoirs of Rajkot, Chinchkhede and Kedar (2013) recorded 126 species from Navegaon National Park from Gondia district, Lad and Patil (2015) recorded 131 species from Bhayander and Naigaon wetlands in Thane district, Puri (2015) recorded 27 species from Zaliya lake in Gondia district, Jain (2015) reported 17 species from Sirpur lake Indore, Puri and Virani (2016) recorded 90 species from Chorkhamara reservoir in Gondia district.

Avifaunal diversity of the Khairbandha lake confirm that the site is suitable habitat for the residential and migratory birds. But the birds present in and around the study site are affected by anthropogenic disturbances like washing clothes, direct bathing, washing livestock, immersing of idols, fishing practices and pollution due to spraying of insecticides on the crops in catchment area. As there is Adani thermal power station started from 2012 near the study site (13 km away) may increase temperature of surrounding area which affects the bird diversity adversely in future at present study area. Yet the avifauna of the Khairbandha lake is

diverse; keeping in view the varied avifauna recorded, steps should be taken to do proper maintenance and conservation of the site.

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