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Faunal Diversity in Ramsar Wetlands of India

Kailash Chandra, Daizy Bharti, Santosh Kumar, C. Raghunathan,
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मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन,
सूचना एवं प्रसारण और
भारी उद्योग एवं लोक उद्यम
भारत सरकार

सत्यमेव जयते

MINISTER
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GOVERNMENT OF INDIA

प्रकाश जावडेकर
Prakash Javadekar

MESSAGE

Wetlands are some of the most productive habitats on the planet Earth. They often support high diversity of animals including mammals, birds, fishes and invertebrates and serve as nurseries for many species. Wetlands provide a range of ecosystem services that benefit humanity, including water filtration, storm protection, flood control and recreation.

Wetlands in India stand across 5.31m ha. Majority of the wetlands are man-made providing irrigation and allied facilities to dependent mankind. Interestingly, most of these wetlands fall outside protected areas but are subjected to certain degree of protection from any illegal activity. Global treaty, Ramsar convention has safeguarded 2400 wetlands world-over, designating them as Ramsar sites. In India, as on today, 42 Ramsar sites have been declared based on their high degree of faunal assemblages including migratory birds.

It is utmost priority of the Government of India to protect all the remaining wetlands and safeguard their biodiversity as they produce an array of vegetation and other ecological products that can be harvested for commercial use. The most significant of these is fish, the life cycle of which wholly or partially, occurs within a wetland system. Fresh and salt water fish are the main source of animal protein for several million people in India.

I am pleased to know that the Zoological Survey of India has taken an initiative to document the details about the various faunal elements present in the Ramsar sites and published a book titled 'Faunal Diversity in Ramsar Wetlands of India'. The book also provides a list of protected faunal species and the conservation policies that are being implemented in India for aquatic habitats of national and international importance.

I am confident that the book will be helpful for prioritizing the management plan for this ecologically fragile ecosystem for the betterment of human species.

With best wishes.

Date: 29.01.2021

(Prakash Javadekar)

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Union Minister of State
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Government of India

सत्यमेव जयते

स्वच्छ भारत
एक कदम स्वच्छता की ओर

बाबुल सुप्रियो
केन्द्रीय राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
भारत सरकार

Message

Indian culture right from ancient ages has advocated the importance of water and its benefits to mankind as no life can exist on planet Earth without water. All civilizations in ancient India and elsewhere originated close to water sources. Along with humans all associated organisms evolved using water resources.

Among ecosystems, wetlands are recognized as being essential to sustainable development and human welfare due to their environmental, social, and economic value. Wetlands are also highly vulnerable to global environmental changes through alterations of their hydrological regimes, and these changes can threaten the conservation of wetland-dependent species and their associated habitats.

In recent decades, the Government of India has taken various initiatives to save these natural waterbodies and also to create a number of micro watersheds that in one way or other augment the depleted groundwater levels. Balancing the development of nation and wise use of ground water remains as the prime concern of the government.

Considering the importance of wetlands in biodiversity perspectives, the book *'Faunal diversity of Ramsar wetlands of India'* has been published by the Zoological Survey of India which documents the diversity of organisms from Protozoa to Mammalia in the 42 designated Ramsar sites in India. The book provides a very first glimpse of the rich diversity these protected wetlands harbour and urging the need of their better conservation.

I appreciate the efforts of the Director, Zoological Survey of India and authors for collating information on existing biological diversity in the wetlands that will help the researchers as well as policy makers to develop efficient monitoring strategies to conserve the wetlands and their biodiversity to a great extent.

(Babul Supriyo)

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निदेशक
Dr Kailash Chandra
Director

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Government of India
Zoological Survey of India
Ministry of Environment, Forest and Climate Change

Foreword

Wetlands are transitional areas between aquatic and terrestrial ecosystems where the water table is generally at or near to the surface, or the land is covered under shallow water. The wetlands mainly includes marshes, swamps, flood plains, peat lands, bogs, shallow ponds, littoral zones of larger water bodies, and tidal marshes. Wetlands are not only attractive but also extremely useful to humanity as they are the key to providing water, food and timber in general. In addition they protect us against the floods and droughts and also offer space for recreational activities. The Indian wetlands have been poorly explored and possess higher risk because of tourism, road construction, firewood collection, tree cutting, uncontrolled grazing, and construction of hydroelectric projects. Significant changes in the hydrology of wetlands due to climate change result in noteworthy threat to its biodiversity, consequently deeper knowledge of wetland diversity and its associated fauna must be achieved. Some of the threatened species utilizes the wetlands as an habitat that are also under particular threat from over-extraction of freshwater, overuse of their resources, draining and pollution. It has been observed that over 50% of the world's wetland have been lost in the past century and as much as 30% of the present species in some freshwater habitats are under threat of extinction.

It is utmost required to make inventory, collect information, encourage research, create network, build capacity, and generate baseline information which may serve as reference for developing guidelines for effective management and monitoring mechanisms to track the conservation and health of wetlands.

Given the urgent need to better understand and conserve the wetlands, the present document provides a much needed information on the animal diversity and their distribution in Ramsar wetlands throughout India. I sincerely hope that this document will serve as a bridge between biodiversity conservation and sustainable livelihoods.

Kailash Chandra
Director

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PREFACE

Wetlands are ecologically as well as economically important systems which harbour rich natural resources and play a crucial role in various hydrological cycle, carbon sequestration, and global greenhouse gas emission. As defined by Ramsar convention 1971, '*Wetlands are area of marsh, fen, peat-land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meter*'. The wetlands act as buffers for terrestrial run-off and thus prevent eutrophication of inlands and coastal waters. Further, it not only acts as a reservoir of biodiversity but also triggers the mass movement of living creature, i.e., refuge for migratory birds. The system often creates an oxic-anoxic condition which facilitates simultaneous activity of both aerobic and anaerobic life forms, e.g., microbes, larvae of insects, and fishes. However, due to anthropogenic activity and climate change the wetlands are under high pressure not only in India but globally and our understanding of the various life forms it harbours, remains far from complete. Even the wetlands in biodiversity hotspots of India are under stress and thus strive to conserve itself and the associated diversity.

The Convention on Wetlands is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. As of now there are 171 Contracting Parties on the convention on wetlands. The total number of wetlands of international importance around the world is 2,414 covering and area of 254,543,972 ha. Since India became a contracting party to the Ramsar convention in 1981 a total of 42 Ramsar sites spread over an area of 1,081,438 ha have been identified thus far.

The Ministry of Environment Forest and Climate Change (MoEFCC), Government of India is the nodal agency for implementing the conservation programme on wetlands, mangroves and coral reefs. The programme started in 1980s and was guided by the National Committee on Wetlands, Mangroves and Coral Reefs to advise the government on appropriate policies and programmes for the conservation of these ecosystems, to suggest specific sites for conservation action, and to identify research and training priorities. Financial support is also been provided time to time by the MoEFCC for conservation and management plans for the wetlands in India.

The efforts to conserve the biodiversity found in wetlands are being conducted worldwide with the goal to minimise the loss of irreplaceable biodiversity through sustainable management and conservation practices. However, in India the documentation of the various animal forms present in these wetlands does not exists, only a partial list of taxa is known. In this regards, the present document provides a vary baseline information retrieved from the earlier literature on the diversity of animals (Protozoa to Mammalia) from the Ramsar wetlands of India. The book documents a total of 6868 species and their distribution in the Ramsar wetlands of India. We have tried to provide the information available on the species present in the wetlands and the surrounding riparian zone. The report is our endeavour to document the wetland diversity and to present the richness these wetlands possess. This is just a preliminary information and it will not be surprising that future research on the diversity of the Ramsar wetlands will update the present book as well as enrich the present number of species, i.e., 6868 to atleast 20,000. Since many faunal groups are unexplored. We have made an attempt to add all the literature available online and offline from where the list of species in the present book have been compiled.

We sincerely hope that our book will help the researchers to identify the gap areas as well as further studies on the species diversity and ecology employing modern methodologies.

Chandra *et al.*

Abbreviations

Sequence of the wetlands as mentioned in the tables (11-42) having species list

1. Kolleru Lake
2. Deepor Beel
3. Nalsarovar
4. Pong Dam Lake
5. Renuka wetland
6. Chandertal wetland
7. Wular Lake
8. Tsomoriri
9. Hokera wetland
10. Surinsar- Mansar Lake
11. Ashtamudi wetland
12. Sasthamkotta Lake
13. Vembanad-Kol wetland
14. Bhoj wetland
15. Loktak Lake
16. Chilika Lake
17. Bhitarkanika mangroves
18. Harike Lake
19. Kanjli
20. Ropar
21. Sambhar Lake
22. Keoldeo National Park
23. Point calimere Wildlife and Bird Sanctuary
24. Rudrasagar Lake
25. Upper Ganga River
26. East Kolkata Wetlands
27. Sundarban wetland
28. NandurMadhameshwar
29. Keshopur-Miani Conservation Reserve
30. Beas Conservation Reserve
31. Nangal Wildlife Sanctuary
32. Nawabganj Bird Sanctuary
33. ParvatiArga Bird Sanctuary
34. Saman Bird Sanctuary
35. Samaspur Bird Sanctuary
36. Sandi Bird Sanctuary
37. SarsaiNawarJheel
38. Asan Conservation Reserve
39. Kabartal wetland
40. Sur Sarovar
41. Lonar Lake
42. Tso Kar Wetland complex.
RW- Ramsar wetland

WETLANDS

An Overview

Wetlands are one of the most productive ecosystems on the Earth, providing many important services to human societybut are highly ecologically sensitive (Turner et al. 2000, Ghermandi et al. 2008, ten Brink et al. 2012). Water for irrigation, fisheries, non-timber forest products, water supply, nutrient removal, toxics retention and biodiversity maintenance are some of the Ecosystem goods provided bywetlands (Turner et al., 2000). Of primary importance these major services include: Carbon sequestration; Erosion control (Wetlands support vegetation that acts as a flood buffer and reduces stream bank erosion during flooding events); Flood water storage (store water during heavy rain and flooding events and then slowly release the water thereby significantly reducing damage downstream); Ground water recharge (stored surface water infiltrates into the ground and recharge the aquifers which slowly release water back to adjacent surface water bodies, such as streams, providing water during low flow periods); Water purification (trap sediments, utilize excess nutrients present in runoff, and breakdown many waterborne contaminants); Recreation & Economic Benefits (cultural heritage, visited for recreational purposes, hiking, bird watching, wildlife photography, and hunting) (Turner et al., 2000). The genesis, geographical location, water regime and chemistry, dominant species present, and soil and sediment characteristics of the wetlands supporting enormous diversity defines each one of them (Space Applications Centre, 2011). Globally, the areal extent of wetland ecosystems ranges from 917 million hectares (mha) (Lehner and Döll, 2004) to more than 1275 mha (Finlayson and Spiers, 1999) with an estimated economic value of about US$15 trillion a year (MEA, 2005). Of these global wetlands there are currently over 2,200 Ramsar Sites designated around the world spread over 2.1 million square kilometres. The world's first Ramsar site was the Cobourg Peninsula in Australia, designated in 1974.

Wetlands possess a rich repository of biodiversity, and are known to play a significant role in carbon sequestration. They occur in all climatic zones - from tropical deserts to cold tundra, and at all altitudes - from below the sea level to about 6000 m elevation in the Himalaya. Wetlands come into being wherever

water accumulates for long enough periods allowing the establishment of plants and animals specially adapted to the aquatic environment. Presence of water permanently is not a criteria and its depth may generally fluctuate. Wetlands therefore, occur in or along water bodies - from temporary ponds to shallow or deep lakes, springs, streams and rivers. Wetlands are "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water" and "must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year" (Cowardin et al. 1979). Wetlands in India are grouped on the basis of topographical variation into four major types- 1) Himalayan wetlands, 2) wetlands in Gangetic plain, 3) wetlands in the desert and 4) coastal wetlands.

Though the earth is surrounded by two thirdsof water, the amount of fresh water available is meagre contributing to less than one percent. Wetlands shares only 0.0001% of the total fresh water available occupying 6.45% of the earth's surface. Despite the significant ecological, hydrological and socio-economic values played by them, wetlands have been facing threats from several man made induced factors. Even those wetlands protected by law are not completely free from degradation due to the anthropogenic threats. Moreover, many wetlands in rural and sub-urban areas are not covered either by the Indian Forest Act 1927 or Wild Life Protection Act 1972. These wetlands are under threat in many ways and therefore invite due attention for their conservation and management. Towards this, the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India launched a Wetland Conservation Programme all over the country. Under this programme, integrated and comprehensive wetland conservation strategy is planned and implemented by the State Governments, with the technical and financial support from the Government of India.

In recent years, there has been a vast effort worldwide to conserve and preserve these natural resources. India harbours a wide variety of wetlands and the first step towards planning the conservation and sustainable management of wetland resources is to have an accurate and updated database. Geographic Information System (GIS) and satellite remote sensing that are the best available technologies for such a purpose. The first

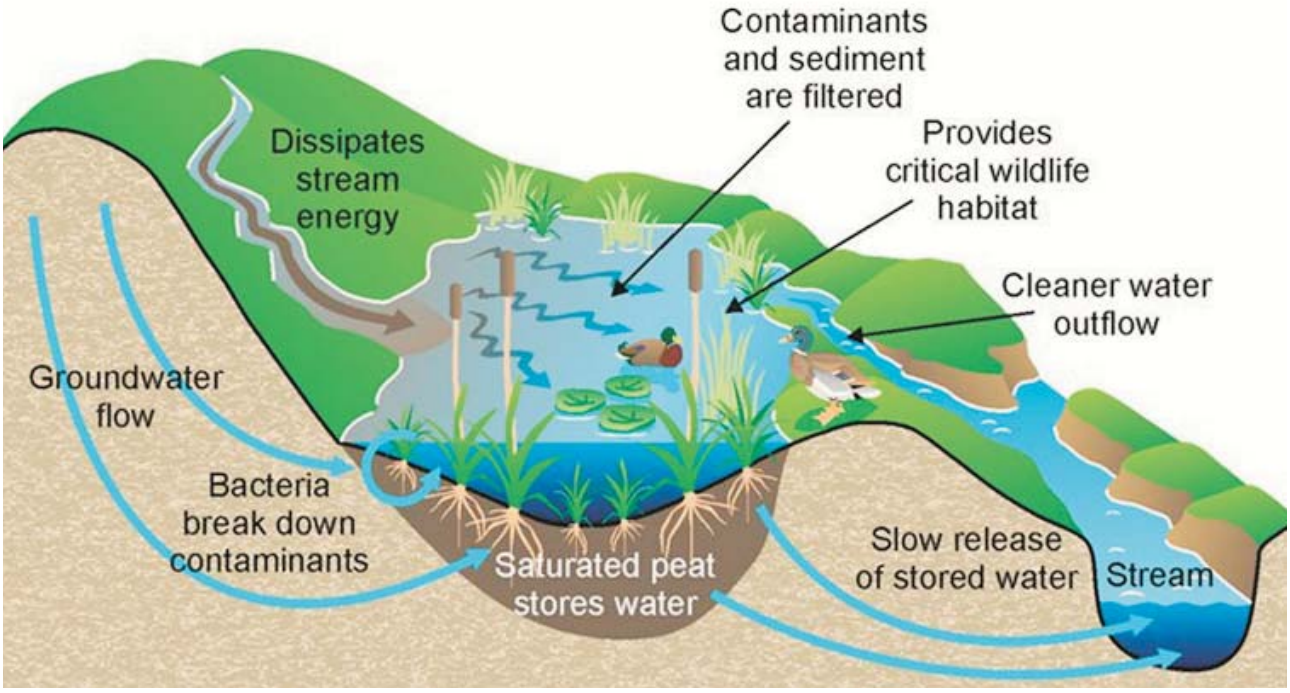


Figure 1. The working of wetlands (http: //myweb.rollins.edu). Streams flowing into rivers through wetlands transports fewer suspended solids and nutrients to the rivers than if they flow directly into the rivers.

scientific national inventory of wetlands in India carried out on a 1:250, 000 scale using satellite remote sensing data (1992-93), estimated the total wetland extent to be about 8.26 mha. Wetlands being dynamic and influenced by both natural and man-made activities, need frequent monitoring. Regular update on the status of the wetlands is significant in view of the accelerating pressure on the

occur and cycling of nutrients takes place (Adams, 1988 cited in Juliano and Simonovic, 1999, p. 7) (figure 1).

Overlooking these values of wetlands and the interference by humans due to rapid population growth, intensified industrialization, commercial and residential development leading to pollution by domestic and industrial sewage,

very existence of these resources due to development activities and population pressure being witnessed currently.

It has been observed that wetlands lower the impact of flooding by absorbing water and reducing the speed of the water flow. Due to this wetlands are considered to be a natural capital substitute for conventional flood control investments such as dams, and embankments (Boyd and Banzhaf, 2007). Further, they trap suspended solids and nutrient load during flooding. They also play a major role in carbon sequestration especially the coastal wetlands. In agricultural and urban landscapes they act as a sink for the contaminants. Natural wetlands remove the nitrates and phosphorus from the surface and subsurface runoffs (Verhoeven et al., 2006). Thus, wetlands have been suggested as a low cost measure to reduce point and non-point pollution (Bystrom et al., 2000). Wetlands also help in maintaining the species diversity since many faunal species depend on it for their entire life cycles or during a particular stage of their life history. Basically wetlands support the food chain by providing an environment where photosynthesis can

and agricultural run-offs as fertilizers, insecticides and feedlot wastes resulted in a major threat to most of the wetlands. Mitsch & Gosselink (1986) described wetlands as the "kidneys of the landscape" since the hydrological conditions (such as nutrient availability, degree of substrate anoxia, soil salinity, sediment properties and pH) have a direct impact on the biotic response. A slight change in the hydrologic conditions may result in massive change in species diversity and abundance and eventually its productivity.

The disappearance of Indian wetlands are primarily due to two reasons, i) acute (filling up of wetlands with soil) and ii) chronic (gradual elimination of forests cover and, or, soil unfriendly practices in the catchment areas leading to erosion and sedimentation over a period of time). Thus the loss of wetlands at a current rate is of great concern since 74% of the Indian population is rural (World Development Report, 1994; Vijayan et al. 2004). According to Rao (1997) the total requirement of water in rural areas will riseto 1,050 billion cubic meters from the present consumption of 750 billion cubic meters. Nearly 40% of the Indian urban population have a rather

limited quantity of access to drinking water. TERI (The Energy and Resources Institute) investigated the downward transition of India's water sustainability since 1947 and has predicted a dismal scenario for 2047 that states "Annual per capita water availability in India fell by 62% in the first fifty years of Independence, a trend that is likely to worsen in the next fifty years with a projected 67% decline…" (Vijayan et al. 2004). This emphasises the need for the taking appropriate measures for the survival of Indian wetlands.

It is also evident that wetlands are not only important for human survival but it also supports the diverse populations of wildlife and plants, including several endemic species. India contains over 16% of the world's population in about 2.42% of earth's surface. Thus, there is always an increasing demand of the wetland products (e.g., water, fish, food, fibres and medicinal plants). According to Foote et al. (1996), there is a high impact with the loss of 1 km2 of wetlands in India than the loss of 1 km2 of wetlands in low population areas with abundant wetlands. The revival of original wetlands from the reclaimed areas are quite difficult after it has been occupied by the non-wetland users (Vijayan et al. 2004). Further, the complexity is added by contamination of these wetlands by pesticides and industrial effluents. It has been estimated that over three million people around the world suffer from the pesticide poisoning of which over 0.2 million dies every year, with most of the cases from India (Sehgal, 2003). Still we do not have information on the quantum and characteristic of the contaminants in commonly used wetlands.

Wetlands of India

Indian topography and climatic regimes help support and sustain diverse and unique wetland habitats. Natural wetlands in India constitutes the high altitude Himalayan lakes, wetlands in the flood plains of the major river systems, saline and temporary wetlands, coastal wetlands (lagoons, backwaters and estuaries), mangrove swamps, coral reefs, marine wetlands etc. Indian wetlands possess a range of the ecosystem types known worldwide except forbogs, fens and typical salt marshes. In addition to the natural wetlands, a large number of man-made wetlands, resulting from the needs of irrigation, water supply, electricity, fisheries and flood control etc., also contribute substantially to the faunal and floral diversity. Apart from this, various reservoirs, shallow ponds and numerous tanks also support wetland biodiversity.

The National Wetland Committee of the Ministry of Environment Forest and Climate Change (MoEF&CC) has taken several proactive steps towards long term conservation of the Indian wetlands of National and International interests. The committee initiated major actions with the support of the National Wetland Committee, Standing Committee on Bioresources (SC-

Faunal Diversity in Ramsar Wetlands of India

B) of National Natural Resource Management System (NNRMS) and MoEFCC. Further efforts were taken to conduct a nationwide mapping of Inland wetlands by SAC (Space Application Centre) Ahmedabad, of the ISRO (Indian Space Research Organisation) in collaboration with various state remote sensing application centres. This provided a detailed spatial inventory of water bodies/wetlands in the country at a reconnaissance scale of 1:250000 which did not include wetlands below 56 ha, thereby recommending mapping at a larger spatial scale (Prasad et al. 2002). It has been estimated that freshwater wetlands alone support 20 percent of the known range of biodiversity in India (Deepa & Ramachandra 1999). Wetlands in India occupy 58.2 mha, including areas under wet paddy cultivation (Directory of Indian Wetlands). Majority of the inland wetlands are directly or indirectly dependent on the major rivers like Ganga, Brahmaputra, Narmada, Godavari, Krishna, Kaveri, and Tapti, occupying hot arid regions of Gujarat and Rajasthan, deltaic regions of the east and west coasts, highlands of central India, wet humid zones of south peninsular India, and the Andaman and Nicobar and Lakshadweep Islands.

State/Union Territory-wise Wetland Distribution in India

Among the Indian states, Gujarat ranks first with a total wetland area of about 3.47 m ha (about 23% of the total Indian wetland area) comprising vast stretches of intertidal mud-flats and salt pans. States having more than 1 m ha area of wetlands includes and followed by Gujarat is Andhra Pradesh (1.45 m ha), Uttar Pradesh (1.24 m ha), West Bengal (1.11 m ha) and Maharashtra (1.01 m ha). According to NWIA (2011) and Panigrahy (2012), Lakshadweep ranks first (96.12) in terms of percentage extent of the total state geographic area, mainly due to the presence of coral and mangrove followed by the other major states/Union Territories (UTs) having more than 10 % area, i.e., Andaman and Nicobar Islands (18.52), Daman–Diu (18.46), Gujarat (17.56), Pondicherry (12.88) and West Bengal (12.48). Tamil Nadu has the highest number of lakes (4369) followed by Uttar Pradesh (3684) and West Bengal (1327). Oxbow lakes/cut-off meanders are observed in Uttar Pradesh, West Bengal, Bihar, Assam and Odisha. A huge number of riverine wetlands are present in West Bengal, Bihar, Uttar Pradesh, Assam and Jammu and Kashmir. West Bengal has the highest area under mangrove (209,330 ha) followed by Gujarat (90,475 ha) and Andaman & Nicobar Islands (66,101 ha). Coral reefs are seen in Lakshadweep (55,178 ha), Andaman & Nicobar Islands (49,379 ha), Gujarat (33,548 ha) and Tamil Nadu (3898 ha). Gujarat has a large area under intertidal mud-flats (2,260,365 ha) followed by Tamil Nadu (33,164 ha) and Andhra Pradesh (31,767 ha). Jammu and Kashmir has the highest share of HAWs accounting for 87.24 per cent area with 2104 lakes, followed by Arunachal Pradesh with 1672 lakes contributing to 9.4 per cent of the area (NWIA 2011) (Panigrahy et al. 2012).

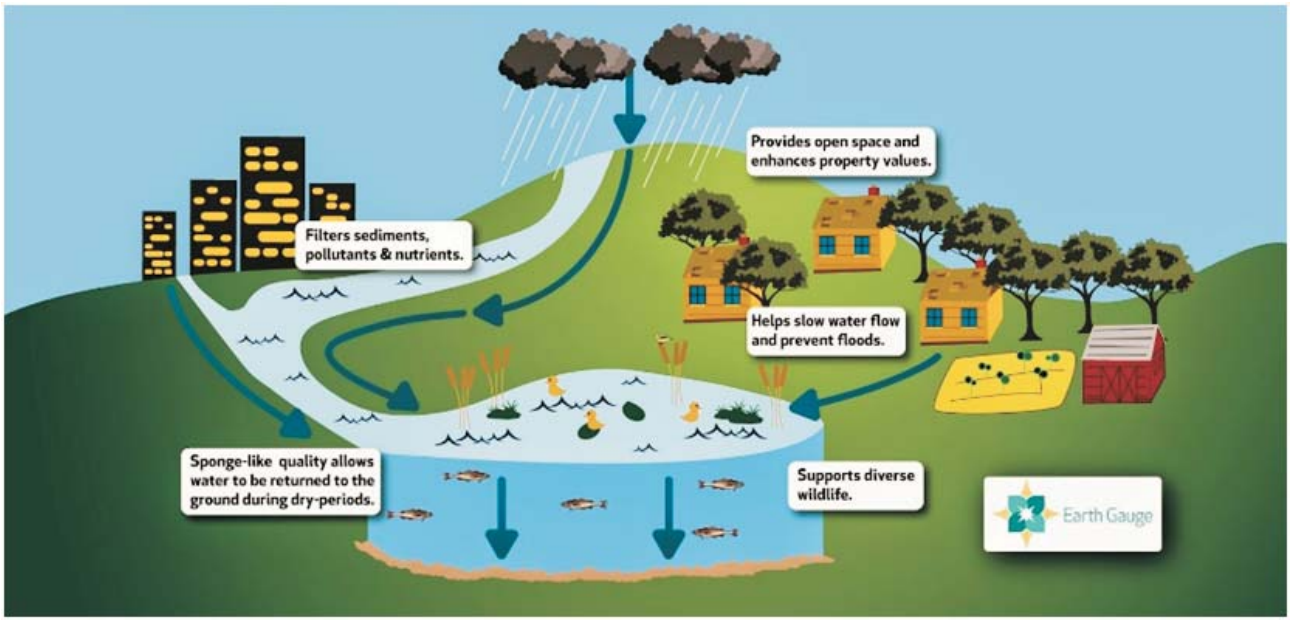


Figure 2. Representation of the benefits of the Wetlands (https://microbewiki.kenyon.edu/index.php/File:How-wetlands-work.jpg)

Table 1. State/Union Territory-wise wetland area in Indian states.

S No.	State	Wetland area (ha)	% of state geographic area
1.	Andhra Pradesh	447133	5.26
2.	Arunachal Pradesh	155728	1.78
3.	Assam	764372	9.74
4.	Bihar	403209	4.40
5.	Chhattisgarh	337966	2.50
6.	Delhi	2771	0.93
7.	Goa	21337	5.76
8.	Gujarat	3474950	17.56
9.	Haryana	42478	0.86
10.	Himachal Pradesh	98496	1.77
11.	Jammu & Kashmir	391501	1.76
12.	Jharkhand	170051	2.13
13.	Karnataka	643576	3.36
14.	Kerala	160590	4.13
15.	Madhya Pradesh	818166	2.65
16.	Maharashtra	1014522	3.30
17.	Manipur	63616	2.85
18.	Meghalaya	29987	1.34
19.	Mizoram	13988	0.66
20.	Nagaland	21544	1.30
21.	Orissa	690904	4.49
22.	Punjab	86283	1.71
23.	Rajasthan	782314	2.29
24.	Sikkim	7477	1.05
25.	Tamil Nadu	902534	6.92
26.	Tripura	17542	1.59
27.	Uttar Pradesh	1242530	5.16
28.	Uttarakhand	103882	1.94
29.	West Bengal	1107907	12.48
	Total	**15017354**	

Wetland Types

The major area (5.26 mha ; 34.46%) of in India is occupied by the river and stream wetlands, followed by the reservoirs (2.48 mha; 16.26%), inter-tidal mudflats (2.41 mha; 15.82%), tanks/ponds (1.31 mha areas; 8.6%) and lakes/ponds (0.71 mha areas; 4.78%). The total wetland area of the entire country is estimated to be 15.260 mha, which is about 4.63 per cent of the geographic area of the country scaling at 1:50,000 with about 201503 wetlands mapped. (Panigrahy et al. 2012). Apart from this, nearly 555557 small wetlands constituting an area of <2.25 mha have also been identified. It is estimated that that the total wetland area is about 10 mha excluding the rivers/streams. (Figure 3; table 2, 3).

Table 2. Wetland Types of India (after Panigrahy *et* al. 2012).

S. No.	Wetland Category	Total wetland area (ha)	% of wetland area
1.	**Inland wetlands- Natural** (Lakes/pondes; Ox-bow lakes/ cut-off meanders; High-altitude wetlands; Riverine wetlands; waterlogged; River/stream)	6623067	43.40
2.	**Inland wetlands- Man-made** (Reservoirs/barrages; Tanks/ponds; waterlogged; Salt pans)	3941832	25.83
	Total – Inland	*10564899*	*69.22*
3.	**Coastal wetlands- Natural** (Lagoons; Creeks; Sand/beeach/ Intertidal mud flats; Salt marsh; Mangroves; Coral reefs)	3703971	24.27
4.	**Coastal wetlands- Man-made** (Salt pans; Aquaculture ponds)	436145	2.86
	Total – Coastal	4140116	27.13
	Sub- Total	14705015	96.36
5.	**Wetlands** (< 2.25 ha)	555557	3.64
	Total	**15260572**	**100**

Inland-Natural wetlands accounted for around 43.4 per cent of the total area, while Coastal - Natural wetlands account for 24.27 per cent. As far as wetland units are concerned tanks are maximum in number (122370) as mappable units. However, 555557 small wetlands (< 2.25 ha) are mapped as point features (3.64 %).

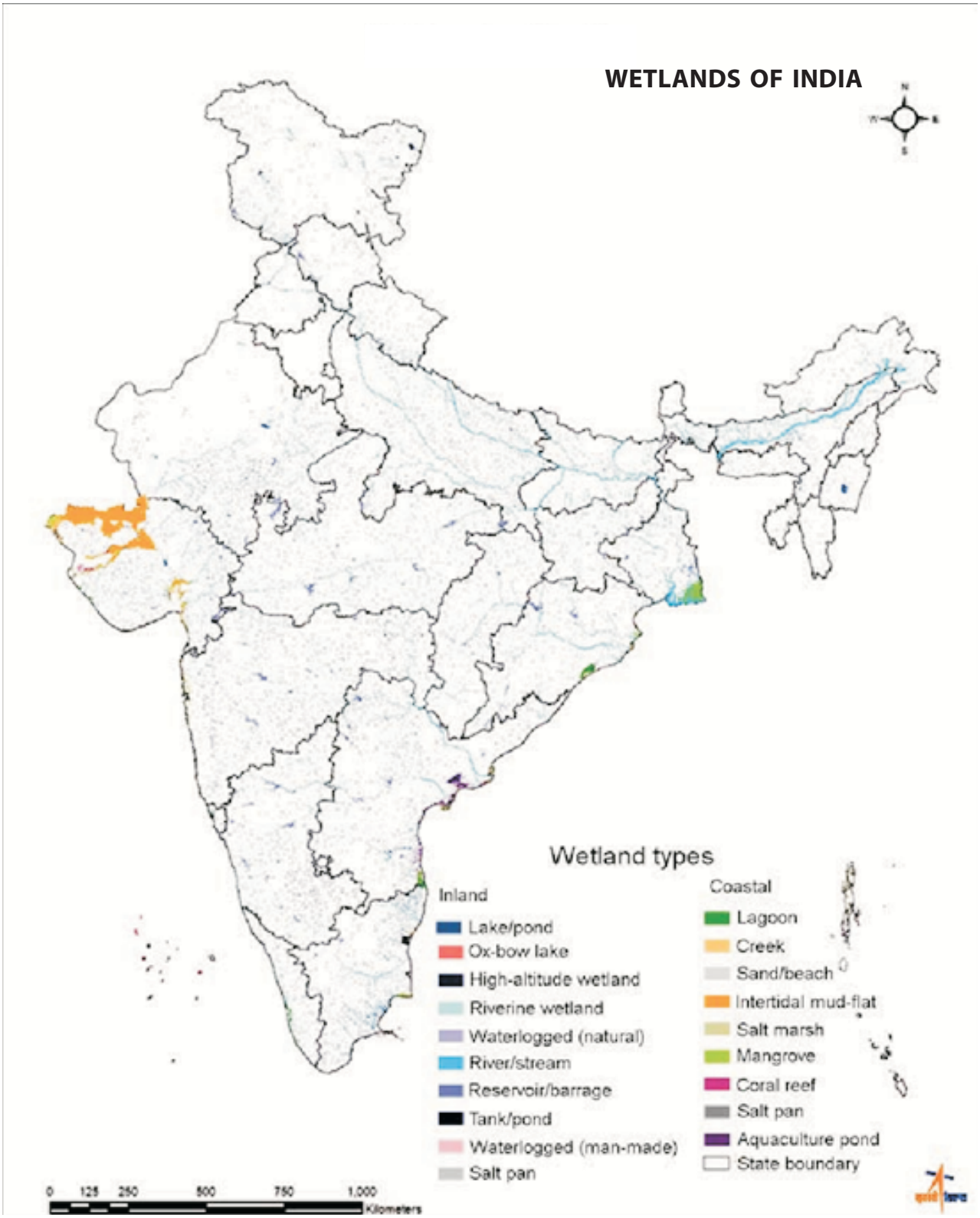


Figure 3. Type wise Inland wetland area of India derived using LISS III data (2006-2007) on a 1:50,000 scale (Panigrahy et al. 2012).

Table 3. Types of Wetlands in India and their number

S. No.	Wetland Category	No. of Wetlands
	NATURAL	
1.	Lake/Pond	11740
2.	Ox-bow lake/Cut-off meander	4673
3.	High altitude wetland	2707
4.	Riverine wetland	2834
5.	Waterlogged	11957
6.	River/Stream	11747
	MAN-MADE	
7.	Reservoir/Barrage	14894
8.	Tank/Pond	122370
9.	Waterlogged	5488
10.	Salt pan	60
	Sub-total	142812
	Wetlands(<2.25ha)	555557
	TOTAL	744027

Under the National Wetlands Conservation Programme (NWCP), a total of 115 wetlands has been identified in 24 States and 2 Union Territories of the country for conservation and management (Table 4).

Table 4. State/year-wise list of identified wetlands under the

National Wetlands Conservation Programme (NWCP)

State/Union Territory	No.	Wetland	Year of Identification
Andhra Pradesh	1.	Kolleru	1987
Assam	2.	Deepar Beel	1994
	3.	Urpad Beel	2006
	4.	Sone Beel	2008
Bihar	5.	Kabar	1988
	6.	Barilla	2004
	7.	Kusheshwar Asthan	2004
Gujarat	8.	Nalsarovar	1988
	9.	Great Rann of Kachh	2004
	10.	Thol Bird Sanctuary	2004
	11.	Khijadiya Bird Sanctuary	2004
	12.	Little Rann of Kachh	2004
	13.	Pariej	2004
	14.	Wadhwana 2004	
	15.	Nanikakrad2004	
Haryana	16.	Sultanpur 2004	
	17.	Bhindawas 2004	
Himachal Pradesh	18.	Renuka	1988
	19.	Pong Dam 1994	
	20.	Chandratal 1997	

National Wetlands Conservation Programme (NWCP)

State/Union Territory	No.	Wetland	Year of Identification
	21.	Rewalsar	2004
	22.	Khajjiar	2006
Jammu & Kashmir	23.	Wullar	1987
	24.	Tso Morari	2002
	25.	Tisgul Tso & Chisul Marshes	2002
	26.	Hokersar	2002
	27.	Mansar-Surinsar	2002
	28.	Ranjitsagar	2004
	29.	Pangong Tsar2002	
	30.	Gharana	2008
	31.	Hygam	2008
	32.	Mirgund	2008
	33.	Shalbugh	2008
	34.	Chushul & Hanley	2008
Jharkhand	35.	Udhwa	2005
	36.	Tilaiya Dam	2006
Karnataka	37.	Magadhi	2004
	38.	Gudavi Bird Sanctuary	2004
	39.	Bonal	2004
	40.	Hidkal & Ghataprabha	2004
	41.	Heggeri	2006
	42.	Ranganthittu2006	
	43.	K.G. Koppa wetland	2006
Kerala	44.	Ashtamudi	1987
	45	Sasthamkotta	1988
	46.	Kottuli	2005
	47.	Kadulandi	2005
	48.	Vembnad Kol2005	
Madhya Pradesh	49.	Barna	2004
	50.	Yashwant Sagar	2004
	51.	Wetland of Ken River	2004
	52.	National Chambal Sanctuary	2004
	53.	Ghatigaon	2004
	54.	Ratapani	2004
	55.	Denwa Tawa wetland	2004
	56.	Kanha Tiger Reserve	2004
	57.	Pench Tiger Reserve	2004
	58.	Sakhyasagar	2004
	59.	Dihaila	2004
	60.	Govindsagar	2005
	61.	Sirpur	2008
Maharashtra62.	Ujni	1987	
	63.	Jayakawadi	2006
	64.	Nalganga wetland	2006
Manipur	65.	Loktak	2004
Meghalaya	66.	Umiam lake	2008
Mizoram	67.	Tamdil	2004
	68.	Palak	2004
Odisha	69.	Chilika	1987
	70.	Kuanria wetland	2006

National Wetlands Conservation Programme (NWCP)

State/Union Territory	No.	Wetland	Year of Identification
	71.	Kanjia wetland	2006
	72.	Daha wetland2006	
	73.	Anusupa	2008
Punjab	74.	Harike	1987
	75.	Ropar	1992
	76.	Kanjli	1988
	77.	Nangal	2008
Rajasthan	78.	Sambhar	1987
Sikkim	79.	Khechuperi Holy Lake	2006
	80.	Tamze Wetland	2006
	81.	Tembao Wetland Complex	2006
	82.	Phendang Wetland Complex	2006
	83.	Gurudokmar Wetland	2006
	84.	Tsomgo wetland	2006
Tamil Nadu	85.	Point Calimere	2003
	86.	Kaliveli	2004
	87.	Pallaikarni	2004
Tripura	88.	Rudrasagar	1998
	89.	Gumti reservoir	2008
Uttar Pradesh	90.	Nawabganj	2004
	91.	Sandi	2004
	92.	Lakh Bahoshi2004	
	93.	Samaspur	2004
	94.	Alwara Wetland	2006
	95.	Semarai Lake2006	
	96.	Nagaria lake2006	
	97.	Keetham Lake	2006
	98.	Shekha wetland	2006
	99.	Saman Bird Sanctuary	2006
	100.	Sarsai Nawar2006	
	101.	Patna Bird Sanctuary	2008
	102.	Chandotal	2008
	103.	Taal Bhaghel2008	
	104.	Taal Gambhirvan & Taal Salona	2008
	105.	Aadi jal Jeev Jheel	2008
Uttarakhand106.	Ban Ganga Jhilmil Tal	2008	
	107.	Asan	2008
West Bengal108.	East Kolkata Wetland	2002	
	109.	Sunderbans	2003
	110.	Ahiron Beel	2004
	111.	Rasik Beel	2004]
	112.	Santragachi	2005
	113.	Patlakhawa- Rasomati	2008
Chandigarh (UT)	114.	Sukhna	2006
Puducherry (UT)	115.	Ousteri lake	2008

Ramsar Wetland Convention

The Ramsar Convention is an international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. As per the Ramsar convention "Wetlands" are: "areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters" (www.Ramsar.org). The convention (Article 2.1) further states that wetlands "may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six meters at low tide within the wetlands". According to the Ramsar Convention wetland ecosystems in India constitute most of the natural water bodies (such as rivers, lakes, coastal lagoons, mangroves, peat land, coral reefs) and man-made wetlands (such as ponds, farm ponds, irrigated fields, sacred groves, salt pans, reservoirs, gravel pits, sewage farms and canals). Ramsar Convention has two main objectives i.e., Conservation and sustainable utilization and stopping the intrusion and loss of wetlands. The convention has been instrumental and highly successful in mobilizing most of the nations to pledge for not only wetland conservation but also wise use. The signatories of the convention have to formulate laws which ensure the conservation and wise use of listed wetlands in their territory (Art 3.1).

Table 5: Ramsar Classification System for wetland type (Sharma et al. 2014; http://www.ramsar.org/cda/en/ramsar-news-latest-classification-system/main/ramsar/1-2676%5E21235_4000_0_).

	MARINE/COASTAL WETLANDS
A	Permanent shallow marine waters; in most cases less than six meters deep at low tide; includes sea bays and straits.
B	Marine sub tidal aquatic beds; includes kelp beds, sea-grass beds, and tropical marine meadows.
C	Coral reefs.
D	Rocky marine shores; includes rocky offshore islands, sea cliffs.
E	Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.
F	Estuarine waters; permanent water of estuaries and estuarine systems of deltas.
G	Intertidal mud, sand or salt flats.
H	Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
I	Intertidal forested wetlands; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
J	Coastal brackish/ saline lagoons; brackish/ saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.
K	Coastal freshwater lagoons; includes freshwater delta lagoons.
Zk(a)	Karst and other subterranean hydrological systems, marine/ coastal.
	INLAND WETLANDS
L	Permanent inland deltas.
M	Permanent rivers/ streams/ creeks; includes waterfalls.
N	Seasonal/ intermittent/ irregular rivers/ streams/ creeks.
O	Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.
P	Seasonal/ intermittent freshwater lakes (over 8 ha); includes floodplain lakes.
Q	Permanent saline/ brackish/ alkaline lakes.
R	Seasonal/ intermittent saline/ brackish/ alkaline lakes and flats.
Sp	Permanent saline/ brackish/ alkaline marshes/ pools.
Ss	Seasonal / intermittent saline/ brackish/ alkaline marshes/ pools.
Tp	Permanent freshwater marshes/ pools; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.

Ts	Seasonal / intermittent freshwater marshes/ pools on inorganic soils; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.
U	Non-forested peat land; includes shrub or open bogs, swamps, fens.
Va	Alpine wetlands; includes alpine meadows, temporary waters from snowmelt.
Vt	Tundra wetlands; includes tundra pools, temporary waters from snowmelt.
W	Shrub-dominated wetlands; shrub swamps,
Xf	Freshwater, tree-dominated wetlands; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.
Xp	Forested peatlands; peatswamp forests.
Y	Freshwater springs; oases.
Zg	Geothermal wetlands.
Zk(b)	Karst and other subterranean hydrological systems, inland.

Human-made wetlands

1	Aquaculture (e.g., fish/ shrimp) ponds.
2	Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).
3	Irrigated land; includes irrigation channels and rice fields.
4	Seasonally flooded agricultural land (including intensively managed or grazed wet meadow or pasture).
5	Salt exploitation sites; salt pans, salines, etc.
6	Water storage areas; reservoirs/ barrages/ dams/ impoundments (generally over 8 ha).
7	Excavations; gravel/ brick/ clay pits; borrow pits, mining pools.
8	Wastewater treatment areas; sewage farms, setting ponds, oxidation basins, etc.
9	Canals and drainage channels, ditches.
Zk(c)	Karst and other subterranean hydrological systems, human-made.

The most widely accepted classification of the wetlands has been devised by the Convention on Wetlands of International Importance (Ramsar Convention). The classification system divides wetlands into three major classes that can be further divided into 42 wetland types (Table 5). The classification is intended to provide a broad framework to aid rapid identification. The wetlands are represented by codes approved by the recommendation 4.7 and amended by Resolutions VI.5 and VII.11 of the Conference of the Contracting Parties (Sharma et al. 2014). However, Schot (1999) simplified the classification by identifying five broad categories, i.e., Marine, Estuarine, Riverine, Lacustrine, and Palustrine.

There are around 2100 Ramsar sites around the world with Canada having the largest area covered by the Ramsar sites. As per the Ramsar Secretariat (2013) there are 1052 Ramsar sites in Europe; 289 sites in Asia; 359 sites in Africa; 175 sites in South America; 211 sites in North America; and 79 Sites in Oceania region which have been designated as Ramsar sites or wetlands of International importance. In October 1981, India became a contracting party to the Ramsar Convention designating Chilika Lake (Odisha) and Keoladeo National Park (Rajasthan) as the first two Ramsar Sites of India. Subsequently, four additional sites were designated in 1990, i.e., Loktak Lake (Manipur), Sambhar Lake (Rajasthan), Harike Lake (Punjab) and Wular Lake (Jammu & Kashmir). Very recently, (January 2019), Sunderban (West Bengal) was declared a Ramsar Site making it the 27th Ramsar sites of India. Fourteen more Ramsar sites (Nandur Madhameshwar; Keshopur Miani; Beas conservation reserve; Nangal; Nawabganj; Parvati aranga; Saman; Samaspur; Sandi; Sarsai nawar; Asan; Kabartal, Sur Sarovar; and Lonar) were added during the year 2020 making a total of 42 Ramsar sites in the country.

Ramsar
Wetland Sites

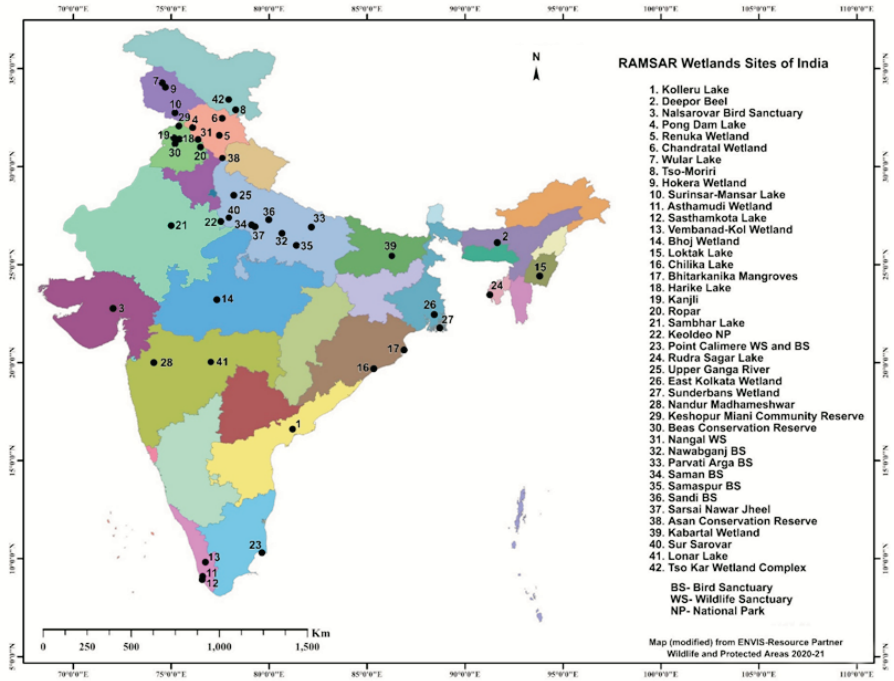


Figure 4: The map showing Ramsar wetlands in India as on August 2020 (http://wiienvis.nic.in/Database/ramsar_wetland_sites_8224.aspx).

For conservation and management of identified wetlands including Ramsar sites in India, the National Wetlands Conservation Programme (NWCP) was implemented in the year 2012-13. The NWCP was later merged with the National Lake Conservation Plan (NLCP) and National Plan for Conservation of Aquatic Ecosystems' (NPCA) to obtain a rather holistic conservation of lakes and wetlands. The details on the state-wise lists of 42 wetlands designated as Ramsar sites in India has been provided in Table 6.

Table 6 : List of Indian wetlands of International Importance under Ramsar Convention (http://wiienvis.nic.in/Database/ramsar_wetland_sites_8224.aspx).

S. No.	Name of Ramsar Site	State/UT	Date of Declaration	Area (in Sq. Km.)
1.	Chilka Lake	Orissa	1.10.1981	1165
2.	Keoladeo	Rajasthan	1.10.1981	28.73
3.	Wular Lake	Jammu & Kashmir	23.3.1990	189
4.	Loktak Lake	Manipur	23.3.1990	266
5.	Harike Lake	Punjab	23.3.1990	41
6.	Sambhar Lake	Rajasthan	23.3.1990	240
7.	Kanjli	Punjab	22.1.2002	1.83
8.	Ropar	Punjab	22.1.2002	13.65
9.	Kolleru Lake	Andhra Pradesh	19.8.2002	901
10.	Deepor Beel	Assam	19.8.2002	40
11.	Pongdam Lake	Himachal Pradesh	19.8.2002	156.62
12.	Tsomoriri	Jammu & Kashmir	19.8.2002	120
13.	Ashtamudi wetland	Kerala	19.8.2002	614
14.	Sasthamkotta Lake	Kerala	19.8.2002	3.73
15.	Vembanad-Kol wetland	Kerala	19.8.2002	1512.5
16.	Bhoj wetland	Madhya Pradesh	19.8.2002	32.01
17.	Bhtarkanika mangroves	Orissa	19.8.2002	650
18.	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu	19.8.2002	385
19.	East Kolkata Wetland	West Bengal	19.8.2002	125
20.	Renuka wetland	Himachal Pradesh	8.11.2005	0.2
21.	Chandertal wetland	Himachal Pradesh	8.11.2005	0.49
22.	Hokersar wetland	Jammu & Kashmir	8.11.2005	13.75
23.	Surinsar-Mansar Lake	Jammu & Kashmir	8.11.2005	3.5
24.	Rudrasagar Lake	Tripura	8.11.2005	2.4
25.	Upper Ganga (Brijghat to Narora Stretch)	Uttar Pradesh	8.11.2005	265.9
26.	Nalsarovar	Gujarat	24.9.2012	120
27.	Sundarban Wetland	West Bengal	30.1.2019	4230
28.	Nandur Madhameshwar	Maharashtra	21.6.2019	14.37
29.	Nawabganj Bird Sanctuary	Uttar Pradesh	19.9.2019	2.246
30.	Sarsai Nawar jheel	Uttar Pradesh	19.9.2019	16.13
31.	Keshopur-Miani community reserve	Punjab	26.9.2019	3.439
32.	Beas conservation reserve	Punjab	26.9.2019	64.289
33.	Nangal Wildlife Sanctuary	Punjab	26.9.2019	1.16
34.	Sandi Bird Sanctuary	Uttar Pradesh	26.9.2019	30.85
35.	Samaspur Bird Sanctuary	Uttar Pradesh	3.10.2019	79.94
36.	Parvati Arga Bird Sanctuary	Uttar Pradesh	2.12.2019	7.22
37.	Saman Bird Sanctuary	Uttar Pradesh	2.12.2019	52.63
38.	Asan	Uttarakhand	21.7.2020	4.44
39.	Kabar taal Lake	Bihar	21.7.2020	26.20
40.	Lonar lake	Maharashtra	22.7.2020	4.27
41.	Sur Sarovar	Uttar Pradesh	21.8.2020	4.31
42	Tso Kar Union	Territory of Ladakh	17.11.2020	95.77

Total 42 Ramsar sites covering an area of 11,528.574 sq. km

Faunal Diversity
of Ramsar Wetlands

An updated systematic checklist of faunal groups, known from 42 Ramsar Wetlands of India is compiled and presented. The relevant information about the diversity of available groups that are reportedly occurring in Ramsar Wetlands of India has been collected from the scientific literature as well as from the exploration cum faunal-study data available with Zoological Survey of India. Altogether 6,873 species of different faunal groups, belonging to 3,304 genera and 1,077 families have been reported from Ramsar Wetlands of India (Tables 7, 8, 9). Protozoans comprise of 571 species, invertebrates 4,429 species, and vertebrates 1,873 species. The faunal diversity of this zone represents 6.7% of India's overall faunal diversity. With regards to the the overall freshwater diversity of India (9,456 species), Ramsar Wetlands in India represent over 72.7% diversity. The present information on faunal diversity in Ramsar wetlands is of immense use for the conservation and management of wetlands as well as their sustainable livelihood. The list of species has been provided with the code number from RW 1-42 as given in abbrevations. The group wise chapters are also provided from Protozoa to Mammalia, known from the respective Ramsar sites. The baseline information could be used for further strengthening the database of each wetland.

Table 7. Faunal Diversity of Ramsar wetlands of India.

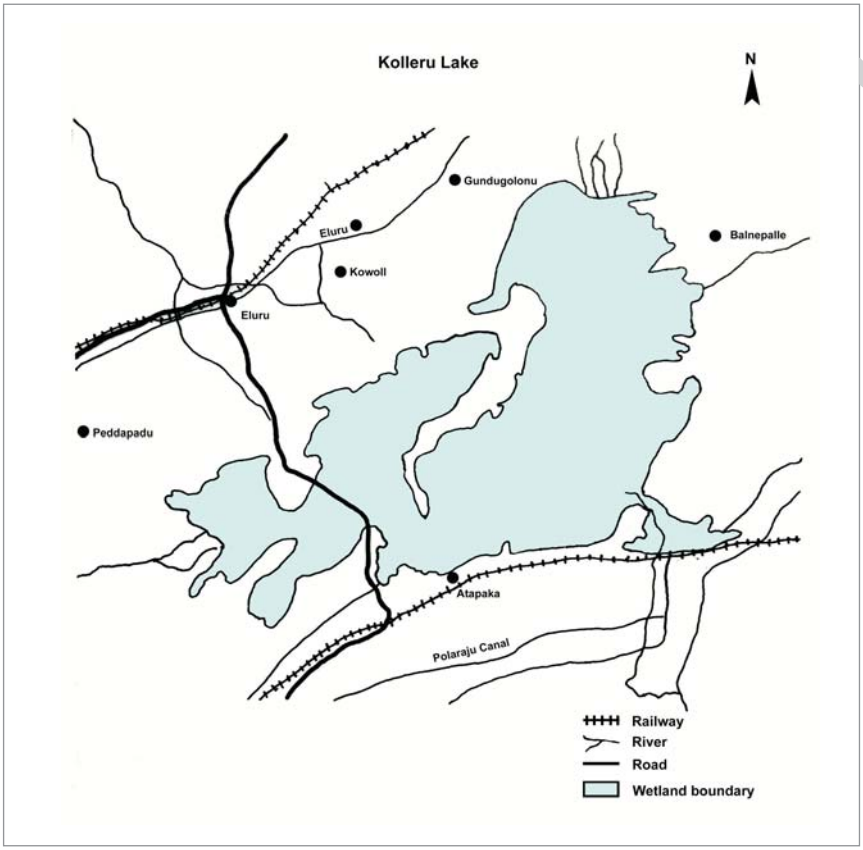
Kingdom	Phylum	World (living)	India	Ramsar Wetlands
Protista	**Phylum Protozoa**	**36,400**	**3,545**	**571**
Animalia	**Phylum Mesozoa**	**122**	**10**	**-**
	Phylum Porifera	**8,838**	**550**	**21**
	Phylum Cnidaria	**11,522**	**1,453**	**68**
	Phylum Ctenophora	**199**	**19**	**-**
	Phylum Platyhelminthes	**29,487**	**1,789**	**-**
	Phylum Rotifera	**2,049**	**467**	**293**
	Phylum Gastrotricha	**828**	**163**	**-**
	Phylum Kinorhyncha	**196**	**10**	**-**
	Phylum Nematoda	**25,033**	**2,984**	**252**
	Phylum Acanthocephala	**1,330**	**306**	**-**
	Phylum Spiuncula	**156**	**41**	**-**
	Phylum Echiura	**198**	**47**	**-**
	Phylum Annelida	**17,388**	**1,035**	**199**
	Phylum Onychophora	**183**	**1**	**-**
	Phylum Arthropoda	**12,56,192**	**76,461**	**3,082**
	Subphylum Chelicerata	1,13,781	6,083	240
	Class Arachnida	1,12,442	6045	240
	Class Merostomata	4	2	-
	Class Pycnogonidia	1,335	36	-
	Subphylum Crustacea	67,735	3,909	709
	Subphylum Hexapoda	10,63,531	66,087	2,133
	Class Collembola	8,162	339	-
	Class Diplura	975	18	-
	Class Protura	816	20	-
	Class Insecta	10,53,578	65,710	2,133
	Subphylum Myriapoda	11,153	382	-
	Class Chilopoda	3,112	101	-
	Class Diplopoda	7,837	271	-
	Class Symphyla	204	10	-
	Phylum Phoronida	**16**	**3**	**-**
	Phylum Bryozoa (Ectoprota)	**6,186**	**337**	**-**
	Phylum Entoprocta	**186**	**10**	**-**
	Phylum Brachiopoda	**392**	**8**	**-**
	Phylum Chaetognatha	**170**	**44**	**-**
	Phylum Tardigrada	**1,167**	**31**	**-**
	Phylum Mollusca	**84,978**	**5,227**	**514**
	Phylum Nemertea	**1,368**	**6**	**-**
	Phylum Echinodermata	**7,550**	**784**	**-**
	Phylum Hemichordata	**139**	**14**	**-**
	Phylum Chordata	**71,526**	**6,816**	**1,873**
	Subphylum Cephalochordata	33	6	-
	Subphylum Urochordata	2,804	531	-
	Subphylum Vertebrata (Craniata)	68,689	6,279	-
	Pisces	34,362	3,439	689
	Amphibia	7,667	427	47
	Reptilia	10,450	641	143
	Aves	10,357	1,343	840
	Mammalia	5,853	429	154
	Total (Animalia)	**15,27,399**	**98,616**	**6,302**
Grand Total (Protista + Animalia)		**15,63,799**	**1,02,161**	**6,873**

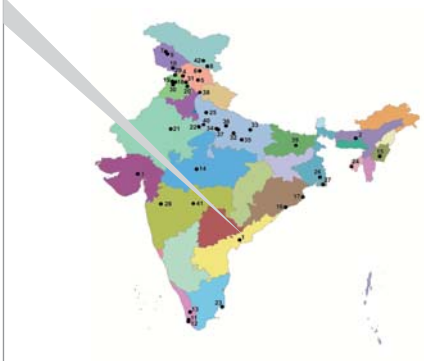
Table 8. Number of families, genera and species in different phyla, known from Ramsar wetlands of India.			
Phylum	**Family**	**Genera**	**Species**
Phylum Protozoa	162	231	571
Phylum Porifera	5	14	21
Phylum Cnidaria	29	48	68
Phylum Rotifera	21	53	293
Phylum Nematoda	76	152	252
Phylum Annelida	49	126	199
Phylum Arthropoda	325	1,574	3,082
Phylum Mollusca	139	262	514
Phylum Chordata	271	844	1,873
Class Pisces	108	339	689
Class Amphibia	7	20	47
Class Reptilia	24	85	143
Class Aves	95	313	840
Class Mammalia	37	87	154
Total (Protozoa + Animalia)	**1,077**	**3,304**	**6,873**

Table 9. Number of families, genera and species in order/groups of phylum Arthropoda, known from Ramsar wetlands of India.

Subphylum	Class	Orders/Groups	Family	Genera	Species
Chelicerata	Arachnida	-	23	95	240
		Total	**23**	**95**	**240**
Crustacea	Branchiopoda	Cladocera	16	64	144
Crustacea	Maxillopoda	Copepoda	22	55	182
Crustacea	Oligostraca	Ostracoda	8	22	36
Crustacea	Malacostraca	Decapoda	58	150	347
		Total	**104**	**291**	**709**
Hexapoda	Insecta	Ephemeroptera	4	8	17
Hexapoda	Insecta	Odonata	11	55	87
Hexapoda	Insecta	Orthoptera	16	129	206
Hexapoda	Insecta	Plecoptera	2	6	8
Hexapoda	Insecta	Dermaptera	7	12	17
Hexapoda	Insecta	Mantodea	4	12	16
Hexapoda	Insecta	Blattodea (Termites)	3	9	15
Hexapoda	Insecta	Hemiptera	34	130	211
Hexapoda	Insecta	Hymenoptera	19	138	256
Hexapoda	Insecta	Coleoptera	27	165	331
Hexapoda	Insecta	Lepidoptera	34	394	671
Hexapoda	Insecta	Diptera	37	130	298
		Total	**198**	**1,188**	**2,133**
		Grand Total	**325**	**1,574**	**3,082**

1. KOLLERU LAKE



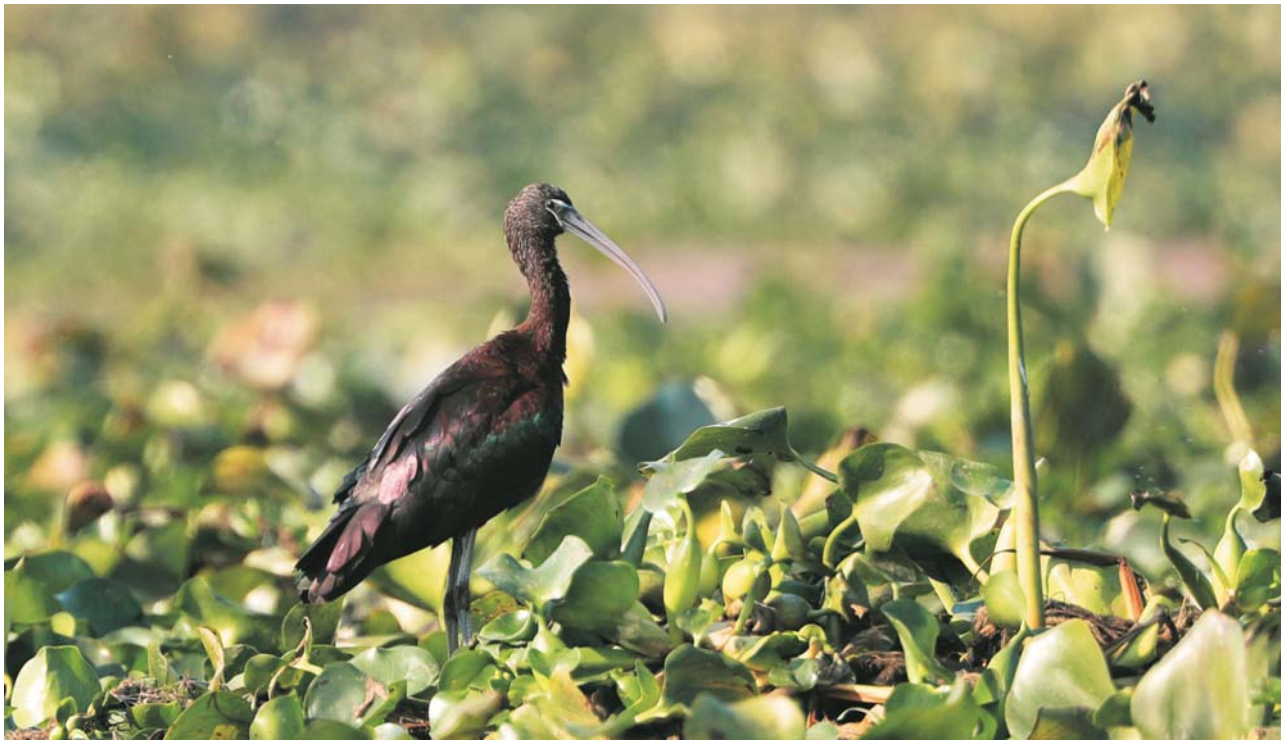


The Kolleru Lake was designated as a Ramsar site on 19th August 2002 under the categories approved by the recommendation of 4.7 of the Conference of the Contracting Parties. The Lake is situated in Andhra Pradesh, India - 16°37'N 081°12'E, occupying an area of 90100 ha at maximum flooding and is located at an elevation of 0-5m above msl. It is situated between two major river basins of the rivers Godavari and Krishna, and functions as a natural flood balancer reservoir of the two deltas. The lake is large, natural, shallow, and freshwater with associated marshes. Apart from 30 inflowing drains and channels, the lake is fed mainly by two seasonal rivers, the Budameru and the Tammileru. The lake eventually drains into the Bay of Bengal through the Upputeru River. The wetland habitats ranges from coastal freshwater lagoons to seasonal freshwater marshes/pools. The lack of regulation of the seaweed flow of the Kolleru waters during monsoon causes rise in the high-flood line leading to major flood problems in the surrounding cities of Eluru and Gudivada. It is a habitat for a large

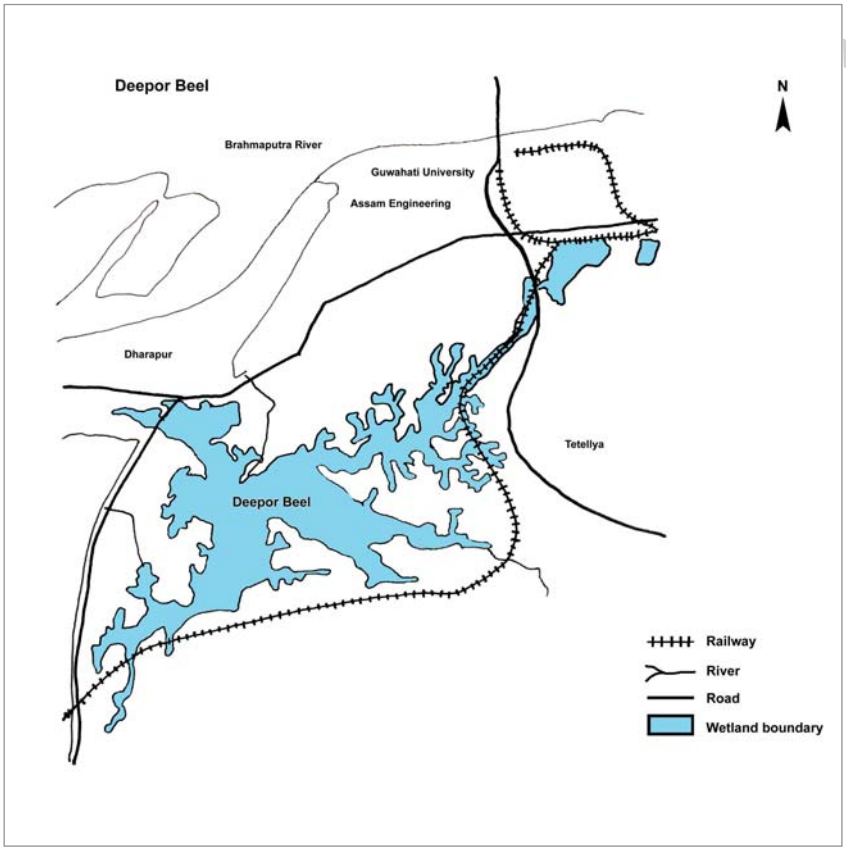
number of resident and migratory birds.According to Rao and Rao (1987) about 160 species including the vulnerable Spot-billed Pelican (Pelecanus philippensis), thousands of waterfowl and 98 species of fisheshave been recorded. The migratory birds includes the Gargeney teals, Mallards, Flamingos, Grey Pelicans, Adjutant storks etc. The wild ducks includes the Mallards, Pintails, whistling teals etc. The lake regularly provides habitat to over 50, 000 waterfowls. It also supports a large number of species of fishes and prawns. Rao et al., (1987) reported 61 species of fish and 12 species of prawns. The Indian climbing perch

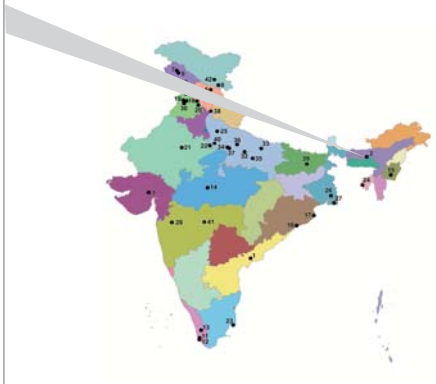
Anabas oligolepis and A. testudineus dominate the landings. Commercially important species of catfish includes Clarias batrachus, Heteropneustes fossilis and Wallango attu while the murrel species areChanna striata, and C. punctate. Carp landings are represented by Labeo rohita, Catla catla, Cirrhinus mrigala, and Puntius sarana. Other fish species includes Etroplus spp. Mugil cephalus, Mystus gulio, Macrognathus spp. and Anguilla bengalensis (https://rsis.ramsar.org/). Besides this the lake also supports fishing, agriculture and related occupations of the people dependent on it for their livelihood. Part of the lakes has been declared as wildlife sanctuary recently with a view to protect the flora, fauna and the ecosystem. The lake dries up in the summer due to poor drainage in the inflowing systems thereby increasing the nutrient concentration that affects the lake water quality, eventually fishes and birds life thus slowly reducing the very basic natural interdependence of life forms upon which human economic life relies. The issue of eutrophication and tidal inflows are also a concern for the lake. It is necessary to conserve the Kolleru lake area and introduce management systems that would sustain biodiversity of the lake and conservation of the ecosystem without inhibiting the genuine development needs of the area.

This book documents a total of 405 species from this lake belonging to Protozoa to Mammalia with information on the groups that still remains to be explored. Apart from 232 species of birds and 108 species of fishes the lake harbours 07 species of protozoans, 13 species of rotifers, 44 species of crustaceans, 01 species of molluscs. There is a need to explore the diversity of lesser reported faunal groups from this lake, i.e., nematodes, annelids, arachnids, insects, molluscs, amphibians, reptiles and mammals.



2. DEEPOR BEEL



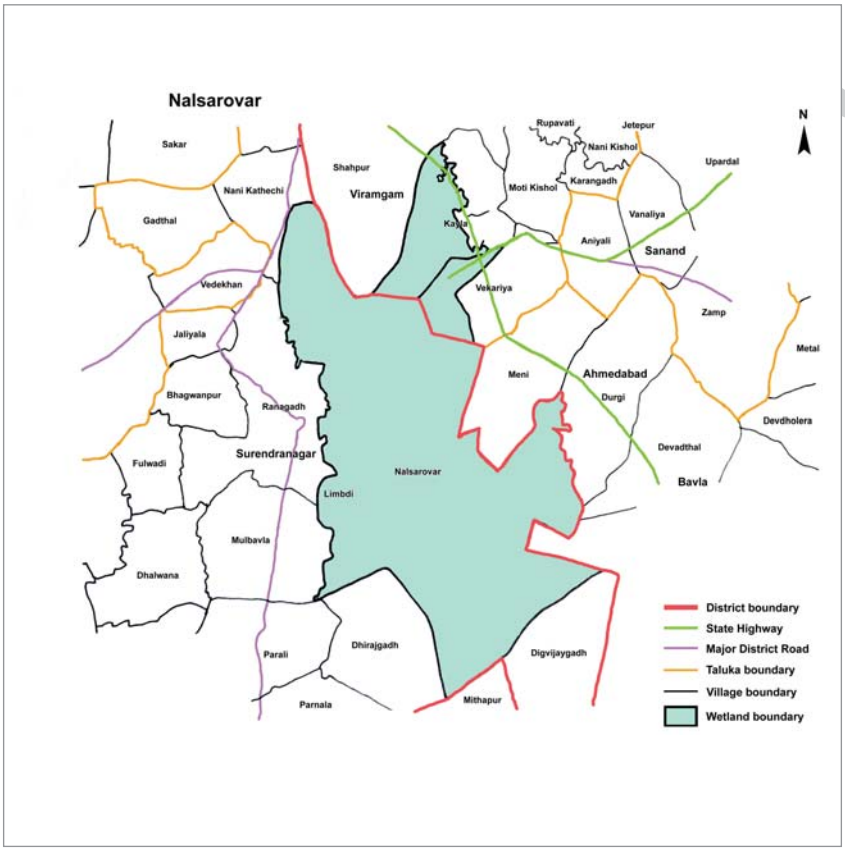


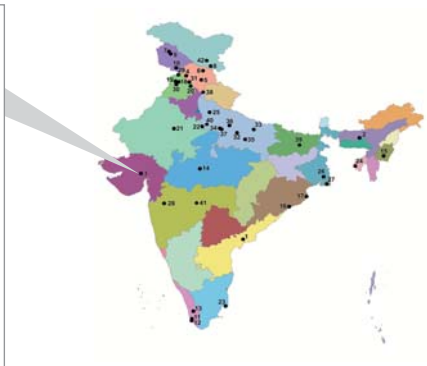
The Deepor Beel is a freshwater, permanent lake located in Kamrup district, south-west of Guwahati city and located on southern bank of the Brahmaputra River (26°05' - 26°11'N 91°35'-91°43'E). The Deepor Beel was designated as a Ramsar site in November 2002. The lake is considered as the main water storage for Guwahati City covering an area of 4000 ha and situated 53 above msl. The diversity of the fauna of Deepor Beel is recorded by several studies. The dominant species from the groups of cladoceran, copepod, rotifers and protozoans of zooplanktons were identified from Deepor Beel including important benthic fauna Tubifex sp., Nais sp., Pheritima sp., Dero sp., Limnodrillus sp., Chironomus sp., Bellemya sp., Bortia sp., Chaoborous sp., Culicoides sp., Dragon fly larvae, Cybister larvae, Pila globosa, Unio sp., etc. The Beel has 203 species of birds including the largest concentration of aquatic birds, migratory winter birds as well as resident ones. TheBeel supports threatened, near threatened, endangered and vulnerable bird species including some globally threatened birds, which includes the Spot billed Pelican, Pelicanus philippensis, (Near threatened) lesser and Greater Adjutant Stork, Leptoptilos javanicus (vulnerable) and L. dubius (Endangered), and Baer's Pochard, Aythya baeri (vulnerable) and A. nyroca (Near threatened), Pallas Fish Eagle, Haliaeetus leucoryphus (vulnerable), Greater Spotted Eagle, Aquila clanga (vulnerable), Darer, Anhinga melanogaster (Near threatened), Black-necked Stork, Ephippiorhynchus asiaticus (Near threatened), and Greater Grey Headed Fish Eagle, Ichthyophaga ichthyaetus (Near threatened). The Beel is visited by Asian elephant, Elephas maximus, and other important mammals like the Hoolock Gibbon (Hylobates hoolock), Rhesus Macaque (Macaca mulatta), Assamese Macaque (Macaca assamensis), Capped Langur (Trachypithecus pileatus), Slow Loris (Nycticebus coucang), Leopard (Panthera pardus), Jungle cat (Felis chaus), Leopard cat (Prionailurus bengalensis), and three civets, i.e., Large Indian (Viverra zibetha), small Indian (Veverricula indica) and Palm (Paguma larvata).The 64 fish species present provide livelihoods for a number of surrounding villages, and nymphaea nuts and flowers, as well as ornamental fish, medicinal plants, and seeds of the Giant water lily Euryale ferox provide major revenue sources in local markets; orchids of commercial value are found in the neighbouring forest. Potential threats include

over-fishing and hunting pressure upon water birds, pollution from pesticides and fertilizers, and infestation by water hyacinth (Eichhornia crassipes). Local people traditionally utilise the Beel to collect fodder for domestic cattle, natural food, such as vegetables, flowers, aquatic seeds, fish, molluscs and other essential requirements. Poor people inhabiting the vicinity of the beel ecosystem, collect their required protein in the form of fish and other animal meats. Several conservation issues like siltation, heavy fishing, pollution from cities, disturbance to birds, railway tracks, trapping during winters, and industrial pollution from wool mills, and encroachment have been reported (https://rsis.ramsar.org/).

This document compiled a total of 634 species as reported in earlier literature. 46 species of protozoans, 188 species of rotifers, 72 species of crustaceans, 33 species of insects, 13 species of molluscs, 67 species of fishes, 10 species of amphibians, 203 species of birds, 02 species of mammals are recorded from this site. The lesser explored faunal groups include poriferans, cnidarians, nematodes, annelids, arachnids, crustaceans, insects, reptiles, and mammals, diversity of which can be revealed by future studies.

3. NALSAROVAR





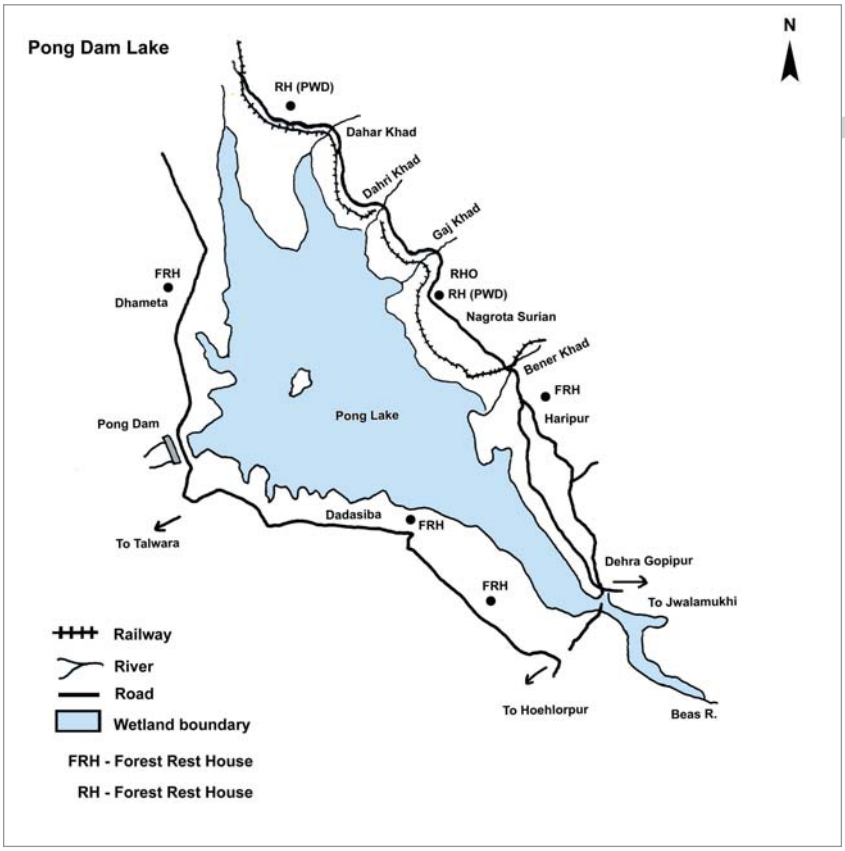
The Nalsarovar (Nalsarovar Bird Sanctuary) was designated Ramsar site on September 2012. The Sanctuary lies within the administrative jurisdiction of Surendranagar and Ahmedabad districts in Gujarat, India (22°78'N to 22°96'N and 71°92'E to 72°64E). Ahmedabad being the nearest large town with 65 km distance in the northeast direction. The site is spread over an area of 12,082 ha (120.82km2) and an elevation of 9.10 m above msl. The monthly average temperature ranges from 4.9°C to 45.5°C with mean annual rainfall of around 700 mm. The sanctuary is a freshwater shallow lake, with muddy lagoons and about 300 islets and considered as largest natural wetland in the Thar Desert Biogeographic Province, representing a highly dynamic environment with salinity and depth varies depending on annual rainfall that changes the habitats within the same year. Due to the impervious salt pan, the area has a good water retention capacity. The main water source is rain water, however, the rivers Surendranagar-Bhogavo and Brahmani also flows into the wetlands. In addition, the Ghoda feeder canal from Mehsana district also feeds Nalsarovar. Thus the catchment area of Nalsarovar, over 3000 km2, extends as far as the Mehsana district.

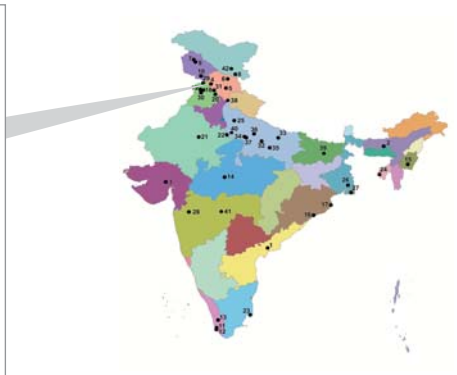
Nalsarovar supports arich biological diversity in the Thar Desert Biogeographic Province, since it supports 216 species of birds, 13 species of mammals, 11 species of reptiles, 19 species of fish, 76 species of zoobenthos and zooplanktons. The area is very rich in its floral diversity as it supports 48 species algae, 1 pteridophyte and 74 species of flowering plants. Nalsarovar can be called as bird heaven as it supports 216 birds including many residential and migratory birds species including many threatened species like the Dalmatian Pelican (Pelecanus crispus), Sarus Crane (Grus antigone), Greater Spotted Eagle (Aquila clanga), Sociable Lapwig (Vanellus gregarius), White carp (Cirrhinus cirrhosis) etc. Globally threatened species such as the Marbled Teal (Marmaronetta angustirostris), Sociable Lapwing (Vanellus gregarius), and Lesser Flamingo (Phoenicopterus minor) use this as a stopover site

during migration and on the return flight. The wetland is also habitat of the endangered Indian Wild Ass (Equus hemionus) which uses this area in the dry season. Blackbuck (Antelope cervicapra), another threatened mammalian species is found in this site. Local communities heavily rely on the lake as it provides them with a source of drinking water and water for irrigation, as well as an important source of income from fishing Catla (Catla catla) and Rohu (Labeo rohita). An average of 75,000 tourists visit the wetland annually encouraging tourism.

The faunal compilation of the site from earlier literature revealed 6 sps of protozoans, 156 sps of rotifers, 18 sps of crustaceans, 46 sps of insects, 1 sps of molluscs, 35 sps of fishes, 6 sps of amphibians, 21 sps of reptiles, 146 sps of birds, 26 sps of mammals, are recorded from this site.

4. PONG DAM LAKE

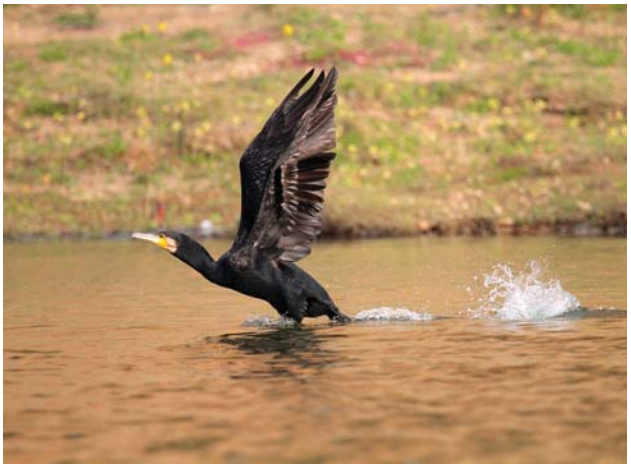




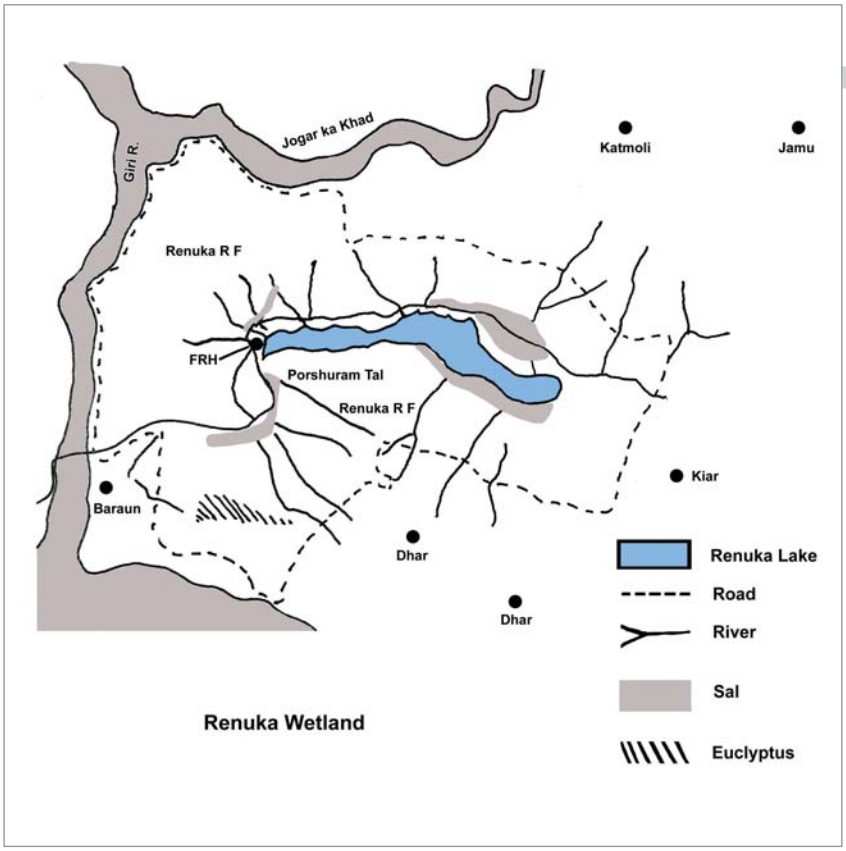
Pong Dam is a water storage reservoir, spread over an area of 15662 ha at about 450m above msl, on the Beas River near the foothills of the Himalaya on the northern edge of the Indo-Gangetic plain (31°52' - 32°10'N and 75°57'- 76°14'E), in the district Kangra, Himachal Pradesh. The Dam was designated as site in November 2002. The location of this lake on the trans-Himalayan fly path of migratory birds facilitate the interception of the waterfowl (Gaston and Pandey 1987) which enhances the biodiversity values of the area during each migration season. The monsoon affects the area prominently, i.e., the summers are hot and humid (maximum temp. 40°C) and the winters are quite cold and mostly dry. The formation of the Pong dam has prevented flooding during the monsoon season as most of excess water are dispersed and stored within the reservoir. The reservoir generates hundreds of Megawatt energy through this hydel project for the Himachal Pradesh as well as neighbouring states. The water is also being channelled to the fertile areas of Punjab and Rajasthan Deserts for irrigation purposes. The larger size and its location makes it a suitable habitat for migratory birds arriving from Central Asia. The organic matter, worms, insects, and molluscs on the mudflats provides diet for many winter waterfowl and plovers. Over 220 bird species belonging to 54 families have been recorded. The sanctuary is an important staging area for an annual migratory waterfowl population of more than 20,000 birds comprising mainly of Bar-headed geese (Anser indicus), Northern lapwing (Vanellus vanellus), Ruddy shelduck (Tadorna ferruginea), Pintail (Anas acuta), Common teal (Anas crecca), Mallard (Anas paltyrhynchos), and Coot (Fulica atra) etc. The Redheaded grebe (Podiceps griseigena) was recorded from this reservoir for the first time in India (Gaston and Pandey, 1989). This gives the area national as well as international significance for the conservation of several waterfowl species (Scott and Poole, 1989). The fairly uncommon in India away from coast such as Blackheaded gull, Great black-headed gull and Herring gull species, visit each winter that also acts as an important staging area

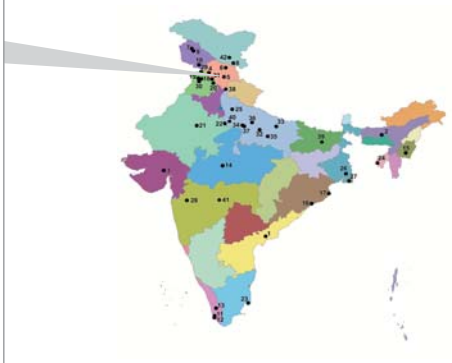
for migrants such as Bar-headed Geese and Northern Lapwing,while five species, namely Ruddy shelduck, Pintail, Common teal, Mallard and Coot, winter at the reservoir in thousands. A total of 62 fish species belonging to six families have been recorded from the site. The dam can also be categorized as a fish reservoir since it harbours certain important migratory species of fishes like Golden Mahseer, Snow trout and Carp. Pong dam is the only reservoir in the country, which provides the opportunity forMahseer angling. Anthropogenic disturbances are fishing and cultivation along the shoreline, there is reported to be little poaching. The most hazardous threats comes from agricultural and forestry malpractices in the water catchment area.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups documented includes 100 spp of insects, 62 spp of fishes, 8 spp of amphibians, 29 spp of reptiles, 406 spp of birds, and 18 spp of mammals. The animal groups which require further detailed studies are protozoans, rotifers, poriferans, cnidarians, nematodes, annelids, aranchnids, crustaceans, insects, of molluscs, fishes, amphibians, reptiles, birds, and mammals.



5. RENUKA WETLAND



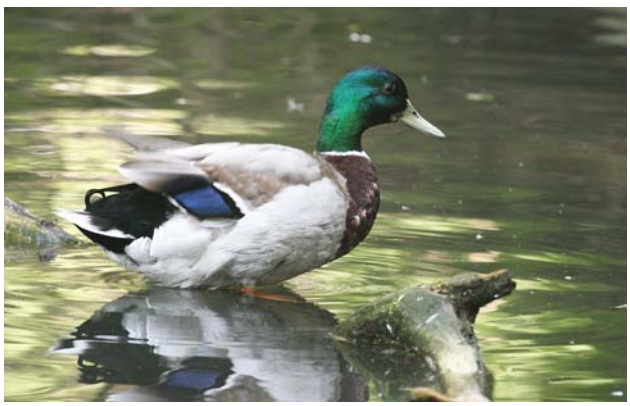


Renuka wetland was designated Ramsar site in November 2005. The lake is located 37 km northeast of Nahan, the administrative headquarter of the district Sirmaur (31°36'N 77°27'E) in the tate of Himachal Pradesh. It is spread over an area of 20 ha. The annual rainfall ranges from 1500-2000 mm of which 70% occurs during the monsoon months of July, August, and September. Temperature ranges from 5°C in winters to 44°C in summer. It is a natural wetland with freshwater springs and inland subterranean karst formations, which is fed by a small stream flowing from the lower Himalayan emerging from the Giri River. The lake has a maximum depth of 13m and the water is hard due to the presence of calcium and magnesium from the leaching of dolomite formation from the catchment area. However, the Lake water helps to maintain the water quality by capturing and satbilizing the sediments and removing nutrients like nitrogen and phosphorus. The subtropical vegetation is found in the total catchment area of the lake where the dominant vegetation comprises of bamboos, palms, Harar (Terminalia chebula) and Kacchnar (Bauhinia variegata) and can be classified as hydrophytes, shrubs, climbers and woody.The prominent vegetation ranges from dry deciduous like Shorea robusta, Terminalia tomentosa, Dalbergia sissoo to hydrophytes.

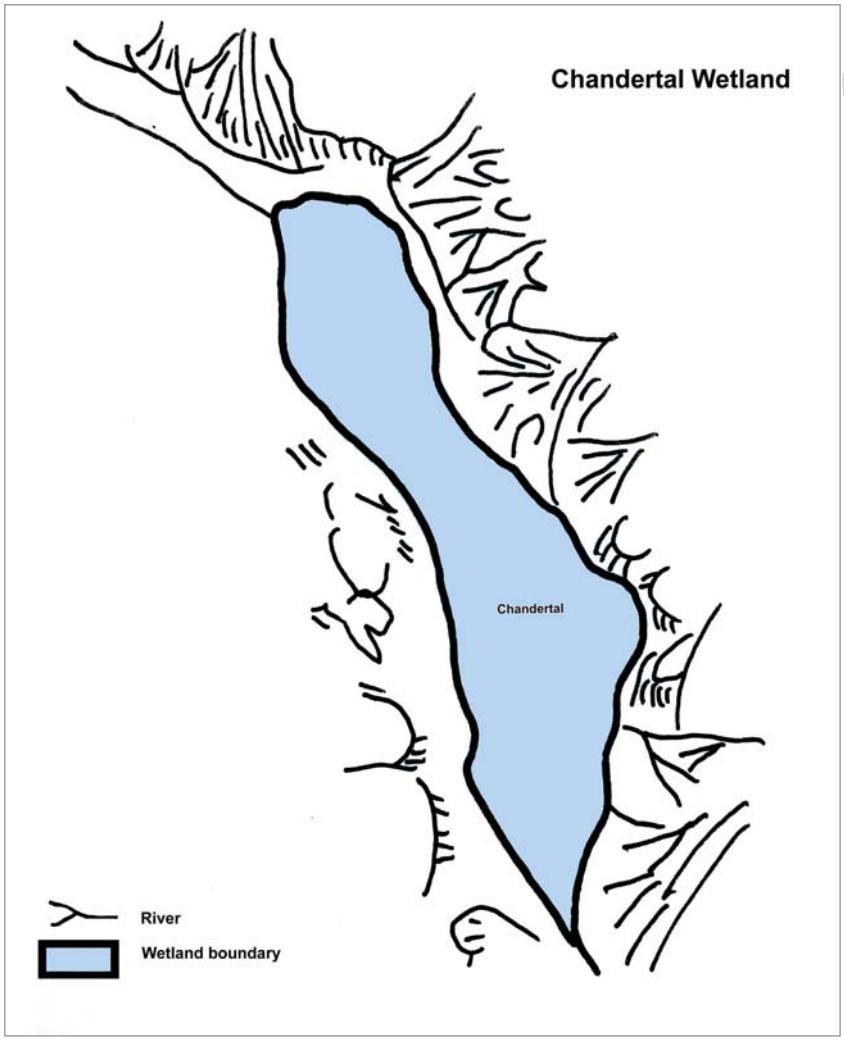
According to the Zoological Survey of India (2000) the lake is home to 443 species of fauna from protozoa to mammals. The lake harbors 19 species of fishes representative of lacustrine ecosystems like Mahseer, Sole, Bam, Borna snakehead (Channa amphibius), Chikli (Nemacheilus sikmaiensis), Khavali (Puntius amphibious), Rohu (Labea rohita), Saslu (Rasbora caverii), Barred baaril (Barilius barila) etc. There are 103 species of birds of which 66 are residents, e.g. Crimson-breasted barbet (Megalaima haemacephala), Mayna, Bulbul (Pycnonotus cafer), Robin (Saxicoloides fulicata), Minivet (Pericrocotus flammeus), House swift (Apus nipalensis), Pheasants, Egrets, Herons, Mallards and Lapwing. Due to abundance of food, shelter and water, a good number of wild animals like Sambhars

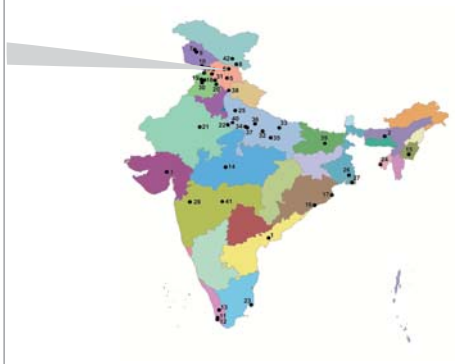
(Cervus unicolor), Barking deer (Muntiacus muntjack), Ghorals and birds have made this catchment ecologically very important and have also made this area as their habitat. The lake has a high religious significance and is named after the mother of Hindu sage Parshuram, and is thus visited by thousands of pilgrims and tourists, treating it as sacred.. Conservation measures so far include community awareness, and prevention of silt influx from eroded slopes occupying50 ha. The high altitude and unique geographic position of the site makes it difficult for long-term surveys and scientific studies. The Lake attracts a large number of tourists due to its picturesque locations. Renuka area has one mini zoo and a Lion safari which is maintained by the Forest Department.

Several earlier and recent studies explored faunal diversity of the wetland reporting 5 spp of protozoans, 1 spp of poriferans, 1 spp of cnidarians, 16 spp of annelids, 5 spp of aranchnids, 13 spp of crustaceans, 235 spp of insects, 6 spp of molluscs, 23 spp of fishes, 9 spp of amphibians, 13 spp of reptiles, 99 spp of birds, and 25 spp of mammals. Future studies and surveys can be designed to explore the diversity of unexplored groups e.g., protozoans, rotifers, and nematodes.



6. CHANDERTAL WETLAND



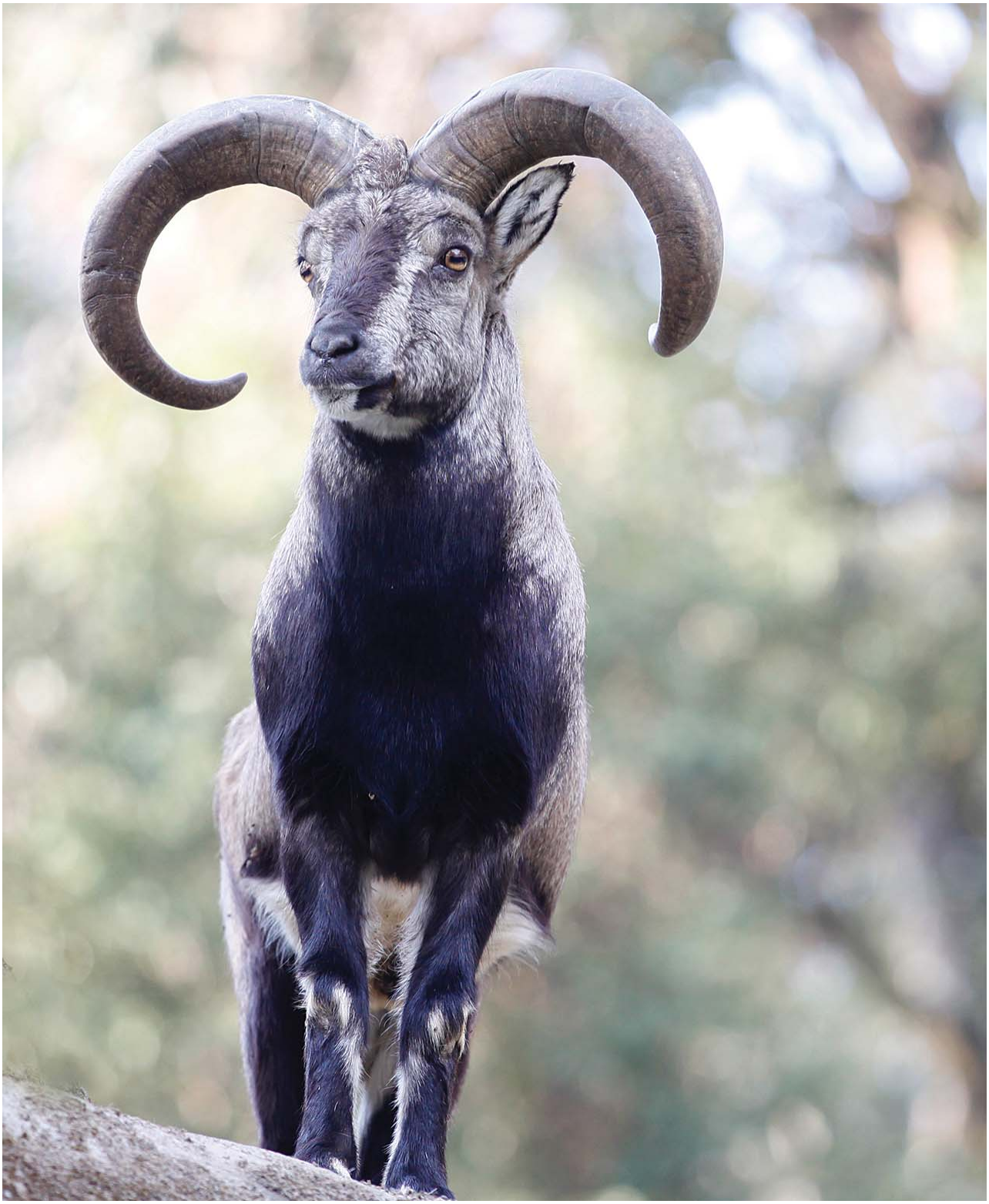


Chandertal is a high altitude freshwater wetland in the cold desert part of Western Himalayas near the Kunzam pass joining the Himalayan and Pir Panchal ranges (32°29'N 77°36'E). It lies in the upper Chandra valley with an outlet into the Chandra River, in the Lahaul and Spiti district of Himachal Pradesh. The wetland was designated Ramsar site in the year 2005 and is spread over an area of 49 ha and situated at 4,337 m asl. Precipitation occurs in the form of snow fall and sub-zero temperature often fall to -37°C to -40°C during the winter season. The wetland Chandertal area is covered by immature glacier type of soil. Chandertal wetland helps the reduction of flood in downstream as water moves into wetland faster than it moves todownstream part of the channel. It also helps in retention of moisture in the catchment and subsequently helps in the growth of grasses and herbaceous plants that protect the land against erosion during the summer season.

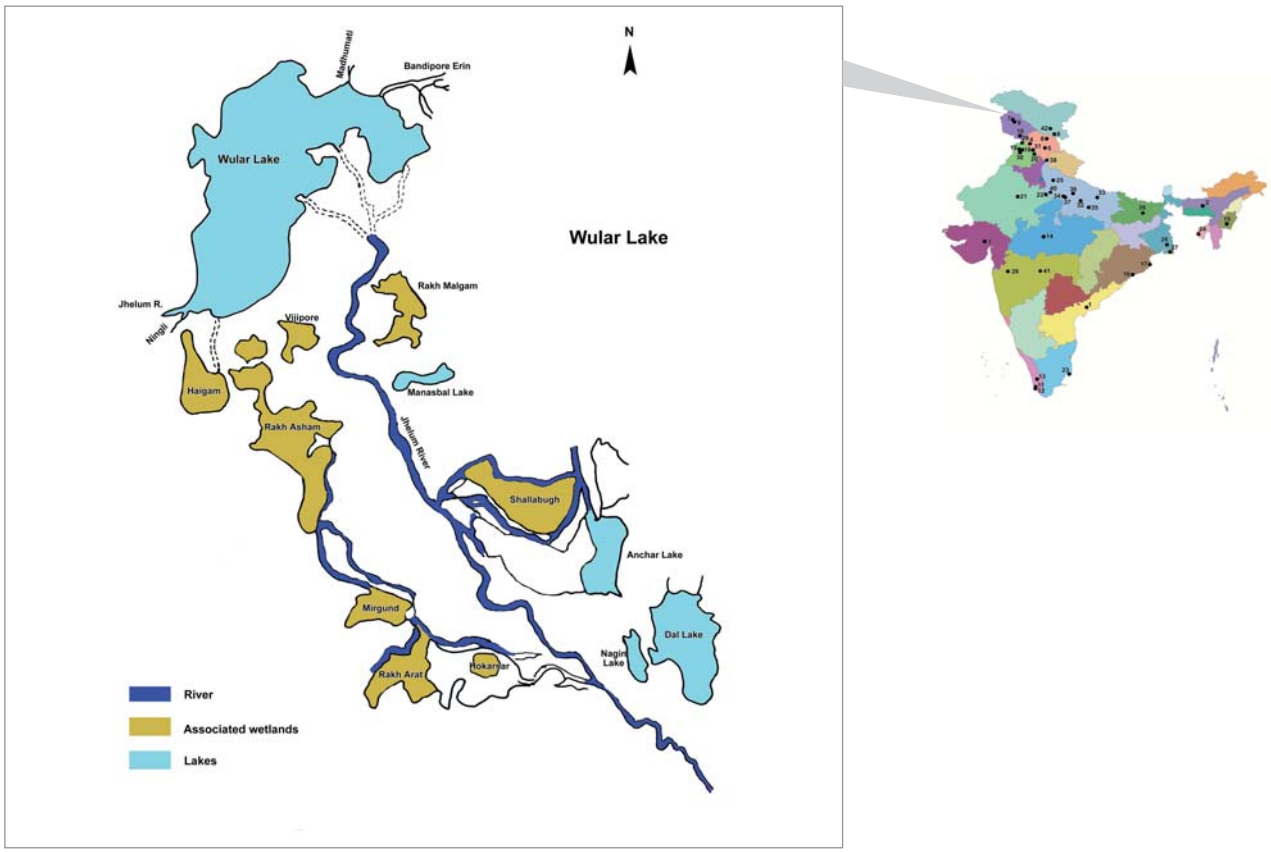
This wetland harbors CITES and IUCN Red-listed species such as the Snow Leopard (Panthera uncia), Bobak Marmot (Marmota bobak), Royal's vole (Alticola roylei), Himalayan Ibex (Capra sibirica hemalayanus), and Blue sheep (Pseudois nayaur). Further, it is a refuge for many species like Snow cock (Tetraogallus himalayensis), Chukor, Black ring stilt (Himantopus mexicanus), Brahmi ducks (Tadorna ferruginea), Kestrel (Falco tinnunculus), Golden eagle (Aquila chrysaetos), Chough (Pyrrhocorax pyrrhocorax). These species, over the years, have developed special physiological features as adaption strategies to cold arid climate, intense radiation, and oxygen deficiency. Other than the occurrence of spiders the insect fauna consists of beetles, wingless grasshopper's, butterflies and bugs. The margins of the lake abound in larvae of mayflies, stoneflies and caddis flies. Though there are minor anthropogenic activities in the vicinity, some 65% of the larger catchment is degraded forest due to

overgrazing by the nomadic herdsmen, and the remnant 35% of the area is covered by herbs and grasses ideal for migratory grazers. Other threatening factors are fragile and sparse vegetation, summer trekking, littering waste, and lack of sanitation facilities. Since declaring the site a nationally important wetland in 1994, the authorities have been providing funds for ecotourism facilities. Conservation aspects are mainly coordinated by Spiti Forest Department who is the custodian along with the State Council of Science, Technology and Environment.

The earlier studies and surveys revealed about 14 spp of protozoans, 7 spp of annelids, 11 spp of insects, 51 spp of birds, 17 spp of mammals asrecorded from this site. The unexplored groups include rotifers, nematodes, annelids, crustaceans, molluscs, fishes, amphibians, and reptiles diversity of which can be revealed by future studies.



7. WULAR LAKE

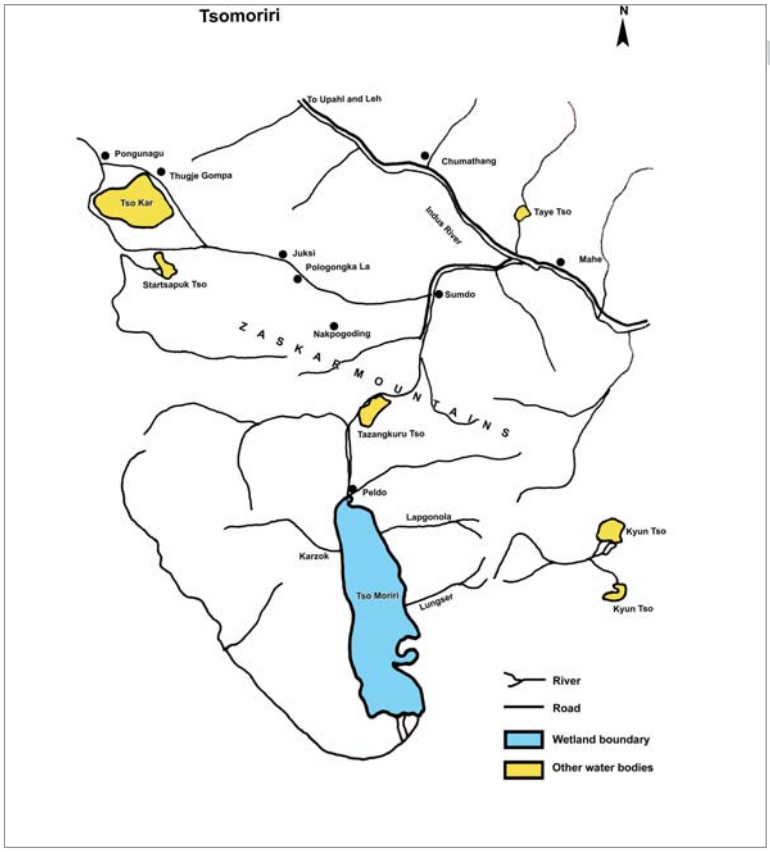


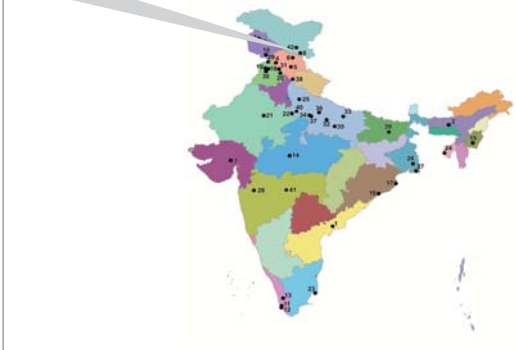
Wular is the largest freshwater lake in India that is surrounded by high mountain ranges on the north-eastern side. The lake is situated in the district of Bandipur, Jammu and Kashmir state (with an area spread over 18,900 ha at about 1530m msl. It was designated as a Ramsar site in 1990. The river Jhelum passes through the lake at Babyari and leaves it at Ningli. A number of wetlands like Malgam, Nygam, Nawgam are located at the fringes of this lake in the Baramula district of Kashmir, which are important for sustaining a large population of both migratory and resident birds. It plays a key role in the hydrographic system of the Kashmir valley in absorbing the flood waters. The lake is covered by dense growth of macrophytes, particularly Trapa natans which provides a substantial revenue to the State Government. The lake, along with the extensive marshes surrounding it, supports a high diversity of wildlife. The zonations of vegetation i.e., emergent, rooted, floating leaf type and submergent, are distinguishable in the lake. All three zones are characterised by a specific type life form embracing a distinctive assemblage of plant species. The extent and occurrence of individual species is closely related to variations in water depth and its associated influences. A good assemblage of both phytoplankton and zooplankton are recorded from this area. The dominant fish species found in the lake are Cyprinus carpio, Barbus conchonius, Gambusia affinis, Nemacheilus sp., Crossocheilus latius, Schizothorax curvifrons, S. esocinus, S. planifrons, S. micropogon, S. longipinus, and S. niger. The Wular Lake with its characteristic ecological features supports a rich population of avifauna. Thousands of ducks and geese visit the lake, the main one being Greylag goose (Anser anser), Ruddy Shelduck (Tadorna ferruginea), Common Teal (Anas crecca), Northern Pintail (A. acuta), Eurasian Wigeon (A. Penelope), Mallard (A. platyrhynchos), Garganey (A. querquedula), Gadwall (A. strepera), Northern Shoveller (A. clypeata), Common Pochard (Aythya farina), White-eyed or Ferruginious Pochard (A. nyroca), Red crested Pochard (Rhodonessa rugina) and Cotton Pigmy Goose (Netta coromandelianus). The resident ones include the Little Grebe (Tachybaptus ruficollis), Little Bittern (Ixobrycus minutus), Grey Heron (Ardea cinerea), Little Erget (Ergretta garzetta), Water Rail (Rallus aquaticus), Common Moorhen (Gallinula chloropus), and White-breasted Waterhen (Amaurornis phoenicurus). The area is important for

wintering, staging and breeding birds. The common Otter (Lutra lutra is also reported to be present in Wular. Human activities include rice cultivation and tree farming. It is an important habitat for fish, and caters to about 60% of the total fish production within the state of Jammu and Kashmir providing support to an important fishing industry and is a valuable source of water for irrigation and domestic use. The lake is a source of livelihood for a large human population living along its fringes. Encroachments resulting in converting vast catchment areas into agriculture land; Pollution from fertilizers and animal wastes; Hunting pressure on waterfowl and migratory birds; weed infestation are some of the recent threats. The high altitude and thegeographic position of the site makes it difficult for long-term surveys and scientific studies.

Several earlier and recent studies explored faunal diversity where 2 spp of protozoans, 9 spp of annelids, 42 spp of crustaceans, 12 spp of fishes, 20 spp of birds are recorded from this site. Future studies and surveys can be designed to explore the diversity of unexplored groups of animals like rotifers, nematodes, aranchnids, insects, molluscs, amphibians, and mammals.

8. TSOMORIRI



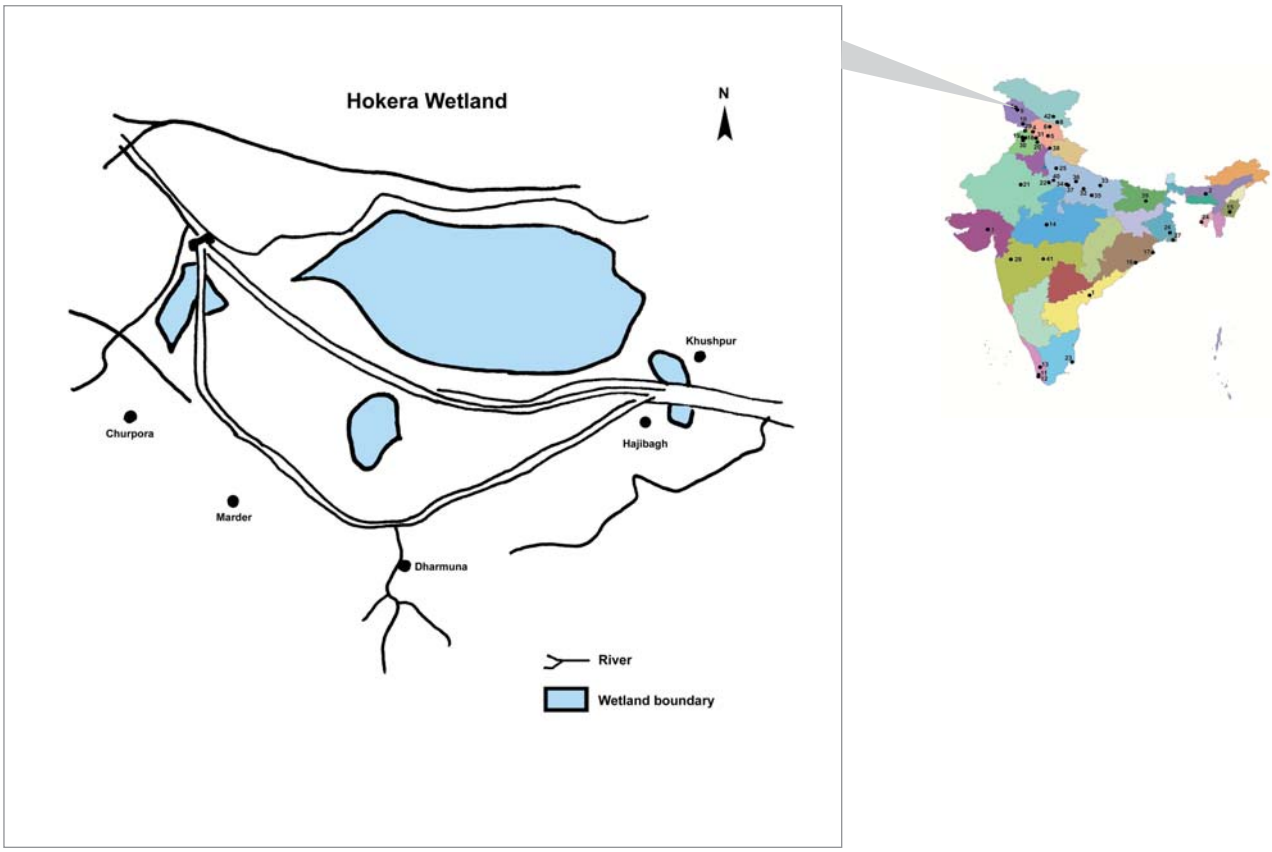


Tsomoriri, known as one of the highest lakes in the world, lies in the Changthang (literally meaning, northern plains) region (32°54'N 78°18'E). It is a freshwater cum brackish lake, with wet meadows and borax-laden wetlands along the shores with about 40m of depth. The lake was designated Ramsar site in November 2002. It is spread over an area of 12000 ha and situated at 4,595m above msl. Annual precipitations of 100 mm and temperature ranges of 0-30°C in summer, -10 to –40°C in winter have been recorded,and the area is a high altitude cold desert. The most important feature of Changthang is the absence of a consistent slope, which would enable water to drain away. The undulating land forms itself into huge basins, into which snowmelt streams flow that settles into the lake. Tsomoriri is a unique example of a wetland type in the Trans-Himalayan biogeographic zone. Tsomoriri and Tsokar wetlands represent the only breeding ground of the Barheaded goose (Anser indicus) in India, and the only breeding ground for the globally threatened Blacknecked crane (Grus nigricollis), outside china. Other than the Barheaded goose, the main waterbird species breeding in the area include: the Ruddy shelduck (Tadorna ferruginea), Common redshank (Tringa tetanus), Brownheaded gull (Larus brunnicephalus), Lesser sand plover (Charadrius mongolus) and Greatcrested grebe (Podiceps cristatus). Of the smaller mammals, marmots are found commonly on the hill slopes surrounding the lakes and even along roadsides. Voles, hares and numerous species of pikka or the mouse-hare are also plentiful. The Great Tibetan Sheep or Argali (Ovis ammon hodgsoni) and Tibetan Wild Ass (Equus kiang) are endemic to the Tibetan plateau, of which the Changthang is the westernmost part. The 400-year-old Korzok monastery attracts many tourists, and the wetland is considered sacred by local Buddhist communities. The local community, in recognition of WWF-India's project work, dedicated Tsomoriri as a WWF Sacred Gift for the Living Planet. The rapidly growing attraction of the recently opened area to western tourists as an "unspoilt destination" with pristine high desert landscapes and lively cultural traditions brings great promise but also potential threats to the ecosystem. Increasing pollution levels in areas of tourist concentration like trekking routes and campsites is gradually becoming a problem along with other major increasing threats such as the construction of a roads, absence of garbage disposal facilities

resulting in dumping garbage into nearby streams as well as into marmot, mouse hare or vole burrows. Direct disturbances are another serious threat for the diversity of the area e.g. Kiang chasing by jeep safari, disturbance of the Blacknecked crane in its feeding and breeding grounds. Increased pressure on grazing lands is of particular concern since the prospects for pasture regeneration are severely limited by the extreme climatic conditions occurring in the region.

Previous surveys and studies revealed 16 spp of nematodes, 10 spp of crustaceans, 9 spp of insects, 20 spp of birds, 9 spp of mammals from this site. The unexplored groups include protozoans, rotifers, nematodes, annelids, aranchnids, molluscs, fishes, amphibians, reptiles, diversity of which can be revealed by future studies.

9. HOKERA WETLAND



The Hokera wetland is located in the North West Himalayan biogeographic province of Kashmir (34°00'-34°10'N and 74°40'-74°45'E) spread over an area of 1375 ha and situated at 1584 m asl. The wetland was designated a Ramsar site in the November 2005. It is a natural permanent wetland with a back drop of the snow-draped Pir Panchal,the water greatly fluctuates through the seasons of the year in response to the main discharge from the Flood Spill Channel. Hokera is natural perennial wetland contiguous to the Jhelum basin, and it is the only site with remaining reedbeds of Kashmir and pathway of 68 waterfowl species like Large Egret (Ardea alba), Great Crested Grebe (Podiceps cristatus), Little Cormorant (Phalacrocorax niger), Large Cormorant (Phalacrocorax carbo) Common Shelduck (Tadorna tadorna), Tufted Duck (Aythya fuligula) and endangered White-eyed Pochard (Aythya nyroca), coming from Siberia, China, Central Asia, and Northern Europe. Hokera is a depository of rich diversity of birds both resident and non-resident (summer/winter migrants).

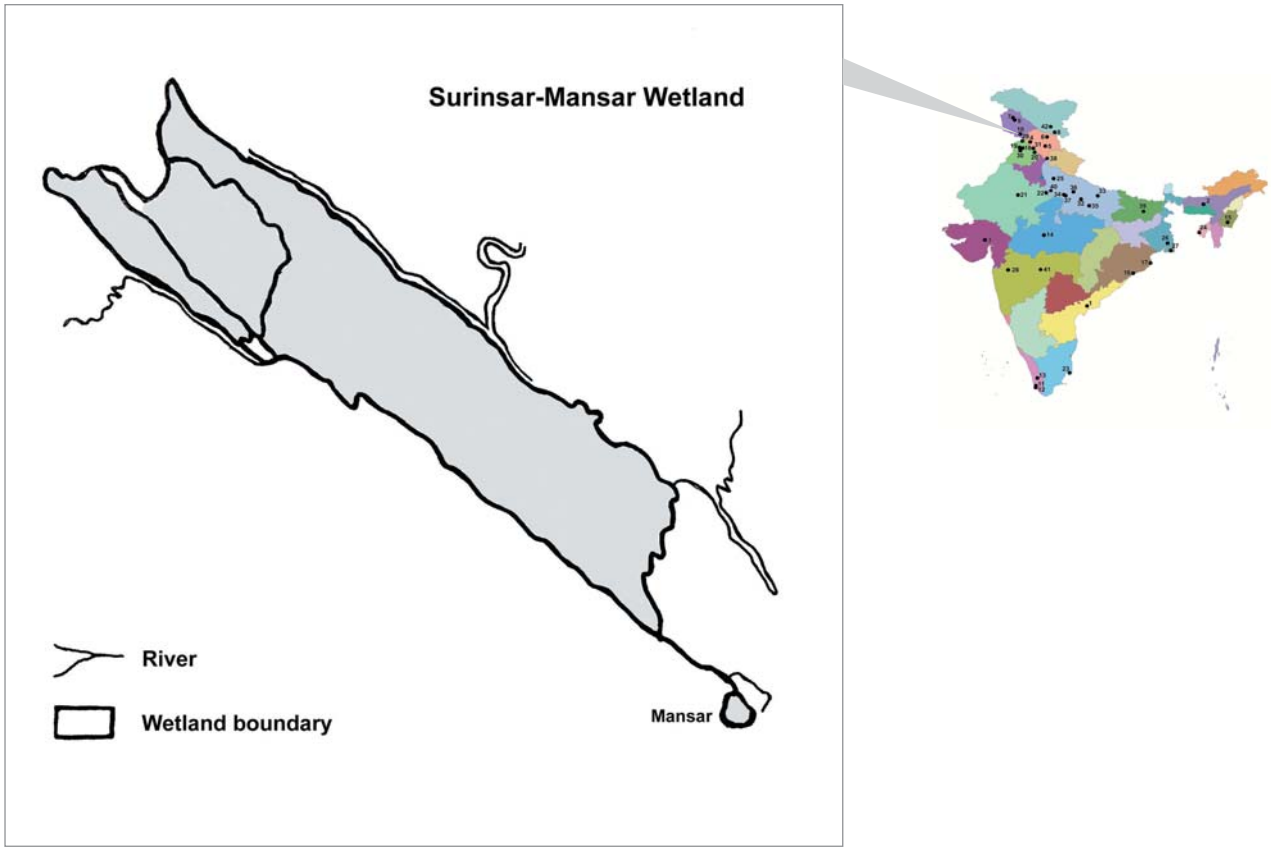
The wetland is extensively used as a feeding and spawning ground and nurseries by the fishes; whereas open water supports in its growth. During spring fishes migrate up from Jhelum to Hokera, as it supports essential ecological processes for the fish stock (carps). But the fluctuating water table in the river system often fragments river Jhelum from the breeding ground; therefore Hokera together with surrounding wetlands harbors adult fish. Sustainable exploitation of fish, fodder and fuel is significant, despite water withdrawals since 1999. Potential threats include recent housing facilities, littered garbage, and demand for increasing tourist facilities. Potential threats are rising pressure of tourism, effluents of agricultural fields along with pesticides, fertilizers, increasing slit from flood, land usage and rapid urbanisation. The diverse inhabiting fauna also control insect pests on the neighbouring farms.

The wetland helps in water storage and acts as a flood absorbtion basin, i.e., the water that enters the wetland apart from silt from the catchment area brings nutrients

from surrounding agricultural fields. The complex floral composition of the lake traps the sediments and nutrients, acting as flood absorption basin through water storage,thus, helping the city of Srinagar and surrounding fields from floods.

The high altitude and different geographic position of the site makes difficulties for long-term surveys and scientific studies. Several earlier and recent studies recorded faunal diversity as5 spp of molluscs, 1 sp of amphibians, 7 spp of birds are recorded from this site. Future studies and surveys can be designed to explore the diversity of unexplored groups of animals like protozoans, rotifers, nematodes, annelids, aranchnids, crustaceans, insects, fishes, reptiles, mammals.

10. SURINSAR-MANSAR LAKE



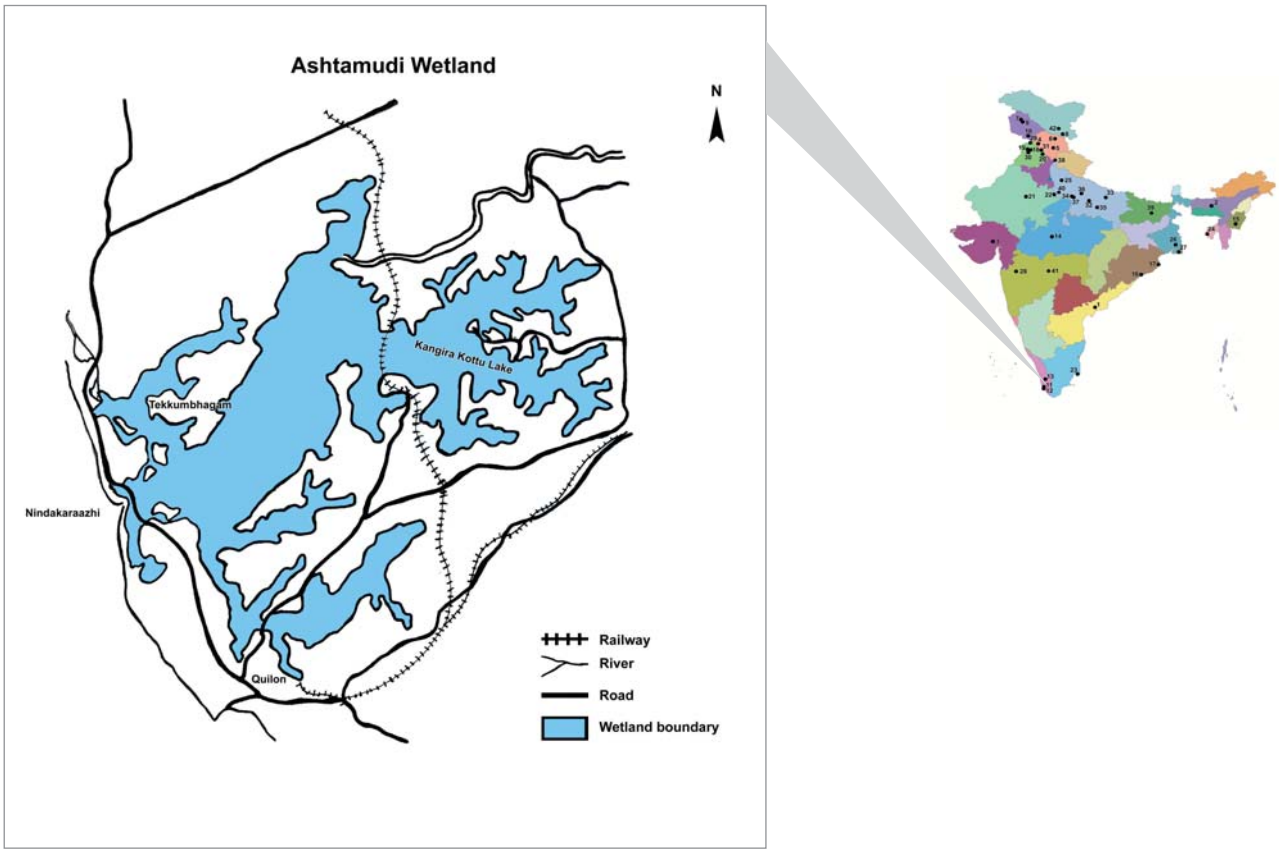
Surinsar-Mansar Lake is a freshwater composite of lakes situated in semi-arid Punjab Plains. Surinsar lake is located about 40 km (32°46'N 75°02'E) and Mansar Lake is located about 35 km (32°45'N 75°23'E) both from Jammu, towards northeast under Udhampur District in the Jammu & Kahsmir State. The Surinsar and Mansar lakes are spread over an area of 20.40 ha and 329.40 ha at anelevation of 605m and 710 m asl, respectively. The lakes were designated as a Ramsar site in November 2005. The catchment area of Mansar is about 2000 ha and that of Surinsar is about 1000 ha. The site is occupied by sedimentaries of Siwalik Tertiary age geologically. The lithography of the area shows light grey sand stone, subordinate clay, calcareous and pebbly lenses.Surinsar is oval in shape having a maximum depth of 24.04 m and chiefly rain-fed and has no permanent inlet or outlet. It has a maximum length of 888 m and a breadth of 444 m with alkaline water (pH 7.2 to 8.9) having a small island. The lake harbors a complete belt of varied macrophytic vegetation all along its banks and also supports fish species. Mansar lake is semi oval in shape having an average width of 680 m and depth of 37.8 m and is primarily fed by surface run-off and partially by mineralised water through paddy fields, and water rises in monsoon with rainfall. The pH of the lake varies between 6.4 and 7.6, maximum in July and minimum in September. The fluctuation in water level is about 2 m. The monsoon rains extend from July to September and the average rainfall is around 1500 mm. The winters are usually dry with occasional rains in January while the summers are hot with an average atmospheric temperature ranging between 35°C and 40° C. Both lakes are an attractive habitat for a wide variety of resident and migratory water fowls,. Some rare small freshwater medusa are also found here.

Mansar Lake supports about 54 zooplankton taxa belonging to Protozoa, Coelentrata, Copepoda, Ostracoda, Insecta, dominated by Rotifera and Cladocera. Mansar lake attracts avifauna and the lake supports CITES and IUCN Redlisted Flapshell Turtle

(Lissemys punctate), Soft-shell Turtle (Aspideretes gangeticus). The Mansar Lake supports the very rare medusae (Mansariella lacustris). This composite lake is high in micro nutrients which is an attractive habitat, as breeding and nursery grounds for migratory waterfowls like Fulica atra, Gallinula chloropus, Podiceps nigricollis, P. cristatus, Aythya fuligula, A. farina, Anas querquedula, A. strepera, A. platyrhynchos, A. clypeata (Northern Shoveler), A.acuta, A. penelope. Other frequently encountered waterfowls are Pond heron (Ardeola grayii), Yellow bittern (Ixobrychus sinensis), Large egret (Ardea alba),Llittle egret (Ergretta garzetta), Teal (Anas crecca, Tadorna ferruginea and Porphyrio porphyry) and Purple moorhen.The site is socially and culturally very important with many temples around owing to its mythological origin from the Mahabharata period. Although the lakes support a variety of fishes, fishing is discouraged for religious values. Puntius chonchonius, Channa gachua, Rasbora rasbora, Labeoa rohita and Trichogaster fasciatus constitute the common ichthyofauna of the lake. Other noteworthy species include Danio rerio, Mastacembelus armatus, Ophiocephalus punctatus. The main threats are increasing visitors, agricultural runoff, bathing and cremation rituals. Conservation is focused on awareness-raising.

The animal groups reported earlier includes 61 spp of protozoans, 23 spp of rotifers, 1 sp of cnidarians, 8 spp of insects, 7 spp of fishes, 19 spp of birds. The animal groups which require further studies are nematodes, annelids, aranchnids, crustaceans, molluscs, amphibians, reptiles, mammals.

11. ASHTAMUDI WETLAND

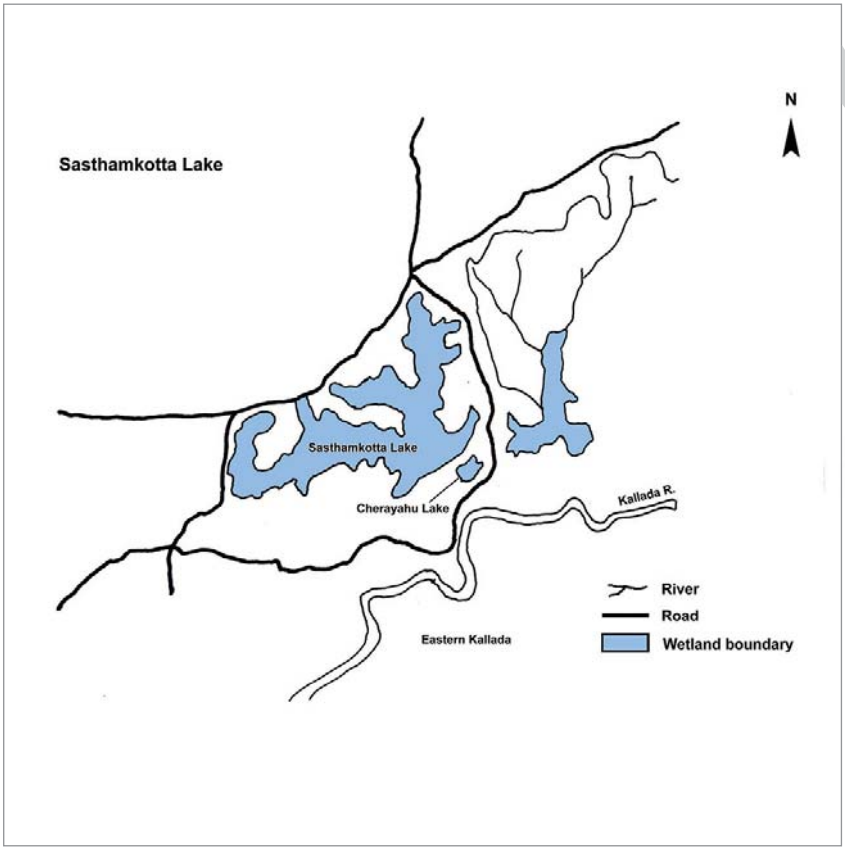


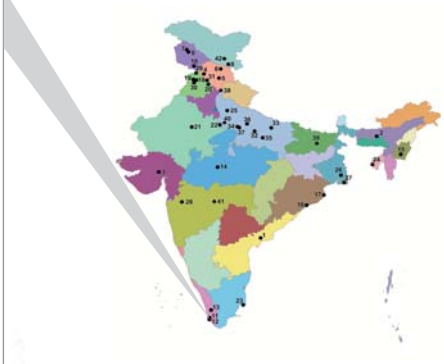
The Ashtamudi is the second largest largest wetland in Kerala and part of the extensive estuarine system. The wetland lies in Kollam district (08°50'-09°05'N 76°35'E) spread over an area of 61400 ha and situated at 10 m above msl. The wetland was designated Ramsar site in November 2002. The palm-shaped extensive water body has eight prominent arms, adjoining the Kollam town. The arms converge into a single outlet at Neendakara near Kollam before entering the Lakshadweep Sea. This estuary is the deepest among all the estuarine of Kerala with a maximum depth of 6.4m at the confluence zone. The major river feeding the Ashtamudi is the Kallada River, formed by the confluence of three rivers, viz., the Kulathupuzha, the Chendurni and the Kalthuruthy. The Kallada river which originates from the Western Ghats, traverses through virgin forests and finally falls into the Ashtamudi wetland, after travelling a distance of about 120 km. It carries an average runoff of 76,000 million m3 of freshwater into the estuary every year. The area records a maximum temperature of 27.5°C and a minimum of 25.5°C. In the coastal area it is hot and humid during April-May while cool during December-January. True mangroves Avicennia officinalis, Bruguiera gymnorrhiza and Sonneratia caseolaris are present and around 43 species of marshy and mangrove associates are present along with two endangered species Syzygium traencoricum and Calamus rotang. The lake supports 57 species of avifauna, of which 6 are migratory and 51 resident species, 97 species of fishes (42 are typically marine, 3 estuarine, 9 estuarine-riverine, 15 marine-estuarine) and unique copepod species. It is also a congenial habitat for all species of penacid and palaemonid prawns, edible crabs, black clams etc. It is the second biggest fish-landing centre next to Vembanad estuary; thousands of fishermen depend directly on the estuary for their livelihood. Population density and urban pressures pose threats to the site, including pollution from oil spills from thousands of fishing boats and from industries in the surrounding area and conversion of natural habitat for development purposes. Pollution from oil spills from thousands of fishing boats. Pollution from industries such as paper mills, aluminium industries and ceramics. Pollution from coconut husk retting. Disposal of huge quantities of untreated sewage from Kollam city, direct

disposal of human excreta from hanging latrines. Natural habitat faces serious degradation including reclamation of the estuary.

The earlier studies recorded 57 spps of protozoans, 33 spp of crustaceans, 8 spp of insects, 15 spp of molluscs, 129 spp of fishes, 90 spp of birds from this site. The unexplored groups include rotifers, nematodes, annelids, aranchnids, amphibians, reptiles, mammals, diversity of which can be revealed by future studies.

12. SASTHAMKOTTA LAKE





The Sasthamkotta Lake is the largest fresh water lake in Kerala and is the source of drinking water for half a million people in the Kollam district. The lake was designated a Ramsar site in November 2002 and is spread over an area of 373 ha and situated at 33 m above msl (09°00'-09°05'N 76°35'-76°40'E). The area receives an annual average rainfall of 2398 mm. with a mean annual temperature between 26.7° C and 29.16° C. It is surrounded by hills on all sides except in the south. A large part of the lake has been reclaimed for agriculture. The source of water is from the underground sprouts. The water contains no common salts or other minerals and supports no water plants. The lake has a capacity to hold 22390 million liters of water.

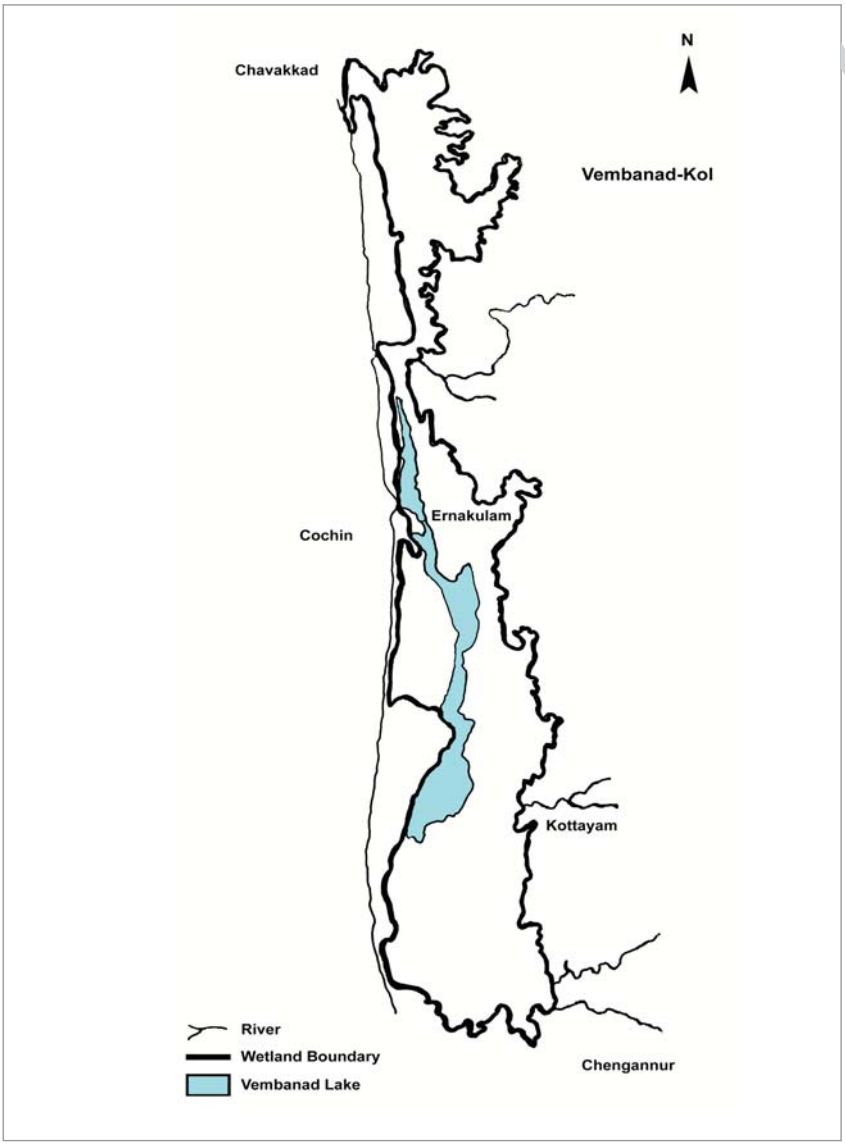
The insectivorous plant Drosera sp. is found on the eastern shore of the lake. Vegetation is very scant, floating and rooted plants are very less. Cashewnut, paddy, tapioca and plantain are grown on and along the banks of the lake. Phytoplankton is scarce and primary productivity is low. The lake provides food, spawning and nursery ground to 17 species of freshwater fishes and two genera of prawns. The most common fishes encountered in the lake are Callichrous bimaculatus and Wallago attu. Some indigeneous fish species include, Puntiusnticto punctatus (Day), Puntius sarana subnasutus (Ham.), Horabagrus brachysoma (Gunther), Etroplus suratensis (Bloch), Aplocheilus lineatus (Val.), Parambassi thomassi (Day) and Macrognathus guentheri. Some other species include, Megalpos cyprinoides (Broussonet), Puntius fialmentosus (Valenciennes), Puntiusn tictopunctatus (Day), Puntius sarana subnasutus (Ham.), Glossogobius giuris (Ham. Buch.), Horabagrus brachysoma (Gunther), Sigala spp., Mystus gulio (Ham.), Singhi Heteropneustes fossilis (Bloch), Etroplus suratensis (Bloch), Etroplus maculatus (Bloch), Amblypharyngodon melettinus (Val.), Xenentodon cancila (Ham. Buch.), Aplocheilus lineatus (Val.), Parambassi thomassi (Day), Macrognathus guentheri. The Lake abounds in 21 species of herrings and sardines of the family Cupeidae alone. Notable migratory birds are Teals. Bonnet monkeys frequent the banks.

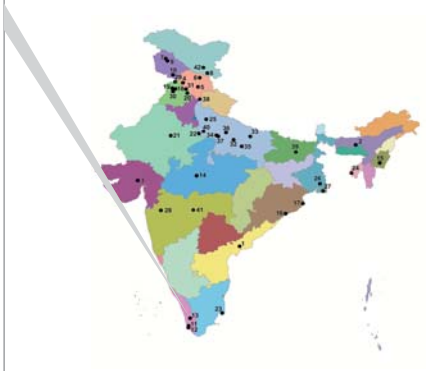
The lake is used for fishing and surrounding areas are under cultivation and utilized for cattle grazing, fisheries production, water supply to Kollam municipality and suburbs are other uses. The ancient Sastha temple, which lends its name to the town is an important pilgrim

centre. The main threats are filling up of parts of lake for cultivation, agricultural and domestic wastes from surrounding areas entering the lake. Reclamation of the land for agriculture along the banks and adjacent causing soil erosion. Domestic sewage disposal change the physical properties of the water.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups studied includes 1 sp of crustacean and 17 spp of fishes.

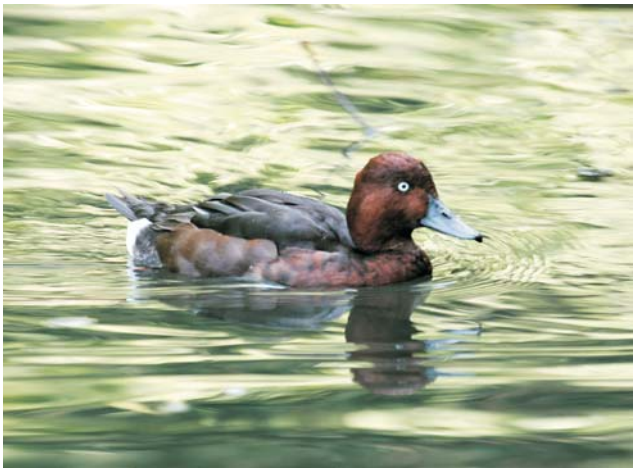
13. VEMBANAD-KOL WETLAND





Vembanad-Kol is the largest brackish, humid tropical wetland ecosystem on the southwest coast of India (09°00'-10°40'N 76°00'-77°30'E). The wetland was designated Ramsar site in November 2002. It is spread over an area of 1,51,250 ha with an elevation of 0.6-2.2 m above msl. The wetland is fed by 10 rivers and all these rivers originate in the Western Ghats and characterised by a continuous chain of lagoons or backwaters 96 km long, being one of the largest estuarine system in Kerala. The wetland has two distinct zones according to thetype of water it consists;the southern zone is dominated by freshwater while the northern zone has salt or brackish water. The main benefit of the wetland is that it protects three densely populated districts of Kerala from flood, aids ground water recharge and helps supply water for the region.The value of the system in local transport of people and trade is considerable. Other most significant values include flood occlusion, fishery, lime shellfishery, rice production, pollution abatement, inland navigation, port facility (Cochin Port) and backwater tourism.

Mangrove vegetation is abundant at Kumarakom, Vypeen, Kannamali and Chettuva. Rare species found here are: Excoecaria agallocha, Bruguiera sexangula.

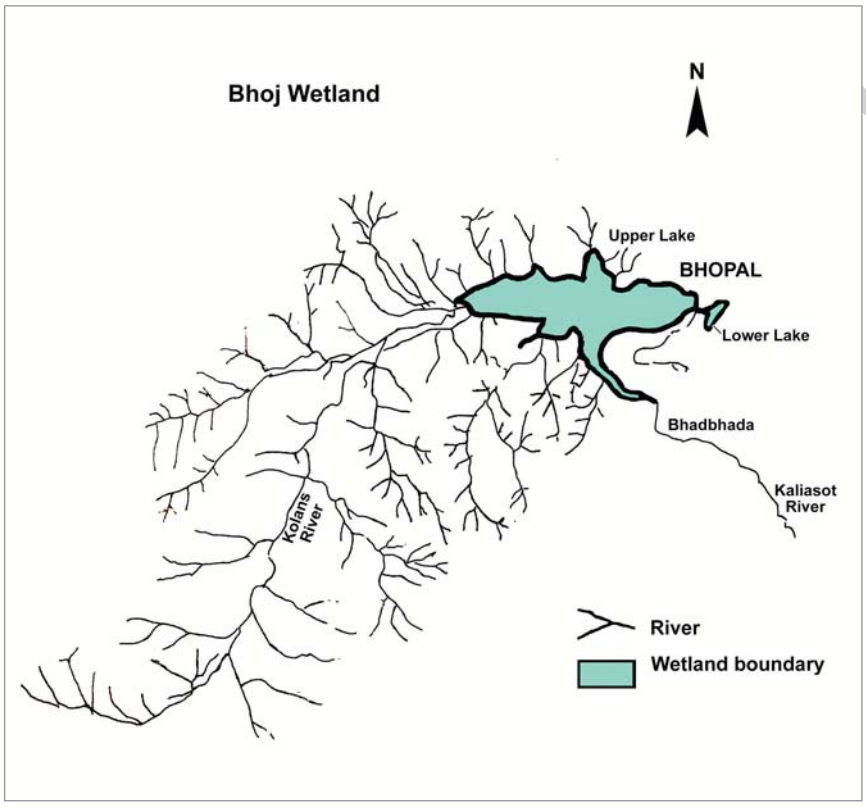


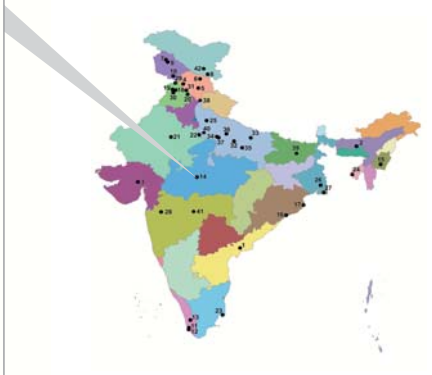
It is renowned for its live clam resources and sub fossil deposits. The soft organically rich sedimentary substratum of the inshore region is a perfect habitat for shrimps and the estuarine zone plays an important role in the life cycle of many shrimps and entire Vembanad kol act as nursery and breeding site for important shrimps like Penaeus indicus, P. monodon, Metapenaeus dobsoni, M. monoceros, M. affinis, M. macrobrachiumrosenbergii. It also serves as a habitat for a variety of finfish, shellfish, and is a nusery of several species of aquatic life, and acts as a transitional ecotone between the sea and land. Many fish species depend on the wetland for food, spawning and nursery. The Vembanad supports the third largest population of more than 20,000 waterfowls in India during the winter months. Ninety-one species of resident/local migratory and 50 species of migratory birds are found in the Kol area. Both resident and migratory waterfowl are abundant. Endangered species of water fowl include: Spot-billed Pelican (Pelicanus philippensis); Oriental Darter (Anlinga melanogaster); Water Cock (Galliere cincera) & Black-billed Tern (Sterna malnogaster). The birds come from different regions and stay here for breeding and feeding.

Land reclamation for agriculture and plantations is a major threat. Pollution due to industrial effluents, agrochemicals, sewage, etc. Lime shell fishery- claims over extraction of lime shell. Reclamation and bunding activities in the river mouth is affecting the natural facility for breeding and migration of species.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups recorded includes 67 spp of protozoans, 18 spp of rotifers, 3 spp of poriferans, 45 spp of cnidarians, 6 spp of nematodes, 81 spp of annelids, 3 spp of aranchnids, 170 spp of crustaceans, 25 spp of insects, 87 spp of molluscs, 106 spp of fishes, 10 spp of amphibians, 22 spp of reptiles, 256 spp of birds, 21 spp of mammals.

14. BHOJ WETLAND



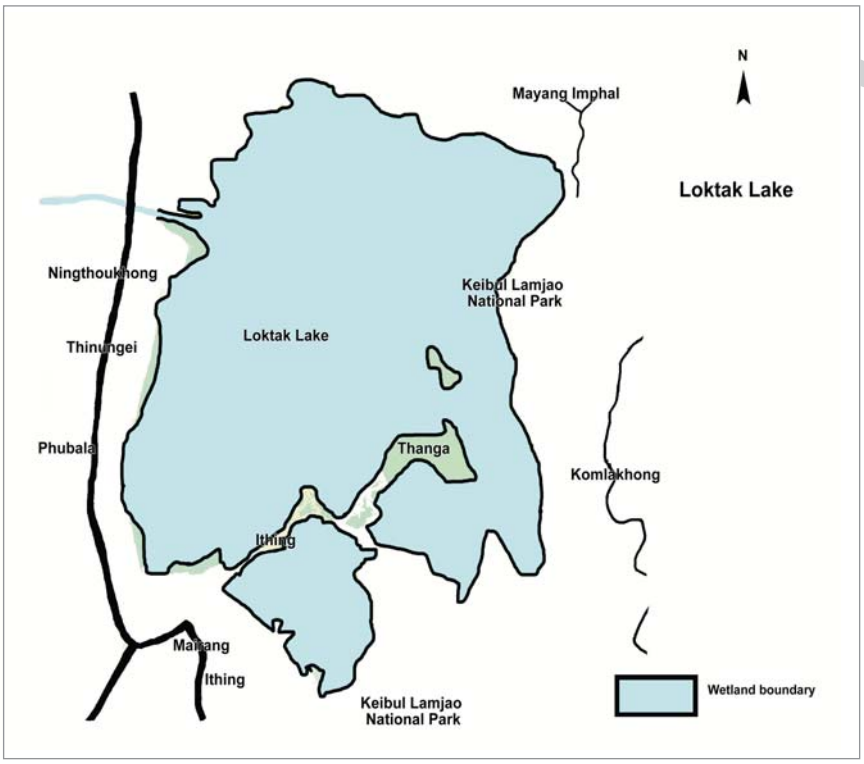


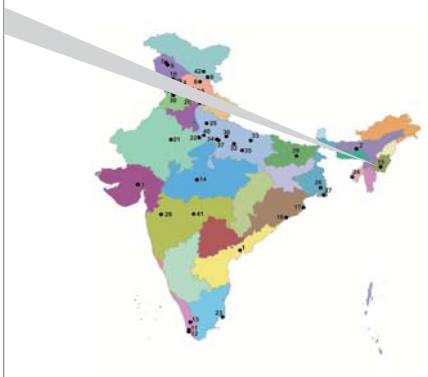
The Bhoj wetland was designated Ramsar site in November 2002. The wetland is a manmade unique reservoir consisting of twin lakes named Upper and Lower lakes (23°13'-23°16'N 77°15'-77°26'E). It is spread over an area of 65,000 ha and 129 ha situated at an elevation of 523 m above msl. The Upper Lake was created in the 11th century by constructing an earthen dam across the Kolans River which is surrounded by Van Vihar National Park on the south, and the lower is surrounded by human settlements from all sides. During the intervening 900 years the ecosystem has stabilized and presently it represents a naturalwetland.May is generally the hottest month with a mean daily maximum temperature of 40.7° C, and mean daily minimum temperature 26° C. In the summer the maximum temperature may go upto 44° C. During the monsoon, relative humidity is usually about 70%. Rest of the year the air is generally dry and the relative humidity is less than 20%. However, in the areas adjacent to the lakes, the relative humidity is about 40%. The wetland supports a wide variety of flora and fauna. 106 species of Macrophytes (belonging to 87 genera of 46 families), which includes 14 rare species and 208 species of phytoplankton have been reported from the wetland. 105 species of zooplanktons which includes (rotifers 41, protozoa 10, cladocera 14, copepod 5, ostracoda 9, coleopteran 11, and diptera 25) have also been reported. Fish fauna consist of 43 species

(natural and cultural species), 27 species of avifauna, 98 species of insects and more than 10 species of reptiles and amphibians (including 5 species of tortoise) have been recorded so far. Diverse flora provide an ideal habitat in the form of food and shelter for a large number of avifauna. Due to biotic interaction and natural selection process a characteristic relationship between vegetation and the avifauna has developed. A total of more than 20,000 birds have been observed annually. White stork, Blacknecked stork, Barheaded goose, Spoonbill, etc., that have been rare sighthings in the past have started appearing evidentially in the recent times. A recent phenomenon is the congregation of more than 100-120 Sarus cranes in the lake. Sincethe implementation of a management action plan in 1995 a number of bird species have been sighted which had rarely or never before been seen in the region. Life of the people of Bhopal is very much centralized in and around these two lakes and the people are sentimentally attached to the lakes. The lakes provide daily potable water supply, Immersion of Idols and Tazias, washing of cloth in lower lake, cultivation of water chesnut in upper lake and lotus in lower lake, and pisciculture are the regular activities.The water of the Upper Lake was used for drinking purposes up to year 1947 without any treatment which proves that water quality was very good. After Bhopal became the capital of Madhya Pradesh in 1956, it noticed tremendous population inflow and consequent rapid urban development which adversely affected the twin lakes. The wetland is under constant threat due to discharge of sewage water, growth of thick mats of aquatic weeds in the peripheral areas and increasing silt load from the surrounding hills and its catchment area.

The earlier studies on faunal diversity of the site recorded 21 spp of protozoans, 53 spp of rotifers, 1 sp of crustacean, 282 spp of insects, 45 spp of fishes, 9 spp of amphibians, 42 spp of reptiles, 46 spp of birds, 47 spp of mammals. The unexplored groups include nematodes, annelids, aranchnids, molluscs, fishes, amphibians, reptiles, birds, mammals, diversity of which can be revealed by future studies.

15. LOKTAK LAKE



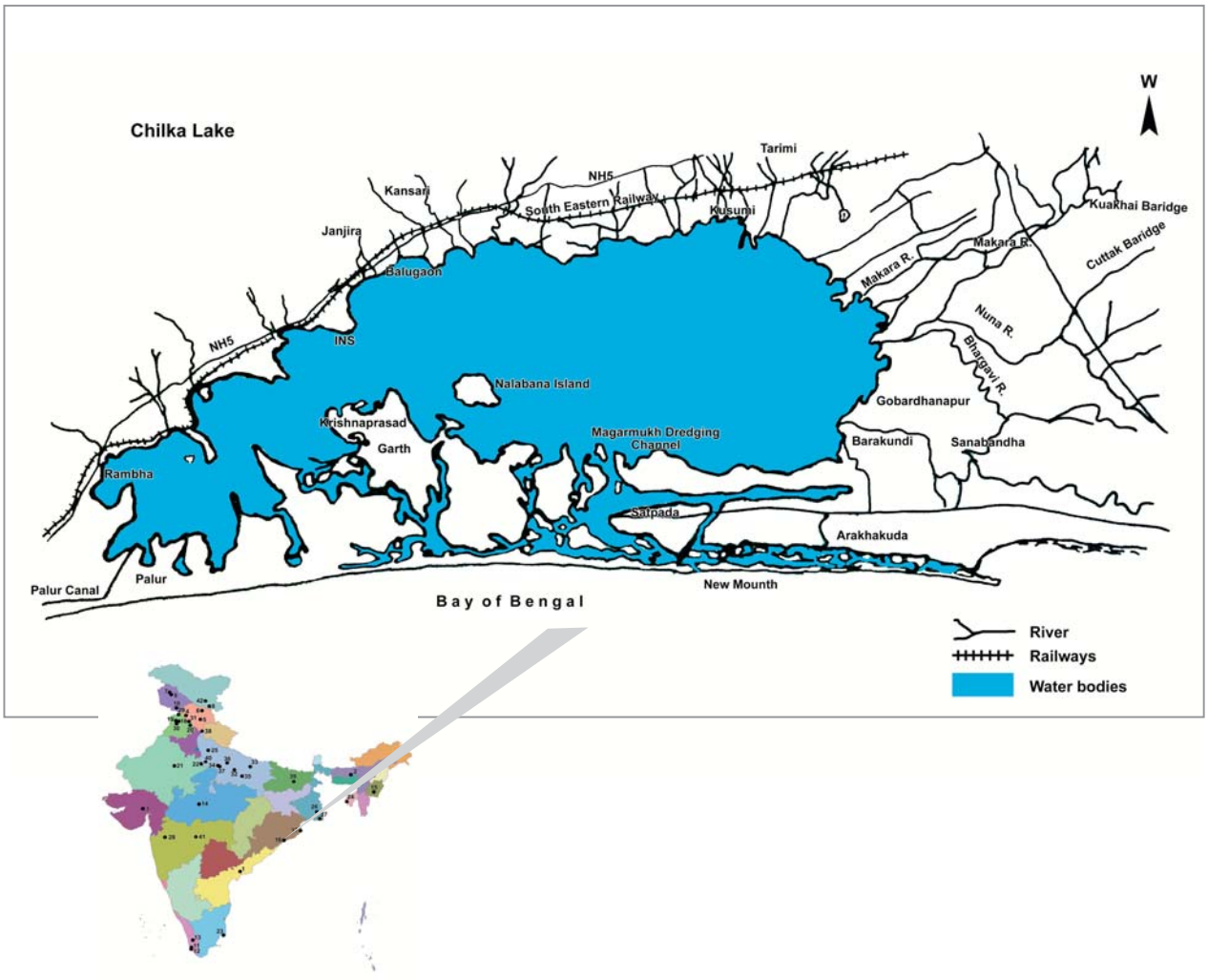


Loktak is the largest natural freshwater lake in the North Eastern region of India that plays an important role in the ecological and economic security of the region. The lake is spread over an area of 31200 ha in the district of Bishanpur, Manipur (24°25'-24°42'N 93°46'-93°55'E) situated at an elevation of 800-2070m above msl. It was designated a Ramsar site in the year 1990. It is a large shrinking freshwater lake where the surrounding swampland is supplied by several streams. It is covered extensively by naturally occurring phumids (mass of floating vegetation) which are a specialized habitat for many life forms. The aquatic macrophytes comprising 233 species belonging to emergent, submergent, free-floating and rooted floating leaf types have been found in the lake. 176 invertebrates and 249 vertebrates have been recorded from the lake, including some rare animals such as Indian python, Sambhar and Barking deer. The lake provides refuge to thousands of birds, of at least 116 species. Of these, 21 species of waterfowl are migratory, most migrating from different parts of the northern hemisphere beyond the Himalayas. Keibul Lamjao National Park is the natural habitat of one of the most endangered deer, the Thamin or Brow-antlered deer (Cervus eldi eldi) locally called Sangai which is represented by about hundred individuals and was once thought to be extinct (Pebam 2002). A large population of people living in and around the lake depend upon the lake resources for their livelihood.

It has been the breeding ground of a number of riverine migratory fishes from the Irrawady-Chindwin river system and an important fish habitat. It is of enormous socio-economic importance for the inhabitants of Manipur valley. The lake is used extensively by local people as a source of water for irrigation and domestic use and is an important wintering and staging area for waterbirds, particularly ducks. It also plays an important role in flood control. The livelihood of the rural population around the lake is dependent to a great extent upon the fish of the lake. Due to deforestation in the catchment area and denudation of vegetation, soil erosion rate has increased considerably during recent years and this has resulted in siltation of the lake. Severe infestations of the lake by water hyacinth compounded with the problem of phumids present in the lake greatly interferes with the water circulation resulting in increasing rate of siltation and pollutants getting deposited in the lake ecosystem. The root-cause of the problems can be traced to loss of vegetal cover in the catchment area and construction of the Ithai barrage. The construction of a dam for hydroelectric power generation and irrigation purposes has caused the local extinction of several native fish species.

Several earlier and recent studies explored faunal diversity where 51 spp of protozoans, 15 spp of rotifers, 78 spp of nematodes, 4 spp of annelids, 55 spp of crustaceans, 196 spp of insects, 17 spp of molluscs, 67 spp of fishes, 28 spp of amphibians, 30 spp of reptiles, 94 spps of birds, 1 sp of mammal are recorded from this site.

16. CHILIKA LAKE

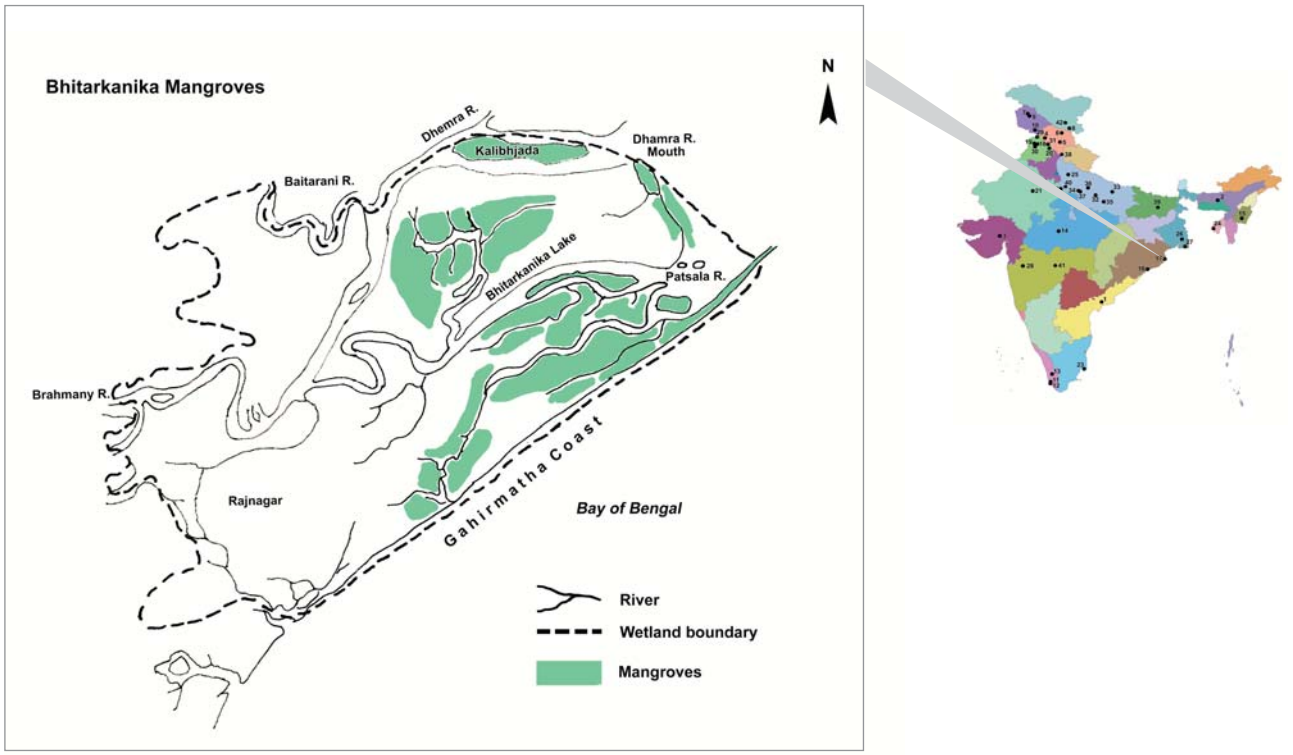


Chilika is the largest brackish water lagoon in India that is shallow throughout its spread. The lake is spread over an area of 116500 ha in the East coast of India in Odisha state (19°28'-19°54'N 85°06'-85°35'E) at an elevation of 0-2m above msl. It was designated as a Ramsar site in the year 1981. The lake is bordered in the North-east by the cultivated plains of Daya and Bhargavi valleys, in the North-West and West by forests of the Eastern Ghats in Puri and Ganjam districts, in South and South-East by the Bay of Bengal. The lake stretches over approximately 70 km in lenghthin north-east to south west, widest in its north-east side with about 30 km, and has a gradual pear shape tapering, narrow to 3 to 5 km, to the south west. The lake is connected to the sea by a 29 km long irregular channel with several small sandy and generally ephemeral islands. Very high productivity and the presence of a variety of habitats in and around the lake due to its part freshwater and part saltwater character, helping in the proliferation of an amazing number of species. The lagoon is of great value in preserving genetic ecological diversity because of the variety of habitats, flora and fauna. Chilika is one of the terminuses on the migratory flyways and some of the largest congregations of aquatic birds in India can be seen here, particularly in winter. Saline areas support aquatic algae. A major survey by Zoological Survey of India (ZSI) in 1985-88, revealed a large number of species present in and around the lagoon excluding terrestrial insects. Chilika attracts the huge number of migratory waterfowls found anywhere on the Indian subcontinent and the site is an important area for breeding, wintering and staging for 33 species of waterbirds. Over a million migratory waterfowl and shorebirds winter here and it comprises a substantial portion of the migratory flyway of several waterfowl. Among the endangered bird species are White bellied sea eagle and Peregrine falcon. It harbours an assemblage of marine, brackish

water and freshwater biota, a number of which are now listed in the endangered, threatened and vulnerable categories. Over 400 vertebrate species have been recorded. Several endangered, rare, threatened and vulnerable species are found here like Irrawady dolphin, Dugong, Green sea turtle, Spoonbill, Blackbuck and Fishing cat. Significant number of people are dependent upon the lake's resources. It supports fisheries that are a lifeline to a community of over 100,000 fisherfolk and contributes significantly to India's international trade. The past two decades have seen a lot of transformation in the ecological and social character of Chilika. Natural and anthropogenic problems include: situation; changes in salinity level; increase in weeds and aquaculture activities.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported from the site includes 104 spp of protozoans, 6 spp of poriferans, 17 spp of cnidarians, 46 spp of nematodes, 38 spp of annelids, 91 spp of crustaceans, 291 spp of insects, 134 spp of molluscs, 205 spp of fishes, 6 spp of amphibians, 34 spp of reptiles, 158 spp of birds, 19 spp of mammals. The animal groups which require further studies are rotifers and aranchnids.

17. BHITARKANIKA MANGROVES



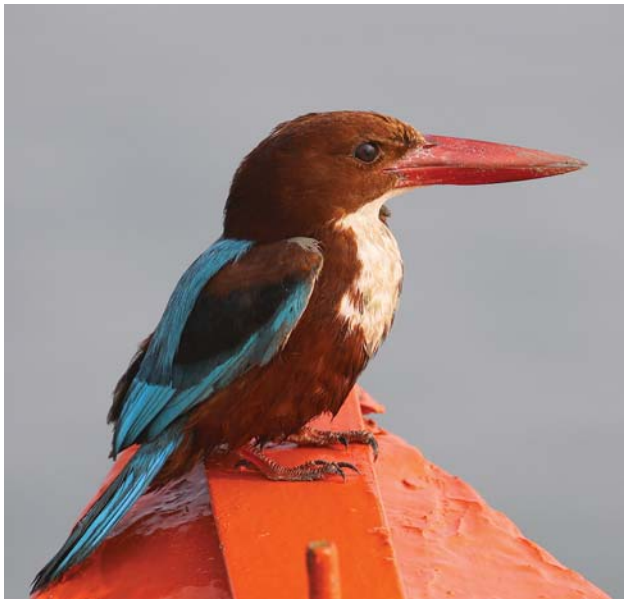
Bhitarkanika represents one of finest remnant patch of mangrove along the Indian coastal region, representing the Indo-Malayan mangrove community. The lake is spread over an area of 65000 ha in the deltaic region of two rivers namelyBrahmani and Baitarani on the Northeastern coast of India (20°30'-20°48'N 86°45'-87°03'E) at an elevation of 1.5-2m above msl, with the higher ground extending to 3-4 m. It was designated as a Ramsar site in August 2002. Due to 25 years of continued conservation measures implemented the site is one of the best known wildlife sanctuaries and emerged as renowned coastal wetland. The Gahirmatha beach, which forms the eastern boundary of Bhitarkanika Wildlife Sanctuary, supports the largest known nesting beach of Olive Ridley Sea Turtle in the world. Olive Ridley Sea Turtle (Lepidochelys olivacea) is an endangered species according to the IUCN Red List. Nearly half a million Olive Ridleys nest every year at Gahirmatha. Besides, the coastal water of Gahirmatha is a major mating area for the Olive Ridley sea turtle that migrate to this coast every winter (Dash and Kar, 1990). The mangrove forests and its adjoining wetlands support a large number of resident as well as migratory waterfowl. Of the 174 species of birds, 82 breed here and 57 species winter in Bhitarkanika. The endangered Lesser Adjutant Stork also breeds here. One of the largest heronries in the country is located here where more than 20,000 birds consisting of 11 species nest in this heronry during June to November perennially.

It supports a wide variety of wetland habitats ranging from tidal rivers and creeks to riverine islands and intertidal zones.Bhitarkanika supports the highest density of endangered saltwater crocodile (Crocodylus porosus) in India. Nearly 700 Saltwater crocodiles inhabit Bhitarkanika and its associated river systems (Kar and Patnaik, 1999). The wetland also supports Grey Pelican (Pelecanus philippensis) which is a vulnerable species according to IUCN Red List. The Water Monitor Lizard (Varanus salvator) otherwise rare in most part of India commonly occurs here. Besides the Water Monitor, two other species namely Common (V. bengalensis) and Yellow (V. flavescens) monitors are also sympatric here (Biswas and Kar, 1981). Notable among other reptiles of Bhitarkanika are King Cobra (Ophiophagus hannah), Burmese Python (Python molurus bivittatus), Banded Krait (Bungarus fasciatus), Common Krait (Bungarus caeruleus) and Golden Tree Snake (Chrysopelia ornata). Bhitarkanika is also home for several mammals. Five species of marine dolphins have been recorded from the area. The commonest species encountered in this area is the Indo-pacific Humpbacked Dolphin (Sousa chinensis). The other four species are Irrawady Dolphin (Orcaella brevirostris), Pantropical Spotted Dolphin (Stenella attenuate), Common Dolphin (Delphinus delphis) and Finless Black Porpoise (Neophocaena phocaenoides). The other common species of mammals encountered in this area are the Striped Hyaena (Hyaena hyaena), Fishing Cat (Felis viverrina), Jungle Cat (Felis chaus),

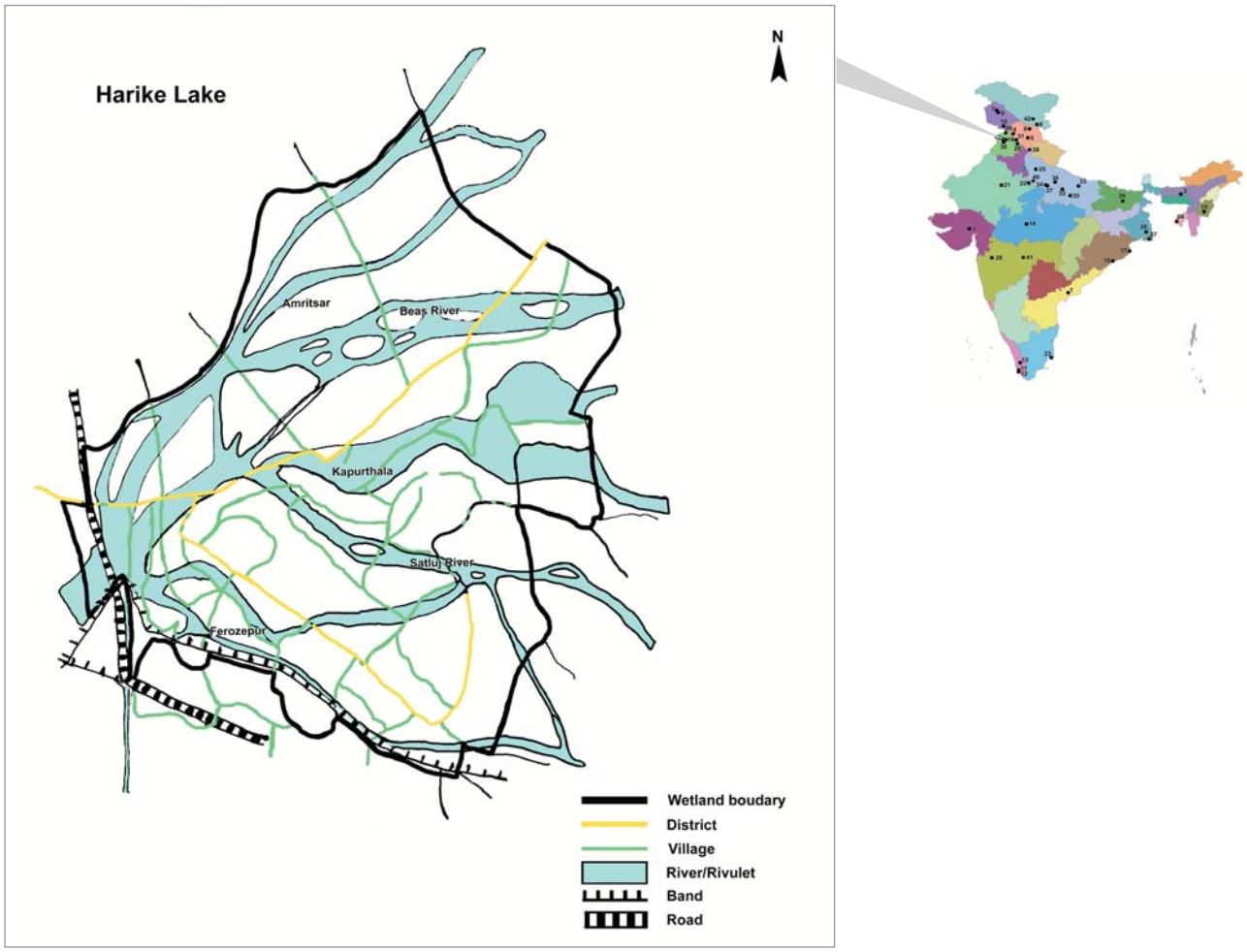
Smooth Coated Otter (Lutra perspiciliata), Civets (Paradoxurus hermaphrodites, Vivericula indica), Indian Porcupine (Hystrix indica), Wild Boar (Sus scrofa), Spotted Deer (Cervus axis) and Sambhar (Cervus unicolor).

Like many mangrove areas, the dense coastal forests provide vital protection for millions of people from devastating cyclones and tidal surges. Of the 58 recorded species of mangroves, 55 species are found in Bhitarkanika, wider mangrove diversity than in the Sundarbans. Traditionally, sustainable harvesting of food, medicines, tannins, fuel wood, and construction materials, and particularly honey and fish, has been the rule, but population pressures and encroachment may threaten that equilibrium. Increasing human population has been a major threat to this wetland resulting in construction of saline embankments for aquaculture and destruction of mangroves. Clearing of the mangrove forest for agriculture,intensive fishing activities in the peripheral river systems, exploitation of mangroves for house construction, fencing and fuel wood, poaching of wild animals are some of recents threats. The coastal wetlands and the agricultural fields adjoining these wetlands are increasingly being converted into brackish water prawn culture ponds. This has resulted in a loss of wintering ground for the migratory waterfowl.

Previous studies revealed partially about the faunal diversity of the site. 14 spp of amphibians, 9 spp of reptiles, 245 spp of birds, 13 spp of mammals are recorded from this site. The unexplored groups include protozoans, rotifers, nematodes, annelids, aranchnids, crustaceans, insects, molluscs, fishes, diversity of which can be revealed by future studies.



18. HARIKE LAKE



Harike Lake is a shallow water reservoir with thirteen islands, situated at the confluence of Sutlej and Beas rivers. The lake is triangular in shape, with its apex in the west, a bund, called the Dhussi Bund forming one side, a canal on the second and a major road on the third. The Harike barrage connects Amritsar city with Ferozpur, Faridkot and Bhatinda by a national highway. The lake is spread over an area of 4100 ha in the districts of Kapurthala, Ferozepur and Amritsar, Punjab (31°13'N 75°12'E) at an elevation of 218m above msl. It was designated a Ramsar site in 1990.

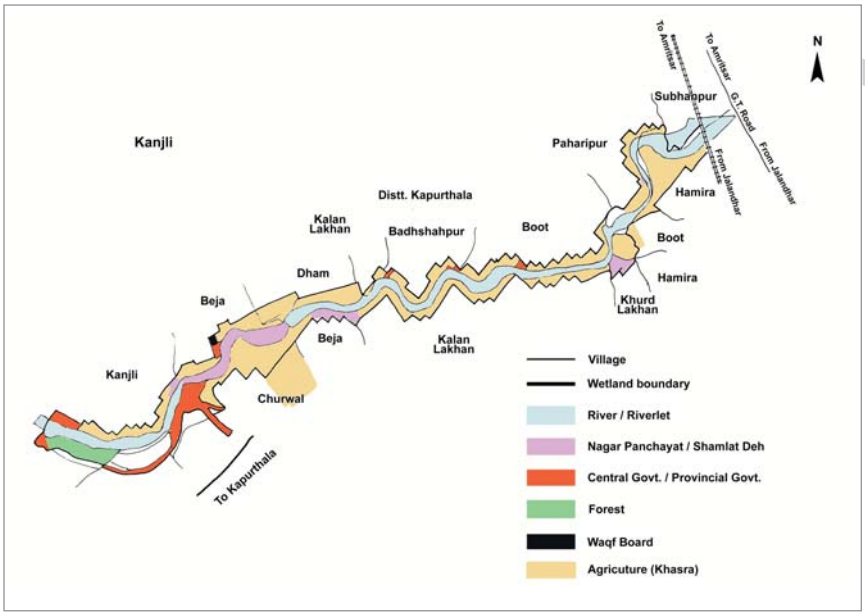
Harike lake constitutes the main reservoir which is the deeper portion of the wetland just adjoining the barrage, built downstream on to confluence of rivers near Harike township with the idea of storing and providing irrigation and drinking water to parts of southern Punjab and adjoining Rajasthan. Dense floating vegetation covers 70% of the lake, while the marshy islands and shores together with extensive wetlands stretching beyond the reservoir area, earthen mounds with trees have been constructed by the state wildlife department in the marsh area, to increase nesting sites for the birds. Harike Lake is an important site for breeding, wintering and staging birds, supporting over 200,000 Anatidae (ducks, geese, swans, etc.) during migration. It is a refuge for a large number of resident and migratory birds, in particular diving ducks, the Scaup duck, Falcated teal and the White-headed stiff tailed duck, species rarely seen elsewhere within India. The Wigeon, Common teal, Pintail, Shoveller, Brahminy ducks, Crested pochard, Common pochard and Tufted ducks are commonly seen during the winter. A total of 167 bird species were recorded during 1980-85 period; 40 species were long distance migrants which pass through or winter at Harike Lake. It supports rare, vulnerable and endangered faunal species which include the Testudine turtle and the Smooth Indian otter, both of which are listed in the IUCN Red list of Threatened Animals. Some 7 species of turtle and 26 species of fish have been recorded. The mammals found at Harike include the Jungle cat, Jackel, Indian Wild Boar and the Common Mongoose.

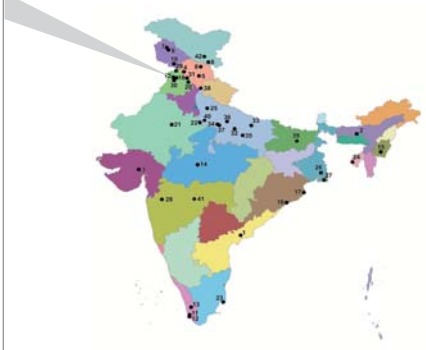
The wetland plays a major role in maintaining the hydrological balance in the catchment of the Sutluj and Beas River systems. The entire lake is leased on an

annual basis to commercial fishery organizations avital source of water and fish for the people of Punjab. The major cause of wetland loss and degradation include; large scale utilization of both surface and ground waters for irrigation. The expansion of intensive agriculture resulting in encroachments on the wetland habitat. Drainage of agricultural chemicals into the waters. Discharge of untreated waste from catchment towns into the rivers which feed the wetland, and consequent weed spread. Deforestation of the lower shivaliks, causing soil erosion and siltation.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups studied includes 10 spp of protozoans, 4 spp of annelids, 5 spp of molluscs, 71 spp of fishes, 349 spp of birds. The animal groups which require further studies are rotifers, nematodes, aranchnids, crustaceans, insects, amphibians, reptiles, mammals.

19. KANJLI





This freshwater wetland came into formation in 1870 with the construction of Head Regulator near village Kanjli on the Kali Bein rivulet in Kapurthala District.It is a permanent stream converted into a small reservoir at Kanjli for the purpose of storage for irrigation supplies. The wetland is spread over an area of 183 ha in the districts of Kapurthala (31°25'N 75°22'E) at an elevation of 210m above msl. It was designated a Ramsar site in February 2002. The average annual rainfall in the region is around 700 mm extending from July to mid October. The temperature ranges from an average minimum of 6° C, occasionally dropping below the freezing point of water, in winter to a maximum of 45° C in summer (Verma et al. 1994). Kali bein is one of the important tributaries of river Beas and played an important role in the formation of fertile plains by bringing down large sediment loads during floods with varying depth of water from 10 to 25 feet depending upon the season and water inflow. It is important from an ecological point of view as well as it provides many ecosystem services, supporting a considerable diversity of aquatic, mesophytic, and terrestrial flora and fauna in the biogeographical region, and acts also as a key regulator of groundwater discharge and recharge in particular seasons.

The dominant zooplankton species include Diffulgia sp., Vorticella sp., Brachionus sp., Epiphanes sp., Monostyla sp., Testudinella sp., Chaetogaster sp., Diaphanosoma sp., Ceriodaphnia sp., Chydorus sp.,

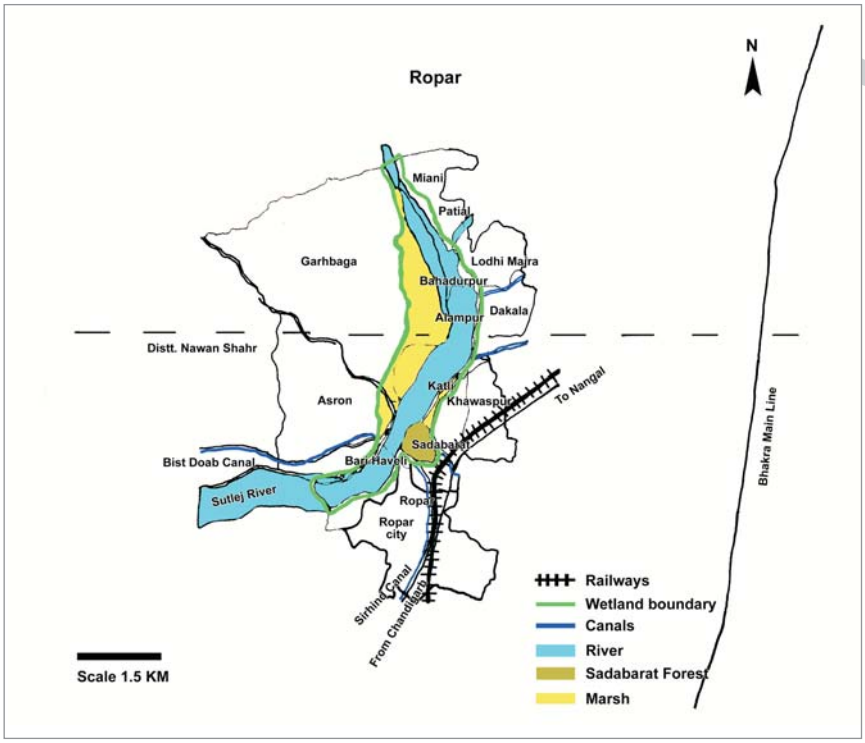
Macrothrix sp., Cyclops sp., Mesocyclops leuckartii and Chiromomus larvae. About 17 fish species have been reported, the common fish species are Catla catla, Channa marulius, C. striatus, Cirrhinus mrigala, Labeo calbasu, L. rohita. The wetland attracts a large number of resident and migratory birds. It acts as an important staging around for long distant migratory birds. About 50 species of birds have been reported. Some migratory birds of Kanjli wetland includes various species of waterfowl, White eyed pochard, Wigeon, Tufted

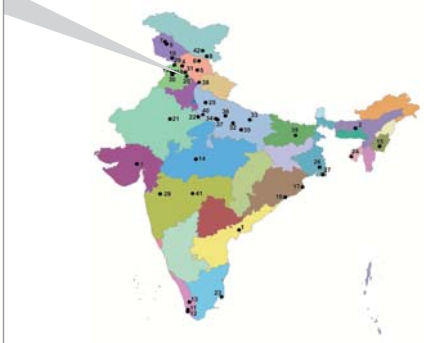
pochard, Common teal, Large whistling teal, Pintail, Mallard, Shoveller. Tortoise is commonly found in the area. Certain other reptiles have also been reported. The mammilion fauna includes Indian Civet, Mongoose, Indian porcupine, squirrel and common Indian hare.

The site plays a crucial role in the agriculture due to the direct abstraction of water for irrigation by the local population, which depends on the surrounding fertile plain. The stream is considered to be the most significant in the state from the religious point of view, as it is associated with the first Guru of the Sikhs, Shri Guru Nanak Dev Ji. The site is a center for environmental tourism and picnicking. Someconcern to the wetland includes excessive weed growth reducing inflow of water, increasing pollution levels, deforestation in catchment areas, excessive grazing, soil erosion etc.

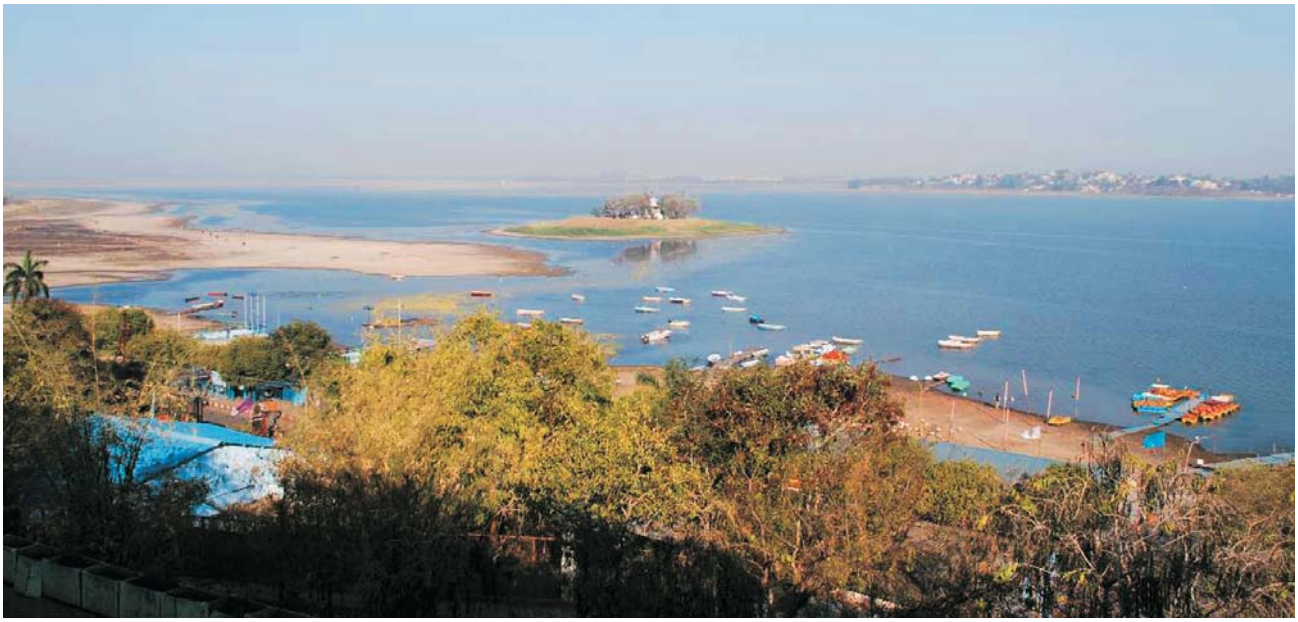
The earlier studies revealed about the faunal diversity of the site. 23 spp of protozoans, 13 spp of rotifers, 3 spp of nematodes, 14 spp of crustaceans, 4 spp of insects, 11 spp of molluscs, 17 spp of fishes, 8 spp of birds, are recorded from this site. The unexplored groups include nematodes, annelids, aranchnids, amphibians, reptiles, mammals, diversity of which can be revealed by future studies.

20. ROPAR





This is a man-made freshwater reservoir formed by the construction of a barrage in 1952 for diversion of water from the Sutlej River for drinking and irrigation to parts of Punjab and Haryana. It may be categorized as a man-made freshwater riverine and lacustrine wetland. The wetland is located at about 45 km in the North-West of Chandigarh and is spread over an area of 1365 ha (30°57'-31°06'N 76°25'-76°36'E) at an elevation of 275m above msl. It was designated as a Ramsar site in February 2002. It plays a significant hydrological role in charging the aquifers apart from providing protection from floods and enhancing water quality. Diverse kind of food chains and food webs are being supported. The Ropar wetland supports about 19 species of trees, 13 species of shrubs and grasses and about 15 species of aquatic plants. This wetland regularly supports a substantial proportion of a variety of both local and migratory birds and serves as breeding ground for many species. Coots (Fulica attra), are found in large numbers in this wetland area followed by Common Pochard (Athya ferina), Red Crested Pochard (Netta rufina), and Tufted Pochard (Athya fuligula). It serves as an important habitat for some threatened species in the Shivalik foothills like the Scaly Ant Eater and others.

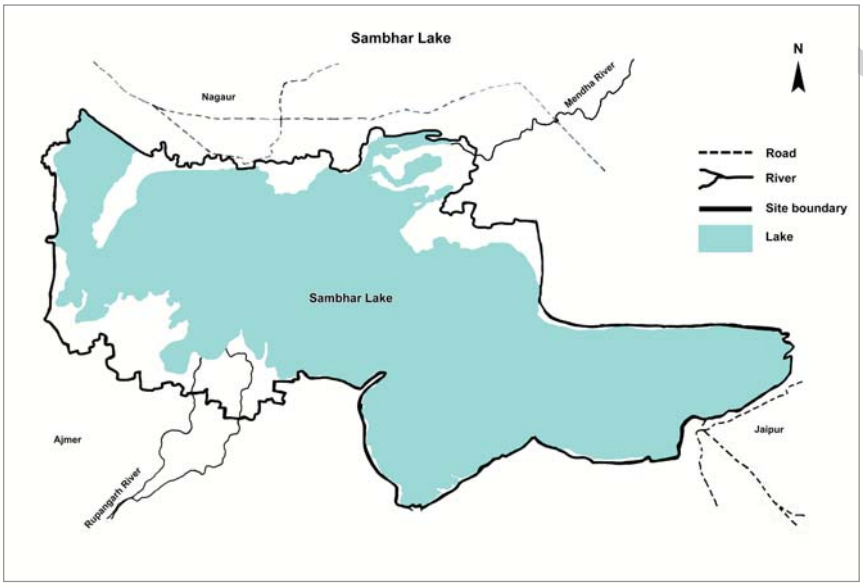


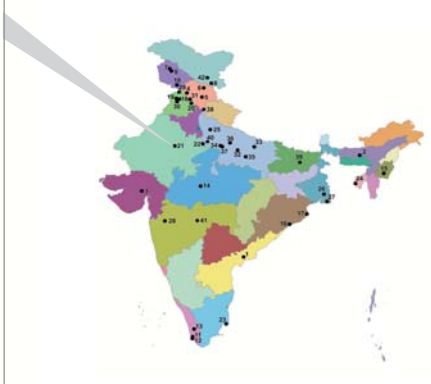
Some important species of snakes and amphibians are also found in this wetland. The Indian otter, Sambhar and Hog deer (Schedule-I of the Wildlife Protection Act, 1972) are also reported from this wetland and is also the probable habitat of the endangered Indian Pangolin (Manis crassicaudata). Local fisheries are economically significant, and wheat, rice, sugar cane, and sorghum are cultivated in the local area. This wetland contributes to the tourism activities to a substantial extent, i.e., nature lovers, bird watchers, swimmers and environmentalists visit the area regularly and enjoy its natural beauty.

The wetland faces severe problems of siltation from the adjoining barren and soft hills which need immediate greening. The hills are very prone to continuous and extensive erosion leading to shrinkage of the wetland area. External interference with the resident and migratory birds, illegal fishing and poaching of wildlife are some threats to many species. Increasing industrialisation is posing a big problem to the ecological status of Ropar wetland. The fertilizer plant at Nangal and, the thermal power plant at Ropar, are mainly responsible for water quality degradation of this ecosystem. Inflow of chemical pollutants like agrochemical resides run off, industrial effluents and sewage from some towns in the upper reaches like Nangal, Naya Nangal, Anandpur Sahib, Kiratpur sahib, need assessment and control measures. Invasive and growth of weeds (Parthenium and Lantana) into the wetland area is also a cause of concern.

This report reveals about the faunal diversity of the site, and also indicates the gap areas. The animal groups studied includes 10 spp of protozoans, 5 spp of annelids, 21 spp of insects, 22 spp of fishes, 4 spp of amphibians, 18 spp of reptiles, and 117 spp of birds. The animal groups which require further studies are rotifers, nematodes, aranchnids, crustaceans, molluscs, and mammals.

21. SAMBHAR LAKE





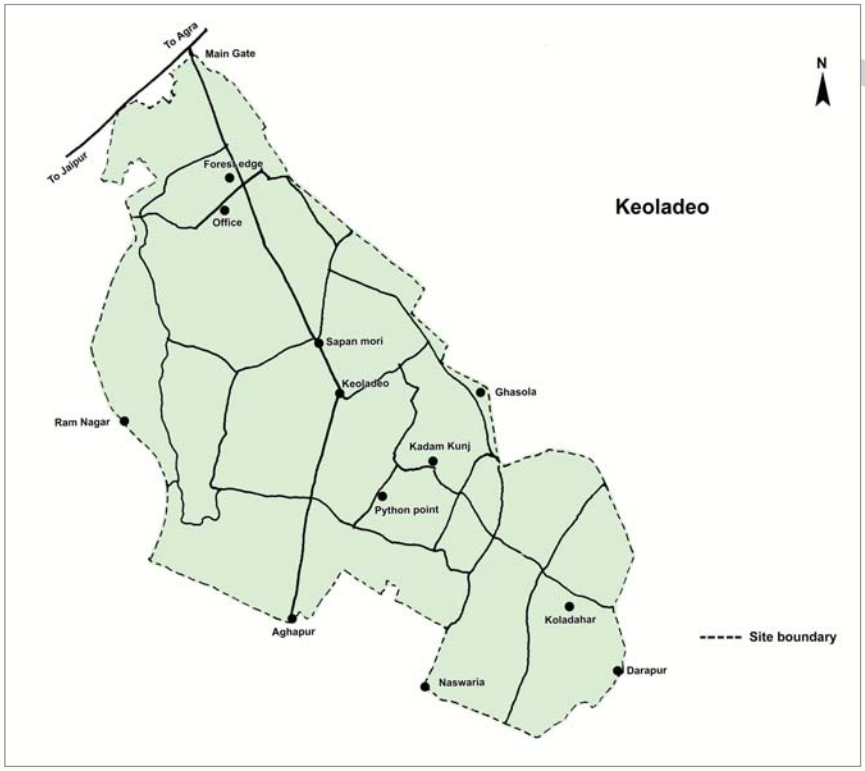
The Lake is spread over an area of 24000 ha in the district of Jodhpur, Rajasthan (26°52'-27°02'N 74°54'-75°14'E) at an elevation of 365m above msl. It was designated a Ramsar site in 1990. It is the largest salt water lake in India located 60 km west of Jaipur in Rajasthan. The large saline lake fed by four streams set in a shallow wetland with substantial seasonal fluctuations. It is surrounded by sand flats and dry thorn scrub. The waters of Sambhar have been used for manufacturing salt. Very low potassium concentration makes the brine quite unique.. There is, however, another distinctive feature of this extensive saline wetland. One of the most conspicuous organisms is the green algae, Dunaliella salina, common in salt water lakes.

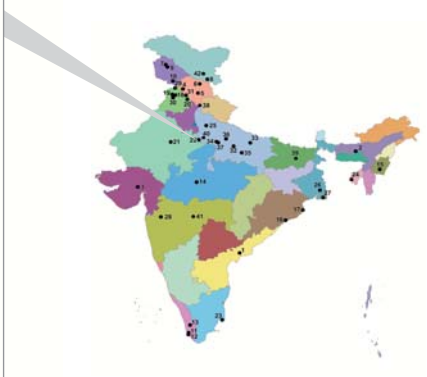
During winter, it receives large numbers of winged visitors, some migrating from as far north as Siberia. Sambhar Lake is famous for harbouring flamingos in large numbers, next only to Rann of Kutch in the country. The waders congregate here in appreciable

numbers besides migratory ducks; especially pochards, coots, northern shoveller, blackheaded gull and other aquatic birds. The terrestrial fauna confined to the catchment area includes rare/threatened species like Uromastix, saw-scaled viper, desert cat, desert fox etc. Some 45 species of aquatic birds including ducks, geese and shorebirds have been recorded and for many speciesSambhar Lake is one of the few perennial sustenance habitats. Human activities consist of salt production and livestock grazing.Siltation, soil saliniation and discharge of sewage from the town are some of the major problems confronting the wetland. Shortage of water and increasing desertification is a problem. Grazing pressure from domestic animals from some 20 villages located around the lake pose a threat. Illegal hunting by local people is also reported.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups studied includes 21 spp of protozoans, 46 spp of crustaceans, 70 spp of insects, 271 spp of birds, and 6 spp of mammals. The animal groups which require further studies are rotifers, poriferans, cnidarians, nematodes, annelids, aranchnids, molluscs, fishes, amphibians, and reptiles.

22. KEOLADEO NATIONAL PARK





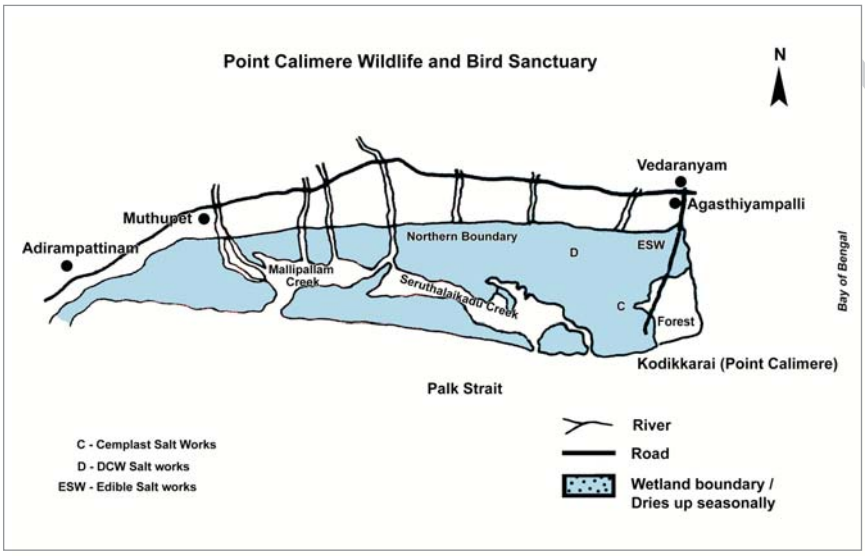
Keoladeo National park is situated at the confluence of the Ghambhir and Banganga rivers in Bharatpur district of Rajasthan, is one of the most enchanting waterfowl refuges in the world. The site is spread over an area of 2873 ha and is located about 50 kms in the west of city of Agra (27°07'-27°12'N 77°29'-77°33'E) at an elevation of 174m above msl. It was designated a Ramsar site in 1981. Climate is hot in summer with maximum temperature rising to 51°C and cold in winter at 0°C with fog. Monsoon is the main source of precipitation with an average rainfall of 662 mm. Keoladeo is a complex of ten artificial, seasonal lagoons, varying in size, situated in a densely populated region. Vegetation is a mosaic of scrub and open grassland that provides habitat for breeding, wintering and staging migratory birds. The richness and diversity of plant life inside this small park is remarkable. A total of 379 species was recorded in 1980. The tropical climate of Keoladeo with its variety of habitats ranging from upland terrestrial to submerged aquatic, along with the dynamics of the wetland system and its strategic geographic location on the flyway of migratory birds, contributes to the high diversity of life forms it can support.

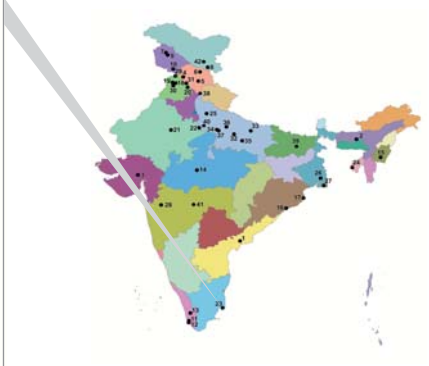
There has been a report of 354 species of birds from the park. It also supports 54 species of fish and in a good rainy season it receives more than 65 million fish fry and fingerlings along with water from the Ajan bund. The park has 27 species of herbivores, Bluebull, feral cattle and spotted deer are common while sambhar (Cervus unicolor), mongoose and civets are few. Wild boar, jackel, porcupine, hyaena and bats are also seen. Herpetofauna comprises of 7 species of turtles, 5 species of lizards, 13 species of snakes and 7 species of amphibians. Formerly known as the Bharatpur Ghana Bird Sanctuary, the park, which has been extensively modified and managed, supports enormous congregations of migratory waterfowl in winter, and massive colonies of breeding, fish-eating birds in the monsoon and autumn. The rare and most endangered of the cranes, the Siberian crane, which is reported in winter regularly only in Bharatpur in India, was the star visitor to the park till a few years back. The canal provides water for agriculture and domestic consumption. Cattle and water buffalo graze on the site. Major threats to the park system are derived from: shortage of water, agricultural run offs from the neighbouring villages contributing to pollutants such as heavy metals and pesticides. Additionally, the invasive

growth of the grass Paspalum distichum has changed the ecological character of large areas of the site, reducing its suitability for certain waterbird species, notably the Siberian crane.

The earlier studies on the faunal diversity of the site revealed 49 spp of rotifers, 2 spp of nematodes, 75 spp of aranchnids, 28 spp of crustaceans, 15 spp of insects, 54 spp of fishes, 354 spp of birds, 42 spp of mammals from this site. The unexplored groups include protozoans, annelids, molluscs, amphibians, reptiles, diversity of which can be revealed by future studies.

23. POINT CALIMERE WILDLIFE AND BIRD SANCTUARY



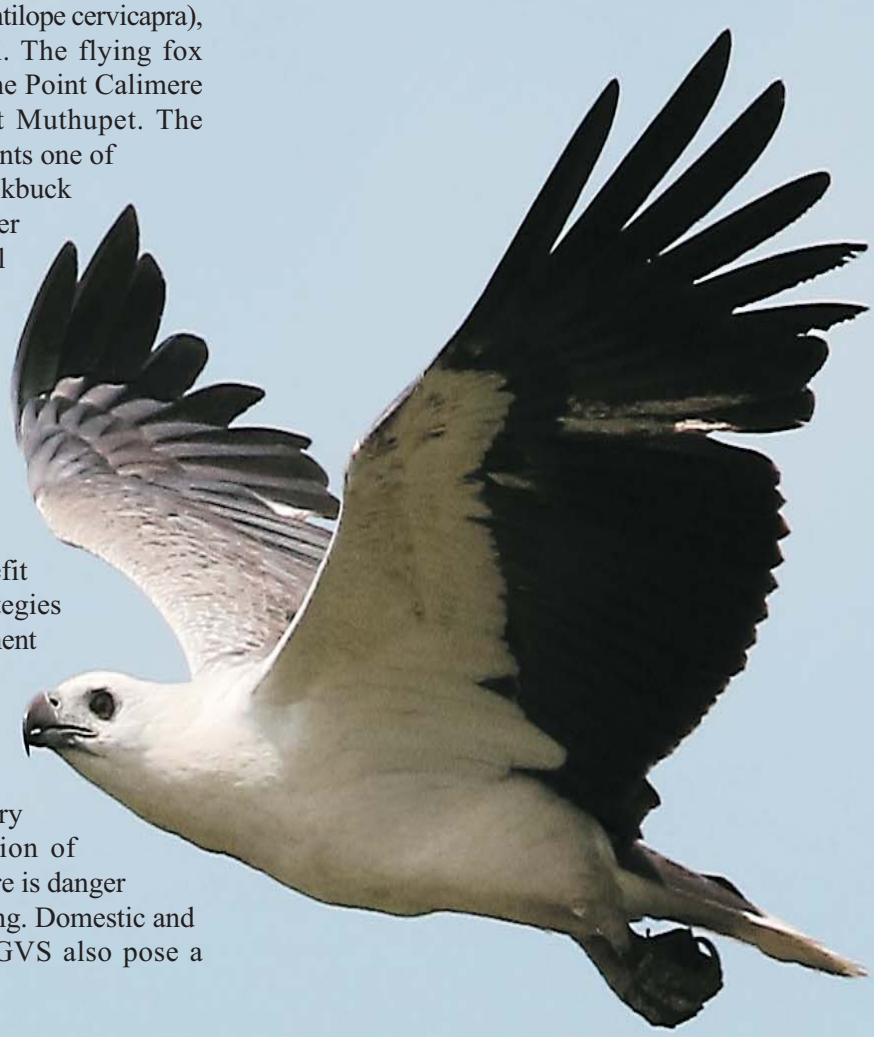


The Point Calimere Wildlife and Bird Sanctuary is a coastal area consisting of shallow waters, shores, and long sand bars, intertidal flats and intertidal forests, chiefly mangroves, and seasonal, often-saline lagoons, as well as human-made salt exploitation sites. The site includesthe existing Point Calimere Wildlife Sanctuary (WLS), Great Vedarnyam Swamp (GVS) and Talaignayar Reserve Forest (TRF). It is spread over an area of 38500 ha and is situated at the southern end of Nagappattnam district, Tamil Nadu (10°17'-10°22'N 79°25'-79°52'E) at an elevation of 0-6m above msl, the highest point being the Ramarpattham. It was designated a Ramsar site in 1981. The Point Calimere region was first identified as an area of high conservation significance for birds by the late Dr. Salim Ali in 1962. It is a marine-coastal wetland with a wide diversity of habitats and ecological features, including intertidal salt marshes, forested wetlands, mangroves and brackish to saline lagoons. Hydrological values include monsoon-season flood prevention, both in the surroundings and downstream due to water regulation, groundwater recharge, silt trapping and prevention of soil erosion. Due to the diversity of habitats, the vegetation of the

Point Calimere Wildlife Sanctuary is equally diverse, ranging from dry evergreen forests, mangrove vegetation, and salt marsh to grasslands. The dominant trees of the forest are Manilkara hexandra and Salvadora persica in the open areas. Insectivorous plants such as Drosera burmanii and D. indica are also present in the grassland habitat. It is the breeding ground or nursery for many species of marine fishes, which are vital to the fisheries of the coast.

More than 209 bird species have been identified; it supports about 30,000 flamingos, 200-300 endangered Grey Pelican (Pelecanus philippensis), the endangered Asian Dowitcher (Limnodromus semipalmatus), the vulnerable Spoonbill Sandpiper (Eurynorhynchus

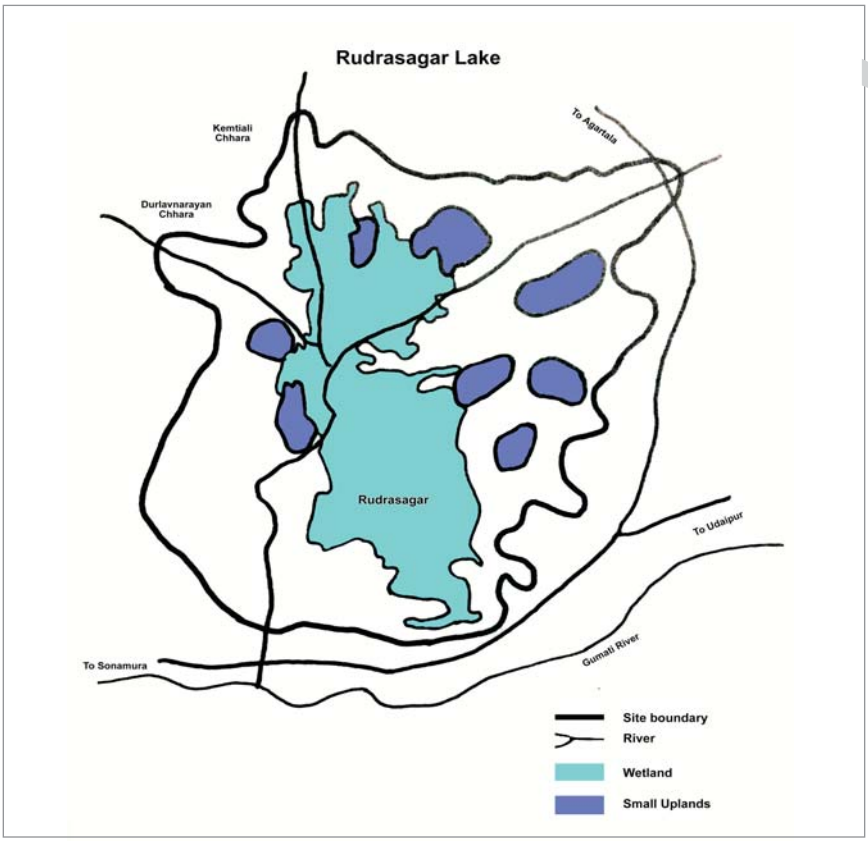
pygmaeus) as per the IUCN Red List, and tens of thousands of other waterbirds. Some of the major waterbird species are the Greater flamingo (Phoenicopterus roseus) and the Lesser flamingo (P. minor), Spot-billed pelican, Spoonbilled sandpiper, Asian dowitcher, White bellied seaeagle, Brahminy kite and Osprey. Landbirds include Paradise flycatcher, Indian pitta, Rosy starling, Blyth's reed warber, Crested serpent eagle and Brown shrike. Fourteen species of mammals have been reported from the sanctuary. The larger mammals are the blackbuck (Antilope cervicapra), spotted deer, wild boar and jackel. The flying fox resides in large groups on trees in the Point Calimere forest and the mangrove forest at Muthupet. The blackbuck of Point Calimere represents one of the three isolated populations of blackbuck existing in Tamil Nadu, with the other populations in the Guindy National Park, and near Satyamangalam.



One of the major outcoming resources is electricity generation and irrigation of water that is channelled to fertile areas of the Punjab and Rajasthan deserts. About 1800 fishermen have direct employment and 1000 families benefit indirectly. Recent management strategies have shifted away from law enforcement and use restrictions towards more participatory approaches and community awareness, and the site is well suited to "community-based ecotourism". Threats to the sanctuary mainly come from illegal extraction of timber and non-timber produce. There is danger from industrial pollution and poaching. Domestic and industrial saltworks operating in GVS also pose a serious problem.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups studied includes 106 spp of molluscs, 209 spp of birds, 9 spp of mammals. The animal groups which require further detailed studies are protozoans, rotifers, nematodes, annelids, aranchnids, crustaceans, insects, fishes, amphibians, reptiles.

24. RUDRASAGAR LAKE

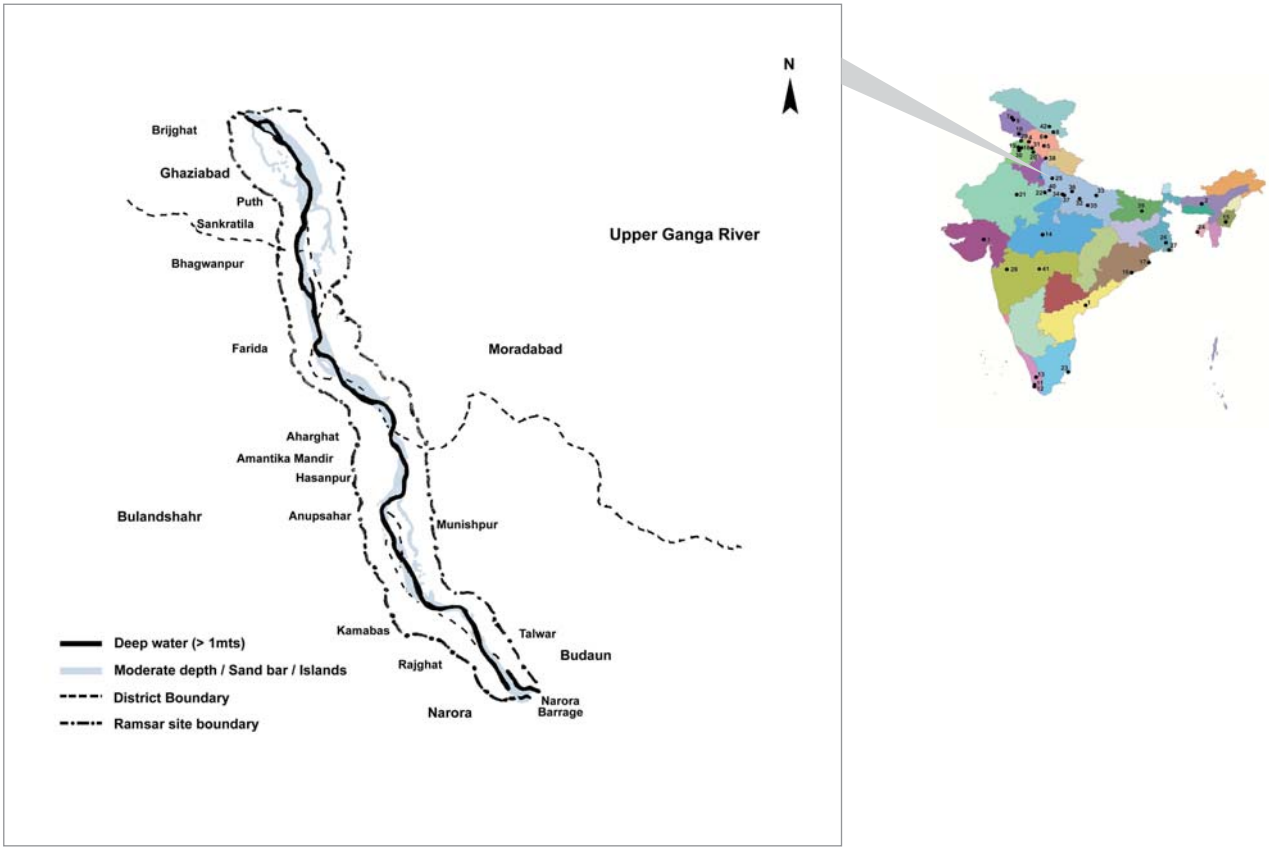


The lake is a lowland sedimentation reservoir in the Northeast hills, fed by three perennial streams namely Oacherra, Durlavnaraya cherra and Kemtalicherra discharging to the River Gomti by a discharging canal called Kachigang. It is spread over an area of 240 ha and is situated in the Melaghar Block under Soamura Sub-Division in the West Tripura District and at a distance of about 50 km from the state capital of Tripura (23°29'N 90°01'E) at an elevation of 7-16m above msl. It was designated as a Ramsar site in 2005. The lake is mainly formed by slit deposition of the streams, so the soil in lake area is silty clay loam to clay loam. Surrounding plains are used for paddy cultivation. Uplands in catchment are used for horticulture and agro-forestry and habitation. It is a very important site for flora as it supports endangered Azolla sps, Nelumbo

sps, Utricularia sps, Ipmea sps. The connection with the one of the main rivers makes it an ideal breeding ground for many aquatic life forms. Fish species include rare Macrobrachium sps, Botia sps, Notopterus Chitala, Cylonia sps, Kachuga sps, Oxygstus spp. and endangered species Mystusaor, Mystus gulio, Ompak paba, Notopterus chitala, Labeo bata, Cirrhinus reba, Macrobrachium rude, Macrobrachium rosenbergii, Channa marulius. It is abundant in commercially important freshwater fishes like Botia spp, Notopteruschitala, Mystus spp., Ompok pabda, Labeo bata, and freshwater scampi, with an annual production of 26 metric-tons, and an ideal habitat for IUCN Red listed Three-striped Roof Turtle Kachuga dhongka. Due to high rainfall (2500mm) and downstream topography, the wetland is regularly flooded with 4-5 times annual peak, assisting in groundwater recharge as well as a flood control basin. Lands are owned by the state with perennial water areas leased out to the subsistent fishermens' cooperative, and surrounding seasonal water bodies are cultivated for paddy. Main threats are the increasing silt loads due to deforestation, expansion of agricultural land and intensive farming, and land conversion for population pressure. This lake is used for recreation and tourism. Every year on "Nirmahal" festival is celebrated with participation from various states of India. Local people organise swimming competition, boat race, mela on the auspicious occasion of Vijaya Dashami. Most do sport fishing. Approximately 50,000 tourists from state and outside visit Rudrasagar every year.

The earlier studies revealed about the faunal diversity of the site, i.e., 7 spp of crustaceans, 5 spp of molluscs, 24 spp of fishes, are recorded from this site. The unexplored groups include protozoans, rotifers, nematodes, annelids, aranchnids, insects, amphibians, reptiles, birds, mammals, diversity of which can be revealed by future studies.

25. UPPER GANGA RIVER



The Upper Ganga river is spread over an area of 26590 ha and is a 85 km stretch from Brijghat (28°46'N 78°08'E) to Narora(28°21'N 78°17'E) and Ghaziabad, Bulandsahar, Badayun and Moradabadat with an elevation of from 204.7 to 183 m above asl. It was designated a Ramsar site in 2005. The Upper Ganga basin is a shallow river stretch of the great Ganges with intermittent small stretches of deep-water pools and reservoirs upstream from barrages. During the major part of the year the climate of the total river stretch is influenced largely by the prevalence of dry air, extreme temperatures in summer and winter. It is only during the monsoon months that air of oceanic origin reaches, bringing with it increased humidity, cloudiness and rain. Major plant species, some of which have high medicinal values, include Dalbergia sissoo, Saraca indica, Eucalyptus globulus, Ficus bengalensis, Dendrocalamus strictus, Tectona grandis, Azadirachta indica and aquatic Eichhorina.

More than 100 species of birds belonging to 34 families both aquatic and terrestrial avifauna were identified along with their population. The stretch includes Pintails (Anas acuta), Brahmini Duck (Tadorna ferruginea), Coot (Fulica atra), Cormorant (Phalacrocorax fuscicollis), Purple moorhen (Porphyrio porphyrio), Spoonbill (Platalea leucordia), Openbills (Anastomus oscitans), Barheaded geese (Anser indicus), Gulls (Larus ridibundus) according to 2002 survey conducted by WWF India. Upper Ganga River supports mammalian species like Ganges river dolphins (Platanista gangetica) listed in CITES, IUCN Redbook as Endangered, Common-otters (Lutra lutra), two species of crocodiles i.e. endangered (Gavialis gangeticus) and vulnerable (Crocodylus palustris). Under the national legislation these species are also protected as Schedule I of Wildlife protection Act 1972. A total of 88 species of fishes are reported from the stretch like Wallago attu, Chela laubuca, Colisa fasciatus, Chanda ranga, Glossogobius giuris, Nangra punctata, Puntius sp. and Puntius sophore are common in the river. Besides, out of 12 species of turtles identified from this stretch, 6 species are considered as endangered including Indian Softshell turtle (Aspideretes

gangeticus). This river stretch is of Hindu religious importance for thousands of pilgrims and is used for cremation and holy baths for spiritual purification. Major threats are sewage discharge, agricultural runoff, mass bathing, post cremation rituals, washing of clothes and intensive fishing. Conservation activities carried out are plantation to prevent bank erosion, training on organic farming, and lobbying to ban commercial fishing.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported from the site includes 88 spp of fishes, 20 spp of reptiles, 108 spp of birds, 21 spp of mammals. The animal groups which require further studies are protozoans, rotifers, nematodes, annelids, aranchnids, crustaceans, insects, molluscs, and amphibians.

26. EAST KOLKATA WETLANDS

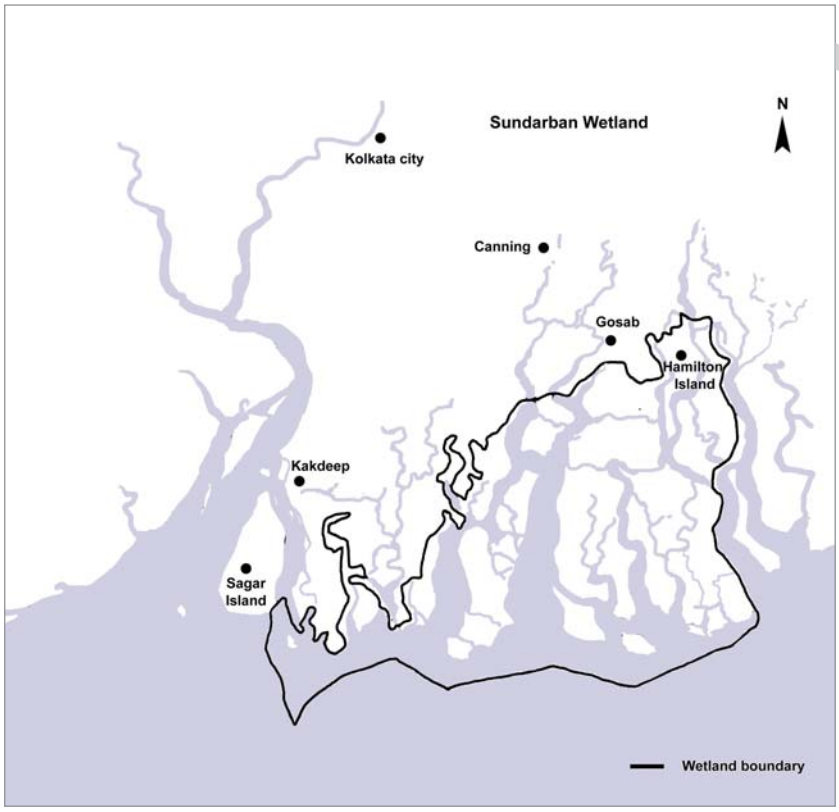
The East Kolkata (Culcutta) wetlands is World-renowned as a model of a multiple use wetland, the site's resource recovery systems, developed by local people through the ages, have saved the city of Calcutta from the costs of constructing and maintaining waste water treatment plants. It is spread over an area of 12500 ha and is situated in the Kolkata city, West Bengal (22°25'-22°40'N 88°20'-88°35'E) at an elevation of 02 m above msl. It was designated a Ramsar site in 2002 (Global Telecommunications System). It is used as a natural waste water treatment plant comprising intertidal marshes including salt marshes, salt meadows, with significant waste ponds, oxidation basins, largely human made and the naturally treated water chiefly used for pisciculture and agriculture, with sufficient amount of nutritional contents the water flows through fish culture areas covering about 4,000 ha, where most of their bio-chemical reactions with the help of solar energy. In the process, it treats the waste water and has saved the city of Kolkata from constructing and maintaining a wastewater treatment plant. Thus the system is described as "one of the rare examples of environmental protection and development management where a complex ecological process has been adopted by the local farmers for mastering the resource recovery activities" (RIS). The wetlands east of Kolkata are well known over the world for their multiple uses. The resource recovery systems, developed by the local people through ages using waste water from the city, are the largest in the world. The other ecological services provided by the wetlands are vegetables, fishes and many other essential comdities providing livelihoods for about 50,000 people directly and as many indirectly. The fish ponds are mostly operated by worker cooperatives, legal associations and in others in cooperative groups whose tenurial rights are under legal challenge. Amongst the rare mammals Marsh mongoose (Herpestes palustris), small Indian mongoose (Herpestes auropunctatus), Palm civet (Paradocurus hermaphroditus) and Small Indian civet (Viverricula indica) are significant in and around East Kolkata Wetlands area. About 12 mammals are reported from this region. Threatened reptiles like, Indian mud turtle Lissemys punctuta (locally threatened) is also reported occasionally from the adjacent locality. Among the reptiles significant species are Xenochorphis sp., Enhydrus enhydrus, Varamus salvator and Cerberus rhynchops are significant. Among the amphibians Rana

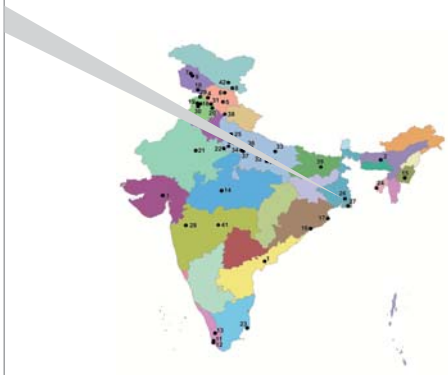
hexadactyla, Rana cyanophlyctis, Rana tigenna and Rana limnocharis are significant.

Presently more than 132 bird species comprising of both local and migratory types are reported to visit these clusture of wetlands. Among these grebe, coot, darter, shag, cormorant, teals, egrets, jacanas, snipes tern, eagle, sand piper, gulls, rails kingfishers etc. are significant. Apart from intense encroachment stress of urban expansion, a potential threat is seen in recent unauthorized use of the waste water outfall channels by industries which add metals to the canal sludge and threaten the edible quality of the fish and vegetables.

This report reveals about the faunal diversity of the site with compilation of 64 spp of protozoans, 126 spp of rotifers, 13 spp of poriferans, 8 spp of cnidarians, 72 spp of nematodes, 16 spp of annelids, 31 spp of aranchnids, 149 spp of crustaceans, 704 spp of insects, 191 spp of molluscs, 91 spp of fishes, 16 spp of amphibians, 27 spp of reptiles, 132 spp of birds, and 12 spp of mammals.

27. SUNDARBANS WETLAND



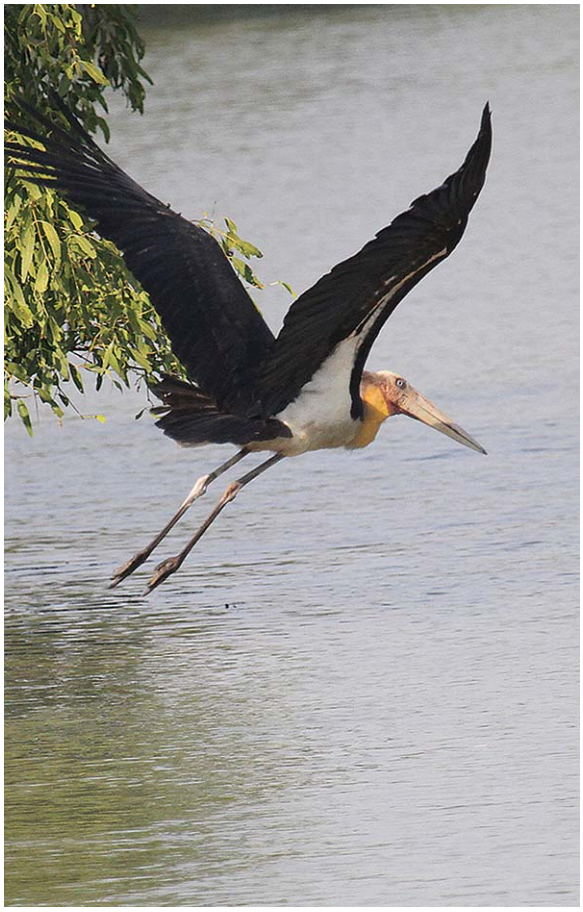


Sundarban Wetland is spread over two administrative districts, namely 24-Parganas (South) (13 blocks) and 24 Parganas (North) (6 blocks) in West Bengal (21°32'-22°40'N 88°05'-89°00'E; at an elevation of 02 m above msl.) over an area of 9630 sq. km. It was designated a Ramsar site in 2019.It is bound by the river Hooghly on the west, Ichamati-Kalindi-Raimangal on the east, Dampier-Hodges line on the north and the Bay of Bengal on the south. The wetland is located within the largest mangrove forest in the world, the Sundarbans, which encompasses hundreds of islands and a maze of rivers, rivulets and creeks, in the delta of the Rivers Ganges and Brahmaputra on the Bay of Bengal in India and Bangladesh.The Sundarbans constitutes over 60% of the total mangrove forest area in the entire country and has 90% of the total Indian mangrove species. These comprise of true mangroves or major elements, minor elements of mangroves and mangrove associates, black mangrove trees and shrubs, non-halophytic non-mangrove associates in the area, halophytic herbs, shrubs, and weeds and epiphytic and parasitic plant. The Sundarban Tiger Reserve is situated within the Site and declared as "critical tiger habitat" under national law and also a "Tiger Conservation Landscape" of global importance. The Sundarbans are the only mangrove habitat which supports a significant population of tigers. Two of the world's four horseshoe crab species, and eight of India's 12 species of kingfisher are also found here. The uniqueness of the habitat and its biodiversity, and the many tangible and intangible, local, regional and global services they provide, makes the Site's protection and management a conservation priority.The Tiger Reserve is also home to a large number of endangered and globally threatened species like the fishing cat (Prionailurus viverrinus) and estuarine crocodile (Crocodilus porosus), Gangetic (Platanista gangetica) and Irrawady Dolphin (Oracella brevirostris), King cobra (Ophiophagus hannah) etc. Among other mammals, terrestrialfauna comprises of wild boars, spotted deer, porcupines, otter and monkeys, which are the principal species of wild animals found in the Sundarbans. Among the reptiles, the King Cobra, the common cobra, Banded Krait, Russells Viper comprise the community of venomous reptiles, while the Phython, Chequered KilBack, Dhaman, Green Whip Snakle and several other species constitute the non venomous snakes. The lizards are mainly Varanus salvatorand the rare monitor frequently found within

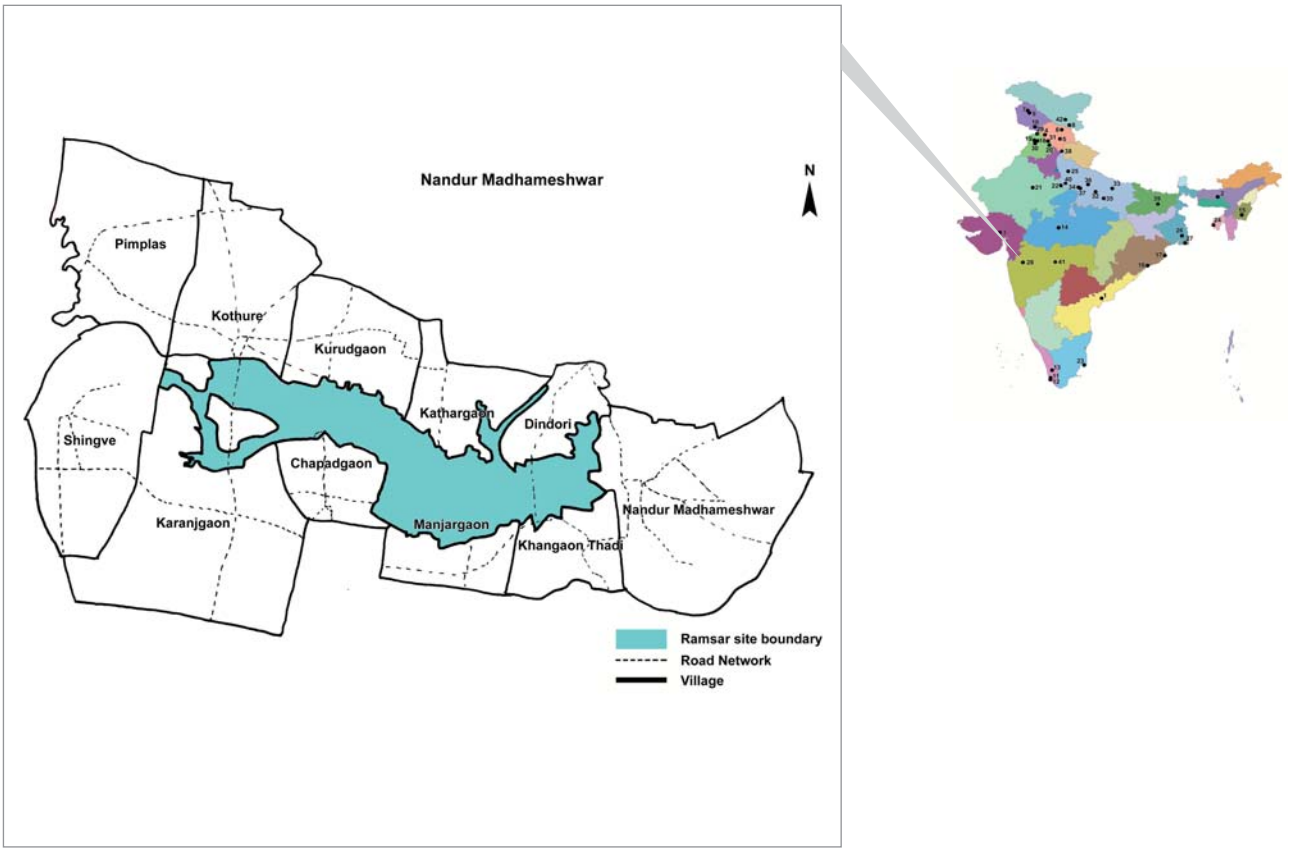
the reserve. The sea facing beaching of the Reserve forms a nesting ground for Olive Ridley Turtles (Lepidochelys olivacea). The endangered Northern River Terrapin (Batagur baska) also uses the beaches as their nesting round.

Sundarban is extremely rich in avifauna which includes a large number of migrants from the higher latitudes that visit the area in winter. It consists of herons, egrets, cormorants, vultures, green pigeons, sand pipers, large and small spoonbills, darters, seagulls, teal, partridges and a great variety of wild geese and ducks. Also found are Whale Shark, Tiger Shark, Hammer Headed Shark, Saw fish, Guitar Fish and some common edible fishes for e.g., Hilsa ilisha, Septipinna breviceps, S. Taty, Gudusia chapra etc. Among the crustaceans, commonly found are the One Armed Fiddler Crab (Uca spp.) and the two species of trilobite (Tachepleursgygus and Carcinoscropius rotundicauda). The mangrove forests protect the hinterland from storms, cyclones, tidal surges, and the seepage and intrusion of saltwater inland and into waterways. They serve as nurseries to shellfish and finfish and sustain the fisheries of the entire eastern coast.

The earlier studies revealed about the faunal diversity of the site with a report of 185 spp of protozoans, 1 spp of poriferans, 8 spp of cnidarians, 56 spp of nematodes, 34 spp of annelids, 150 spp of aranchnids, 304 spp of crustaceans, 801 spp of insects, 207 spp of molluscs, 371 spp of fishes, 11 spp of amphibians, 75 spp of reptiles, 380 spp of birds, and 61 spp of mammals are recorded from this site.



28. NANDUR MADHAMESHWAR



The Nandur Madhameshwar is spread over an area of 1437 ha and is located 40 km away from Nashik town in Maharastra (20°01'18"N 74°06'24"E) at the confluence of Godavari and Kadawa River, is a mosaic of lakes, marshes and riparian forest on the Deccan Plateau, at an elevation of 514-536 m above msl. It was designated a Ramsar site in September 2019. The climate of the area is generally dry, except during South-West monsoon season. The maximum temperature in summer is 42.5°C and minimum temperature in winter is less than 5.0 °C. The region receives around 750 mm of rainfall, most of which is concentrated during the monsoon period. During the construction of the Nandur Madhameshwar at the confluence of the Godavari and Kadwa rivers, the site was created originally designed to overcome water shortages in the surrounding area. The site now acts as flood control basin, ground water recharge, supporting rich biodiversity. Reported species richness includes at least 536 species of aquatic and terrestrial plants, eight species of mammals, 25 species of freshwater fishes and 41 species of butterflies.

Of the recorded birds, 148 inhabiting the wetland are migratory. The reservoir is an important staging and wintering ground for migratory waterfowl, of which over 20,000 have been recorded. These include Little Cormorant (Phalacrocorax niger), Black-winged Stilt (Himantopus himantopus), Black-tailed Godwit (Limosa limosa), Little Stint (Calidris minuta) and Small Pratincole (Glareola lacteal). The Eastern Imperial Eagle Aquila heliaca is the only globally threatened species known from this area. 25 fish species from ten families at Nandur Madhameshwar wetland were recorded by Central Institute of Fisheries Education, Mumbai. The wetland helps to protect fish species until they mature and reach breeding stage. The

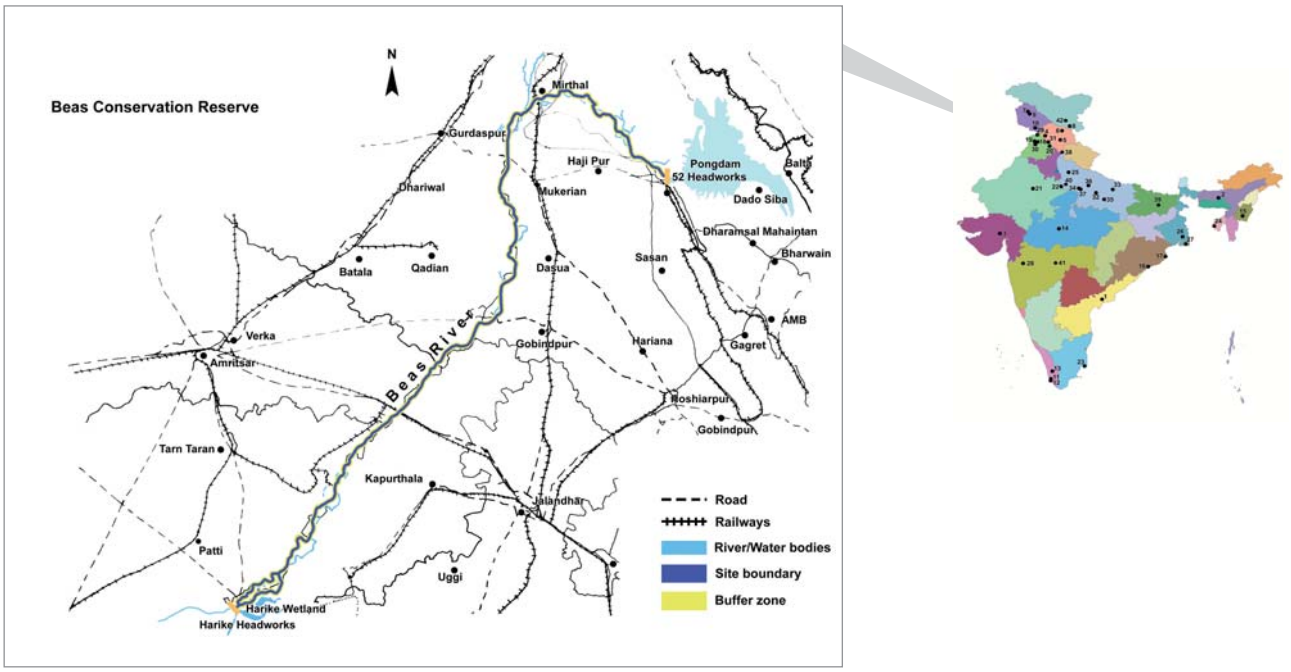
productive and shallow habitats resulted from continuous accumulation of silt are extensively used as feeding and spawning grounds and nurseries by fishes during rainy season. The occurrence of Ompok malabaricus, Parapsilorhynchus prateri and Rasbora labiosa are endemic to Western Ghats and other native fishes at Nandur Madhameshwar is proof that the site is vital for food, spawning and migration path on which fish stocks, within and outside the sanctuary depends. The site harbours some of India's most iconic species, such as the leopard and Indian sandalwood (Santalum album). It also inhabitated by critically endangered species including Deolali minnow (Parapsilorhynchus prateri), Indian vulture (Gyps indicus) and white-rumped vulture (Gyps bengalensis). Invasive species including common water hyacinth (Eichhornia crassipes) threaten the site, along with the effects of urban development and water abstraction. The wetland is also known for providing variety of ecosystem services like regulating services (recharging of ground water, climate regulation, safety from floods), supporting services (facilitating nutrient recycling, soil formation, providing habitat to flora and fauna) and cultural services (providing recreational and tourism opportunities, supporting spiritual and cultural practices, facilitating scientific research).

29. KESHOPUR-MIANI COMMUNITY RESERVE

The Keshopur-Miani Community Reserve is spread over an area of 34390 ha and is located in the State of Punjab, lying in the flood plains of the rivers Ravi and Beas (32°05'34"N 75°23'23"E) at an elevation of 242-245 m above msl. It was designated a Ramsar site in September 2019. The Reserve is a mosaic of natural marshes, aquaculture ponds and agricultural wetlands, chiefly fed by the annual rainfall runoff. The vegetation types include free floating macrophytes like Eichhornia crassipes, Pistia stratiotes, and Salvinia molesta and emergent like Phragmites sps, Cyperus papyrus, Typha species and wild rice species. The highest number of migratory water bird species recorded from annual bird census includes Fulica atra, Mareca strepera, Gallinula chloropus, Spatula clypeata, Anas acuta and Anas crecca. It is heavily human-influenced, and includes a series of managed fishponds and cultivated crops such lotus and chestnut. This management helps support a variety of flora, with 344 species of plants recorded in the area. It is an example of well human- managed wetland which provides food for people and supports local biodiversity. Threatened species present include the vulnerable common pochard (Aythya ferina) and the endangered spotted pond turtle (Geoclemys hamiltonii). Hydrological values are recharging of ground water for sustaining agriculture, habitat for resident and migratory birds and rare and endangered species, stabilisation of local climate, natural storage base for carnon and natural sinks for pollutants. It is an important corridor for movement of animals.

Previous studies revealed about the faunal diversity of the site 20 spp of insects, 24 spp of fishes, 2 spp of amphibians, 19 spp of reptiles, 128 spp of birds, 15 spp of mammals are recorded from this site. The unexplored groups include protozoans, rotifers, nematodes, annelids, aranchnids, crustaceans, molluscs, diversity of which can be revealed by future studies.

30. BEAS CONSERVATION RESERVE

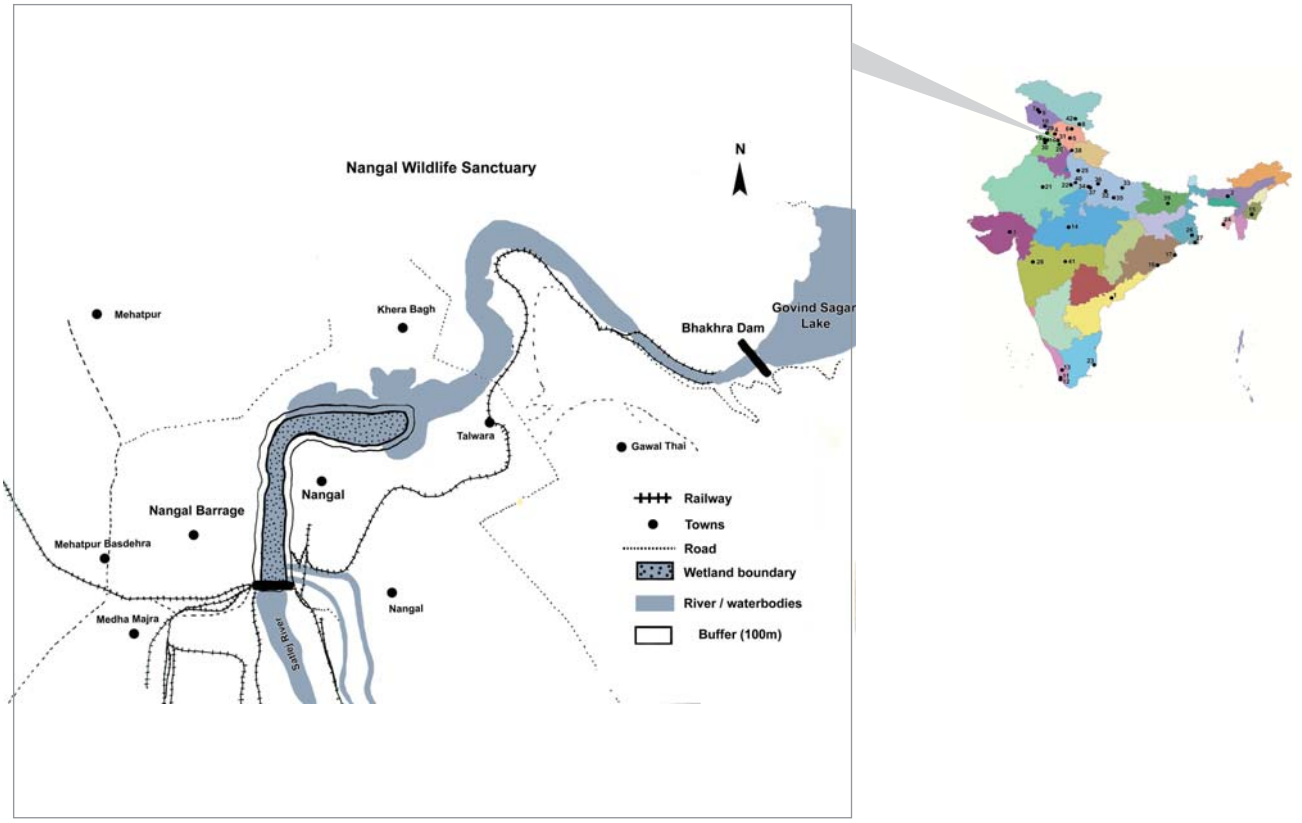


Beas Conservation Reserve is a 185-kilometre stretch of the Beas River located where the river meanders from the Himalayan foothills to the Harike Headworks, where its course is diverted into a number of channels. It is spread over an area of 642892 ha and is located primarily in the north-west of the State of Punjab (31°23'41"N 75°11'40"E) at an elevation of 210-320 m above msl. It was designated as a Ramsar site in September 2019. The main channel of the river is broad and dotted with islands, sand bars and braided channels creating a complex environment and supports adequate biodiversity. The soil mainly constituted by recent deposits known collectively as Indo-gangetic alluvium. The average depth of the Beas conservation reserve varies from about 1.5 m during the dry season to about 4.5 m during the rainy season. The soil mainly constitutes recent deposits known collectively as Indo-gangetic alluvium, which consists of alluvial sand, clay and loam. The temperature ranges from a minimum of around 1°C in January to a maximum of about 45°C during the peak summer in June. The conservation reserve has fish species including Indian river shad (Gudusia chapra), dwarf barb (Puntius phutunio), Indian rohu (Labeo rohita), freshwater garfish (Xenentodon cancila), rayfinned fish (Osteobrama cotio), reba carp (Cirrhinus reba), singhara (Sperata seenghala), sole (Channa marulius), grass carp (Ctenopharyngodon idella), silver carp (Hypophthalmichthys molitrix), common carp (Cyprinus carpio), katla (Catla catla), mali (Wallago attu), mrigal (Cirrhinus mrigala), white carp, salmo (Salmo facia), olive barb (Puntius sarana), large razerbelly minnow (Salmophasia bacaila), dwarf river monster (Bagarius bagarius), chitala (Chitala chitala), bagrid catfish (Rita rita).The site is inhabitated by many fresh water turtless like Indian softshell turtle, Indian flapshell turtle, narrow-headed softshell turtle, spotted pond turtle, crowned river turtle and brown roofed turtle.The Reserve also hosts the only known population in India of the endangered Indus river dolphin (Platanista gangetica minor). Further threatened species include the endangered masheer (Tor putitora) and hog deer (Axis porcinus) as well as the vulnerable smooth-coated otter (Lutrogale perspicillata). In 2017, a programme was initiated to re-introduce the critically endangered gharial (Gavialis gangeticus) with 47 individuals released into the River 30 years after their disappearance. Major threats include urban and domestic pollution as well as impacts of agriculture along most

of the River's course. The Department of Forests and Wildlife Preservation, Punjab, conduct the scientific management of the wetland.

This report reveals about the faunal diversity of the site and also indicates the gap areas. The animal groups reported from the site includes 2 spp of protozoans, 2 spp of crustaceans, 18 spp of fishes, 5 spp of reptiles, 5 spp of mammals. The animal groups which require further detailed studies are rotifers, nematodes, annelids, aranchnids, insects, molluscs, amphibians, birds.

31. NANGAL WILDLIFE SANCTUARY

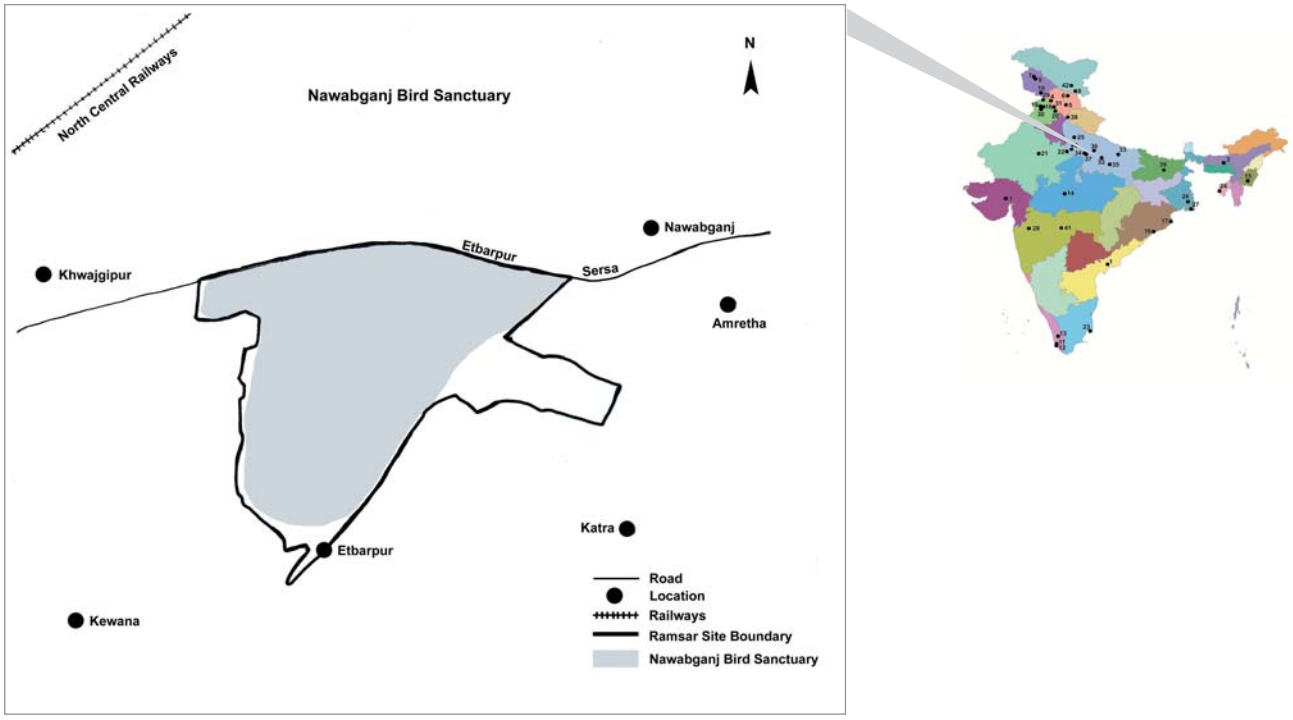


The Nangal Wildlife Sanctuary is spread over an area of 11600 ha and is located 100 km from Chandigarh in Punjab in Northwest India (31°22'-31°37'N 76°23'-76°38'E), at an elevation of 326 m above msl. It was designated a Ramsar site in September 2019. The site situated in the Shiwalik foothills of Punjab, is the highly eco-sensitive Nangal Wildlife Sanctuary, supporting abundant flora and fauna. The Sanctuary is bordered in the North by boundary of Himachal Pradesh and private land of village Swamipur bagh and Khera bagh, in the South by Urban area of Nangal town and expense of Sutlej River, in the east by private/urban land of villages Talwara, Dabheta and Hambewal, and in the west by private land of village Bhabour Sahib and Naya Nangal. It has a man-made reservoir constructed as part of the Bhakra-Nangal Project in 1961. It is an important ecosystem for its significant hydrological values as it helps to regulate the water cycle, stabilize microclimate, in recharging of groundwater and maintains the quality and quantity of water. It plays a major role in trapping the sediments and also in preventing and reducing the heavy flow of water and saves public property from devastating floods. It also regulates nutrient cycling which help in optimum functioning of hydrological, ecological and biological processes of nature. It also regulates nutrient cycling which help in optimising the productivity of the floodplains of the surrounding villages. More than 150,000 people of the surrounding villages are directly benefiting from the ecosystem services of the wetland and nearly half a million downstream are indirectly benefited. The characteristic vegetation of the wetland includes Typha elephantine, Phragmites karka and tall grasses, mainly Saccharum spontaneum and Saccharum bengalense. There are also Cenchrus species (anjan grass) in sandy places and Desmostachys bipinnata (dab) flourishes under dry conditions. Vetiveria zizanoides, Arundo donax (nara), Eragrostis atrovirens, Cyperus rotundus, Cyperus difformis (nut grass) are the other major species in the marshy areas. The reservoir attracts several resident as well as migratory birds, making it a biodiversity rich wetland. Nangal Sanctuary is a very important and strategic refuelling base for the very long distance/route migratory birds. Species of high conservation significance reported from the sanctuary are Axis porcinus, Manis crassicaudata, Panthera pardus, Sterna acuticauda, Aythya farina, Aythya nyroca, Ciconia episcopus,

Clanga clanga, Neophron percnopterusm, Mycteria leucocephala, Haliaeetus leucoryphus, Python molurus, Ompok pabda, Chitala chitala, Tor putitora, Cirrhinus cirrhosis and Wallago attu. It is inhabitated by the endangered Indian pangolin (Manis crassicaudata) and Egyptian vulture (Neophron percnopterus) and the vulnerable leopard (Panthera pardus). The site is of historic importance as the Indian and Chinese Prime Ministers formalized the "Five Principles of Peaceful Coexistence" here in 1954. More than half a million people downstream benefit from the reservoir as the flow of water is regulated, reducing the risks of floods.

The document presents the faunal diversity of the site with report of 6 spp of protozoans, 18 spp of insects, 01 sp of reptiles, 03 spp of mammals. The unexplored groups include rotifers, nematodes, annelids, aranchnids, crustaceans, molluscs, and amphibians, diversity of which can be revealed by future studies.

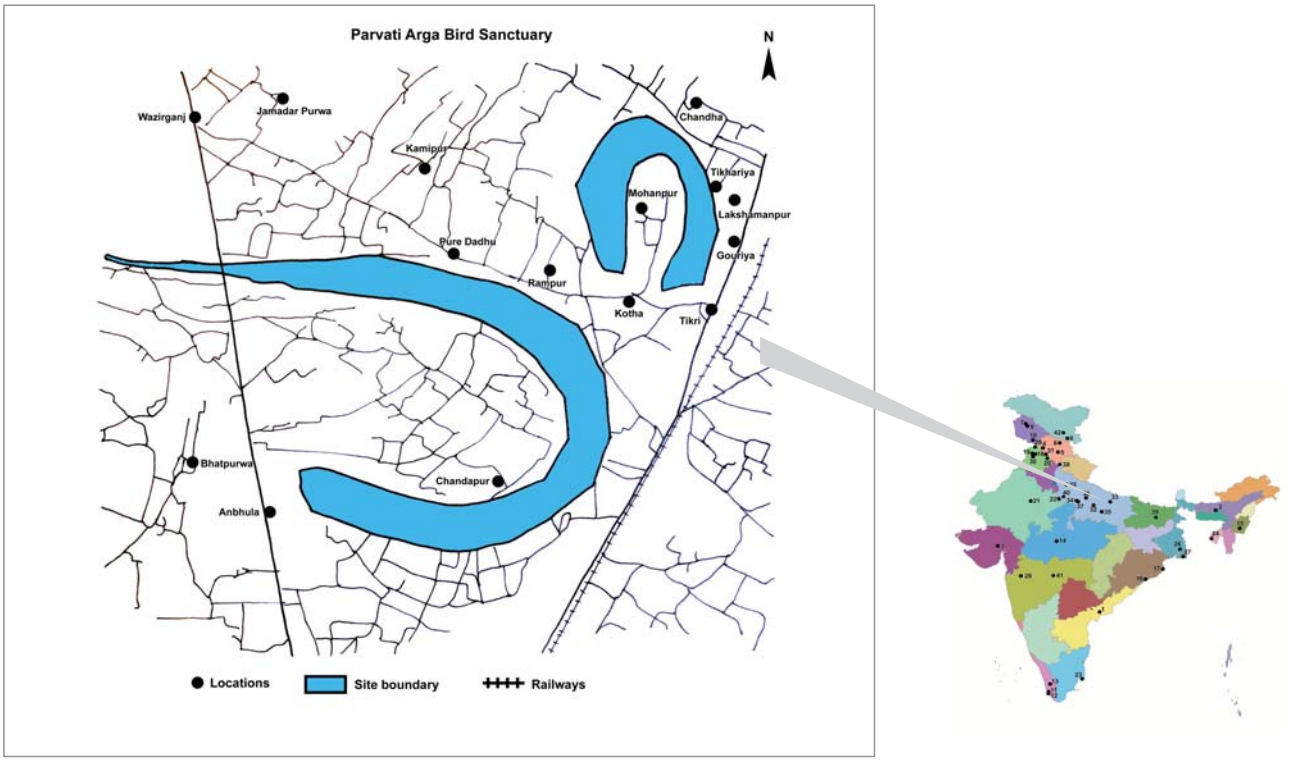
32. NAWABGANJ BIRD SANCTUARY



The Nawabganj Bird Sanctuary is spread over an area of 225 ha and is a shallow marsh situated about 45 Km from Lucknow, along National Highway 25 near the town of Nawabganj in Uttar Pradesh (26°36'49"N 80°39'17"E), at an elevation of 110-113 m above msl. It was designated a Ramsar site in September 2019. It is a shallow marshland 45 kilometres from Lucknow in Uttar Pradesh. It is fed by monsoon rains and additional water supplied by the Sarda Canal. The average rainfall is about < 1,000 mm per annum and the temperature ranges from 1° C to 48° C, humidity is about 94%. The Sanctuary supports recreation and tourism activities as well as local biodiversity.The diverse habitats enable the wetland to sustain a number of species including at least 200 plants, 220 resident and migratory birds, 20 fish, several molluscs (Pila globose), (Limex sp.), (Unio sp.), (Lymnea sp.), butterflies (Graphium sarpedon sarpedon), (Princepts paris paris), (Eurema blanda silhetana), terrestrial and water snakes, turtles, frogs and higher vertebrates such as the blue bull (Boselaphus tragocamelus). With 25,000 waterbirds regularly recorded and 220 resident and migratory species documented, this can be considered as haven for birds. Species reported are mixed heronry, which includes species such as Oriental darter (Anhinga melanogaster),Black-crowned night heron (Nycticorax nycticorax), many species of egrets and cormorants, and the Eurasian spoonbill (Platalea leucordia). Other resident species include Purple moorhen or Swamphen (Porphyrio porphyrio), Pheasant-tailed jacana (Hydrophasianus chirurgus) and Bronze winged jacana (Metopidius indicus). It is a wintering site for Central Asian flyway, like Northern pintail, Northern shoveler, Common teal, Garganey teal, Gadwall, Eurasian wigeon, Red-crested pochard, Ferrugenous duck and Greylag goose. Globally threatened species including the endangered Egyptian vulture (Neophron percnopterus) and Pallas's fish eagle (Haliaeetus leucoryphus) as well as the vulnerable

lesser adjutant (Leptoptilos javanicus) and Woolly-necked stork (Ciconia episcopus) are recorded from the site. The wetland is also important for several species of Anatidae and Fulica. Spotted deer or cheetal (Axis axis) have been introduced to the sanctuary. Protection and afforestation measures have helped increase the overall diversity of wildlife, with golden jackal (Canis aureus) and jungle cat (Felis chaus) now present. The highly invasive common water hyacinth (Eichhornia crassipes) poses a threat, as does the removal of timber from the forests. State forest officers along with the Office of the Conservator of Forest (Wildlife) jointly manage the Sanctuary. The document revealed about the faunal diversity of the site with report of 02 spp of annelids, 61 spp of insects, 12 spp of fishes, 03 spp of amphibians, 16 spp of reptiles, 150 spp of birds, and 16 spp of mammals are recorded from this site. The unexplored groups include protozoans, rotifers, nematodes, molluscs, diversity of which can be revealed by future studies.

33. PARVATI ARGA BIRD SANCTUARY

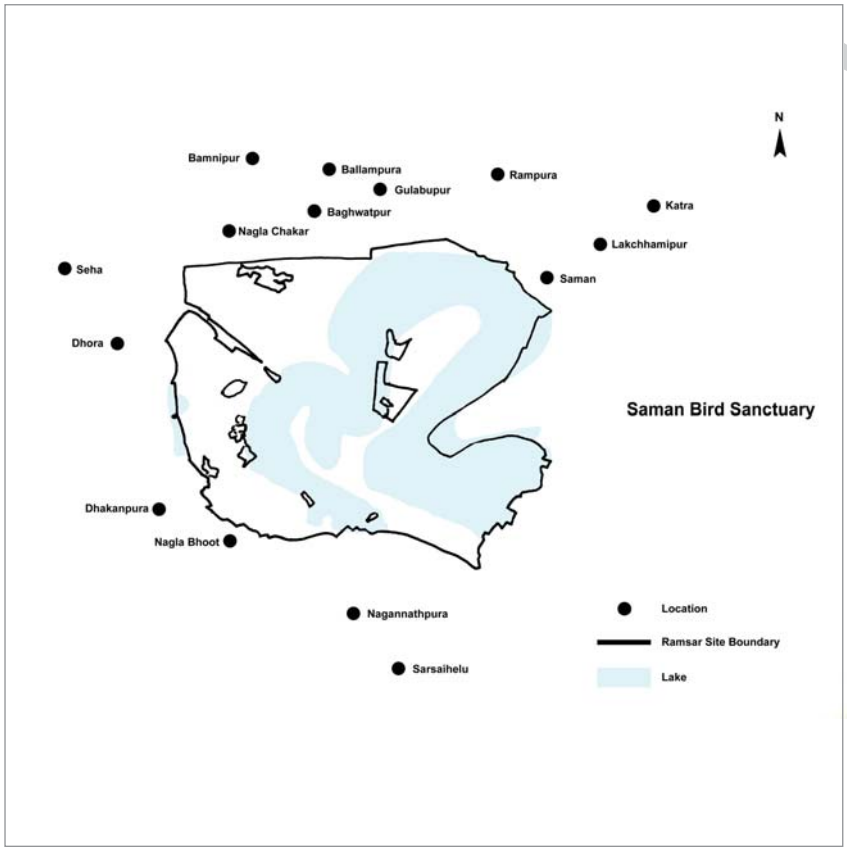


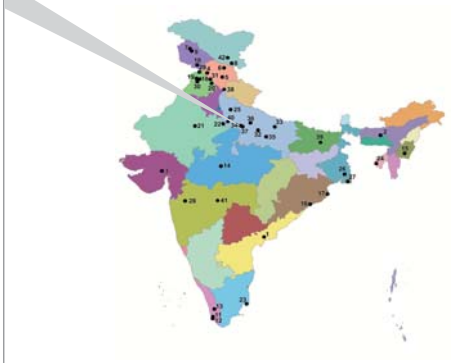
Parvati Arga Bird Sanctuary is a permanent freshwater environment consisting of two oxbow lakes, and it is one of the largest natural floodplain wetland in the state. It is spread over an area of 722 ha and located in the state of Uttar Pradesh, Tarabganj Tehsil, at a distance of about 40 km from Gonda District at Mankapur-Nawabganj Road (26°56'09"N 82°09'45"E), at an elevation of 93-95 m above msl. It was designated as a Ramsar site in December 2019. The average rainfall is around 1240 mm and temperature ranges from 4°C to 48°C. The wetland sustains around 37 species from 7 families of flora and 64 species from 7 families of fauna. These wetlands also support a variety of fish population including that of roho labeo (Labeo rohita), mud eel (Monopterus cuchia), mrigal carp (Cirrhinus mrigala) and Indian mottled eel (Anguilla bengalensis). Apart the variety of fishes reported from the sanctuary, reptiles - Brahminy Skink (Mabuyacarinata), Garden lizard (Varanus bengalensis), Krait (Bangarus caeruleus), insects (Butterflies: plain tiger, common mormon) and mammals Nilgai (Boselaphus tragocamelus) are also sighted in the sanctuary. These wetlands offer exceptional habitats for waterbirds, providing both roosting and breeding sites with over 100,000 birds documented in annual counts. It provides wintering and breeding grounds to a number of migratory and local aquatic bird species such as Oriental darter (Anhinga melanogaster), Black headed ibis

(Threskiornis melanocephalus), Black necked stork (Ephippiorhynchus asiaticus), Sarus crane (Antigone antigone), Indian cormorant (Phalacrocorax fuscicollis) as well as different species of heron, eagles, jacanas, pigeons, barbets and wagtails. The Sanctuary is a harbouring site for some of India's threatened vulture species like the critically endangered White-rumped vulture (Gyps bengalensis) and Indian vulture (Gyps indicus), and the endangered Egyptian vulture (Neophron percnopterus). It is also critical in the maintenance of hydrological regimes, ensuring groundwater recharge and discharge. Meanwhile ancient temples around the lakes provide religious significance and encourage tourism. Invasive species such as the common water hyacinth (Eichhornia crassipes) along with the development of roads and railways present significant threats.

This report reveals about the faunal diversity of the site and also indicates the gap areas. The animal groups studied includes 01 sp of crustaceans, 04 spp of fishes, 05 spp of reptiles, 19 spp of birds, 07 spp of mammals. The animal groups which require further studies are protozoans, rotifers, nematodes, annelids, aranchnids, insects, molluscs, and amphibians.

34. SAMAN BIRD SANCTUARY

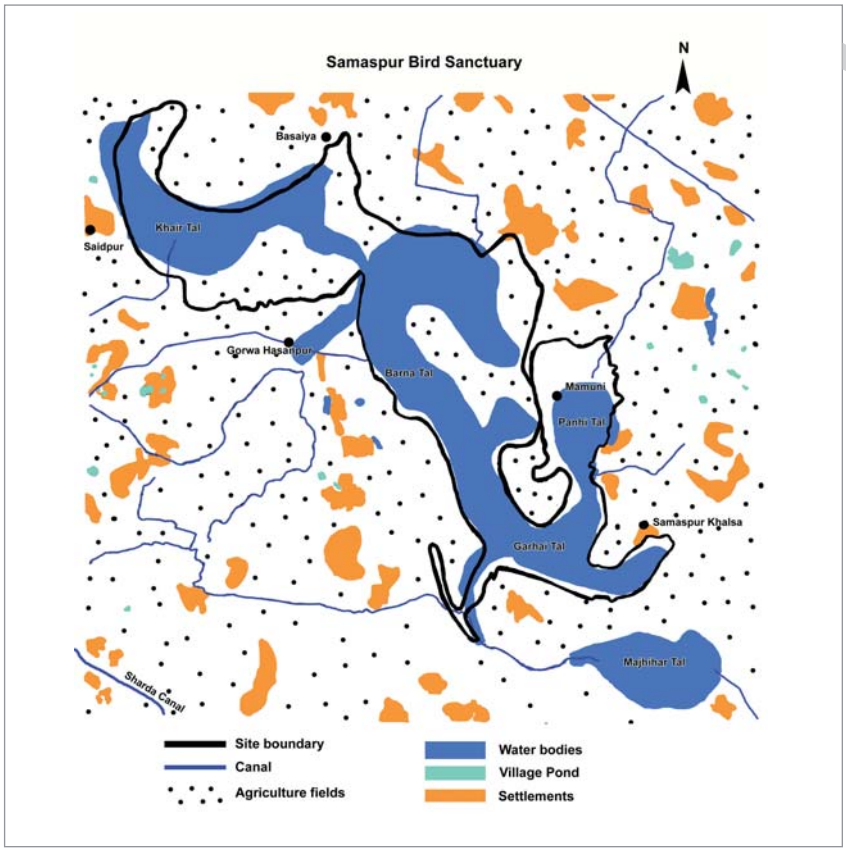


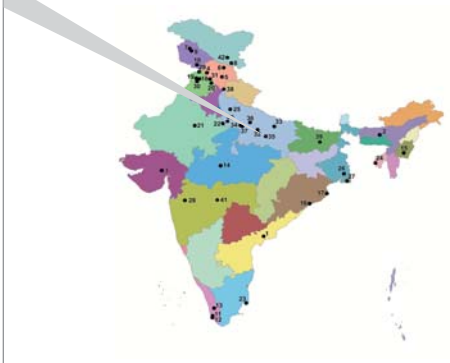


The Saman Bird Sanctuary is a seasonal oxbow lake that is typically representative of gangetic flood plains. It is spread over an area of 526 ha and is located near village Saman in Karhal tehsil of Mainpuri district in the state of Uttar Pradesh (27°00'56"N 79°10'36"E), at an elevation of 150-154 m above msl. It was designated a Ramsar site in December 2019. It is fed by annual monsoon rainfall which lasts from July-august. A highly diverse group of hydrophytic vegetation that includes aquatic plants like Nelumbo, Cyperus, Typha and Phragmites are found in this site. The Sanctuary is rich in diversity and supports many threatened and endangered species including Greater spotted eagle (Aquila clanga) and Sarus crane (Grus antigone) and regularly provides refuge to over 50,000 waterbirds and is particularly important as a wintering site for many migrants including the greylag goose (Anser anser),northern pintail (Anas acuta), whistling duck (Dendrocygna javanica), great white pelican (Pelecanus onocrotalus), black-crowned night heron (Nycticorax nycticorax) and common teal (Anas crecca). The wetland attracts large numbers of migratory birds in winter, while resident avifauna remains all the year round. Water is circumneutral with pH ranging from 5.5 to 7.4. Three to five breeding pairs of sarus crane (Grus antigone) are resident in the Sanctuary. A breeding pair of black-necked stork (Ephippiorhynchus asiaticus) and one or two greater spotted eagles (Aquila clanga) are also regularly sighted. A heronry of around 150 nests of Black-crowned night heron (Nycticorax nycticorax), Egrets (Egretta spp.) and Indian pond heron (Ardeola grayii) are found at the site. Besides birds, the wetland supports populations of blue bull (Boselaphus tragocamelus), jackal (Canis aureus), monitor lizard (Varanus bengalensis), jungle cat and many small mammals. Ecosystem services provided include supply of fresh water for agriculture, as well as recreation and nature-based tourism based around the huge diversity of birds. Settlement encroachment and salinization present threats.

The document compiles the the faunal diversity, i.e., 17 spp of birds, 11 spp of mammals are recorded from this site. The unexplored groups include protozoans, rotifers, nematodes, annelids, aranchnids, crustaceans, insects, molluscs, fishes, amphibians, and reptiles, diversity of which can be revealed by future studies.

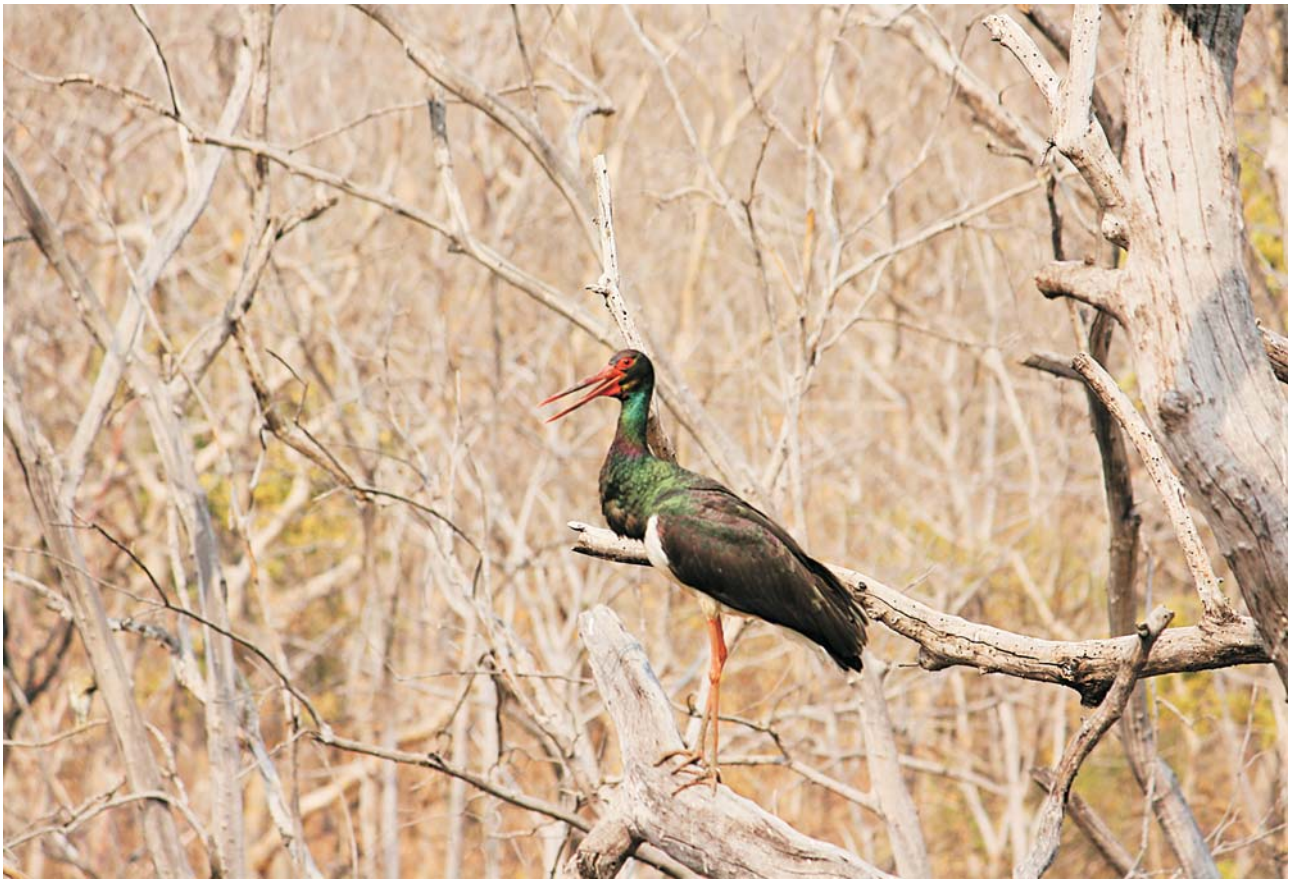
35. SAMASPUR BIRD SANCTUARY



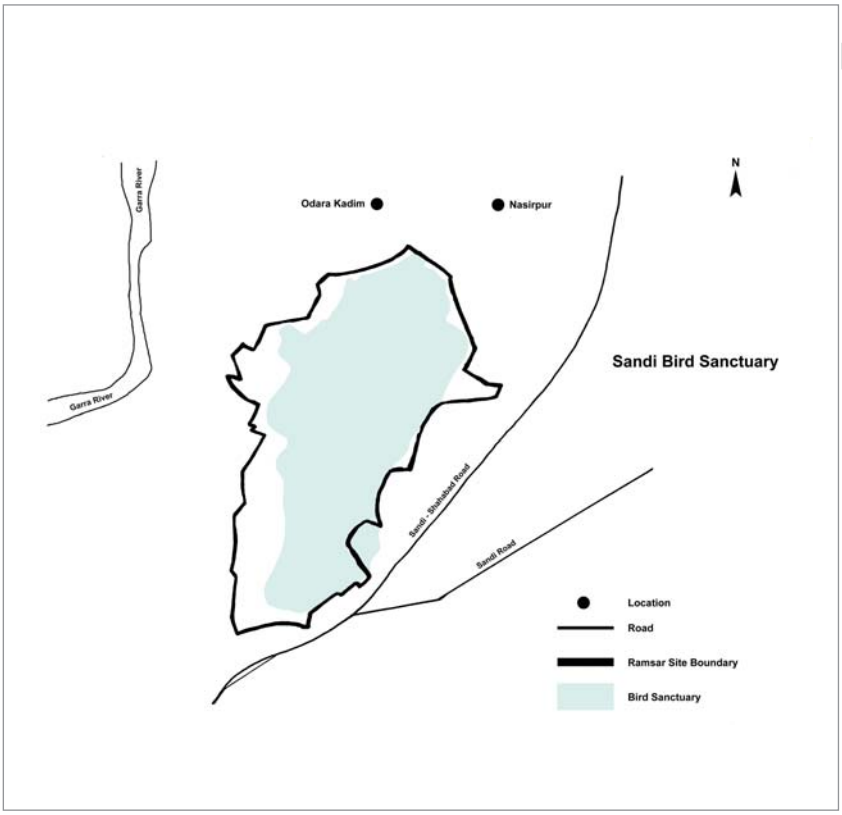


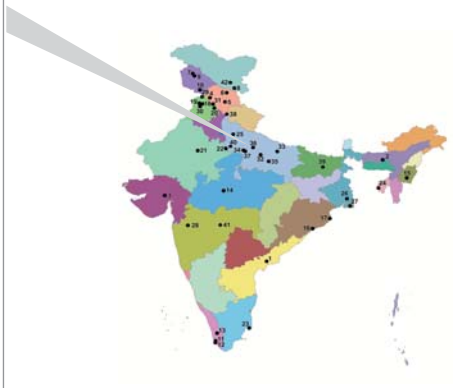
The Samaspur Bird Sanctuary is spread over an area of 800 ha and is a perennial lowland marsh typical of the Indo-Gangetic Plains located in Salon tehsil of Raebareli district of Uttar Pradesh (25°59'44"N 81°23'19"E), at an elevation of 99-104 m above msl. It was designated as a Ramsar site in October 2019. Its six connected lakes (Samaspur, Mamani, Gorwa, Hasanpur, Hakganj and Rohniaare) heavily rely on monsoon rains. The wetland is perennial and receives water from Sharda canal supplemented by monsoon run-off. The Sanctuary is a hotspot of biological diversity having resident and migratory birds, several invertebrates such as molluscs(Pila globose), (Limex sp.) and butterflies (Graphium sarpedon sarpedon, Princepts paris paris etc.), both terrestrial and water snakes, turtles, frogs and higher vertebrates such as the blue bull. The Sanctuary is an important site of migratory bird species that arrive in the winter months and more than 75000 water birds can be sighted within the wetlands complex. Some of the migratory species recorded in the Sanctuary are great crested grebe, spoonbill, ruddy shelduck, northern shoveler, northern pintail, gadwall, common teal, common pochard, tufted duck and greylag goose. The Sanctuary harbours threatened species such as the endangered Egyptian vulture (Neophron percnopterus) and Pallas's fish eagle (Haliaeetus leucoryphus), and more than 1% of the South Asian population of the vulnerable common pochard (Aythya ferina). The site provides food products and agricultural fodder, as well as maintaining this biodiversity. However, invasive species threaten its ecological character, with over 40% of documented floral species being exotic.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups documented includes 08 spp of fishes, and 299 spp of birds. The animal groups which require further detailed studies are protozoans, rotifers, poriferans, cnidarians, nematodes, annelids, aranchnids, crustaceans, insects, of molluscs, amphibians, reptiles, and mammals.



36. SANDI BIRD SANCTUARY



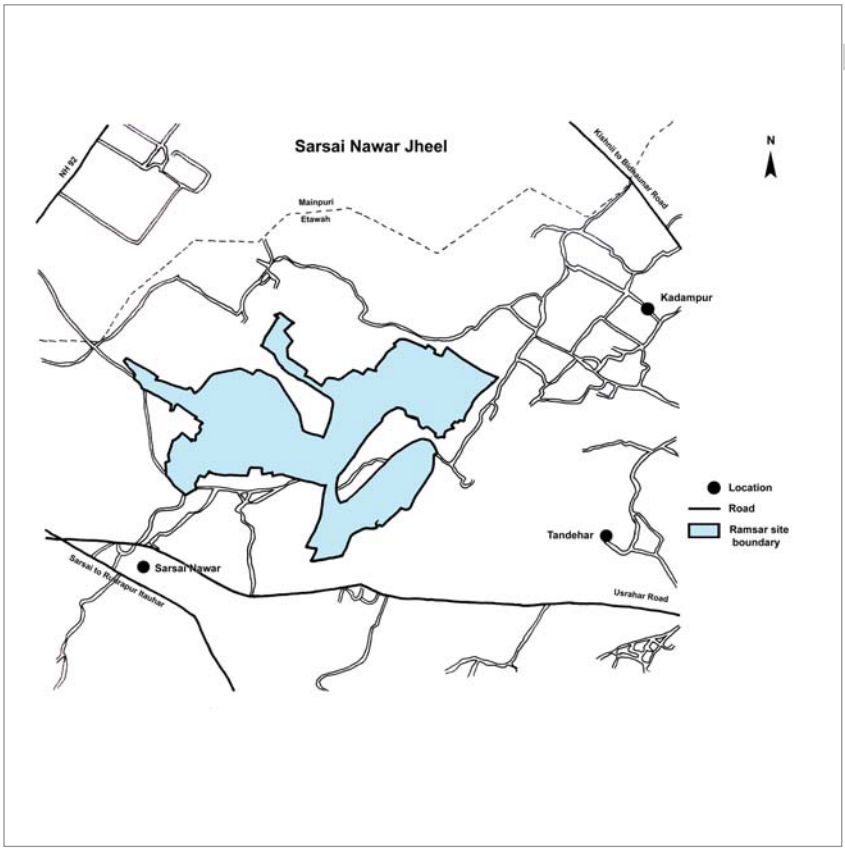


Sandi Bird Sanctuary is a freshwater swamp that truly represents the ecosystems characteristic of Indo-Gangetic Plains. It is spread over an area of 308 ha and is located in the Bilgram tehsil of Hardoi district in state of Uttar Pradesh (27°18'49"N 79°58'19"E), at an elevation of 111 m above msl. It was designated a Ramsar site in September 2019. The main source of water for the wetland is the monsoon rain flowing through natural watercourses. The sanctuary area slopes in the north-western direction towards the Garra River. As a result, some water from the sanctuary lake drains into the river. The water depth in the lake varies from 0.3 m to 6m. The soil pH is in the range of 7 to 9. The soil in the sanctuary is typical of the Gangatic flood plains and the soil in the lake has been found to have high humus content.Rich in aquatic plants the site provides a productive habitat for waterfowl with over 40,000 individuals counted in 2018.

It is home to over 1% of the South Asian populations of common teal (Anas crecca), red-crested pochard (Netta rufina) and ferruginous duck (Aythya nyroca), while the vulnerable sarus crane (Grus antigone) has a population of 200 individuals within the Sanctuary. It also receives thousands of waterfowl in winter, primarily Brahminy duck (Tadorna ferruginea), Red-crested pochard (Netta rufina), Northern pintail (Anas acuta), Northern shoveler (Anas clypeata) and Cotton teal or pygmy-goose (Nettapus coromandelianus). Other resident water birds include Bronze-winged jacana (Metopidius indicus), Pheasant-tailed jacana (Hydrophasianus chirurgus), Asian openbill (Anastomus oscitans), Painted stork (Mycteria leucocephala) and Black-necked stork (Ephippiorhynchus asiaticus). These justify its designation as an Important Bird Area by BirdLife International. Bluebuck, Asia's one of the endemic mammalian species, inhabits in this area. Apart from birds, around 12 species of fish, 2 species of amphibians, 15 species of reptiles, a number of species of butterflies and higher vertebrates such as the blue bull (Boselaphus tragocamelus) have also been reported from the Sanctuary. Water from the wetland is usd for irrigation, acts as flood control basin and helps in ground water recharge. The wetland is a popular recreational and tourism destination and supports surrounding farmers as a source of livestock fodder. Drought presents a threat; the Sanctuary dried out leading to a subsequent collapse in waterbird populations from 2014 to 2015.

Compilation from the earlier literature revealed about the faunal diversity of the site showing 02 spp of annelids, 58 spp of insects, 12 spp of fishes, 02 spp of amphibians, 15 spp of reptiles, 224 spp of birds, 12 spp of mammals are recorded from this site. The unexplored groups include protozoans, rotifers, nematodes, aranchnids, crustaceans, and molluscs, diversity of which can be revealed by future studies.

37. SARSAI NAWAR JHEEL

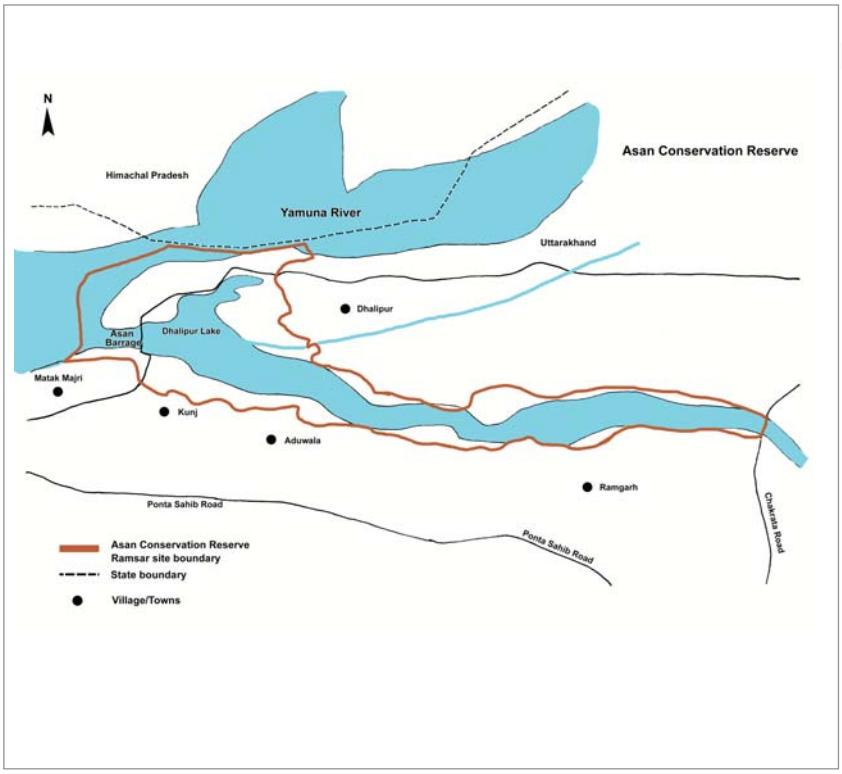


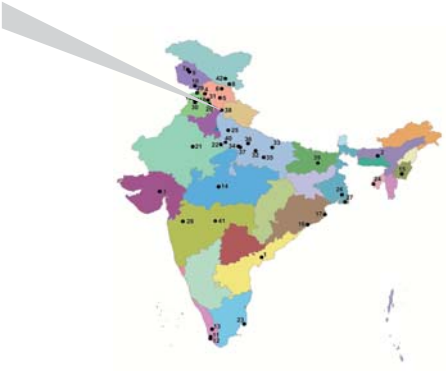
Sarsai Nawar Jheel is a permanent shallow marsh that is surrounded by agricultural fields and is a typical wetland of the Indo-Gangetic floodplain is mostly fed by precipitation run-off. It is spread over an area of 161.27 ha and is located in Indo-Gangetic floodplain landscape of Etawah district in state of Uttar Pradesh (26°58'08"N 79°15'02"E), at an elevation of 60-65 m above msl. It was designated a Ramsar site in September 2019. The wetland is surrounded by settlements on all sides. To the north are town Kishni and village Murcha and the villages Chamarpur Rudrapur and Kuita form the southern side. The settlements of village Kadampur, Andandpur and Usrahar are located on the eastern boundary whereas, Trirkhi Trilokpur and Bhadarpura on the southern end. The wetland derives its name from Sarus crane (Grus antigone) and is considered to be the roosting area of the largest flock of sarus crane in the region, consisting of nearly 400 individuals. Several riverine fish species, including rohu (Labeo rohita), catla (Catla catla), Mystus sp. and other species uses the wetland as breeding and spawning ground for a number of fish species like Cirrhinus mrigala, Gibelion catla, Heteropneustes fossilis and Sperata seenghala. Sarsai Nawar Jheel plays an important role in maintaining fish diversity within the River Ganga. Other threatened species present include the critically endangered white-rumped vulture (Gyps bengalensis) and endangered woolly-necked stork (Ciconia episcopus).Main resident species of storks, namely the painted stork (Mycteria leucocephala) and black-necked stork (Ephippiorhynchus asiaticus) are observed through out the year. The wetland also supports a considerable population of flap-shell turtle (Lissemys punctate) and many families of the common mongoose (Herpestes javanicus). The wetland is also a site of spiritual and religious significance with the nearby Hajari Mahadev temple visited by thousands of pilgrims each year. Droughts along with drainage have the potential to threaten the site's ecological character. It is recognized by Birdlife International as an Important Bird Area due to its rich bird fauna. The maintenance of the bird fauna is chiefly mediated by the interactions with local

communities and the agricultural activities.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported includes 04 spp of fishes, 11 spp of birds, 01 sp of mammals. The groups which require further detailed studies are protozoans, rotifers, nematodes, annelids, arachnids, crustaceans, insects, molluscs, amphibians, and reptiles.

38. ASAN CONSERVATION RESERVE





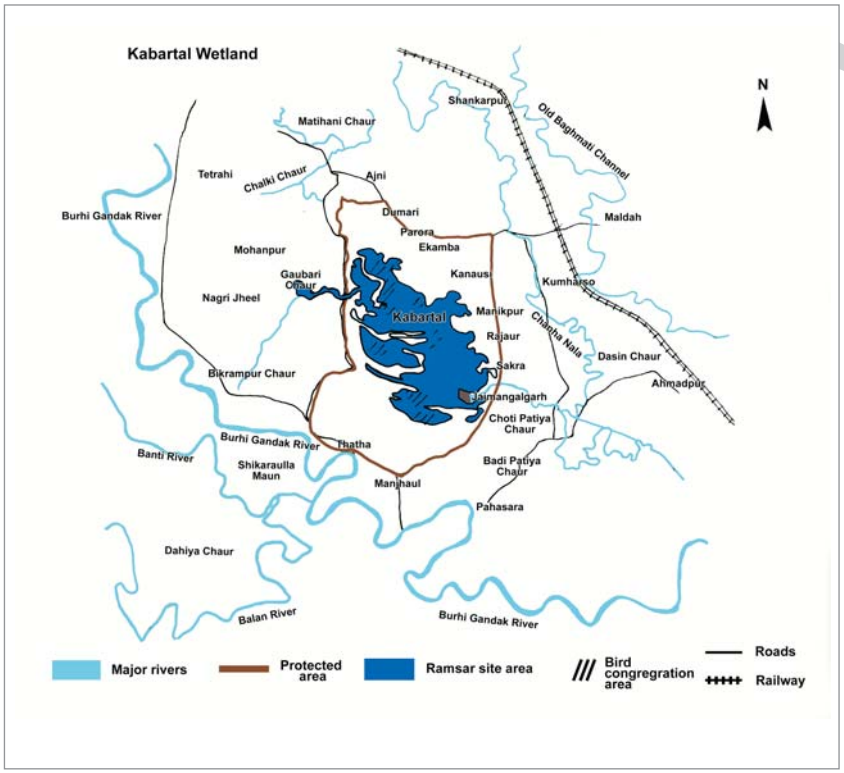
Asan Conservation Reserve comprises a freshwater wetland system at the confluence of Asan River and Yamuna River canal near village Dhalipur in Dehradun district, Uttarakhand (30°26'01"N 77°40'58"E) at an elevation of 396-402 m above msl. The Reserve was designated Ramsar site in 2020 and is spread over an area of 444.4 ha. The area of the reserve is composed of Quaternary grouprock type, these are Doon gravel, post Subathu Formation, Sabathu Formations and Green Pyllite. The rock formations in the area include riverterraces, gravel and conglomerates of Upper Shiwalik. The left bank of the reservoir (at the side of river Asan) is composed of Upper Shiwalikconglomerates. The right bank of the reservoir (side of river Yamuna) contains patches of Doon gravel with some Upper Shiwalikconglomerates. The area on the other side of river Yamuna is composed of the Lower Shiwalik conglomerates. Soil of the areais highly organic, with fine granular, clayey and clayey loam, supporting considerable undergrowth.There are three distinctseasons winter (October to March), Summer (April to June), Monsoon (July to September). The area has a typical North Indian subtropicalclimate. The temperature variation is 2°C to 38°C. The area is surrounded by bushes, some of the dominant plant species. Among animals, birds are the most conspicuous of the fauna of Asan.

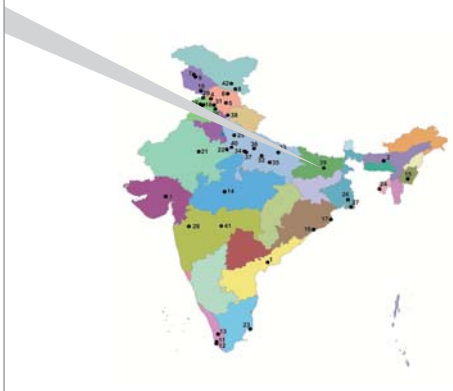
The wetland is well known in the entire northern India because of the avian diversity it supports. Todate by collating all records about 332 species of birds have been observed at Asan including the critically endangered red-headed vulture (Sarcogyps calvus), white-rumped vulture (Gyps bengalensis) and Baer's pochard (Aythya baeri). More than 1% of the biogeographical populations of two waterbird species have been recorded, these being red-crested pochard (Netta rufina) and ruddy shelduck (Tadorna ferruginea). The presence of 78 species of invertebrates (odonata, coleoptera,annelida, mollusca), 40 fishes, 4 amphibians, 1 reptile and 20 mammal species from the site was reported in a report on the faunal diversity of Asan wetland by the Zoological Survey of India (ZSI) in 2003. Furtheranalysis of the fish fauna of Asan with reference to recent available resources gives a total of 51 speciesbeing present in the site.This wetland serves as feeding, migration path and spawning ground for several fish species. A total of51 fish species have been known to inhabit the site. Fishing is prohibited in the reserve and it plays animportant role in supporting and

maintaining the fish diversity.Landslides in the area are very frequent and magnitude of the soil erosion is high. The water level of the reservoir is maintained and regulated to supply waterto two downward hydro power stations. The site provides important ecosystem services in terms of water for energy production, groundwaterrecharge, biodiversity, scientific and educational support, and recreation and tourism services.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported includes 51 spp of fishes, 332 spp of birds, 20 spp of mammals. The groups which require further detailed studies are protozoans, rotifers, nematodes, arachnids, and crustaceans.

39. KABARTAL WETLAND



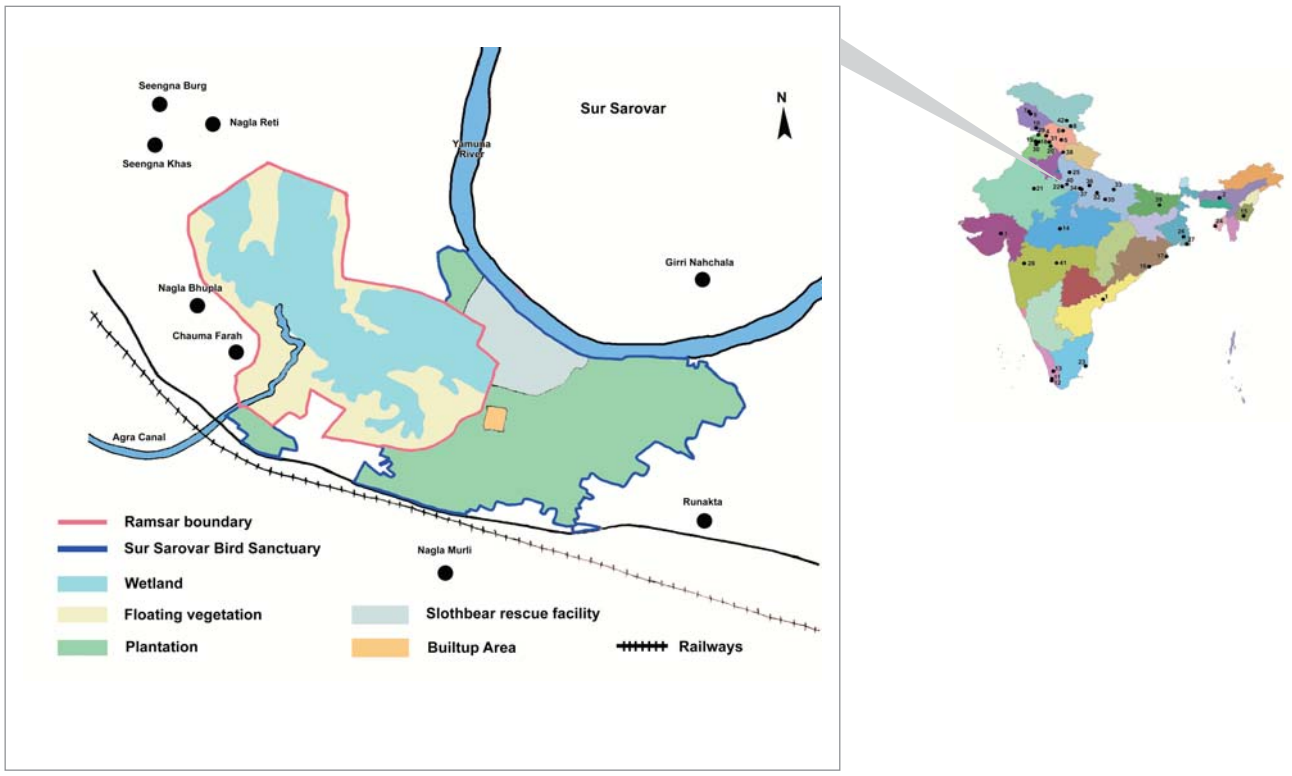


The Kabartal wetland,also known as Kanwar Jheel, is the largest of a series of shallow permanent as well as intermittently inundated wetlandsformed in the depression between River Burhi Gandak and paleochannel of River Bagmati. The wetland is an extensive floodplain wetland complex formed in the lower reaches of Gandak – Kosi interfan in North Bihar, located at a distance of 21 km from Begusarai town, Bihar (25°37'05"N 86°08'22"E). It is spread over an area of 2620 ha at an elevation of 27-45 m above msl. It was designated a Ramsar site in 2020.There are 14 waterbodies located mostly on northern, eastern and southern fringes of Kabartal, whichconnect to the wetland system during periods of high flows, but appear as distinct bodies in lean seasons. The wetland plays an important role in the hydrography of the region byaccommodating a significant proportion of rainfall and bankflows of River Gandak protecting the adjoining settlements from flood risk as well asrecharging groundwater. The absorption of floodwaters is a vital service in Bihar State where 70% of the land is vulnerable to inundation. During the dry season, areas of marshland dry out and are used for agriculture.Significant biodiversity is present, with 165 plant species and 394 animal species recorded, including 221 bird species. The Wetland is an important stopover along the Central Asian Flyway, with 58 migratory waterbirds using it to rest and refuel. It is also a valuable site for fish biodiversity with over 50 species documented. Five critically endangered species inhabit the site, including three vultures – the red-headed vulture (Sarcogyps calvus), white-rumped vulture (Gyps bengalensis) and Indian vulture (Gyps indicus) – and two waterbirds, the sociable lapwing (Vanellus gregarius) and Baer's pochard (Aythya baeri). Besides birds, recorded biodiversity at Kabartal includes 165 plant species, 44 phytoplankton and 46 macrophyte species girdled andinterspersed with patches of 75 terrestrial species. In addition to that, there are 394 animal species: 70 zooplankton, 17 molluscs, 42 insects, 37 fish, 7 amphibians, 5 reptile, and 221 bird species, several of which are vulnerable, rare and endangered. Of the 50 fish species reported, 26 species mainly belong to Cypriniformes, Siluriformes, Beloniformes, Channiformes, Perciformes, and Mastacembeliformes. The Zoological Survey of India records the presence of 35 species throughout the year and an additional 15 when the river connects to the wetland in times of

flood. Records indicate a gradual increase in air breathing species (Clarias batrachus, Heteropneustes fossilis, Anabas testudineus); catfishes (Wallago attu, Mystus sp.) and forage fishes. Indian major carps like Labeo rohita, Catla catla are also found in the wetland. Kabartal is also an importantsource of animal fodder. The wetland is also a source of Wild rice (Desaria – a variety of deepwater rice), makahana (Euryale ferox), singada (Trapa natans), Kamal (Nelumbo nucifera), Crab (Paratelphusa spinigera) and edible mollusc (Pila globosa). The island of Jaimangalgarh located near the southern boundary of the wetland is revered as a site of religious andcultural significance. Major threats to the Site include water management activities such as drainage, water abstraction, damming and canalization.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported includes 37 spp of fishes, 148 spp of birds, 5 spp of mammals.

40. SUR SAROVAR



SurSarovar, also known as Keetham Lake, is a man made reservoir located along the River Yamuna, 20 km from the Agra City in the state of Uttar Pradesh(27°15'06"N 77°50'24"E). The lake was originally created to supply water to the city of Agra in summer, the wetland soon became an important and rich ecosystem.It is spread over an area of 431 ha at an elevation of 166-176 m above msl. It was designated as a Ramsar site in August 2020.Flanked by the RiverYamuna on its northern periphery, the wetland produces a mosaic of ecological niches that support a number of flora and fauna. This man madewetland is surrounded by dense and luxuriant vegetation of semi evergreen and deciduous forests with Prosopis juliflora being the dominant species. The entire lake area gets covered by profuse growth of macrophytic vegetation of water hyacinth (Eichornia sp.) and Potamogeton sp. during the summer.

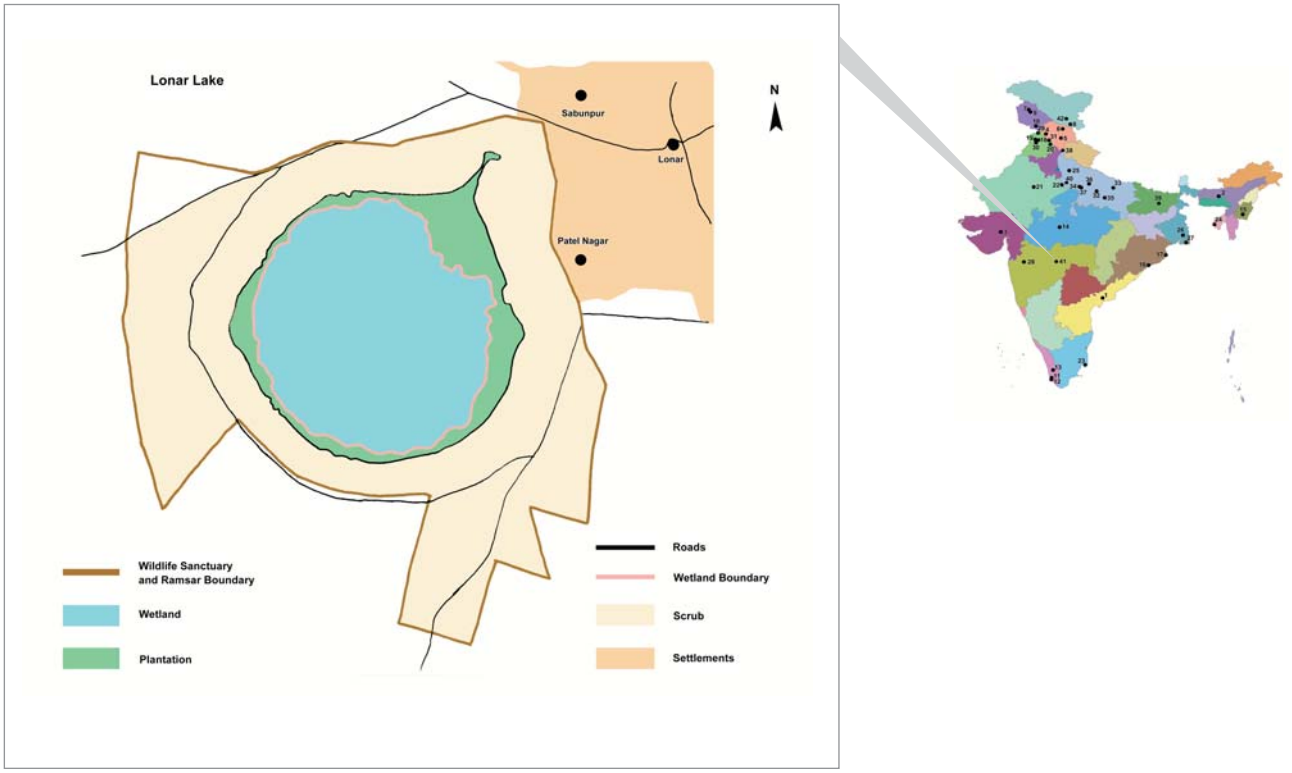
The water quality of Sur Sarovar supports a wide range of avifauna during winter season.The River Yamuna flowing along the northern boundary functions as a complementary perennialwetland, which along with agricultural fields, provides a habitat to a variety of waterbirds. During summer, when the water becomes the limitingfactor, the Sur Sarovar wetland becomes the favoured habitat of a number of aquatic avifauna such as comb duck (Sarkidiornis melanotos),spotbilled duck (A. poecilorhyancha),lesser whistling teal (Dendrocygna javanica), painted stork (Mycteria leucocephala), and sarus crane(Grus antigone) etc. Besides this, the lake has been an important staging and dispersal ground for migratory birds of the Central Asian Flywayduring winter.The important aquatic birds inhabiting Sur Sarovar are: Little Grebes, Cormorants, Darter, Grey Heron, Purple Heron, Paddy Bird, Cattle Egrets, Large Egrets, Smaller Egrets, Little Egrets, Night Heron, Indian Reef Heron, Black necked Stork, White Ibis, Eurasian Spoon Bill, Greying Goose, Bar headed Goose, Ruddy Shelduck, Northern Pintail, Common Teal, Gadwall, andWigeon, Shoveler.Over 30,000 waterbirds known to visit the reservoir annually. Over 1% of the South Asian regional population of the Greylag Goose (Anser anser) is present.

Other animal species recorded from the wetland includes the Chital (Axis axis), Blue bull (Boselaphus tragocamelus), Golden Jackal (Canis aureus), Jungle cat (Felis chaus), Indian Palm Squirrel (Funambulus pennantii), Indian Gray mangoose (Herpestes edwardsi), Indian Crested porcupine (Hystrix indica), Indian Hare (Lepus nigricollis), Honey badger (Mellivora capensis), Little Indian field mouse (Mus booduga), and Loamri (Vulpes vulpes). The invasivce alien animal species

includes African catfish (Clarias gariepinus) and Tilapia (Oreochromis karongae). Unsustainable tourism, invasive species, and household sewage and urban wastewater present significant threats to the site.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported includes 34 spp of insect, 10 spp of fishes, 91 spp of birds, 14 spp of mammals.

41. LONAR LAKE



Lonar Lake, also known as Lonar crater, is a notified National Geo-heritage site that is a natural, saline lake situated in Buldhana district (19°58'33"N 76°30'30"E) in the state of Maharashtra. It was formed by meteorite impact in theDeccan Trap region, composed of basaltic flows.Lonar Lake has a mean diameter of 1.2 kilometres (3,900 ft) and is about 137 metres (449 ft) below the crater rim. The meteor crater rim is about 1.8 kilometres (5,900 ft) in diameter.It is spread over an area of 427 ha at an elevation of 481-488 m above msl. It was designated a Ramsar site in July 2020.This Ramsar site boundaries coincides with those of the Wildlife Sanctuary. Lonar wetland has habitations like villages of Lonar, Lonai, Patel nagar,Sabunpura and a road in the north east. Agricultural fields forms the Eastern, Western and Northern boundaries.This wetland on the Deccan Plateau is an endorheic or closed basin, almost circular in shape, formed by a meteorite impact onto the basalt bedrock, located in an arid region, which has exceedingly high range of pH values because of high naturalconcentrations of soda (Na2CO3) and other salts, chloride, sodium, calcium etc.

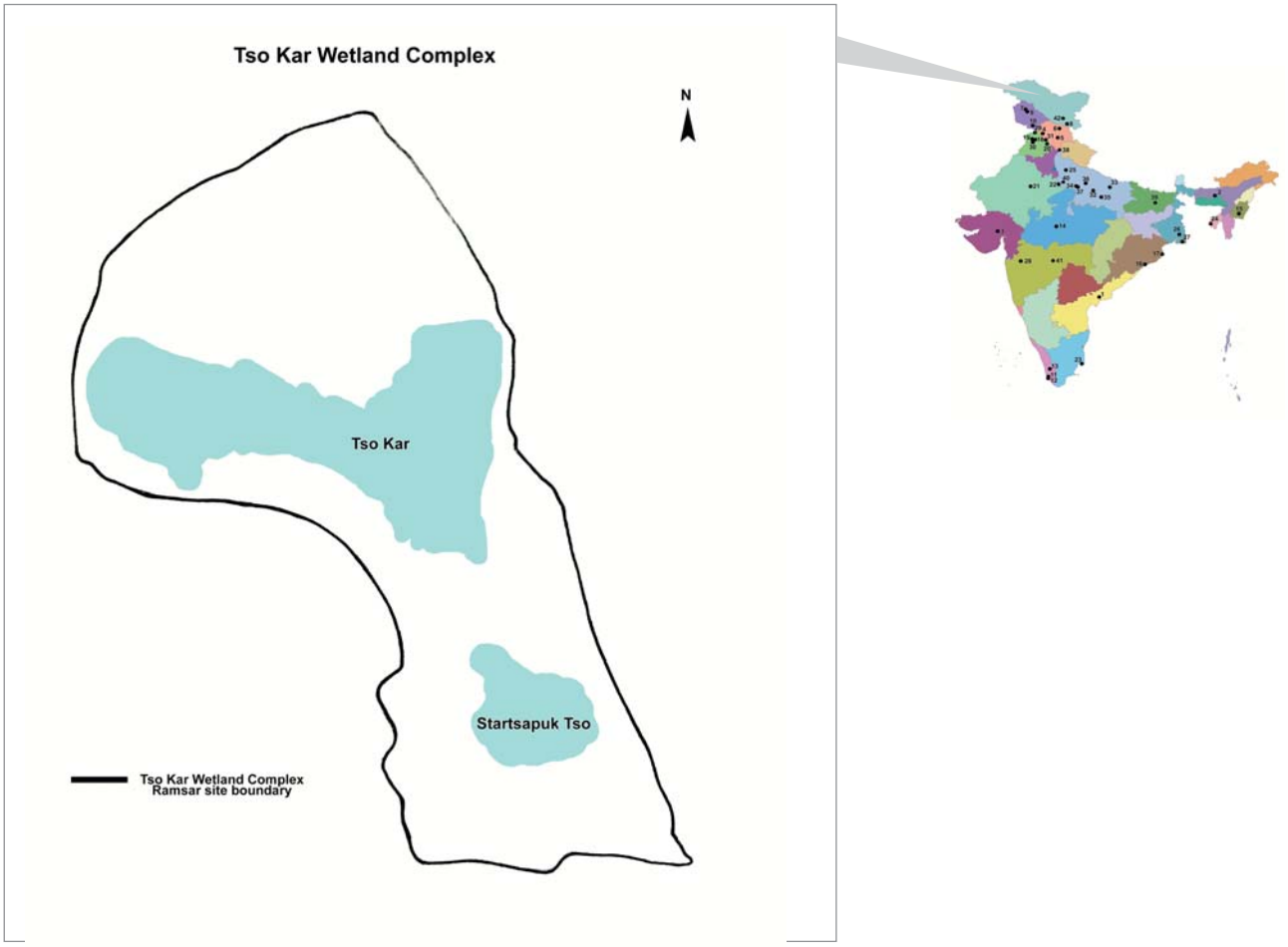
Almost circular in shape, the depression is surrounded by steeply rising escarpments, lyingamongst the vast monotonous plateau. The drainage is endorheic with natural springs and precipitation as major sources of the water.Circumference of the wetland along its outer rim is 600 hectares. The water is high of salinity as well as alkalinity with a maximum depth of 5.50m. towardsthe north east, the scarp slope is breached by a gully, making accessibility to wetland easier. Specialized micro-organisms such as anaerobes, cyanobacteria and phytoplankton survive in this harsh chemical environment. Outside the lake, there is considerable diversity of plant and animal life, as springs which help feed the lake provide a source of fresh water.

Outside the lake, there is considerable diversity of plant and animal life, as springs which help feed the lake provide a source of fresh water. Inhabiting the site are 162 species of birds including the vulnerable Asian woollyneck (Ciconia episcopus) and common pochard (Aythya ferina), 46 species of reptiles, and 12 species of mammals including the iconic grey wolf (Canis lupus), and 14 species of molluscs. Besides, the wetland also supports nearly 30 species of trees, 10 species of shrubs, 13 species of climbers, 8 species of herbs and 6 species of grasses.The wetland forms an important wintering site for the migratory bird species of Central Asian Flyway. Also, the site has high archaeological, cultural and spiritual significance with 27 temples, 3

monuments, 7 temple tanks and 3 inscriptions inside the crater.Factors which threaten the site include household sewage and urban wastewater, and unsustainable tourism.

This report reveals about the faunal diversity of the site, also indicates the gap areas. The animal groups reported includes 7 spp of amphibians, 27 spp of Arachnids, 162 spp of birds, 84 spp of insects, 18 spp of mammals, 14 spp of molluscs, and 49 spp of reptiles.

42. TSO KAR WETLAND COMPLEX



Tso Kar is a high altitude wetland complex located at in the Changthan region of Ladakh (33°17'53"N 78°00'42"E). The complex includes two connected lakes, the freshwater Startsapuk Tso and the larger hypersaline Tso Kar. The complex presents a notable example of two such lakes existing in close proximity. It is spread over an area of 9577 ha at an elevation of over 4500 m above msl. It was designated a Ramsar site in November 2020. The name Tso Kar refers to the white salt efflorescence on the margins of the lake caused by evaporation of the saline waters. The region is characterized by extreme climatic conditions with local mean annual air temperature of about -4°C, and annual precipitation less than 90 mm. Temperature during winter ranges from -20 to -40 °C while in summer it ranges from below 0 to 30 °C. The lake and in particular presence of the fresh water attracts attracts various animals in a biologically sparse region. The local climate is arid with glacier meltwater being the primary source of water for the lake.

The site acts as an important stopover ground for migratory bird along the CentralAsian Flyways and is one of the most important breeding grounds. The typical character of this basin, i.e., presence of both salt and freshwater, makes it a unique wetland not only in Ladakh but in the entire Indian subcontinent. This is the only reason that besides supporting so many

Himalayan birds this wetland also supports coastal species like pied avocets (*Recurvirostra avosetta*). Also, there is no other wetland in India which support breeding of black-necked crane (*Grus nigricollis*), bar-headed goose (*Anser indicus*) and saker falcon (*Falco cherrug*) during same time of the year in a same basin, making this a unique wetland complex. It is one of the few sites where the great crested grebe (Podiceps cristatus) breeds in large numbers with 130-140 nests seen during summer months. Many threatened species such as the endangered saker falcon (*Falco cherrug*) and Asiatic wild dog or dhole (*Cuon alpinus laniger*), and the vulnerable snow leopard (*Panthera uncial*)inhabits the site.The local Changpa community consider the wetlands in the basin to be of sacred origin. The Stories/Folklore regarding its divine origin are embedded in the local culture resulting in imposing sanctions and rules by the local community that prohibit use of the water from the wetlands and its biotic resources. The Buddhist ideology of the local community also prevents harvest of avifauna and other animals that use the sites and its resources. All this has resulted in the maintenance of the ecological character of the wetland.

The report reveals about the faunal diversity of the site and also indicates the gap areas. The animal groups reported includes 139 spp. of birds, 2 spp. of reptiles and 16 spp. of mammals.

Wetland Management

- Conservation and Policies

Wetlands are not delineated under any specific administrative jurisdiction. The primary responsibility for the management of these ecosystems is in the hands of the Ministry of Environment and Forestsand Climate Change. Although some wetlands are protected after the formulation of the Wildlife Protection Act, others are in grave danger of extinction. Effective coordination between the different ministries, energy, industry, fisheries revenue, agriculture, transport and water resources, is essential for the protection of these ecosystems.

In the recent years, an unprecedented spurt of interest in wetlands has been observed at all levels among researchers, engineers, managers, conservationists, sociologists, economists, various NGOs, and above all the Governments. Several research papers and books are being published on understanding the wetlands ecosystem. A number of organizations, policy makers are realizing the value and are working for conservation and sustainable management of wetlands. However, in spite of all these efforts, many of our wetlands demand our attention. It is required that various gaps in conservation process be identified so that these important ecosystems can be conserved. The strategies for conservation and management of a wetland must be decided keeping in view the local geography, hydrology, climate, socio-economic condition of local communities and policy framework. The conservation strategies for a wetland must be based on the sound scientific research (Sharma et al. 2014).

One important reason for failure of conservation initiatives is the lack of accurate scientific information on wetlands. The decision makers have to base their decisions on insufficient and insignificant data which lead the conservation process to nowhere. It is highly required that genuine research is conducted which leads to desirable policy interventions. The research must focus on the basic wetland science, socio-economic aspects, and Wetland policy (Sharma et al. 2014).

The Indian constitution has the provision that highlights the importance of water resources and its conservation. Article 48A of the Constitution of India clearly states that *"The State shall endeavour to protect and improve*

environment and to safeguard the forests and wild life of the country". Further, the article 51A says that *"It shall be the duty of every citizen of India, to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures"*. The National Water Policy was formed in 1987, however with its revision in 2002 focussed on the revival of wetlands by traditional systems only. The National Water Mission under the Nation Action Plan on Climate Change also recommended conservation of lakes and other water bodies with implementation of programme for repair, renovation and restoration of water bodies in areas/situation sensitive to climate change. Developing an inventory of water bodies, especially those having unique features, mapping of catchments and surveying and assessing land use patterns with emphasis on drainage, vegetation cover, silting, encroachment, conservation of mangrove areas, human settlements and human activities and its impact on catchments and water bodies, thereby creating awareness among people about the importance of ecosystems of the water bodies (Sharma et al. 2014).

Ministry of Environment, Forests and Climate Change (MoEFCC) published rules for the protection of water bodies in India in December, 2010. Under the provisions of the Environment (Protection) Act 1986, MoEFCC issued the Wetlands (Management and Conservation) Rules, 2010 for conservation and management of wetlands.

Protection laws and government initiatives

Wetlands conservation in India is indirectly influenced by an array of policy and legislative measures (Parikh & Parikh 1999). Some of the key legislations are given below:

- The Indian Fisheries Act - 1857
- The Indian Forest Act - 1927
- Wildlife (Protection) Act - 1972
- Water (Prevention and Control of Pollution) Act - 1974
- Territorial Water, Continental Shelf, Exclusive Economic Zone and other Marine Zones Act - 1976
- Water (Prevention and Control of Pollution) Act - 1977
- Maritime Zone of India (Regulation and fishing by foreign vessels) Act - 1980
- Forest (Conservation Act) – 1980
- Environmental (Protection) Act - 1986
- Coastal Zone Regulation Notification - 1991
- Wildlife (Protection) Amendment Act - 1991
- National Conservation Strategy and Policy (Statement on Environment and Development) – 1992
- National Policy and Macro level Action Strategy on Biodiversity-1999

Apart from government regulation, development of better monitoring methods is needed to increase the knowledge of the physical and biological characteristics of each wetland resources, and to gain, from this knowledge, a better understanding of wetland dynamics and their controlling processes. India being one of the mega diverse nations of the world should strive to conserve the ecological character of these ecosystems along with the biodiversity of the flora and fauna associated with these ecosystems.

PROTOZOA

Protozoans are single-celled eukaryotic microorganisms which colonize and inhabit virtually all environments where eukaryotic life has been found and thus, are one of the most successful groups on the earth. They range in size from 1µm (smallest protozoa, Leishmania donovani, a flagellate causing kalaazar in humans to 50mm or more (largest protozoa, Foraminifera, i.e., Cycloclypeus carpenter. Protozoans are motile and nearly all possess flagella, cilia or pseudopodia, in one or more stages of their life (Britannica 2017). They are common predators on bacteria, testate amoeba, algae, fungi, diatoms (Hausmann et al., 2003), and other small organisms, and thus serves as an important link in nutrients cycles for the benefit of other life forms (Mitchell et al., 2008). Their sensitivity towards any change in the environment, diversity, as well as the structure and functional characteristics contain immense information to develop and test bioindicators for evaluating environmental health. Many protozoan species can be considered as a highly valuable bioindicators in water quality analysis due to rapid growth, high turnover rates and short generation times allowing them to response quickly to changing environmental conditions (Berger et al., 1997). Protozoans, especially ciliates, have been employed as bioindicators of water quality in rivers, lakes and waste waters. For example the ciliate Metopus es in aquatic habitat represents the presence of Hydrogen Sulphide in the habitat. Similarly, a list of about 300 ciliate species which can be used as bioindicators was proposed by Foissner and Berger (1996). It has been observed that ciliates play an important role in waste water treatment plants by accelerating the process of water clarification by consuming bacteria, and their identification and quantification permit to rapidly assess the water quality (Curds and Cockburn, 1970; Al-Shahwani and Horan, 1991; Curds, 1992; Silva and Silva-Neto, 2001).

Over 65,000 protozoans have been known so far from the world of which more than half are fossils and about 10,000 species are parasitic. From India, thus far nearly 2800 species of protozoans have been recorded, including the parasitic (constitutes about 48 percent of the total protist diversity; recovered from the gut contents, blood, coelomic fluid and smears of different organs e.g., livers, kidney etc. of different vertebrate and invertebrate hosts), symbiotic (from the gut contents of wood-eating termites, belonging to two main families, i.e., Kalotermitidae, and Rhinotermitidae) and free-living forms (constitutes about 52 percent of the total protist diversity; isolated from soil, sand, mosses, freshwater, marine and brackish water habitats). Indian parasitic protozoa (symbionts and commensals) have been found to occupy diversified host environments, viz., (i) epizoic (found on the body surface of the aquatic animals), (ii) luminicolous (inhabiting lumen of the gut), (iii) coelozoic (inhabiting coelom of invertebrates, especially annelids), (iv) histozoic (found in blood, lymph and tissues of different organs) and (v) coprozoic (found in faecal matter and in waters rich in decomposing organic matter).

The first record of free living protozoans of India was reported by Grant (1842) who described six species of freshwater protozoa from the Calcutta, this work was though unpublished and was only mentioned in (Cantor, 1842). Sir Ronald Ross, who worked on the malarial parasites from India (Secunderabad and Calcutta), elucidated the complete life cycle of malarial parasites of birds' and their transmission by Culex mosquitoes. Further, he was the first to describe a gregarine parasite from a mosquito. Besides these, Anderson (1889) described a commensal ciliate from an earthworm. Subsequently, Annandale recorded two species of ciliates from the fresh and brackish water ponds of Port Canning, Calcutta. Ghosh (1918, 1919, 1920, 1921a, 1921b, 1922, 1928, 1929) published a series of papers reporting 29 species of free-living ciliates from Kolkata

and its nearby localities. Since then, considerable work on protozoa from various habitats has been done by Nair and his co-workers (1960-1974) and Das (1971) from West Bengal, Bhatia and Mallick (1930) from Kashmir and Mahajan (1969, 1971,and 1977) from Rajasthan. Earlier works on freshwater inhabiting ciliates are available in the Ciliophora volume in the Fauna of British India series, written by Bhatia (1936). In West Bengal, in all 152 species of ciliates, belonging to 2 classes, 16 orders, 52 families and 75 genera have been recorded by several investigators since 1840s (Das et al., 1993; Piyali and Das, 1997). As far as Indian wetlands are concerned most of the work has been carried out in the East Kolkata Wetlands and Chilika Lagoon. Recent reports includes, 19 species of testacid rhizopods and ciliates from the Vembanad Lake (Radhakrishnan and Jayaprakas 2015). Sharma and Sharma (2011) reported 21 species of Rhizopoda belonging to eight genera and six families from Deepor Beel, an important floodplain lake of the Brahmaputra River basin, showing the richest diversity of testaceans known to date from any freshwater ecosystem in India. The literature dealing with the protozoan diversity from Ramsar sites and which has been considered in the present document includes: Nair et al. (1967, 1971); Mahajan (1971); Mandal (1987); Jamadar and Choudhury (1988); Mandal et al. (1993); Nandi et al. (1999); Jyothibabu et al. (2008); Slathia and Dutta (2009); Sharma and Sharma (2011); Slathia and Dutta (2013); Bhat et al. (2013, 2014); Bindu et al. (2013); Biswas and Bandyopadhyay (2014); Radhakrishnan and Jayaprakas (2015); Roy and Pal (2016). A total of 570 Protozoan species, including naked amoebae, testate amoebae, ciliates and flagellates recorded so far from 42 Ramsar wetlands of India. The systematic list of the protozoans recorded from Indian Ramsar wetlands is provided in Table 10. The protozoans have been identified from all the Ramsar wetlands of India, with maximum diversity reported from the West Bengal (East Kolkata Wetlands and Sundarbans) followed by the Chilika lake. Though, in some wetlands protozoan diversity is too meagre and demands reinvestigation, i.e., Kolleru Lake (6 species), Nalsarovar (5 species), Renuka (6 species), Wullar Lake (2 species), Bhoj Wetland (9 species), Harike (10 species), Kanjli (18 species), and Sambhar (20 species). The vast majority of microbial eukaryotic organisms are undescribed and unknown in India. In the current scenario, the diversity of these small organisms are much less well understood than that of larger organisms. There is a fundamental need to document the taxonomic composition of protozoan diversity through systematic biodiversity surveys of Ramsar wetlands, since these microbial eukaryotic communities very much influence the health of the aquatic ecosystem. The group is least explored in this country except for West Bengal, Rajasthan, Orissa, Andhra Pradesh, some parts of Indian Himalayan landscape and some north-eastern states.

Table 10. Diversity of Protozoans from Ramsar Wetlands of India.

Phylum METAMONADA
Class TRICHOMONADEA
Order TRICHOMONADIDA
Family TRICHOMONADIDAE

1. *Tetratrichomonas buttreyi* Hibler *et al.*, 1960:RW- 27
2. *Trichomonas ruminantium* Braune, 1913:RW- 27
3. *Trichomonas vaginalis* Donné 1836:RW- 27

Class TRICHONYMPHEA
Order TRICHONYMPHIDA
Family EUCOMONYMPHIDAE

4. *Pseudotrichonympha cardiformis* Karandikar and Vittal, 1954:RW- 27
5. *Pseudotrichonympha subapicalis* Karandikar and Vittal, 1954:RW- 27

Order SPIROTRICHONYMPHIDA
Family HOLOMASTIGOTOIDIIDAE

6. *Holomastigotoides bengalensis* Chakravarty and Banerjee, 1956:RW- 21, 27
7. *Holomastigotoides hartmanni* Koidzumi, 1921:RW- 27
8. *Holomastigotoides ogivalis* De Mello, 1937:RW- 27

Order DIPLOMONADIDA
Family HEXAMITIDAE

9. *Giardia intestinalis* Kulda and Nohýnková, 1995:RW- 27

Phylum DINOFLAGELLATA
Class DINOPHYCEAE
Order GONYAULACALES
Family CERATIACEAE

10. *Ceratium furca* (Ehrenberg) Claparéde and Lachmann, 1859:RW- 27
11. *Ceratium fusus* (Ehrenberg) Dujardin, 1841:RW- 27
12. *Ceratium hirundinella*(O.F. Müller) Dujardin, 1841:RW- 2, 27
13. *Ceratium* sp.:RW- 27
14. *Ceratium symmetricum* Pavillard, 1905:RW- 27

15. *Ceratium trichoceros* (Ehrenberg) Kofoid, 1881:RW- 27
16. *Ceratium tripos* (O.F. Müller) Nitzsch, 1817:RW- 15, 27

Order GYMNODINIALES
Family GYMNODINIACEAE
17. *Gymnodinium aeruginosum* F. Stein, 1878:RW- 2, 15

Order PERIDINIALES
Family PERIDINIACEAE
18. *Peridinium* sp.:RW- 3, 21, 27
19. *Peridinium tabulatum* Playfair, 1912:RW- 2, 15
20. *Protoperidiniumoceanicum* (VanHöffen, 1897) Balech, 1974:RW- 11
21. *Protoperidiniumpentagonum* (Gran, 1902) Balech, 1974:RW- 11
22. *Protoperidinium claudicans* (Paulsen, 1907) Balech, 1974:RW- 11
23. *Protoperidinium divergens* (Ehrenberg) Balech, 1974:RW- 11
24. *Protoperidinium fatulipes* (Kofoid, 1907) Balech, 1974:RW- 11
25. *Protoperidinium globulus* (Stein, 1883) Balech, 1974:RW- 11
26. *Protoperidinium grande* (Kofoid, 1907) Balech, 1974:RW- 11
27. *Protoperidinium longipes* Balech, 1974:RW- 11
28. *Protoperidinium oblongum* (Aurivillius) Parke and Dodge, 1976:RW- 11
29. *Protoperidinium ovum* (Schiller, 1911) Balech, 1974:RW- 11
30. *Protoperidinium pellucidum* Bergh, 1881:RW- 11
31. *Protoperidinium tuba* (Schiller) Balech, 1974:RW- 11

Order DINOPHYSIALES
Family DINOPHYSIACEAE
32. *Dinophysishastata* Stein, 1883:RW- 11
33. *Histioneis depressa* Schiller, 1928:RW- 11
34. *Ornithocercus magnificus* Stein, 1883:RW- 11
35. *Ornithocercus quadratus* Schütt, 1900:RW- 11
36. *Ornithocercus steini* Schütt, 1900:RW- 11
37. *Ornithocercus thumii* (Schmidt) Kofoid and Skogsberg, 1928:RW- 11
38. *Phalacroma apicatum* Kofoid and Skogsberg, 1928:RW- 11
39. *Phalacroma rapa* Jorgensen, 1923:RW- 11
40. *Podolampus bipes* Stein, 1883:RW- 11
41. *Podolampus elegans* Schütt, 1895:RW- 11
42. *Podolampus palmipes* Stein, 1883:RW- 11
43. *Podolampus reticulata* Kofoid, 1907:RW- 11
44. *Podolampus spinifera* Okamura, 1912:RW- 11

Order NOCTILUCALES
Family NOCTILUCACEAE
45. *Noctiluca miliaris* Suriray in Lamarck, 1816:RW- 27
46. *Noctiluca* sp.:RW- 27

Phylum CERCOZOA
Class IMBRICATEA
Order EUGLYPHIDA
Family CYPHODERIIDAE
47. *Cyphoderia ampulla*Ehrenberg, 1840:RW- 2
Family EUGLYPHIDAE
48. *Assulina muscorum* Greeff, 1888:RW- 2
49. *Assulina seminulum* Ehrenberg, 1838:RW- 2
50. *Euglypha acanthophora* Ehrenberg, 1841:RW- 2, 14, 15
51. *Euglypha ciliata* Ehrenberg, 1848:RW- 26
52. *Euglypha compressa* Carter,1890:RW- 26
53. *Euglypha laevis* Ehrenberg, 1845:RW- 2, 26
54. *Euglypha rotunda* Wailes and Penard 1911:RW- 26
55. *Euglypha* sp.:RW- 10, 27
56. *Euglypha strigosa* (Ehrenberg, 1848):RW- 26
57. *Euglypha tuberculata* Dujardin, 1841:RW- 2, 13, 26
58. *Pareuglypha indica* Nair and Mukherjee, 1968:RW- 27
59. *Pareuglypha reticulata* Penard, 1902:RW- 10
60. *Pareuglypha* sp.:RW- 10
61. *Tracheleuglypha dentata* (Vejdowsky, 1832) Deflandre, 1928:RW- 26

Family TRINEMATIDAE
62. *Trinema enchelys* (Ehrenberg, 1938) Leidy, 1878:RW- 13, 15, 26
63. *Trinema lineare* Penard, 1890:RW- 2, 15, 26
64. *Trinema* sp.:RW- 14

Family ASSULINIDAE
65. *Placocista lens* Penard,1899:RW- 27
66. *Placocista spinosa* (Carter, 1865) Leidy, 1879:RW- 26

Phylum FORAMINIFERA
Class GLOBOTHALAMEA
Order ROTALIIDA
Family ELPHIDIIDAE
67. *Elphidium advenum* Cushman, 1922:RW- 13
68. *Elphidium craticulatum* Fichtel and Moll, 1798:RW- 13
69. *Elphidium crispum* Linnaeus, 1758:RW- 13
70. *Elphidium macellum* Fichtel and Moll, 1798:RW- 13
71. *Elphidium* sp.:RW- 27

Family BOLIVINITIDAE
72. *Bolivina nobilis* Hantken, 1875:RW- 13
73. *Bolivina striatula* Cushman, 1922:RW- 13

Family NUMMULITIDAE
74. *Operculina complanata* Defrance in Blainville, 1822:RW- 13
75. *Operculina cumingii* Carpenter, 1860:RW- 13
76. *Operculina granulosa* Leymerie, 1846:RW- 13

Family DISCORBIDAE
77. *Discorbis orbicularis* Terquem, 1876:RW- 13
78. *Discorbis rosacea* d'Orbigny, 1826:RW- 13

Family CIBICIDIDAE

79. *Cibicides lobatulus* Walker and Jacob, 1798:RW- 13
Family NONIONIDAE
80. *Nonion boueanum* d'Orbigny, 1846:RW- 13
81. *Nonion scaphum* Fichtel and Moll, 1798:RW- 13
82. *Nonion sloanii* d'Orbigny, 1839:RW- 13
83. *Nonion* sp.:RW- 13
Family GLOBIGERINACEA
84. *Globigerina bulloides* d'Orbigny, 1826:RW- 13
Family ROTALIIDAE
85. *Rotalia beccarii* Linnaeus, 1758:RW- 13
86. *Rotalia calcar* d'Orbigny in Deshayes, 1830:RW- 13
Family CALCARINIDAE
87. *Calcarina calcar* d'Orbigny in Deshayes, 1830:RW- 27
88. *Calcarina* sp.:RW- 27
OrderÊLITUOLIDA
FamilyÊLITUOLIDAE
89. *Ammobaculites dilatatus* Cushman and Brönnimann, 1948:RW- 13
90. *Ammobaculites foliaceous* Brady, 1881:RW- 13
91. *Ammobaculites taylorensis* Cushman and Waters, 1929:RW- 13
Family REOPHACIDAE
92. *Reophax cattella* Hoglund, 1947:RW- 13
93. *Reophax scottii* Chadter, 1892:RW- 13
Family TROCHAMMINIDAE
94. *Trochammina inflata* Montagu, 1808:RW- 13
95. *Trochammina nitida* Brady, 1881:RW- 13
96. *Trochammina* sp.:RW- 13
Order TEXTULARIIDA
Family TEXTULARIIDAE
97. *Textularia agglutinans* d'Orbigny, 1839:RW- 13
98. *Textularia conica* d'Orbigny, 1839:RW- 13
99. *Textularia* sp.:RW- 13
Class TUBOTHALAMEA
Order MILIOLIDA
Family MILIAMMINA
100. *Miliammina fusca* Brady, 1870:RW- 13
Family HAUERINIDAE
101. *Quinqueloculina agglutinans* d'Orbigny, 1839:RW- 13
102. *Quinqueloculinaoblonga* Ehrenberg, 1840:RW- 13
103. *Quinqueloculina seminulum* Linnaeus, 1758:RW- 13
104. *Quinqueloculina* sp.:RW- 27
105. *Triloculina oblonga* Montagu, 1803:RW- 13
Class MONOTHALAMEA
Order ASTRORHIZIDA
Family SACCAMMINIDAE
106. *Saccammina sphaerica* Brady, 1871:RW- 13
Phylum APICOMPLEXA
Class CONOIDASIDA
Order EUCOCCIDIORIDA
Family HAEMOGREGARINIDAE
107. *Haemogregarina colisa* Mandal, Ray, Sarkar and Kahali, 1984:RW- 27
108. *Haemogregarina mirabilis* Castellani and Willey, 1904:RW- 16
109. *Haemogregarina sundarbanensis* Sabir Hossen Molla, Probir Kumar Bandyopadhyay, Gözde Gürelli Published in Turkiye parazitolojii dergisi 2015:RW- 27
Family GREGARINIDAE
110. *Gregarina basantii* Mandai and Ray, 2007:RW- 27
111. *Gregarina gastrimargi* Sudip Mandal and Rupendu Ray, 2011:RW- 27
Family EIMERIIDAE
112. *Eimeria ahsata* Honess, 1942:RW- 27
113. *Eimeria arloingi* Marotel, 1905:RW- 27
114. *Eimeria cervis* Mandal and Choudhury, 1982:RW- 27
115. *Eimeria charadrii* Mandal, 1965:RW- 27
116. *Eimeria gallinagoi* Mandal, 1965:RW- 27
117. *Eimeria harpodoni* Satna and Bana, 1935:RW- 27
118. *Eimeria najae* Ray and Gupta, 1936:RW- 27
119. *Eimeria neodelicki* Vetterling:RW- 27
120. *Eimeria numeni* Mandal, 1965:RW- 27
121. *Eimeria roscoviensis* pluvialtna Mandal, 1965:RW- 27
122. *Eimeria southwelli* Halawani, 1930:RW- 27
123. *Eimeria sundarbanensis* Bandyopadhyay, 2004:RW- 27
124. *Eimeria vanelli* Mandal, 1965:RW- 27
125. *Eimeria zygaenae* Mandal and Chakravarty, 1965:RW- 27
126. *Isospora emberizae* Mandal and Chakravarty, 1964:RW- 27
127. *Isospora sundarbanensis* Ray and Sarkar, 1985:RW- 27
Order EUGREGARINORIDA
Family HIRMOCYSTIDAE
128. *Hirmocystis oxyae*:RW- 27
129. *Hirmocystis psyllae* Sudip Mandal and Rupendu Ray, 2008:RW- 27
Family ACTINOCEPHALIDAE
130. *Steinina indica* Sudip Mandal and Rupendu Ray, 2008:RW- 27
Family CEPHALOIDOPHORIDAE
131. *Cephaloidophora metaplaxi* Pearse, 1932:RW- 27
Family MONOCYSTIDAE
132. *Nematocystis indicus*:RW- 27
133. *Zygocystis indicus* Pradhan and Dasgupta 1983:RW- 27
134. *Zygocystis levinei* Bandyopadhyay and Mitra 2004:RW- 27
Class ACONOIDASIDA
Order HAEMOSPORIDA
Family HAEMOPROTEIDAE
135. *Haemoproteus columbae* Kruse, 1890:RW- 27
136. *Haemoproteus oryzivora* Anschutz:RW- 27
137. *Haemoproteus pastoris* De Mello, 1935:RW- 27

138. *Haemoproteus* sp.:RW- 27
Family PLASMODIIDAE
139. *Plasmodium falciparum* Welch, 1897:RW- 27
140. *Plasmodium malariae* Feletti and Grassi, 1889:RW- 27
141. *Plasmodium vivax* Grassi and Feletti, 1890:RW- 27
Order PIROPLASMIDA
Family BABESIIDAE
142. *Babesia muris* Coles, 1914:RW- 27
143. *Babesia vesperuginis* Dionisi, 1898:RW- 27
Family HAEMOHORMIDIIDAE
144. *Haemohormidium* sp.:RW- 27
Phylum SARCOMASTIGOPHORA
Class ZOOMASTIGOPHORA
Order TRICHOMONADIDA
Family MONOCERCOMONADIDAE
145. *Dientamoeba fragilis* Jepps and Dobell, 1918:RW- 27
146. *Lodamoeba bütschlii* Prowazek, 1912:RW- 27
147. *Monocercomonas ruminatium* Braune, 1914:RW- 27
Phylum PERCOLOZOA
Class HETEROLOBOSEA
Order SCHIZOPYRENIDA
Family VAHLKAMPFIIDAE
148. *Naegleria thortoni* Singh, 1952:RW- 27
Phylum AMOEBOZOA
Class LOBOSA
Order AMOEBIDA
Family AMOEBIDAE
149. *Amoeba discoides* Schaeffer, 1916:RW- 10
150. *Amoeba* sp.:RW- 1, 10, 14, 19
Family ENTAMOEBIDAE
151. *Entamoeba cervix* MandaI and Choudhury:RW- 27
152. *Entamoeba chattoni* Swellengrebal:RW- 27
153. *Entamoeba chiropteris* MandaI and Choudhury:RW- 27
154. *Entamoeba coli* Grassi, 1879:RW- 27
155. *Entamoeba histolytica* Schaudinn, 1903:RW- 27
156. *Entamoeba muris* Grassi , 1882:RW- 27
157. *Entamoeba suis* Hartmann:RW- 27
Family THECAMOEBIDAE
158. *Thecamoeba* sp.:RW- 27, 31
Family FLABELLULIDAE
159. *Flabellula* sp.:RW- 27
Family ACANTHAMOEBIDAE
160. *Acanthamoeba astronyxis* Ray and Hayes, 1954:RW- 27
161. *Acanthamoeba barhysodes*:RW- 27
162. *Acanthamoeba culbertsoni* Singh and Das, 1970:RW- 27
163. *Acanthamoeba palestinensis* Reich, 1933:RW- 27
164. *Acanthamoeba rhysodes* Singh, 1953:RW- 27
165. *Acanthamoeba* sp.:RW- 27
Family ASPLANCHNOIDAE
166. *Astramoeba radiosa*:RW- 10
167. *Astramoeba* sp.:RW- 10
Order ARCELLINIDA
Family NEBELIDAE
168. *Nebela collaris* Ehrenberg, 1848:RW- 13
169. *Nebela flabellulum* Leidy, 1974:RW- 10
170. *Nebela* sp.:RW- 10, 31
171. *Quadrulella symmetrica* (Wallich,1864) Schulze,1875:RW- 26
Family MICROCORYCIIDAE
172. *Diplochlamys leidyi* Greeff, 1888:RW- 26, 27
Family LESQUEREUSIIDAE
173. *Lesqueruesia modesta* Rhumbler, 1895:RW- 26
174. *Lesqueruesia spiralis* (Ehrenberg, 1840):RW- 26
Class DISCOSEA
Order VANNELLIDA
Family VANNELLIDAE
175. *Platyamoeba* sp.:RW- 27
176. *Vannella* sp.:RW- 27
Order DACTYLOPODIDA
Family PARAMOEBIDAE
177. *Mayorella* sp.:RW- 27
Class TUBULINEA
Order ARCELLINIDA
Family ARCELLIDAE
178. *Arcella arenaria* Greef,1866:RW- 26
179. *Arcella arenaria* Greeff, 1866:RW- 6
180. *Arcella catinus* Penard, 1890:RW- 6
181. *Arcelladentata*Ehrenberg, 1830:RW- 10
182. *Arcella discoides* Ehrenberg, 1843:RW- 2, 6, 10, 14, 13, 15, 26
183. *Arcella hemispaerica* Perty, 1852:RW- 2, 13, 15
184. *Arcellamegastoma* Penard, 1902:RW- 10
185. *Arcella polypora* Penard:RW- 10
186. *Arcella* sp.:RW- 3, 10, 14, 21, 27, 31
187. *Arcella vulgaris* Ehrenberg, 1830:RW- 2, 14, 10, 26, 27
188. *Bullinula indica* Penard, 1907:RW- 10
189. *Bullinula* sp.:RW- 10
190. *Pyxidicula invisitata* Awerinzew, 1906:RW- 26
191. *Pyxidicula operculata* (Agardh, 1827) Ehrenberg, 1838:RW- 10, 26, 27
192. *Pyxidicula* sp.:RW- 10
Family PLAGIOPYXIDAE 10
193. *Bullinularia indica* (Penard,1907) Deflandre,1953:RW- 26
194. *Plagiopyxis declivis* Bonnet, 1955:RW- 13, 26
195. *Plagiopyxis labiata* Penard, 1910:RW- 10
196. *Plagiopyxis* sp.:RW-
Family LESQUEREUSIIDAE
197. *Lesquereusia spiralis* Ehrenberg, 1840:RW- 2, 10, 13, 15
198. *Lesquereusia modesta* Rhumbler, 1895:RW- 10
199. *Lesquereusia* sp.:RW- 10
Family CENTROPYXIDAE

200. *Centropyxis aculeata* Ehrenberg, 1838:RW- 2, 14,6, 10, 13, 15, 26
201. *Centropyxis aerophila* Deflandre, 1929:RW- 6, 27
202. *Centropyxis cassis* (Wallich, 1864) Deflandre, 1929:RW- 26
203. *Centropyxis constricta* (Ehrenberg, 1838) Deflandre, 1929:RW- 6, 10
204. *Centropyxis discoides* Penard, 1902:RW- 6
205. *Centropyxis ecornis* Ehrenberg, 1841:RW- 2, 6, 10, 13, 14, 15, 26, 27
206. *Centropyxis hemisphaerica* (Barnard, 1875) Deflandre, 1929:RW- 10
207. *Centropyxis laevigata* Penard, 1890:RW- 6
208. *Centropyxis minuta* Deflandre, 1929:RW- 6, 26
209. *Centropyxis oblonga* Deflandre, 1929:RW- 2
210. *Centropyxis orbicularis* Deflandre, 1929:RW- 2
211. *Centropyxis* sp.:RW- 10,14, 19, 27
212. *Centropyxis spinosa* Cash, 1905:RW- 13, 14, 15, 26
213. *Centropyxis stellata* Wailes, 1927:RW- 10
214. *Centropyxis sylavtica* Deflandre, 1929:RW- 26
Family DIFFLUGIIDAE
215. *Cucurbitella mespiliformis* Penard, 1902:RW- 27
216. *Difflugiaaccutissima* Deflandre, 1931:RW- 26
217. *Difflugia acuminata* Ehrenberg, 1838:RW- 2, 10, 14, 15, 26
218. *Difflugia binucleata* Penard, 1902:RW- 13
219. *Difflugia bryophila* (Penard,1902) Jung, 1942:RW- 26
220. *Difflugia corona* Wallich, 1864:RW- 2, 6, 10, 13, 15, 26
221. *Difflugia curvicaulis* Penard, 1899:RW- 15, 26
222. *Difflugia elegans* Penard, 1890:RW- 26
223. *Difflugia globulosa* Dujardin, 1837:RW- 6, 13, 21, 26, 27
224. *Difflugia lebes* Penard, 1899:RW- 10
225. *Difflugia lithophila* Penard, 1902:RW- 13, 15
226. *Difflugia lobostoma* Leidy, 1879:RW- 13, 15, 26
227. *Difflugia muriformis* Gauthier-Leivre and Thomas, 1958:RW- 15
228. *Difflugia oblonga* Ehrenberg, 1838:RW- 2, 6, 10, 14, 15, 26
229. *Difflugia pyriformis* Perty, 1849:RW- 15
230. *Difflugia rubescens* Penard, 1891:RW- 10
231. *Difflugia* sp.:RW- 1, 3, 10, 13, 19, 27, 31
232. *Difflugia tuberculata* Wallich, 1864:RW- 2, 10
233. *Difflugia urceolata* Carter, 1864:RW- 2, 10, 15, 26
Family HELEOPERIDAE
234. *Heliopera sylvatica* Penard:RW- 26, 27
Family PHRYGANELLIDAE
235. *Phryganella paradoxa* Penard, 1902:RW- 6
Family CRYPTODIFFLUGIIDAE
236. *Cryptodifflugia oviformis* Penard, 1890:RW- 13
Family TRIGINOPYXIDAE
237. *Cyclopyxis arcelloides* (Penard, 1902) Deflandre, 1929:RW- 26
238. *Cyclopyxis eurysterna* Deflandre, 1929:RW- 2, 6, 26
239. *Triginopyxis arcula* (Leidy,1879) Penard, 1912:RW- 26
Phylum CHOANOZOA
Class CRISTIDISCOIDEA
Order NUCLEARIIDA
Family NUCLEARIIDAE
240. *Nuclearia* sp.:RW- 10
Phylum EUGLENOZOA
Class EUGLENOPHYCEAE
Order EUGLENALES
Family EUGLENACEAE
241. *Euglena acus* Ehrenberg, 1830:RW- 2, 15
242. *Euglena deses* Ehrenberg, 1834:RW- 26
243. *Euglena oxyuris* Schmarda, 1846:RW- 2, 15
244. *Euglena* sp.:RW- 10, 13, 27, 30
245. *Euglena tuberculata* Swirenko, 1915:RW- 13
246. *Euglena virdis* Ehrenberg:RW- 3
247. *Trachelomonas hispida* (Perty) F. Stein, 1878:RW- 2, 15
248. *Trachelomonas urceolata* A.C. Stokes, 1887:RW- 2
Family PHACACEAE
249. *Phacus acuminata* Stokes, 1885:RW- 2, 15
250. *Phacus pleuronectus* (O.F.Müller) Nitzsch,1841:RW- 2
251. *Phacus* sp.:RW- 3, 10, 27
Class KINETOPLASTEA
Order TRYPANOSOMATIDA
Family TRYPANOSOMATIDAE
252. *Leishmaniadonovani* (Laveran et Mesnil, 1903) Ross, 1903:RW- 27
253. *Trypanosoma anabasi* Mandal, 1978:RW- 27
254. *Trypanosoma avium* Danilewsky, 1885:RW- 27
255. *Trypanosoma bengalensis* Mandal, 1979:RW- 27
256. *Trypanosoma cancili* Mandal, 1978:RW- 27
257. *Trypanosoma gobida* Mandal, 1984:RW- 27
258. *Trypanosoma striati* Qadri, 1955:RW- 27
259. *Trypanosoma vittati* Tandon and Joshi, 1973:RW- 27
Class PERANEMEA
Order PERANEMIDA
Family PERANEMACEAE
260. *Entosiphon sulcatum* (Dujardin) Stein, 1878:RW- 15
261. *Copromonas ruminantium* Woodcock, 1916:RW- 27
Phylum BIGYRA
Class OPALINEA
Order OPALINIDA
Family OPALINIDAE
262. *Cepedea sundarbanensis* Gangopadhyay and Ray, 2005:RW- 27
Phylum MYXOZOA
Class MYXOSPOREA

Order BIVALVULIDA

Family SPHAEROMYXIDAE

263. *Sphaeromyxa hareni* Sarkar, 1984:RW- 27

264. *Sphaeromyxa theraponi* Tripathi:RW- 27

265. *Zschokkela cascasiensis* Sarkar, 1995:RW- 27

266. *Zschokkela pseudosciaena* Sarkar, 1996:RW- 27

Family MYXIDIDAE

267. *Myxidium boddaerti* Choudhury and Nandi, 1973:RW- 27

268. *Myxidium lepidocephalichthysum* Sarkar and Roy Choudhury, 1997:RW- 27

269. *Myxidium lieberkuhni* Butschli, 1881:RW- 27

Family SINUOLINEIDAE

270. *Sinulinea indica* Sarkar, 1997:RW- 27

271. *Myxoproteus cujaeus* Sarkar, 1996:RW- 27

Family CERATOMYXIDAE

272. *Ceratomyxa cyanoglossi* Das, Pal and Ghosh, 1988:RW- 27

273. *Ceratomyxa daysciaenae* Sarkar and Pramanik 1994:RW- 27

274. *Ceratomyxa sagarica* Choudhury and Nandi, 1973:RW- 27

275. *Ceratomyxa tenulosae* Sarkar and Pramanik, 1994:RW- 27

Family SPAEROSPORIDAE

276. *Myxobilatus anguillaris* Basu and Haldar, 2003:RW- 27

277. *Myxobilatus odontamblyopusi* Basu and Haldar, 2004:RW- 27

278. *Spaerospora corsulae* Sarkar and Ghosh:RW- 27

Family PARVICAPSULIDAE

279. *Neoparvicapsula monolata* Sarkar, 1999:RW- 27

Family MYXOBOLIDAE

280. *Myxobolus bankimi* Sarkar, 1999:RW- 27

281. *Myxobolus catli* Kaur and Singh 2011:RW- 20

282. *Myxobolus cirrhini* Kaur and Singh 2012:RW- 18

283. *Myxobolus dermiscalis* Kaur, Attri and Joshi, 2016:RW- 18

284. *Myxobolus eirasi* Kaur and Singh 2009:RW- 19, 20

285. *Myxobolus filamentosus* Haldar *et al.*, 1981:RW- 19

286. *Myxobolus harikensis* Kaur and Singh, 2011:RW- 18

287. *Myxobolus kanjali* Kaur and Singh 2011:RW- 19

288. *Myxobolus labeosus* Sarkar, 1995:RW- 27

289. *Myxobolus ludhianae* Gupta and Khera, 1991:RW- 18

290. *Myxobolus magauddi* Bajpai, 1981:RW- 19

291. *Myxobolus naini* Kaur and Singh 2008:RW- 19

292. *Myxobolus patialensis* Kaur and Singh 2011:RW- 20

293. *Myxobolus punjabensis* Gupta and Khera, 1989:RW- 19

294. *Myxobolus ropari* Kaur and Singh 2011:RW- 20

295. *Myxobolussaranae* Gupta and Khera, 1990:RW- 19

296. *Myxobolussaugati* Kaur and Singh, 2011:RW- 19

297. *Myxobolussclerii* Kaur and Singh 2010:RW- 19

298. *Myxobolus slendri*:RW- 20

299. *Myxobolus sparsi*:RW- 27

300. *Myxobolus stomum*Ali *et al.*, 2003:RW- 20

301. *Myxobolus szekeli* Kaur and Singh, 2011:RW- 18

302. *Myxobolus venkateshi*Seenappa and Manohar, 1981:RW- 20, 19

303. *Neothelohanellus indicus*:RW- 19

304. *Thelohanelluskalbensi* Singh and Kaur, 2012:RW- 18, 19

305. *Thelohanellus avijiti* Basu and Haldar, 2003:RW- 20

306. *Thelohanellus boggoti* Qadri, 1962:RW- 18

307. *Thelohanellus caudatus* Pagakar and Das, 1993:RW- 19

308. *Thelohanellus deri* Singh and Kaur, 2012:RW- 20

309. *Thelohanellus gangeticus* Tripathi, 1952:RW- 19

310. *Thelohanellus globulosa* Singh and Kaur, 2012:RW- 18

311. *Thelohanellus kanjalensis* Singh and Kaur, 2012:RW- 19

312. *Thelohanellus lamelliformis* Singh and Kaur, 2015:RW- 18

313. *Thelohanellus mrigalae*Tripathi, 1952:RW- 19

314. *Thelohanellus rohi* Singh and Kaur, 2015:RW- 19, 20

315. *Thelohanellus thaili* Singh and Kaur, 2012:RW- 19

316. *Thelohanellus wallagoi* Sarkar, 1985:RW- 18

Order MULTIVALVULIDA

Family TRUILOSPORIDAE

317. *Kudoa agarica*:RW- 27

318. *Kudoa cascasia* Sarkar and Ray Choudhury, 1993:RW- 27

319. *Kudoa coibari* Sarkar, 1999:RW- 27

320. *Kudoa haridasae* Sarkar and Ghosh, 1991:RW- 27

321. *Unicapsula maxima* Sarkar, 1999:RW- 27

Phylum CILIOPHORA

Class OLIGOTRICHEA

Order TINTINNIDA

Family TINTINNIDIIDAE

322. *Amphorella gracilis* R.T. Lowe, 1831:RW- 11

323. *Amphorella quadrilineata* Claparède and Lachmann, 1858:RW- 11

324. *Amphorella quadrilineata* Claparède and Lachmann, 1858:RW- 11

325. *Amphorella tetragona* (Jörgensen, 1924) Kofoid and Campbell, 1929:RW- 11

326. *Brandtiella pallida* (Brandt) Kofoid and Campbell, 1929:RW- 11

327. *Dadayiella bulbosa* (Brandt, 1906):RW- 16

328. *Dadayiella ganymedes* (Entz, 1884) Kofoid and Campbell, 1929:RW- 11

329. *Eutintinnusapertus* Kofoid and Campbell, 1929:RW- 11, 16

330. *Eutintinnus elongatus* Jörgensen, 1924:RW- 11, 16

331. *Eutintinnus fraknoi* (Daday, 1887):RW- 16

332. *Eutintinnus lusus undae* Entz, 1885:RW- 11

333. *Leprotintinnus nordqvistii* (Brandt, 1906):RW- 16

334. *Leprotintinnus simplex* (Schmidt, 1902):RW- 16
335. *Parundella lohmani* :RW- 11
336. *Parundella messinensis* Brandt, 1906:RW- 11
337. *Salpingacantha ampla* Kofoid and Campbell, 1929:RW- 11
338. *Salpingacantha undata* Jörgensen, 1899:RW- 11
339. *Salpingella acuminata* (Claparède and Lachmann, 1858) Jörgensen, 1924:RW- 11
340. *Salpingella decurtata* Jörgensen, 1924:RW- 11
341. *Steenstrupiella steenstrupii* Claparède and Lachmann, 1858:RW- 11
342. *Stenosemella nivalis* (Meunier, 1910):RW- 16
343. *Stenostomella ventricosa* Claparède and Lachmann, 1858:RW- 11, 16
344. *Tintinnidium fluviatile* Stein, 1863:RW- 16, 27
345. *Tintinnidium* sp. :RW- 27
346. *Tintinnopsis beroidea* Stein, 1867:RW- 27
347. *Tintinnopsis compressa* Daday, 1887:RW- 16
348. *Tintinnopsis cylindrical* Daday, 1887:RW- 16, 27
349. *Tintinnopsis directa* Hada, 1932:RW- 16
350. *Tintinnopsis filakinensis* Al-Yamani *et al.*, 2011:RW- 16
351. *Tintinnopsis fimbriata* (Meunier, 1919):RW- 16
352. *Tintinnopsis gracilis* (Kofoid and Campbell, 1929):RW- 16
353. *Tintinnopsis karajacensis* Brandt, 1896:RW- 16
354. *Tintinnopsis lohmanni* Laackmann, 1906:RW- 16
355. *Tintinnopsis nucula* Fol, 1884:RW- 16
356. *Tintinnopsis parvula* (Jorgensen, 1912):RW- 16
357. *Tintinnopsis radix* Imhof, 1886:RW- 11, 16
358. *Tintinnopsis rotundata* Kofoid and Campbell, 1929:RW- 16
359. *Tintinnopsis spiralis* (Kofoid and Campbell, 1929):RW- 16
360. *Tintinnopsis tocantinensis* Kofoid and Campbell, 1929:RW- 27
361. *Tintinnopsis tubulosa* (Levander, 1900):RW- 16
Family CODONELLIDAE
362. *Codonella nationalis* Brandt, 1906:RW- 11
Family METACYLIDAE
363. *Metacylis tropica* (Duran, 1957):RW- 16
Family PTYCHOCYLIDIDAE
364. *Favella adriatica* (Imhof, 1886; Jorgensen, 1924):RW- 16
365. *Favella campanula var. composite* (Schmidt, 1902; Jorgensen, 1924):RW- 16
366. *Favella ehrenbergii* (Claparede and Laachmann, 1858; Jorgensen, 1924):RW- 16
Family CODONELLOPSIDAE
367. *Codonellopsis lusitanica* Jörgensen, 1924:RW- 27
368. *Codonellopsis ostenfeldei* (Schmidt, 1902):RW- 16
369. *Codonellopsis rotundata* Claparède and Lachmann, 1859:RW- 11
370. *Codonellopsis tessellata* Brandt, 1906:RW- 11
Family RABDONELLIDAE
371. *Rhabdonella amor* (Cleve, 1900) Brandt, 1907:RW- 11
372. *Rhabdonella poculum* Ostenfeld and Schmidt, 1901:RW- 11
373. *Rhabdonella spiralis* Fol, 1881:RW- 11
Family UNDELLIDAE
374. *Undella globosa* Brandt, 1906:RW- 11
Family XYSTONELLIDAE
375. *Xystonella treforti* Daday, 1887:RW- 11
Order CHOREOTRICHIDA
Family LOHMANNIELLIDAE
376. *Lohmaniella spiralis* Leegaard, 1915:RW- 11
377. *Lohmanniella oviformis* Leegaard, 1915:RW- 11
Family PETALOTRICHIDAE
378. *Petalotricha ampulla* (Fol, 1881) Kent, 1882:RW- 11
Family STROBILIDIIDAE
379. *Strobilidium gyrans* (Stokes, 1887) Kahl, 1932:RW- 5,27
Order STROMBIDIIDA
Family STROMBIDIIDAE
380. *Strombidium calkinsi* Kahl, 1932:RW- 16
Order OLIGOTRICHIDA
Family DICTYOCYSTIDAE
381. *Dictyocysta elegans* Ehrenberg, 1854:RW- 11
382. *Dictyocysta mitra* Haeckel, 1873:RW- 11
Class HYPOTRICHEA
Order EUPLOTIDA
Family EUPLOTIDAE
383. *Euplotes charon* (Müller, 1773) Ehrenberg, 1830:RW- 16, 21
384. *Euplotes eurystomus* Wrzesniowski, 1870:RW- 16
385. *Euplotes gracilis* Kahl, 1932:RW- 10, 27
386. *Euplotes inkystans* Chatton in Tuffrau, 1960:RW- 21
387. *Euplotes musciola* Kahl:RW- 2
388. *Euplotes patella* Müller, 1773:RW- 16, 27
389. *Euplotes plumipes* Stokes, 1884:RW- 2, 15, 21
390. *Euplotes* sp.:RW- 3, 10, 13, 27
391. *Euplotes vannus* Müller, 1786:RW- 16
392. *Euplotoides woodruffi* Gaw, 1939:RW- 16, 26
Family ASPIDISCIDAE
393. *Aspidisca costata* (Dujardin, 1841) Stein, 1859:RW- 15
394. *Aspidisca lynceus* Müller, 1773:RW- 26
395. *Aspidisca* sp.:RW- 15
Order OXYTRICHIDA
Family OXYTRICHIDAE
396. *Oxytricha chilkaensis* Das, 1995:RW- 16
397. *Oxytricha fallax* Stein, 1859:RW- 2, 15, 27
398. *Oxytricha granulifera* Foissner and Adam, 1983:RW- 26
399. *Oxytricha marina* Kahl, 1932:RW- 16
400. *Oxytricha* sp.:RW- 14
401. *Stylonychia mytilus* (Müller, 1773) Ehrenberg,

1830:RW- 26
402. *Stylonychia* sp.:RW- 10, 15, 31
403. *Tachysoma* sp.:RW- 13
Family URONYCHIIDAE
404. *Diophrys appendiculata* Ehrenberg, 1893:RW- 16, 27
Order STICHOTRICHIDA
Family KERONIDAE
405. *Keronopsis rubra (*Ehrenberg, 1838) Kahl, 1932:RW- 16
Family SPIROFILIDAE
406. *Stichotricha socialis* Gruber, 1879:RW- 2, 15
Family HYPOTRICHIDIIDAE
407. *Hypotrichidium conicum* Ilowaisky, 1921:RW- 26
Class PLAGIOPYLEA
Order PLAGIOPYLIDA
Family PLAGIOPYLIDAE
408. *Plagiopyla narasimhamurtii* Nitla *et al.* 2018:RW- 1
409. *Plagiopyla nasuta* Stein, 1860:RW- 1, 16, 27
410. *Plagiopyla ovuta* Kahl, 1931:RW- 16
411. *Plagiopyla ramani* Nitla *et al.* 2018:RW- 1
412. *Plagiopyla* sp.:RW- 1
Order ACTINOPHRYIDA
Family ACTINOPHRYIDAE
413. *Actinophrys sol* Ehrenberg:RW- 2
414. *Actinophrys* sp.:RW- 10, 14, 21
415. *Actinoshaerium* sp.:RW- 21
Class GYMNOSTOMATEA
Order PLEUROSTOMATIDA
Family LITONOTIDAE
416. *Litonotus fasciola* Wresniowski, 1870:RW- 13, 16, 21, 26
417. *Litonotus* sp.:RW- 10
Family LOXOPHYLLIDAE
418. *Loxophyllum grande* Entz, 1879:RW- 16
419. *Loxophyllum levgatum* Sauerbey,1928:RW- 27
420. *Loxophyllum meleagris* (Müller, 1773) Dujardin, 1841:RW- 16
421. *Loxophyllum niemeccense* Stein, 1859:RW- 15
422. *Loxophyllum setigerum* Quennerstedt, 1867:RW- 16
423. *Loxophyllum uninucleatum* Kahl, 1928:RW- 16
Order SPATHIDIIDA
Family SPATHIDIIDAE
424. *Spathidium fossicola* Kahl, 1933:RW- 16
Family TRACHELOPHYLLIDAE
425. *Trachelophyllum clavatum* Stokes, 1886:RW- 16
Class KINETOFRAGMINOPHORA
Order SUCTORIDA
Family PODOPHRYIDAE
426. *Sphaerophrya pusilla* Claparede and Lachmann, 1859:RW- 21
Family DENDROSOMATIDAE
427. *Tokophrya* sp.:RW- 16
Class COLPODEA
Order BURSARIOMORPHIDA
Family BURSARIIDAE
428. *Bursaria truncatella* Müller, 1773:RW- 26
Order COLPODIDA
Family COLPODIDAE
429. *Colpoda cucullus* O.F. Müller, 1773:RW- 2, 5, 15
430. *Colpoda* sp.:RW- 15
Class CRYPTOPHYCEAE
Order CRYPTOMONADALES
Family CAMPYLOMONADACEAE
431. *Chilomonas paramecium* Ehrenberg, 1832:RW- 15
Class KARYORELICTEA
Order PROTOHETEROTRICHIDA

Family GELEIIDAE
432. *Geleia nigriceps* Kahl,1933:RW- 16
Class OLIGOHYMENOPHOREA
Order SCUTICOCILIATIDA
Family CYCLIDIIDAE
433. *Cyclidium citrullus* Cohn, 1866:RW- 16
Order THIGMOTRICHIDA
Family ANCISTRIDAE
434. *Ancistrumina barbata* Issel, 1903:RW- 27
435. *Ancistrumina obtusae* Jamadar and Choudhury, 1988:RW- 27
436. *Fenchelia kapili* Jamadar and Choudhury, 1988:RW- 27
437. *Fenchelia sagarica* Jamadar and Choudhury, 1988:RW- 27
438. *Protophrya indica* Jamadar and Choudhury, 1988:RW- 27
Family NUCLEOCORBULIDAE
439. *Nucleocorbula adherens* Santhakumari and Nair, 1970:RW- 13
Order PERITRICHIDA
Family SCYPHIDIIDAE
440. *Scyphidia (Gerda) ubiquita* Hirshfield,1949:RW- 27
441. *Scyphidia bengalensis* Jamadar and Choudhury, 1988:RW- 27
442. *Scyphidia* sp.:RW- 16
Family TRICHODINIDAE
443. *Trichodina balakrishna* Santhakumari and Nair, 1973:RW- 13
444. *Trichodina heterodentata* Duncan, 1977:RW- 7
445. *Trichodina japonica* Imai, Miyazaki and Nomura, 1991:RW- 27
446. *Trichodina mukundai* Ray and Choudhury:RW- 27
447. *Trichodina mystusi* Asmat and Haldar, 1998:RW- 27
448. *Tripartiella copiosa* Lom, 1959:RW- 27
Family VORTICELLIDAE
449. *Carchesium polypinum* (Linnaeus, 1758) Ehrenberg, 1831:RW- 27
450. *Carchesium* sp.:RW- 10, 15, 27
451. *Vorticella aequilata* Kahl, 1935:RW- 2
452. *Vorticella campanula* Ehrenberg, 1831:RW- 2, 13, 15

453. *Vorticella marina* Greeff, 1870:RW- 16
454. *Vorticella* sp.:RW- 1, 10, 14, 19, 26, 27, 31
455. *Zoothamnium rigidum* Precht, 1935:RW- 13
456. *Zoothamnium* sp.:RW- 27
Family EPISTYLIDIDAE
457. *Epistylis* sp.:RW- 15
Order HYMENOSTOMATIDA
Family GLAUCOMIDAE
458. *Glaucoma* sp.:RW- 15
459. *Ichthyophthirius multifiliis* Fouquet, 1876:RW- 7
460. *Monochilum ovale* Schewiakoff, 1893:RW- 5, 21
Family UROCENTRIDAE
461. *Urocentrum turbo* (Müller, 1786) Nitzsch, 1827:RW- 5, 26
462. *Urocentrum* sp.:RW- 10
Family OPHRYOGLENIDAE
463. *Ophryoglena flavaÊ*Ehrenberg, 1834:RW- 15
Order PENICULIDA
Family PARAMECIIDAE
464. *Paramecium aurelia* Müller, 1773:RW- 10
465. *Paramecium bursaria* (Ehrenberg, 1831) Focke, 1836:RW- 10
466. *Paramecium calkinsi* Woodruff, 1921:RW- 16
467. *Paramecium caudatum* Ehrenberg, 1834:RW- 2, 10, 15, 26, 27, 30
468. *Paramecium multimicronucleatum* Powers and Mittchell, 1910:RW- 10
469. *Paramecium* sp.:RW- 1, 10, 14
Order PLEURONEMATIDA
Family PLEURONEMATIDAE
470. *Pleuronema marinum* Dujardin, 1841:RW- 16
Order PHILASTERIDA
Family PHILASTERIDAE
471. *Philaster digitiformis* Fabre-Domergue, 1885:RW- 16
Family CRYPTOCHILIDAE
472. *Thigmozoon fencheli* Santhakumari and Nair, 1973:RW- 13
Family URONEMATIDAE
473. *Uronema filificum* Kahl, 1932:RW- 16
474. *Uronema marinum* Dujardin, 1841:RW- 16
475. *Uronema* sp.:RW- 10
Family COHNILEMBIDAE
476. *Cohnilembus longivelatus* Kahl, 1935:RW- 16
477. *Cohnilembus subulatus* Kent, 1882:RW- 16, 21
478. *Cohnilembus verminus* (Müller, 1773) Kahl, 1933:RW- 16
Family CINETOCHILIDAE
479. *Cinetochilum margaritaceum* Perty, 1852:RW- 21
Order HYMENOSTOMATIDA
Family TETRAHYMENIDAE
480. *Colpidium* sp.:RW- 14
481. *Tetrahymena pyriformis* Ehrenberg, 1830:RW- 16
482. *Tetrahymena rostrata* (Kahl, 1926) Corliss, 1952:RW- 27
Family CALLIMASTIGIDAE
483. *Callimastix equi* Biswas and Bandyopadhyay, 2014:RW- 27
Order SCUTICOCILIATIDA
Family CYCLIDIIDAE
484. *Cristigera* sp. Biswas and Bandyopadhyay, 2014:RW- 27
485. *Cristigera susmai* Jamadar and Choudhury, 1988:RW- 27
Order THIGMOTRICHIDA
Family ANCISTRIDAE
486. *Ancistrumina barbata* Issel, 1903:RW- 27
487. *Ancistrumina obtusae* Jamadar and Choudhury 1988:RW- 27
Class PROSTOMATEA
Order PRORODONTIDA
Family COLEPIDAE
488. *Coleps devdaniensis* Mahajan:RW- 21
489. *Coleps hirtus* (O.F.Müller, 1786) Nitzsch, 1827:RW- 2, 13, 15, 19, 26
490. *Coleps inermis* Perty, 1852:RW- 5
491. *Coleps* sp.:RW- 10, 14
492. *Coleps tesselatus* Kahl, 1930:RW- 5, 16
Family HOLOPHRYIDAE
493. *Holophrya bengalensis minor* Mahajan,1965:RW- 21
494. *Holophrya nairi* Das, 1995:RW- 16
495. *Holophrya nigricans* Lauterborn, 1894:RW- 16
496. *Holophrya simplex* Schewiakoff, 1893:RW- 16, 21
Order PROSTOMATIDA
Family PRORODONTIDAE
497. *Prorodon discolor* Schewiakoff, 1892:RW- 16
498. *Prorodon marinus* Claparede and Lachmann, 1859:RW- 16
499. *Prorodon teres* (Ehrenberg, 1834) Foissner, Berger and Kohmann, 1994:RW- 16
500. *Pseudoprorodon lieberkuhni* Butschli, 1889:RW- 27
Family UROTRICHIDAE
501. *Urotricha discolor* Kahl, 1930:RW- 16
502. *Urotricha elegans* Maupas, 1883:RW- 16
503. *Urotricha globosa* Schewiakoff, 1892:RW- 16
Class NASSOPHOREA
Order NASSULIDA
Family NASSULIDAE
504. *Nassula notata* Muller, 1786:RW- 16
505. *Nassula ornata* Ehrenberg, 1834:RW- 16
Family MICROTHORACIDAE
506. *Drepanomonas revoluta* Penard, 1922:RW- 27
Family LEPTOPHARYNIDAE
507. *Leptopharynx costatus* Mermod, 1914:RW- 26
Order SYNHYMENIIDA
Family ORTHODONELLIDAE
508. *Orthodonella gutta (*Cohn, 1866) Kahl, 1931:RW- 26 (Synonym- Trachelius gutta Sahrhage, 1915)
Class PHYLLOPHARYNGEA

Order DYSTERIIDA
Family DYSTERIIDAE
509. *Dysteria ovalis* (Gourret and Roeser, 1886) Kahl, 1931:RW- 16
Order CYRTOPHORIDA
Family CHILODONELLIDAE
510. *Chilodonella cucullulus* Ehrenberg, 1838:RW- 15, 16, 27
511. *Chilodonella* sp.:RW- 10, 14
512. *Chilodonella uncinata (*Ehrenberg, 1838) Strand, 1928:RW- 7, 26, 27
513. *Trithigmostoma steini* (Blochmann, 1895) Foissner, 1988:RW- 26
(Synonym- *Chilodontopsis bengalensis* Ghosh, 1921)
Order CHLAMYDODONTIDA
Family CHLAMYDODONTIDAE
514. *Chlamydodon mnemosyne* Ehrenberg, 1835:RW- 16, 27
Order RHYNCHODIDA
Family ANCISTROCOMIDAE
515. *Ancistrocoma pelseneeri* Chatton and Lwoff, 1926:RW- 27
516. *Raabella helensis* Chatton and Lwoff, 1950:RW- 27
Class HETEROTRICHEA
Order HETEROTRICHIDA
Family BLEPHARISMIDAE
517. *Anigsteinia salinarum*:RW- 16
518. *Blepharisma intermedium* Bhandary, 1962:RW- 15
Family CAENOMORPHIDAE
519. *Caenomorpha capucina* Kahl, 1932:RW- 16
520. *Caenomorpha levanderi* Kahl, 1927:RW- 16
Family FOLLICULINIDAE
521. *Folliculina ampulla* (Müller, 1786) Lamarck, 1816:RW- 27
522. *Folliculina* sp.:RW- 13
Family CONDYLOSTOMATIDAE
523. *Condylostoma magnum* Spiegel, 1926:RW- 16
524. *Condylostoma patens* O.F. Müller, 1786:RW- 16
525. *Condylostoma* sp.:RW- 10
Family SPIROSTOMIDAE
526. *Gruberia calkensi* Beltran, 1933:RW- 16
527. *Spirostomum ambiguum* (Müller, 1786) Ehrenberg, 1834:RW- 2, 15
528. *Spirostomum teres* Claparède and Lachmann, 1858:RW- 16
Family METOPIDAE
529. *Metopus es* (Claparede and Lachmann, 1858) Kahl, 1932:RW- 16
530. *Metopus fuscus* Kahl, 1927:RW- 16
531. *Metopus ovalis* Kahl, 1927:RW- 16
532. *Metopus vestitutus* Kahl, 1932:RW- 16
Family NYCTOTHERIDAE
533. *Nyctotheroides kaloulae* Ray and Choudhury 1992:RW- 27
534. *Nyctotheroides ornatae*:RW- 27
535. *Nyctotherus marina* Santhakumari and Nair, 1973:RW- 13
Family CLIMACOSTOMIDAE
536. *Climacostomum* sp.:RW- 14
Family STENTORIDAE
537. *Stentor coeruleus* (Pallas, 1766) Ehrenberg, 1830:RW- 26
Class KARYORELICTEA
Order PROTOSTOMATIDA
Family TRACHELOCERCIDAE
538. *Trachelocerca minuta* Dragesco, 1960:RW- 16
539. *Trachelocerca phoenicopterus* Cohn:RW- 16
Order HALTERIIDA
Family HALTERIIDAE
540. *Halteria chlorelligera* Kahl, 1932:RW- 16
541. *Halteria grandinella* (Müller, 1773) Dujardin, 1841:RW- 26
542. *Halteria oblonga* Kellicott, 1885:RW- 16

543. *Halteria* sp.:RW- 10, 16, 11
Order UROSTYLIDA
Family UROSTYLIDAE
544. *Urostyla grandis* Ehrenberg, 1830:RW- 26
Class SPIROTRICHEA
Family HOLOSTICHIDAE
545. *Holosticha manca* Kahl, 1932:RW- 16
546. *Holosticha warranei* Song and Wilbert, 1997:RW- 16
547. *Nassula notata* Müller, 1786:RW- 16
548. *Nassula ornata* Ehrenberg, 1833:RW- 16
Family AMPHISIELLIDAE
549. *Amphisiella oblonga* (Schewiakoff, 1893) Kahl, 1932:RW- 10
Class LITOSTOMATEA
Order HAPTORIDA
Family LACRYMARIIDAE
550. *Lacrymaria coronata* Claparède and Lachmann, 1858:RW- 16
551. *Lacrymaria elegans* Engelmann, 1862:RW- 16
552. *Lacrymaria olor* Müller, 1776:RW- 2, 15, 16, 26
553. *Lacrymaria salinarum* Kahl, 1928:RW- 16
554. *Lacrymaria* sp.:RW- 14
Family HOMALOZOONIDAE
555. *Homalozoon* sp.:RW- 10
Order DILEPTIDA
Family DILEPTIDAE
556. *Dileptus americanus* Kahl, 1931:RW- 27
557. *Dileptus anatinus* Goliñska, 1971:RW- 26
558. *Dileptus anser* (Müller, 1773) Dujardin, 1841:RW- 2, 15
559. *Trachelius ovum* (Ehrenberg, 1831) Ehrenberg, 1838:RW- 2, 15, 21

Family DIDINIIDAE

560. *Didinium nasutum* (Müller, 1773) Stein, 1859:RW- 21, 26

Order VESTIBULIFERIDA

Family BALANTIIDIDAE

561. *Balantidium coli* (Malmsten, 1857) Stein, 1863:RW- 27

562. *Balantidium* sp.:RW- 27

Class OLIGOHYMENOPHOREA

Order PENICULIDA

Family FRONTONIIDAE

563. *Frontonia acuminata* Ehrenberg, 1833:RW- 2, 15, 27

564. *Frontonia atra* Ehrenberg, 1833:RW- 21

565. *Frontonia conplanata* Wetzel, 1927:RW- 21

566. *Frontonia depressa* Stokes, 1886:RW- 2

567. *Frontonia fusca* Quennerstedt, 1869:RW- 16

568. *Frontonia leucas* Ehrenberg, 1833:RW- 15, 16, 27

569. *Frontonia marina* Fabre-Domergue, 1891:RW- 16

570. *Frontonia* sp.:RW- 26

Order THIGMOTRICHIDA

Family HEMISPEIRIDAE

571. *Boveria teredinidi* Nelson, 1923:RW- 13, 27

For details of the wetland names, kindly refer Table 6, page xx.

The compiled list of protozoan (Table xx) from the Ramsar wetlands of India shows a meagre diversity with report of only 571 species constituting about 24 percent of the total protozoan diversity reported from India. It is also evident that many wetlands have been poorly explored for the presence of protozoans, since there diversity is reflected by only few species. It also appears that many of these species may eventually synonymised when detailed investigations on each taxa performed based on modern methodologies, i.e., live observations and stained preparations supplemented with gene sequences. These wetlands demands reinvestigation and proper documentation of the protozoan diversity including the free living and parasitic forms. A perusal of literature revealed that only some scattered reports are available and many Ramsar sites still remains unexplored for the protozoan's fauna e.g., Pong Dam, Tso Morari, Hokersar, Sasthamkotta, Bhitarkanika, Keoldeo National Park, Point Calimere, Rudra Sagar, and Upper Ganga. Taxonomic studies and inventorization of protozoa from Ramsar sites of these states are required to get a first-hand estimate of the protozoan diversity of the country. Furthermore, expertise needs to be developed/promoted for these unicellular microbes.

PORIFERA

Sponges belong to the phylum Porifera are mainly a group of marine or rarely freshwater filter feeding animals that are sedentary in nature and possess a porous body. During different phases of their lifespan they exhibit a variety of living modes, viz., periphytonic, planktonic, neustonic, and benthic. Sponges are primitive multicellular animals that have no digestive system, no circulatory system, and no nervous system. They do not have organs and their cells are not organized into well-defined tissues. The water enters in through the pores located throughout their body wall into a central cavity that is lined with collar cells having flagellum. The water flows through the central cavity with the help of current generated by the movement of flagellum and eventually exits the sponge through the large opening at the top of the body called the osculum. Along with water food enters the body which is being captured by the collar cell's ring of tentacles. The food is digested in food vacuoles or transferred to the amoeboid cells in the middle layer of the body wall for digestion. Apart from food the water also supplies oxygen to the sponge and removes waste product from the body. As mentioned above they are well known for absorbing and utilizing material available in water and in evaluating the quality of water as they have the potential to indicate both population alterations and pollution induced cytopathology (Soota & Saxena, 1983; Harrison 1974).

Freshwater sponges characteristically produce asexual reproductive bodies called gemmules during dry summer period, which are quite often encountered in zooplankton samples during summer and winter seasons (Saxena, 2015). Shape and microspination pattern of their siliceous spicules serve the most valuable taxonomic clues.

Sponges are the major components of the benthic fauna and are distributed from the intertidal to the deepest zone and are a potential source of many new bioactive compounds. This phylum is represented in the Indian seas by over 500 species under 4 classes, i.e., Calcispongiae (Calcareous sponges), Demospongiae (Silicious sponges), Hyalospongiae (Hexactincllid sponges or glass sponges), Sclerospongiae (Coralline sponges). In India out knowledge of the identity, biology, distribution, population structure and possibilities of commercial exploitation of sponges is inadequate and requires prioritization.

The studies on Indian sponges was initiated by Annandale (1907-1915) who worked on the freshwater sponges of India. After that, a check list was published by Khera & Chaturvedi (1976) and Soota & Pattanayak (1982) studied the freshwater sponges with report of nine species belonging to six genera and extending the range of distribution of some species. Subsequently contributions were made for sponges of Gujarat and Rajasthan (Soota et al. 1983; Soota and Saxena 1983; Soota 1991; Saxena 1996; Saxena 2001; Devarshi 2006; Saxena 2015). Out of over 4500 sponge species, including both marine and freshwater ones, from the world, 545 species are recorded to harbor Indian waters (Thomas, 1996a, 1998) with most of them being marine forms (Chandra et al., 2016). Out of them, 512 species are exclusively marine (Chandra et al., 2017a), whereas 33 species are found to be associated with freshwater ecosystems. This indicates that a very little work has been done on the shallow water marine sponge fauna of peninsular India. The fauna of the west coast of India is rather poorly worked out when compared to that of the east coast. Along the east coast, Madras and Chilka Lake were investigated to some extent (Dendy 1887; Annandale 1914, 1915a; Ali 1954, 1956a; Ali 1956b; Ali, 1960). The fauna of the deep sea sponge fauna of the Bay of Bengal were studied by Dendy and

Burton (1926) and Burton (1928). The major contributions dealing with the fauna of the Gulf of Kutch are those of Dendy (1915, 1916) and that of Gulf of Mannar and Island system of India by Thomas (1996a) with a report of 34 species of coral boring sponges. The present compilation of the sponges from the 27 Ramsar wetlands have been mainly the work of Annandale 1915a, Mandal and Nandi, 1989, Pattanayak, 1995, Mehta and Paliwal, 2000, Nandi, 2009.

A total of 21 poriferans belonging to 4 families and 16 genera have been reported so far from the 41 Ramsar wetlands of India. The systematic list of the poriferans recorded from Indian Ramsar wetlands is provided in Table 1. The poriferans have been identified mainly from 5 Ramsar wetlands of India, with maximum diversity reported from the East Kolkata Wetlands with 13 species followed by the Chilika Lake with 6 species. Though, in some wetlands poriferans diversity is too meagre and demands reinvestigation, i.e., Vembanand (3 species), Sundarbans (1 species), and Renuka wetland (1 species). In the current scenario, it is clear that the diversity of poriferans are much less well studied and understood than that of larger organisms. There is a fundamental need to document the taxonomic composition through systematic biodiversity surveys, biology, distribution, population structure and possibilities of their commercial exploitation from the Ramsar wetlands, since their communities serves as the bioindicator of the health of the aquatic ecosystem. The group is least explored in this country and knowledge of their identity is inadequate and requires prioritization.

Table 11. Diversity of Poriferans from Ramsar Wetlands of India.

SI. No.	Species	Distribution
	Phylum PORIFERA	
	Class DEMOSPONGIAE	
	Order SPONGILLIDA	
	Family SPONGILLIDAE	
1.	*Corvospongilla lapidosa Annandale, 1908*	26
2.	*Dosilia plumosa Carter, 1849*	26
3.	*Ephydatia meyeni carter, 1849*	5, 26
4.	*Eunapius calcuttanus Annandale,1911*	26
5.	*Eunapius carteri Bowerbank, 1863*	26
6.	*Radiospongilla cerebellata Bowerbank, 1863*	26
7.	*Radiospongilla indica Annandale, 1907*	26
8.	*Spongilla alba Carter, 1849*	16, 26, 27
9.	*Spongilla crateriformis Potts*	26
10.	*Spongilla lacustris Linnaeus, 1759*	26
11.	*Stratospongilla indica Annandale, 1908*	26
12.	*Trochospongilla latouchiana Annandale, 1907*	26
13.	*Trochospongilla phillottiana Annandale, 1907*	26
	Family SUBERITIDAE	
14.	*Protosuberites aquaedulcioris Annandale, 1915*	16
15.	*Protosuberites lacustris Annandale, 1915*	16
16.	*Suberites sericeus Thiele, 1898*	16
	Order TETRACTINELLIDA	
	Family TETILLIDAE	
17.	*Tetilla dactyloidea Carter,1869*	16
	Order CLIONAIDA	
	Family CLIONAIDAE	
18.	*Pione vastifica Hancock,1849*	16
	Class DEMOSPONGIAE	
	Order HAPLOSCLERIDA	
	Family CHALINIDAE	
19.	*Haliclona tenuiramosa Burton, 1930*	13
20.	*Songe (undetermined)*	13
21.	*Tedania anhelans (Vio in Olivi, 1792)*	13

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Details of the numbering of wetlands: 1. Kolleru Lake 2. Deepor Beel 3. Nalsarovar 4. Pong dam Lake 5. Renuka wetland 6. Chandertal wetland 7. Wular Lake 8. Tsomoriri 9. Hokera wetland 10. Surinsar- Mansar Lake 11. Ashtamudi wetland 12. Sasthamkotta Lake 13. Vembanad-Kol wetland 14. Bhoj wetland 15. Loktak Lake 16. Chilka Lake 17. Bhitarkanika mangroves 18. Harike Lake 19. Kanjli 20. Ropar 21. Sambhar Lake 22. Keoldeo 23. Point calimere WLBS 24. Rudrasagar Lake 25. Upper Ganga River 26. East Kolkata Wetlands 27. Sundarban wetland 28. Nandur Madhameshwar 29. Keshopur-Mianiconservation reserve 30. Beas conservation reserve 31. Nangal Wildlife Sanctuary 32. Nawabganj Bird Sanctuary 33. Parvati Arga Bird Sanctuary 34. Saman Bird Sanctuary 35. SamaspurBird Sanctuary 36. SandiBird Sanctuary 37. Sarsai nawar Jheel38. Asan 39. Kabartal 40. Sur Sarovar 41. Lonar lake

CNIDARIA

The phylum Cnidaria includes radially symmetrical multicellular organisms and contains over 11,000 species (WoRMS, 2018) of animals found exclusively in aquatic (freshwater and marine) environments. Their distinguishing feature is being possession of cnidae, specialized cells of the ectoderm that they use mainly for capturing prey. The body wall is made of two layers of cells, the ectoderm and endoderm with an intervening acellular to rather cellular structure, i.e., mesoglea, which is a non-living jelly-like substance.

The life cycle of cnidarians include two alternating stages, i.e., swimming medusae (reproductive) and sessilepolyps (asexual), both of which are radially symmetrical with mouths surrounded by tentacles that bear cnidocytes. As mentioned the polyps may be solitary or colonial whereas medusa are always solitary. They have a single orifice and body cavity which are used for digestion and respiration. Cnidarian are trimorphic since some species produce colonies that are single organisms composed of medusa-like or polyp-like zooids, or both. Cnidarians possess decentralized nerve net and simple receptors, with report of the presence of balance-sensing statocysts in several free-swimming species of Cubozoa and Scyphozoa and some have simple eyes.

The pioneering work on cnidarians were performed by the Annandale, Leloup, Menon, Ganapti and Nagabhushanam. Study of Indian freshwater Cnidaria began with the work by Annandale (1905), with report of Hydra orientalis, but later treated it as H. vulgaris Pallas (Annandale 1911a). A second species of the same genus, Hydra oligactis Pallas, was reported by Annandale (1911a). Same year Annandale (1911b) observed the presence of freshwater madusae from Western Ghats that was later described as Limnocnida indica by Annandale (1912). Haldar and Choudhury (1995) reported Eirene menoni Kramp from Kolkata. Kramp (1958) described two species namely, Moerisia gangetica from Kolkata and Moerisia lyonsi Boulenger from Meghalaya (Haldar and Mondal, 1999). Malhotra et al., (1976) described Mansariella lacustris from Mansar Lake, Jammu, Khatri (1984) described Keralica idukkensis from Kerala, and Ahmed et al. (1987) described Limnocnida biharensis from Bihar; all three species were new to science. The diversity of cnidarians were reported from Indian Ramsar wetlands and are included in the present compilation are Annandale (1915), Malhotra et al. (1976), Mandal & Nandi (1989), Misra (1995), Ghosh (1999), Julka & Paliwal (2000) and Nandi (2009).

The taxonomy of Cnidarians from India has been poorly documented and as mentioned by Boulion and Boero (2000), Haldar and Mandal, (1999), Jankowski, et. al., (2008), Bouillon et al., (2006), with status of many species remains unclear due to insufficient data and some of those identified are accidental, e.g., Hydrozoans. Some freshwater medusae was described from India, namely Limnocnida biharensis; Mansariella lacustris and Keralika idukkensis last two species has uncertain taxonomic status Boulion and Boero (2000), Jankoski (2001). The recent reports of Hydrozoans from India are rather scattered and reflect that their study probably based on accidental encounters. Information on Cnidarians (Hydrozoa) from several parts of the country is lacking. The present report could retrieve from the

previous literatures the presence of cnideria species in only sixty eight out of 41 Ramsar sites, namely East Kolkata Wetlands (8 species), Sundarbans (8 species), Renuka wetlands (1 species), Chilika (17 species), Vembanand (45 species), Mansar-Surinsar (1 species). As indicated from the present report with reporting of only one species from two Ramsar sites hints that study of unexplored wetlands, especially the Ramsar wetlands, will definitely provide more information on diversity and distribution of this little known group.

Table 12. Diversity of Cnidarians from Ramsar Wetlands of India.

Phylum CNIDARIA

Class ANTHOZOA

Order ACTINIARIA

Family EDWARDSIIDAE

1. *Edwardsia jonesii* Seshaiya and Cuttress, 1969: RW- 16, 26, 27
2. *Edwardsia* sp.: RW- 13
3. *Edwardsia tinctrix* Annandale, 1915: RW- 16, 26

Family HALIACTINIDAE

4. *Pelocoetes exul* Annandale, 1907: RW- 16, 26, 27
5. *Pelocoetes minima* Panikkar, 1938: RW- 26
6. *Phytocoeteopsis ramunnii* Panikkar, 1936: RW- 13, 26, 27
7. *Phytocoetes gangeticus* Annandale, 1915: RW- 16, 26, 27

Family NEVADNEIDAE

8. *Nevadne glauca* Annandale, 1915: RW- 16, 26, 27

Family DIADUMENIDAE

9. *Diadumene schilleriana* Stoliczka, 1869: RW- 16, 26
10. *Diadumene* sp.: RW- 27

Family ACTINIIDAE

11. *Anthopleura nigrescens* Verill, 1869: RW- 13
12. *Paracondylactis indicus* Dave in Parulekar, 1968: RW- 26

Family HALCAMPIDAE

13. *Mena chilkaea* Annandale, 1915: RW- 16
14. *Mena limnicola* Annandale, 1915: RW- 16

Family HALAMMOHYDRIDAE

15. *Halammohydra sagarensis* Rao and Misra, 1980: RW- 27

Family VERETILLIDAE

16. *Cavernularia elegans* Herklots, 1858: RW- 16

Class SCYPHOZOA

Order RHIZOSTOMEAE

Family CATOSTYLIDAE

17. *Acromitus rabanchatu* Annandale, 1915: RW- 16, 27
18. *Acromitus* sp.: RW- 13
19. *Scyphomedusae* sp.: RW- 13

Class HYDROZOA

Order LIMNOMEDUSAE

Family OLINDIIDAE

20. *Limnocnida* sp.: RW- 5
21. *Mansariella lacustris* Malhotra, Duda and Jyoti, 1976: RW- 10

Order LEPTOTHECATA

Family CAMPANULARIIDAE

22. *Clytiabrunescens* Bigelow, 1904: RW- 13
23. *Clytiahemisphericum* Linnaeus, 1767: RW- 13
24. *Clytiahendersoni* Torrey, 1904: RW- 13
25. *Clytiarangireae* Agassiz and Mayer, 1902: RW- 13

26. *Clytiaserrulata* Bale, 1888: RW- 16

27. *Obelia bidentata* Clarke, 1875: RW- 13, 16

28. *Obelia* sp.: RW- 13

Family BLACKFORDIIDAE

29. *Blackfordiavirginica* Mayer, 1910: RW- 13

Family LOVENELLIDAE

30. *Eucheilotaceylonensis* Kramp, 1959: RW- 13

31. *Eucheilotamenoni* Kramp, 1959: RW- 13

Family MALAGAZZIIDAE

32. *Malagazziacarolinae* Mayer, 1900: RW- 13

33. *Malagazziataeniogonia* Chow and Huang, 1958: RW- 13

Family EIRENIDAE

34. *Eirene ceylonensis* Browne, 1905: RW- 13

35. *Eirene menoni* Kramp, 1953: RW- 13

36. *Eutima commensalis* Santhakumari, 1970: RW- 13

37. *Eutima hartlaubi* Kramp, 1958: RW- 13

38. *Eutima japonica* Uchida, 1925: RW- 13

39. *Eutima neucaledonia* Uchida, 1964: RW- 13

40. *Eutima lphesbrownie* Torrey, 1909: RW- 13

Order ANTHOATHECATA

Family TUBULARIIDAE

41. *Ectopleura* sp.: RW- 13

Family PENNARIIDAE

42. *Halocordyle* sp.: RW- 13

43. *Pennariadisticha* Goldfuss, 1820: RW- 13

Family CYTAEIDIDAE

44. *Cytaeistetrastyla* Eschscholtz, 1829: RW- 13

Family BOUGAINVILLIIDAE

45. *Bimeria fluminalis* Annandale, 1915: RW- 16

46. *Bougainvilliafulva* Agassiz and Mayer, 1899: RW- 13

47. *Garviafranciscana* Torrey, 1902: RW- 13

Family HYDRACTINIIDAE

48. *Clavactinia gallensis* Thornely, 1904: RW- 16

49. *Hydractiniacarnea* M. Sars, 1864: RW- 13

Family PANDEIDAE

50. *Aequorea conica* Browne, 1905: RW- 13

51. *Aequorea forskalea* Péron and Lesueur, 1810: RW- 13

52. *Leuckartiaraoctona* Fleming, 1823: RW- 13

53. *Pandearubra* Bigelow, 1913: RW- 13

Family ZANCLEIDAE

54. *Zancleacostata* Gegenbaur, 1857: RW- 13

Family CORYNIDAE

55. *Dicyclocoryne filamentata* Annandale, 1907: RW- 16

Order TRACHYMEDUSAE

Family RHOPALONEMATIDAE

56. *Aglaura elata* Haeckel, 1879: RW- 13

57. *Aglaura hemistoma* Peron and Lesueur, 1809: RW- 13

Family GERYONIIDAE

58. *Geryoniaproboscidalis* Forsskål, 177 : RW- 13

59. *Liriopetetraphylla* Chamisso and Eysenhardt, 1821: RW- 13

Family CUNINIDAE

60. *Cuninaperegrina* Bigelow, 1909: RW- 13

Order NARCOMEDUSAE

Family SOLMUNDAEGINIDAE

61. *Solmundella bitentaculata* Quoy and Gaimard, 1833: RW- 16, 13

Order LEPTOTHECATA

Family TIAROPSIDAE

62. *Tiaropsidiumjaponicum* Kramp, 1932: RW- 13

Order SIPHONOPHORAE

Family DIPHYIDAE

63. *Diphyes bojani* Eschscholtz, 1825: RW- 16

64. *Diphyes chamissonis* Huxley, 1859: RW- 13

65. *Eudoxoidesmitra* Huxley, 1859: RW- 13

66. *Lensia hotspur* Totton, 1941: RW- 13

67. *Lensia subtiloides* Lens and van Riemsdijk, 1908: RW- 13

68. *Muggiaeadelsmani* Totton, 1954: RW- 13

1. *Corvospongilla lapidosa Annandale, 1908* 26
2. *Dosilia plumosa Carter, 1849* 26
3. *Ephydatia meyeni carter, 1849* 5, 26
4. *Eunapius calcuttanus Annandale,1911* 26
5. *Eunapius carteri Bowerbank, 1863* 26
6. *Radiospongilla cerebellata Bowerbank, 1863* 26
7. *Radiospongilla indica Annandale, 1907* 26
8. *Spongilla alba Carter, 1849* 16, 26, 27
9. *Spongilla crateriformis Potts* 26
10. *Spongilla lacustris Linnaeus, 1759* 26
11. *Stratospongilla indica Annandale, 1908* 26
12. *Trochospongilla latouchiana Annandale, 1907* 26
13. *Trochospongilla phillottiana Annandale, 1907* 26

Family SUBERITIDAE

14. *Protosuberites aquaedulcioris Annandale, 1915* 16
15. *Protosuberites lacustris Annandale, 1915* 16
16. *Suberites sericeus Thiele, 1898* 16

Order TETRACTINELLIDA

Family TETILLIDAE

17. *Tetilla dactyloidea Carter,1869* 16

Order CLIONAIDA

Family CLIONAIDAE

18. *Pione vastifica Hancock,1849* 16

Class DEMOSPONGIAE

Order HAPLOSCLERIDA

Family CHALINIDAE

19. *Haliclona tenuiramosa Burton, 1930* 13
20. *Songe (undetermined)* 13
21. *Tedania anhelans (Vio in Olivi, 1792)* 13

NEMATODES

Nematodes are members of the phylum Nematoda that possess a worm like body though without appendages and segmented body. They are regarded truly ubiquitous invertebrates which inhabit all types of habitats and comprise of 90% of metazoans (Mclntyre, 1971) numerically. They are mostly microscopic but could also be seen with naked eyes due to their size ranging from 80µm to over 8 m. They generally possess a cylindrical body however, some may have a fusiform, saccate or kidney shaped appearance thus also referred to as round worms or threadworms. The main characteristics of nematodes includes a body cavity, complete digestive tract (or alimentary canal, a tube like structure placed within body wall), well developed nervous system (to some extent), excretory system and reproductive system. The body wall is composed of outer cuticle underlying the thin hypodermis (that expands into the body cavity to form the longitudinal chords between the somatic muscles) and somatic muscles.

Being primarily aquatic organisms they require a film of water for movement. They are known to colonize almost every geographic location, e.g., deserts, forests, lakes, rivers, marshes and deep oceans including some of the extreme habitats such as icebergs and hot springs. Due to their diverse feeding habits they parasitize nearly all groups of animals and a wide variety of plants, thus can be categorized as animal parasitic, plant parasitic and free-living forms (Bongers and Bongers, 1998; Neher, 2001).

Nematodes present an important component of food web due to their crucial role in nutrient cycling by feeding a significant proportion of bacterial and fungal productivity (Neher, 2001). Further, due to their high species richness, abundance, short generation time, pervasiveness and tolerance to monitor changes in environment, they serve as useful models to study ecological interactions (Moens et al. 2004). Some nematodes species are known to be indicator of soil and water health as they are very sensitive to pollutants and as they ingest heavy metals and other pollutants settled in the sediments.

The nematodes parasites of vertebrates, invertebrates and plants are known to cause significant damage to their host, i.e., humans, livestock and crops. Some of the serious disease are caused by nematodes such as river blindness (onchocerciasis), ascariasis, filariasis, trichuriasis, enterobiasis, hookworm, strongyloidiasis, trichinosis, dirofilariasis and angiostrongyliasis. The Plant parasitic nematodes threaten the crops throughout the world, particularly in the tropics and subtropics where it affect the major crops, e.g., wheat, potato, coffee, barley etc. causing the damage and loss of millions of dollars every year (Sasser and Freckman 1987, Berkum and Sheshadri 1970). However, not all nematodes are harmful, some nematodes parasite of insects are considered as good biological agents for controlling agricultural pests. Reports also exists for some soil nematodes being used as biological agent in the management of plant parasitic nematodes.

The first record on taxonomic studies on nematodes was published by Leidy (1951) whoc described the freshwater nematode. Later, Bastian (1865) described 100 new species. Subsequently, major contributions were done by Micoletzky's (1922) with 931 species, De Coninck and Schuurmans Stekhoven (1933), Goodey's (1951), Andrássy (1978) with report of 605 species, Blaxter et al. (1998), De Ley and Blaxter (2002), Esser and Buckingham (1987) with report on 160 species, Abebe et al. (2006). In India the studies of nematodes started initially for the plant parasitic forms due to their importance in agriculture. Contribution on freshwater and soil nematodes came from publications of Ali et al. (1969-1973), Khera (1965-1975), Jairajpuri and Ahmad (1992) and Ahmad and Jairajpuri (2010). Several publication were made on the reproductive biology and taxonomy of free living nematodes by Ahmad and Jairajpuri (1979-1982) and Tahseen and coworkers (1988-2015), Jairajpuri and Khan (1982), Maity et al. 2018, Rizvi (2007, 2008, 2009 and 2010), Khera and Chaturvedi (1977), Siddiqi and Husain (1967). The present compilation reports 324 species of nematodes known from the Ramsar wetlands from the previous literature, few to mention here Stewart (1914), Mondal and Nandi (1989), Sarkar (1995), Khan et al. (2005), Nandi (2009), Ranibala (2013), Mahamood (2014), Mahamood et al. (2014), Selvakumar et al. (2015), Devetter et al. (2017), Chandra et al. (2017), Gupta and Mondal (2018). A general reason for the neglect of nematodes taxonomic studies concerns difficulties with their minute size, techniques for isolation and adequate characterization and identification.

Nematode diversity from India have mainly focused on the free living forms from the sol and parasites of higher vertebrates and plants. Little attention has been given on documenting the diversity of nematode parasite of invertebrates and those found in marine, brackish and freshwater. According to Hugot et al. (2001) nematodes constitute nearly 90% of all Metazoan in number and have 26646 recorded species with 8359 species from vertebrates, 10681 species free-living, 4105 species parasitic in plants and 3501 species parasitic in invertebrate hosts. From India, slightly over 3000 species of nematodes that includes mostly the parasitic nematodes associated with vertebrates and agricultural crops are known. Considering the estimated global diversity of nematodes, i.e., 500,000 species, Baqri (1998) reported that about 80,000 nematode species may be existing in India. About 300 species have been reported from freshwater and soil habitats in India. The present report compiles a total of 254 nematodes species belonging to 74 families have been reported thus far from the Ramsar wetlands of India. This meagre diversity again hints toward the lack of taxonomic studies on nematodes as only seven out of 41 Ramsar sites have been explored thus far for nematodes diversity.

Table 14. Diversity of Nematods from Ramsar Wetlands of India.

Phylum NEMATODA
Class ADENOPHOREA
Order ENOPLIDA
Family ANTICOMIDAE
1. *Anticoma* sp.: RW- 13
2. *Trichoma* sp.: RW- 13
Family ONCHOLAIMIDAE
3. *Adoncholaimus chilkensis* Stewart, 1914: RW- 16
4. *Cucullanus pangasius*: RW- 27
5. *Oncholaimus indicus* Von Linstow**:** RW- 27
Family OXYSTOMINIDAE
6. *Halalaimus estuarii* Sinha, Choudhury and Baqri, 1985: RW- 27
7. *Halalaimus sagarensis* Sinha, Choudhury and Baqri, 1986: RW- 27
Family TOBRILOIDEA
8. *Tobrilus paludicola* (Micoletzky, 1925) Andréssy, 1959: RW- 15
9. *Tobrilus* sp.: RW- 15
Family TRIPYLIDAE
10. *Tripyla arenicola* de Man, 1880: RW- 15
11. *Tripyla* sp.: RW- 15
Family IRONIDAE
12. *Ironus longicaudatus* De Man, 1884: RW- 15
13. *Ironus* sp.: RW- 15
14. *Ironus tenuicaudatus* De Man, 1876: RW- 15
Family ALAIMIDAE
15. *Alaimus similis* Thorne, 1939: RW- 15
16. *Alaimus* sp.: RW- 15
Family TRICHURIDAE
17. *Trichuris discolor* V. Linstow, 1906: RW- 16
Family CAPILLARIIDAE
18. *Capillaria* sp.: RW- 16
Family ANOPLOSTOMATIDAE
19. *Anoplostoma macrospiculum* Sinha, Choudhury and Baqri, 1987: RW- 27
Order MONHYSTERIDA
Family MONHYSTERIDAE

20. *Hofmaenneria keoladeoensis* Khan et al, 2005: RW- 22

21. *Monhystrella kerryi* Khan et al, 2005: RW- 22

Order PLECTIDA

Family CHRONOGASTRIDAE

22. *Chronogaster alata* Gerlaeh, 1956: RW- 15

23. *Chronogaster* sp.: RW- 15

Family PLECTIDAE

24. *Plectus geophilus* de Man, 1880: RW- 15

25. *Plectus* sp.: RW- 26

Family MONOCHIDAE

26. *Mononchus truncatus* Bastian, 1865: RW- 15, 26

27. *Mononchus* sp.: RW- 15, 19

Family MYLONCHULIDAE

28. *Mylonchulus contractus* Jairajpuri, 1970: RW- 27

29. *Mylonchulus dentatus* Jairajpuri, 1970: RW- 15, 27

30. *Mylonchulus goutami* Jana, Chatterje and Manna, 2012: RW- 27

31. *Mylonchulus minor* (Cobb, 1893), Cobb, 1916: RW- 27

32. *Mylonchulus mulveyi* Jairajpuri, 1970: RW- 27

33. *Mylonchulus sagarensis* Sinha, Baqri and Choudhury, 1989: RW- 27

34. *Mylonchulus sigmaturellus* Mulvey, 1961: RW- 27

35. *Mylonchulus sigmaturus* Cobb, 1917: RW- 27

36. *Mylonchus* sp.: RW- 27

37. *Sporonchulus vagabundus* Jairajpuri, 1971: RW- 27

Family ANATONCHIDAE

38. *Miconchus aquaticus* Khan, Ahmad and Jairajpuri, 1978: RW- 27

Family IOTONCHIDAE

39. *Iotonchus indicus* Jairajpuri, 1969: RW- 27

40. *Iotonchus parabasiodontus* Mulvey and Jensen, 1967: RW- 27

41. *Iotonchus qaiseri goutami* Jana, Chatterje and Manna, 2007: RW- 27

42. *Iotonchus rotundicaudatus* Pefia-Santiago and Jimenez-Guirado, 1991: RW- 27

Order TRIPLONCHIDA

Family TOBRILIDAE

43. *Brevitobrilus graciloides* von Daday, 1908: RW- 15

Order MONHYSTERIDA

Family MONHYSTERIDAE

44. *Geomonhystera pervaga* Argo and Heyns, 1973: RW- 15

45. *Geomonhystera* sp.: RW- 15

46. *Monhysterastagnalis* Bastian, 1865: RW- 15

Order DORYLAIMIDA

Family DORYLAIMIDAE

47. *Cephalodorylaimus papillatus* Jairajpuri, 1967: RW- 32

48. *Coomansinema* sp.: RW- 26

49. *Coomansinemoides wasimi* Sen, Chatterjee and Manna, 2012: RW- 26

50. *Dorylaimida juveniles*: RW- 8

51. *Dorylaimoides (Dorylaimoides) geraldi* Sen, Chatterjee and Manna, 2012: RW- 26

52. *Dorylaimoides parvus* Thorne and Swanger, 1936: RW- 26, 27

53. *Dorylaimoides* sp.: RW- 26, 27

54. *Dorylaimus aquatilis* Skwarra, 1921: RW- 15

55. *Dorylaimus bengalensis* Sen, Chatterjee and Manna, 2011: RW- 26

56. *Dorylaimus smgnalis* Dujardin, 1845: RW- 15

57. *Dorylaimus* sp.: RW- 15, 27

58. *Indodorylaimus asaccatus* Sen, Chatterjee and Manna, 2012: RW- 26

59. *Indodorylaimus baqrii* Sen, Chatterjee and Manna, 2012: RW- 26

60. *Laimydorus baldus* Baqri and Jana, 1982: RW- 26

61. *Laimydorus istvani* Sen, Chatterjee and Manna, 2012: RW- 26

62. *Laimydorus parabastiani*: RW- 27

63. *Laimydorus siddiqii* Baqri and Jana, 1982: RW- 26

64. *Mesodorylaimus bastiani* Butsehli, 1873: RW- 15, 26

65. *Mesodorylaimus chamoliensis* Ahmad, 1995: RW- 26

66. *Mesodorylaimus mesonyctius*: RW- 27

67. *Mesodorylaimus* sp.: RW- 15

68. *Mesodorylaimus usitatus* Basson and Heyns, 1974: RW- 26

69. *Sicaguttur sartum* Siddiqi, 1971: RW- 26

70. *Timmus* sp.: RW- 27

Family NYGOLAIMIDAE

71. *Aquatides heynsi* Sen, 2017: RW- 26

72. *Clavicaudoides caudatus*: RW- 27

73. *Laevides laevis* (Thorne, 1939) Thorne, 1974: RW- 26

74. *Nygolaimus* sp.: RW- 27

Family NYGELLIDAE

75. *Nygellus shamimi* Sen, 2015: RW- 26

76. *Nygellus* sp.: RW- 27

Family AETHOLAIMINAE

77. *Aetholaimus indicus* Jairajpuri, 1965: RW- 26

Family APORCELAIMIDAE

78. *Aporcelaimellus indicus* Baqri and Jairajpuri, 1968: RW- 26

79. *Aporcelaimellus papillatus* (Bastian, 1865) Baqri and Khera, 1975: RW- 26

80. *Aporeclaimellus amylovorus*(Thorne and Swanger, 1936) Heyns, 1965: RW- 26, 27

81. *Aporeclaimellus barqrii* Ahmad and Jairajpuri, 1982: RW- 26, 27

82. *Aporeclaimellus chauhani*Baqri and Khera, 1975: RW- 26, 27

83. *Aporeclaimellus coomansi*Baqri and Khera, 1975: RW- 26, 27

84. *Aporeclaimellus tritici*(Bastian, 1865) Andrassy, 1986: RW- 26, 27

Family BELONDIRIDAE

85. *Axonchium (Axonchium) coomansi* Sen, Chatterjee and Manna, 2011: RW- 26

86. *Axonchium elegans* Jairajpuri, 1964: RW- 15

87. *Axonchium* sp.: RW- 15

88. *Belondim porta* Thorne, 1964: RW- 15

89. *Belondira* sp.: RW- 15

90. *Paraoxydirus* sp.: RW- 27

Family LEPTONCHIDAE

91. *Doryllium aestuarii*: RW- 27

92. *Proleptonchus paucipapillatus*: RW- 27

93. *Tyleptus projectus*Thorne, 1939: RW- 26, 27

Family ACTINOLAIMIDAE

94. *Neoactinolaimus* sp.: RW- 15

95. *Neoactinolaimus thornei* Chaturvedi and Khera, 1979: RW- 15

Family LONGIDORIDAE

96. *Paralongidorus* sp.: RW- 27

97. *Xiphinema americanum* Cobb, 1913: RW- 26, 27

98. *Xiphinema inaequale* Khan and Ahmad, 1976: RW- 26

99. *Xiphinema manasiae* Sen, Chatterjee and Manna, 2010: RW- 26

Family QUDSIANEMATIDAE

100. *Discolaimium mazhari* Baqri and Jairajpuri, 1968: RW- 26

101. *Discolaimoides bulbiferus* (Cobb, 1906) Heyns, 1963: RW- 26

102. *Discolaimus major* Thorne, 1939: RW- 26

103. *Discolaimus tenax* Siddiqi, 1964: RW- 26

104. *Eudorylaimus* sp.: RW- 26

105. *Thonus* sp.: RW- 27

Family LOTONCHIDAE

106. *Lotonchus indicus*: RW- 27

107. *Lotonchus parabasidontus*: RW- 27

108. *Lotonchus quaiseri*: RW- 27

109. *Lotonchus rotundicaudatus*: RW- 27

110. *Lotonchus trichurus* Cobb, 1917: RW- 26, 27

Order CHROMADORIDA

Family COMESOMATIDAE

111. *Chromodora* sp.: RW- 13

112. *Sabatieria* sp.: RW- 13

Family ACHROMADORIDAE

113. *Achromadora ruricola* De Man, 1880: RW- 15

Order DESMODORIDA

Family DESMODORIDAE

114. *Desmodora* sp.: RW- 13

Family XYLIDAE

115. *Theristus* sp.: RW- 13

Family RHABDOLAIMIDAE

116. *Rhabdolaimus terrestris* de Man, 1880**:** RW- 8

117. *Rhabdolaimus* sp.: RW- 19

Order RHABDITIDA

Family ASCARIDIDAE

118. *Amplicaecum ixobrychusi* Majumdar and Chakravarty, 1963: RW- 26

119. *Ophidascaris piscatori* Soota and Chaturvedi, 1970: RW- 26

Family HETEROCHEILIDAE

120. *Dujardinascaris dujardini* Travassos, 1920: RW- 26

Family CEPHALOBIDAE

121. *Acrobeles mariannae* Andrassy, 1968: RW- 15

122. *Acrobeles* sp.: RW- 15

123. *Acrobeloides nanus*: RW- 15

124. *Acrobeloides nanus* de man, 1880**:** RW- 8, 15

125. *Acrobeloides* sp.: RW- 15

126. *Acrobeloides tricornis* Thorne, 1925: RW- 8

127. *Acrobeloides tricornis* Thorne, 1925: RW- 8, 27

128. *Acromoldavicus cf. mojavicus*: RW- 8

129. *Brevibucca punctata* Timm, 1960: RW- 8, 15

130. *Cervidellus vexilliger* de man, 1880: RW- 8

131. *Chiloplacus demani* Thorne, 1925: RW- 8

132. *Eucephalobus* sp.: RW- 26

133. *Eucephalobus* sp.: RW- 15, 26

134. *Eucephalobus striatus* Bastian, 1865: RW- 15

135. *Panagrolaimus hygrophilus* Bassen, 1940: RW- 15

136. *Paracrobeles laterellus* Heyns, 1968: RW- 8, 15

137. *Scottnema lindsayae* Timm, 1971: RW- 8

138. *Stegelletina devimucronata* Sumenkova, 1964: RW- 8

Family RHABDITIDAE

139. *Curicularia oxycerca* de Man, 1895: RW- 15

140. *Curviditis curvicaudata* Schneider, 1866: RW- 15

141. *Curviditis* sp.: RW- 15

142. *Cuticularia* sp.: RW- 15

143. *Diploscapter coronatus* Cobb, 1893: RW- 15

144. *Diploscapter* sp.: RW- 15

145. *Mesorhabditis* sp.: RW- 15, 26

146. *Mesorhabditis spiculigera* Steiner, 1936: RW- 15

147. *Mesorhabditis striatica* Dassonville and Heyns, 1984: RW- 15

148. *Pelodem strongyloides* Schneider, 1860: RW- 15

149. *Pelodera* sp.: RW- 15

150. *Rhabditidoides* sp.: RW- 15

151. *Rhabditis* sp.: RW- 15

152. *Rhabditis terricola* Dujardin, 1845: RW- 15

153. *Teratorhabditis andrassyi* Tahseen and Jairajpuri, 1988: RW- 15

154. *Teratorhabditis* sp.: RW- 15

Family TERATOCEPHALIDAE

155. *Teratocephalus* sp.: RW- 26

Family DIPLOGASTRIDAE

156. *Acrostichus* sp.: RW- 15

157. *Diplogaster* sp.: RW- 19

158. *Diplogastrellus gmciloides* Skwarra, 1921: RW- 15
159. *Diplogastrellus thoubalicus* Ahmad, Mahamood and Shah, 2005: RW- 15
160. *Koerneria filicaudala* Khera, 1970: RW- 15
161. *Koerneria luccmi* Korner, 1954: RW- 15
162. *Koerneria* sp.: RW- 15
163. *Mononchoides changi* Goodrich, Heehler and Taylor, 1968: RW- 15
164. *Mononchoides striatus* Butchli, 1876: RW- 15
165. *Paroigolaimellabernensis* Steiner, 1914: RW- 15

Family PANAGROLAIMIDAE

166. *Panagrolaimus* sp.: RW- 15

Family TRICHOSTRONGYLUS

167. *Trichostrollgyluspigmentus* V. Linstow, 1904: RW- 16

Class SECERNENTEA

Order TYLENCHIDA

Family TYLENCHIDAE

168. *Filenchusbutteus* Thorne and Malek, 1968: RW- 8
169. *Filenchus filiformis* Butschli, 1873: RW- 16
170. *Filenchus quartus* Szczgiel, 1969: RW- 8
171. *Tylenchus* sp.: RW- 27

Family BELONOLAIMIDAE

172. *Trophurus clavicaudatus* Sen, Chatterjee and Manna, 2012: RW- 26
173. *Tylenchorhynchus mashhoodi* Siddiqi and Basir, 1959: RW- 26
174. *Tylenchorhynchus swarupi* Singh and Khera, 1978: RW- 26

Order APHELENCHIDA

Family APELENCHOIDIDAE

175. *Aphelenchoides* sp.: RW- 8, 15

Family ANGUINIDAE

176. *Chitinotylenchus paragracilis* Micoletzky, 1922 : RW- 26
177. *Dilylenchusdipsaci* Kuhn, 1857**:** RW- 15
178. *Ditylenchus* sp.: RW- 15
179. *Indoditylenchus sundarbanensis* Sihha, Baqri and Choudhury, 1985: RW- 27
180. *Safianema anchilisposoma* Tarjan, 1958: RW- 26

Family HOPLOLAIMIDAE

181. *Helicotylenchus crenacauda* Sher, 1966: RW- 26, 27
182. *Helicotylenchus crenatus* Das, 1960**:** RW- 15
183. *Helicotylenchus dihystera* Cobb, 1893: RW- 26
184. *Helicotylenchus erythrinae*: RW- 26
185. *Helicotylenchus indicus* Siddiqi, 1963: RW- 26
186. *Helicotylenchus mucronatus*: RW- 26
187. *Helicotylenchus* sp.: RW- 15, 27
188. *Hoplolaimus galeatus* Cobb, 1913: RW- 15
189. *Hoplolaimus indicus* Sher,1963: RW- 26
190. Hoplolaimus sp.: RW- 15
191. Scutellonema bengalensis Sen, 2019: RW- 26

Family CRICONEMATIDAE

192. *Criconema bengalense* Sinha, Baqri and Choudhury, 1991: RW- 27, 26
193. *Hemicriconemoides mangiferae* Siddiqui, 1961: RW- 27, 26
194. *Hemicriconemoides sundarbanensis* Ganguly and Khan, 1982: RW- 27

Family PARAPHELENCHIDAE

195. *Paraphelenchus pseudoparietinus*: RW- 8

Order RHABDITIDA

Family RHABDIASIDAE

196. *Rhabdias bulbicauda* Sarkar and Manna, 2004: RW- 16

Order CAMALLANIDA

Family CAMALLANIDAE

197. *Camallanus anabantis* Pearse, 1933: RW- 15

Family PRATYLENCHINAE

198. *Hirschmaniella gracilis (*de Man, 1880) Luc and Goodey, 1963: RW- 26, 27
199. *Hirschmaniella oryzae* van Breda de Haan, 1902: RW- 15, 26
200. *Hirschmanniella* sp.: RW- 15
201. *Pratylenchus coffeae* Goodey, 1951: RW- 26
202. *Pratylenchus neglectus* Rensch, 1924: RW- 26

Family TELOTYLENCHIDAE

203. *Bitylenchus brevilineatus* Williams, 1960: RW- 26
204. *Bitylenchus goffarti* Sturhan, 1966: RW- 26
205. *Tylenchorhynchus brassicae* Siddiqi, 1961: RW- 26
206. *Tylenchorhynchus* claytoni Steiner, 1937: RW- 15
207. *Tylenchorhynchuselegans* Siddiqi, 1961: RW- 26
208. *Tylenchorhynchus mashoodi*Siddiqi and Basir, 1959: RW- 26
209. *Tylenchorhynchus* sp.: RW- 15

Family PHILOMETRIDAE

210. *Philometra* sp.: RW- 23

Order STRONGYLIDA

Family ANCYLOSTOMATIDAE

211. *Ancylostoma (Ancylostoma) caninum* (Ercolani, 1859), V. Linstow, 1889: RW- 16
212. *Ancylostoma (Cylancylostoma) ceyianicum* Leiper, 1915: RW- 16

Family AMIDOSTOMATIDAE

213. *Amidostomum* sp.: RW- 16

Family MOLINEIDAE

214. *Oswaldocruzia goezei* Skrjabin and Schultz, 1952: RW- 16

Family PROTOSTRONGYLIDAE

215. *Pulmostrongylus palustris* Soota and Chaturvedi, 1970: RW- 26

Family DIAPHANOCEPHALIDAE

216. *Kalicephalus (kalicephaloides) minutus* Baylis and Daubney, 1922: RW- 16

217. *Kalicephalus (occiptodontus) fimbriatus* Ortlepp: RW- 16

218. *Kalicephalus (schadius) willeyi* Linstow: RW- 16

Order ASCARIDIDA

Family ANISAKINAE

219. *Contracaecum spiculigerum* (Rudolphi 1809), Rainiet and Henry, 1912: RW- 16

220. *Contracaecum tricuspe* (Gedoelst, 1916) Baylis, 1920: RW- 16

221. *Contracaeum haliaeti* Baylis and Daubney, 1923: RW- 16

222. *Contracaeum microcephalum* (Rudolphi, 1809) Baylis, 1920: RW- 16

223. *Contracaeum* sp.: RW- 16

Family TOXOCARIDAE

224. *Porrocaecum anguisticolle* (Molin, 1860), Baylis and Daubney, 1922: RW- 16

225. *Porrocaecum reticulatum* (V. Linstow, 1899) Baylis and Daubney, 1922: RW- 16

226. *Toxocara mystax* Zeder, 1800: RW- 16

Family QUIMPERIIDAE

227. *Paragendria* sp.: RW- 16

Family CUCULLANIDAE

228. *Cucullanus* sp.: RW- 16

Family HETERAKIDAE

229. *Heterakis* sp.: RW- 16

Family ASCARIDIIDAE

230. *Ascaridia centropusi* Dey Sarkar, 1995: RW- 16

Family SUBULUROIDEA

231. *Subulura tulsidasi* Dey Sarkar, 1995: RW- 16

232. *Subulura* sp.: RW- 16

Order SPIRURIDA

Family PHYSALOPTERIDAE

233. *Abbreviata varini* (Parona, 1889) Schulz, 1927: RW- 26, 16

234. *Heliconema longissimum* Ortlepp, 1923: RW- 16

235. *Physaloptera alata* Rudolphi, 1819: RW- 16

236. *Physaloptera* sp.: RW- 16

Family GNATHOSTOMATIDAE

237. *Echinocephalus uncinatus* Molin, 1858: RW- 16

238. *Spiroxys gubernae* Chakraborty and Mazumdar, 1959: RW- 16

Family RICTULARIIDAE

239. *Pterygodermatites (Mesopectines) cahirensis* (Jagerskiold, 1904) Quentin, 1969: RW- 16

Family HABRONEMATIDAE

240. *Pseudoproleplus vestibulus* Khera, 1955: RW- 16

241. *Stellocaronema* sp.: RW- 16

242. *Viguiera* sp.: RW- 16

Family ACUARIIDAE

243. *Chevreuxia revoulata* (Rudolphi, 1819) Seurat, 1918: RW- 16

244. *Chevreuxia roonwali* Dey Sarkar, 1995: RW- 16

245. *Echinuria* sp.: RW- 16

246. *Schistorophus tenuis* (Maplestone, 1932), Singh, 1949: RW- 16

247. *Synhimentus coucalus* Dey Sarkar, 1995: RW- 16

Family DIPLOTRIANENIDAE

248. *Diplotriaena puriensis* Dey Sarkar, 1995: RW- 16

Family ONCHOCERCIDAE

249. *Dirofilaria* sp.: RW- 16

250. *Lemdana bengalensis* Soota and Chaturvedi, 1971: RW- 16

Family APROCTIDAE

251. *Aprocta* sp.: RW- 16

Family ROTYLENCHULIDAE

252. *Rotylenchulus reniformes* Linford and Oliveina, 1940: RW- 26

ROTIFERA

The rotifers comprise a group of pseudo-coelomate microscopic organisms, belonging to the phylum Aschelminthes (and also considered as minor phylum grouped under pseudocoelomata), usually ranging in size between 40µm - 250µm, except for some large species (extending up to 2.0 mm), that play a significant role in freshwater ecosystems. They are commonly termed as 'Rotatoria' or 'wheel animalcules' because of the 'corona' or 'wheel organ' that that gives an appearance of rotating wheels and also aids in providing the typical 'rotating' locomotion. They are multicellular and microscopic that are present in aquatic and semi-aquatic, moss and soil environments (Sharma, 1999). Some rotifers have been reported to act as bioindicators in the aquatic environment (Sladecek, 1983). They are ideal tools for ecological studies because of their ability to colonize diverse aquatic and semi-aquatic biotopes and gaining substantial densities within a short time intervals. Few species are associated with freshwater cladocerans, snails, larval stages of insects and on crustaceans (Chandra et al. 2018).

Rotifers are mainly associated with freshwater habitat though during the course of their evolution to exhibit endless profusion of body forms and to present multiplicity, they have invaded and become adapted to wide range of aquatic and semi-aquatic environments (e.g., trickle on the rocks and small tree-holes to large rivers, from bogs to inland salt water lakes and from ephemeral polls to the limnetic, littoral or deepest regions of the largest lakes). About 95% of the rotifers are known from freshwater habitats while less than 5% are restricted to marine or brackish waters.

Rotifers are generally characterized by their jaw-like elements of trophi located in the pharyx and is modified according to the feeding habits of different species. Another important character is the presence of Lorica, a structure formed by the thickening of the cuticle around the trunk regions of their bodies. Based on the presence, absence or nature of the lorica rotifers are classified as loricate, semi-loricate, illoricate or bdelloids.

Rotifers have been reported from distant parts of the globe and from localities ranging from the Arctic to Antarctic regions as well as across the continents. Globally, over 2600 species spread over 200 genera of rotifers have been recorded. Around 2030 species are known from freshwaters (Segers, 2007). A list of 575 species of rotifers were compiled by Sudzuki (1989) from the oriental region that included 250 species from India. Indian rotifers were well documented in several literatures by pioneering research on rotifer taxonomy and diversity (Anderson, 1889; Gurney, 1907, Arora 1963, 1966a, 1966b; Brehm, 1950; Nayar, 1965; Pejler, 1977; Rao and Mohan, 1976; Koste, 1978; Sharma, 1978-2017; Michael, 1980; Sharma and Michael, 1980; 1987a, 1987b; Sharma, 1987; Sharma, 1988; Battish, 1992;

Segers, 1995-2008; Sharma and Sharma 1997-2017; Dhanapathi, 2000; Dumont, 1983; Dussart etal., 1984; Edmondson and Hutchinson, 1934; Edmondson, 1959; Fernando, 2002; Jersabek, and Leitner, 2013). Sharma (1991, 1996) provided state of the art reports on the rotifers diversity report of 310 and 316 species from India. However, Sharma (1997) provided the diversity with report of 330 species belonging to 25 families and 63 genera from India. Nonetheless, Sharma (1997) estimated the actual diversity to be around 500 species from India. Sharma and Sharma (2014) reported the diversity and distribution of 46 species of rotifers from north, east and south states of India. Sharma et al. (2016) ex¬tended the investigations to Loktak Lake and provided a notable update on the rotifer fauna reported earlier by Sharma (2009). Some of the literatures which have been included in the present compilation includes, Kumar (2005, 2009), Kundu et al. (2008), Nandi (2009), Sekhar (2010), Sharma (2010), Reddy et al. (2012), Najib et al. 2013), Bindu et al. (2013), Chitra (2013), Slathia (2013), Sharma and Sharma (2013, 2018), Sanyal et al. (2015), Krishna and Kumar (2017), Meena (2017).

Till date, 419 valid rotifer species belonging to 65 genera and 25 families are recorded from freshwater environments of India. The rich rotifer diversity of the relatively extensively sampled from Deepor Beel and Loktak Lake-two Ramsar sites of India in particular focused attention on the 'Rotiferologist effect'.

Biological diversity of Indian rotifers have been poorly explored and the information available indicates a lack of knowledge of their diversity from different ecosystems. The flood plains lakes, an interesting micro-ecological condition, is another examples that is poorly documented with record of only 40 species mainly due to the inadequate collections (Sharma 1997). Several reports exist that has documented the diversity of rotifers with reporting of about 100 species from West Bengal, about 60 species from Meghalaya, 53 species from Bihar, 33 species from the river Betwa (Madhya Pradesh), 35 species from Kaveri river, 72 species from river Narmada, 132 species from Western Ghats (Adholia 1979, Sharma and Dudani 1992, Michael 1968, Sampath et al. 1979). Sharma (1997) mentioned that about 23 species of rotifers that are endemic to India and proposed that future investigation may increase the number. Further, the species composition and diversity of the rotifers are sensitive to change in the ecology/perturbations in their environment.

As per the literature three orders Monogononta, Gnesiotrocha and Digononta are recorded from Indian wetlands (Ramsar sites). Deepor Beel and Loktak Lake are the two Ramsar sites known as globally rich rotifer habitats, other (freshwater) Ramsar sites spread over scattered parts of India provide notable potential. The present compilation has assembled the data from various reports on the rotifer recorded from the nine out of 41 Ramsar wetlands (Kolleru, Deepor beel, Bhoj, East Kolkata, Vembanand, Keolado National Park, Mansar Surinsar, Nal sarovar and Loktak) with a record of a total of 293 species belonging to 53 genera and 23 families. Maximum number of species have been report thus far from the Deepor beel and Loktak lake with 188 and 15 species respectively followed by the East Kolkata wetland (126 species), Mansar-surinsar (23 species), Keolado NP (49 species), Nal sarovar (156 species), Kolleru (14 species), Vembanand (18 species), and Bhoj (53 species). It is evident that many Ramsar sites, namely; Pong dam, Renuka wetland, Chandratal lake, Wullar lake, Tso-Morari, Hokersar, Ashtamudi, Sasthamkotta, Chilika, Bhitarkanika, Harike, Kanjli, Ropar, Sambhar, Point calimere, Rudra sagar, Upper Ganga, Sunderbans, remains

unexplored for the presence of rotifers. Probable reasons for few studies on the group and unclear taxonomic resolution in some cases could be due to the lack of expertise in the specific group. This present compilation on the rotifer diversity from Ramsar wetlands would be the baseline information and to further concentrate the research in the gap areas to explore the rotifer taxonomy and to know the actual state of the species diversity in these habitats and in general from India.

Table 13. Diversity of Rotifers from Ramsar Wetlands of India.

Phylum ROTIFERA
Class MONOGONONTA
Order PLIOMA
Family BRACHIONIDAE

1. *Anuraeopsis coelata* de Beauchamp, 1932: RW- 14
2. *Anuraeopsis fissa* Gosse, 1851: RW- 2, 14, 15, 22, 26
3. *Anuraeopsis navicula* Rousselet, 1911: RW- 2
4. *Anuraeopsis* sp.: RW- 10, 19
5. *Brachionus ahlstromi* Lindeman, 1939: RW- 2, 26
6. *Brachionus angularis* Gosse, 1851: RW- 1, 2, 3, 13, 14, 15, 22, 26, 39
7. *Brachionus bidentata* Anderson, 1889: RW- 2, 26,13, 22, 3, 14, 30
8. *Brachionus bidentata crassispineus* Hauer, 1963: RW- 26
9. *Brachionus bidentata f. adorna* Wulfert,1966: RW- 26
10. *Brachionus bidentatajirovci* Bartos, 1946: RW- 26
11. *Brachionus budapestinensis* Daday, 1885: RW- 2, 26
12. *Brachionus calyciflorus f. anuraeiformis* Brehm, 1909: RW- 26
13. *Brachionus calyciflorus f. borgerti* Apstein, 1907: RW- 26
14. *Brachionus calyciflorus* Pallas, 1766: RW- 1, 2, 3, 10, 13, 14, 15, 22, 26, 39, 41
15. *Brachionus calyciflorus var. dorcas* Gosse, 1851: RW- 26
16. *Brachionus caudatus aculeatus* Hauer, 1937: RW- 2, 26
17. *Brachionus caudatus* Barrois and Daday, 1894: RW- 1, 2, 3, 10, 13, 14, 22, 26
18. *Brachionus caudatus f. lateralis* Hauer, 1937: RW- 26
19. *Brachionus caudatus personatus* Ahlstrom, 1940: RW- 2, 26
20. *Brachionus caudatus vulgatus* Ahlstrom, 1940: RW- 26
21. *Brachionus dichotomus reductus* Koste and Shiel, 1980: RW- 2, 14
22. *Brachionus diversicornis* Daday, 1883: RW- 2, 3, 14, 15, 22, 26, 39
23. *Brachionus donneri* Brehm, 1851: RW- 2, 14
24. *Brachionus durgae* Dhanapathi, 1974: RW- 2, 3, 14
25. *Brachionus falcatus* Zacharias, 1898: RW- 1, 2, 3, 10, 13, 15, 22, 26, 39
26. *Brachionus forcifula minor* Voronkov, 1913: RW- 26
27. *Brachionus forficula* Wierzejski, 1891: RW- 1, 2, 13, 14, 15, 26
28. *Brachionus fulcatus* Zacharias,1898: RW- 14, 26
29. *Brachionus kostei* Shiel, 1983: RW- 2, 3
30. *Brachionus mirabilis* Daday, 1897: RW- 2, 3, 26, 13
31. *Brachionus patulus* Muler, 1786: RW- 10, 13, 22, 26, 39
32. *Brachionus plicatilis* O.F. Muller, 1786: RW- 10, 13, 15, 22, 26
33. *Brachionus pterodinoides* Rousselet, 1913: RW- 26
34. *Brachionus quadridentatus brevispinus* Ehrenberg, 1832: RW- 26
35. *Brachionus quadridentatus* Hermann, 1783: RW- 2, 3, 13,14,22, 26, 39
36. *Brachionus quadridentatus melhemi* Barrios and Daday 1894: RW- 14
37. *Brachionus quadridentatus rhenanus,* Lauterbom, 1893: RW- 26
38. *Brachionus rotundiformis* Tschugunoff, 1921: RW- 13
39. *Brachionus rubens* Ehrenberg, 1838: RW- 2, 10, 13, 15, 22, 26, 41
40. *Brachionus sessilis* Varga, 1951: RW- 26
41. *Brachionus* sp.: RW- 1, 19, 22, 26
42. *Brachionus urceolaris* Muller, 1773: RW- 13, 26
43. *Braclaionus qradridentatus cluniorbicularis* Skorikov, 1894: RW- 26
44. *Keratella cochlearis* Gosse, 1851: RW- 2, 3, 14, 22, 39
45. *Keratella edmondsoni* Ahlstrom, 1943: RW- 2, 3
46. *Keratella lenzi* Hauer, 1953: RW- 2, 3, 26
47. *Keratella procurva* Thorpe, 1891: RW- 2, 26, 22
48. *Keratella quadrata* O.F. Muller, 1786: RW- 2, 26
49. *Keratella* sp.: RW- 1, 14, 26
50. *Keratella tecta* Gosse, 1851: RW- 2, 3
51. *Keratella tropica* Apstein, 1907: RW- 1, 2, 14, 26, 13, 22, 10, 3, 15, 30, 39
52. *Keratella valga* Ehrenberg: RW- 15, 19, 39
53. *Plationus patulusmacracanthus* Daday, 1905: RW-

2, 3

54. *Plationus patulus* O.F. Muller, 1786: RW- 2, 14, 26

55. *Platyias leloupi* Gillard, 1957: RW- 2, 3

56. *Platyias quadricornis* Ehrenberg, 1832: RW- 2, 3, 10,14, 22, 26, 39

57. *Platyias* sp.: RW- 15, 19

Family EPIPHANIDAE

58. *Ephiphanes macrourus* Barrois and Daday: RW- 1

59. *Epiphanes brachionus* Ehrenberg, 1837: RW- 2, 3

60. *Epiphanes clavulata* Ehrenberg, 1832: RW- 14

61. *Epiphanes senta* O.F. Muller, 1773: RW- 2

62. *Epiphanes* sp.: RW- 19

Family EUCHLANIDAE

63. *Beauchampiella eudactylota* Gosse, 1886: RW- 2, 3, 26

64. *Dipleuchlanis propatula* Gosse, 1886: RW- 2, 3, 26, 39

65. *Euchlanis dilatata* Ehrenberg, 1832: RW- 2, 3,14, 22, 26, 39

66. *Euchlanis incisa* Carlin, 1939: RW- 2, 3

67. *Euchlanis meneta* Myers, 1930: RW- 2, 3

68. *Euchlanis oropha* Gosse, 1887: RW- 26

69. *Euchlanis semicarinata* Segers, 1993: RW- 3

70. *Euchlanis* sp.: RW- 22

71. *Euchlanis triquetra* Ehrenberg, 1838: RW- 2, 3

72. *Tripleuchlanis plicata* Levander, 1894: RW- 2, 3, 26

Family ASPLANCHNIDAE

73. *Asplanchna brightwelli* Gosse, 1850: RW- 2, 10, 14, 26

74. *Asplanchna intermedia* Hudson, 1886: RW- 26

75. *Asplanchna priodonta* Gosse, 1850: RW- 2, 3, 26

76. *Asplanchna* sp.: RW- 1, 15, 22, 26, 39

Family LECANIDAE

77. *Lecane (Hemimonostyla) blachei* Berzins, 1973: RW- 2

78. *Lecane (Hemimonostyla) inopinata* Harring and Myers, 1926: RW- 2, 26

79. *Lecane (Hemimonostyla) sympoda* Hauer, 1929: RW- 2, 26

80. *Lecane (Hemimonostyla) syngenes* Hauer, 1938: RW- 26

81. *Lecane (Monostyla) bulla* Gosse, 1851: RW- 2, 13, 22, 26, 39

82. *Lecane (Monostyla) closterocerca* Schmarda, 1859: RW- 2, 10, 22, 26

83. *Lecane (Monostyla) crenata* Harring, 1913: RW- 26

84. *Lecane (Monostyla) decipiens* Murray, 1913: RW- 2, 22, 26

85. *Lecane (Monostyla) furcata* Murray, 1913: RW- 2, 26

86. *Lecane (Monostyla) hamata* Stokes, 1896: RW- 2, 22, 26

87. *Lecane (Monostyla) lunaris* Ehrenberg, 1832: RW- 2, 26

88. *Lecane (Monostyla) monostyla* Daday, 1897: RW- 2

89. *Lecane (Monostyla) obtusa* Murray, 1913: RW- 2

90. *Lecane (Monostyla) pawlowskii* Wulfert, 1966: RW- 26

91. *Lecane (Monostyla) pyriformis* Daday, 1905: RW- 2, 26

92. *Lecane (Monostyla) quadridentnta* Ehrenberg, 1830: RW- 2, 22, 26

93. *Lecane (Monostyla) sinuata* Hauer, 1938: RW- 26

94. *Lecane (Monostyla) styrax* Harrings, and Myers. 1859: RW- 39

95. *Lecane (Monostyla) stenroosi* Meissner, 1908: RW- 2, 26

96. *Lecane (Monostyla) thienemanni* Hauer, 1938: RW- 2

97. *Lecane acanthinula* Hauer, 1938: RW- 3

98. *Lecane aculeata* Jakubski, 1912: RW- 2, 3, 22, 26

99. *Lecane aeganea* Harring, 1914: RW- 3

100. *Lecane arcula* Harring, 1914: RW- 2, 3, 14, 26

101. *Lecane bifurca* Bryce, 1892: RW- 2, 3

102. *Lecane blachei* Berzins, 1973: RW- 2, 3

103. *Lecane bulla* Gosse, 1851: RW- 2, 3, 14

104. *Lecane closterocerca* Schmarda, 1898: RW- 2, 3, 14

105. *Lecane crepida* Harring, 1914: RW- 2, 3, 14, 26

106. *Lecane curvicornis* Murray, 1913: RW- 2, 3, 10, 26

107. *Lecane decipiens* Murray, 1913: RW- 2, 3, 26

108. *Lecane doryssa* Harring, 1914: RW- 2, 3

109. *Lecane elegans* Harring, 1914: RW- 2, 3

110. *Lecane flexilis* Gosse, 1886: RW- 2, 26

111. *Lecane furcata* Murray, 1913: RW- 2, 3

112. *Lecane haliclysta* Harring and Myers, 1926: RW- 2, 3

113. *Lecane hamata* Stokes,1896: RW- 2, 3, 39

114. *Lecane hastata* Murray, 1913: RW- 2

115. *Lecane hornemanni* Ehrenberg, 1834: RW- 2, 3

116. *Lecane inermis* Bryce, 1892: RW- 2, 3

117. *Lecane inopinata* Harring and Myers, 1926: RW- 2, 3

118. *Lecane lateralis* Sharma, 1978: RW- 2, 3, 26

119. *Lecane leontina* Turner, 1892: RW- 2, 3, 14, 26, 39

120. *Lecane ludwigii* Eckstein, 1883: RW- 2, 3, 10, 14, 26, 39

121. *Lecane luna* O.F.Miiller, 1776: RW- 2, 3, 10, 13,14, 15, 22, 26, 39

122. *Lecane luna f. dorsicalis* Sharma: RW- 39

123. *Lecane lunaris* Ehrenberg, 1832: RW- 2, 3, 14,22, 39

124. *Lecane marchantaria* Koste and Robertson, 1983: RW- 3

125. *Lecane minuta* Segers, 1994: RW- 3, 22

126. *Lecane monostyla* Daday, 1897: RW- 2, 3

127. *Lecane nana* Murray, 1913: RW- 2, 10, 13, 26

128. *Lecane nitida* Murray, 1913: RW- 2

129. *Lecane niwati* Segers, Kothetip and Sanoamuang, 2004: RW- 3
130. *Lecane obtusa* Murray, 1913: RW- 2, 3
131. *Lecane ohioensis* Herrick, 1885: RW- 2, 3, 26
132. *Lecane papuana* Murray, 1913: RW- 2, 3, 13, 14, 26, 39
133. *Lecane paxiana* Hauer, 1940: RW- 2
134. *Lecane pertica* Harring and Myers, 1926: RW- 2
135. *Lecane ploenensis* Voigt, 1902: RW- 2, 3, 39
136. *Lecane pusilla* Harring, 1914: RW- 2, 3
137. *Lecane quadridentata* Ehrenberg, 1832: RW- 3
138. *Lecane rhenana* Hauer, 1929: RW- 2, 3
139. *Lecane rhytida* Harring and Myers, 1926: RW- 2, 3
140. *Lecane ruttneri* Hauer, 1938: RW- 3
141. *Lecane signifera* Jennings, 1896: RW- 2, 3, 26
142. *Lecane signifera ploenensis* Voigt, 1902: RW- 14
143. *Lecane simonneae* Segers, 1993: RW- 3
144. *Lecane sola* Hauer, 1936: RW- 2
145. *Lecane solfatara* Hauer, 1938: RW- 3
146. *Lecane* sp.: RW- 14, 19, 22, 26
147. *Lecane stenroosi* Meissner, 1908: RW- 2
148. *Lecane tenuiseta* Harring, 1914: RW- 2, 3
149. *Lecane thienemanni* Hauer, 1938: RW- 2, 3
150. *Lecane undulata* Hauer, 1938: RW- 2, 3
151. *Lecane unguitata* Fadeev, 1925: RW- 2, 3, 14, 26
152. *Lecane ungulata* Gosse, 1887: RW- 2, 3, 14, 26, 39
153. *Monostyla bamata* Harring and Myers: RW- 10
154. *Monostyla* sp.: RW- 19, 22

Family PROALIDAE

155. *Proales decipiens* Ehrenberg, 1830: RW- 22

Family MYTILINIDAE

156. *Lophocharis salpina* Ehrenberg, 1834: RW- 2, 3
157. *Mytilina acanthophora* Hauer, 1938: RW- 2, 3, 14
158. *Mytilina bisulcata* Lucks, 1912: RW- 2, 3
159. *Mytilina brevispina* Ehrenberg, 1830: RW- 3
160. *Mytilinalobata* Pourriot, 1996: RW- 3
161. *Mytilina michelangellii* Reid and Turner, 1988: RW- 2, 3
162. *Mytilina ventralis* Ehrenberg, 1832: RW- 2, 3, 10, 14, 22, 26
163. *Mytilina ventralis longidactyla* Wulfert, 1965: RW- 2, 26

Family TRICHOTRIIDAE

164. *Macrochaetus collinsi* Gosse, 1867: RW- 2
165. *Macrochaetus danneelae* Koste and Shiel, 1983: RW- 3
166. *Macrochaetus longipes* Myers, 1934: RW- 2, 3
167. *Macrochaetus sericus* Thorpe, 1893: RW- 2, 14, 26
168. *Trichotria* sp.: RW- 19
169. *Trichotria tetractis* Ehrenberg, 1830: RW- 2, 3, 14, 26, 39
170. *Wolga spinifera* Western, 1894: RW- 2, 3

Family LEPADELLIDAE

171. *Colurella adriatica* Ehrenberg, 1831: RW- 2, 3, 22
172. *Colurella bicuspidata* Ehrenberg, 1831: RW- 22
173. *Colurella colurus* Ehrenberg, 1830: RW- 2
174. *Colurella obtusa* Gosse, 1886: RW- 2, 3, 14, 22, 26
175. *Colurella* sp.: RW- 22
176. *Colurella sulcata* Stenroos, 1898: RW- 2, 3
177. *Colurella uncinata* O.F. Muller, 1773: RW- 2, 3, 26
178. *Lepadella (Lepadella) imbricata* Harring, 19I4: RW- 26
179. *Lepadella acuminata* Ehrenberg, 1834: RW- 2, 3, 26
180. *Lepadella apsicora* Myers, 1934: RW- 2, 3
181. *Lepadella apsida* Harring, 1916: RW- 2, 3, 26
182. *Lepadella benjamini* Harring, 1916: RW- 2, 3
183. *Lepadella bicornis* Vasisht and Battish, 1971: RW- 3
184. *Lepadella biloba* Hauer, 1938: RW- 2, 3
185. *Lepadella costatoides* Segers, 1992: RW- 2, 3
186. *Lepadella dactyliseta* Stenroos, 1898: RW- 2, 3
187. *Lepadella desmeti* Segers and Chittapun, 2001: RW- 3
188. *Lepadella discoidea* Segers, 1993: RW- 2, 3
189. *Lepadella ehrenbergi* Perty, 1850: RW- 2, 3, 26
190. *Lepadella elongata* Koste, 1992: RW- 2
191. *Lepadella eurysterna* Myers, 1942: RW- 2, 3
192. *Lepadella heterostyla* Murray, 1913: RW- 2, 3, 26
193. *Lepadella lindaui* Koste, 1981: RW- 2, 3
194. *Lepadella minuta* Weber and Montet, 1918: RW- 2, 3
195. *Lepadella neglecta* Segers and Dumont, 1995: RW- 3
196. *Lepadella ovalislarga* Sharma, 1978: RW- 26
197. *Lepadella ovalis* O.F. Muller, 1786: RW- 2, 3, 14, 26
198. *Lepadella patella* O.F. Muller, 1773: RW- 2, 3, 10, 22, 26
199. *Lepadella quadricarinata* Stenroos, 1898: RW- 3, 26
200. *Lepadella quinquecostata* Lucks, 1912: RW- 2, 3
201. *Lepadella rhomboides* Gosse, 1886: RW- 2, 3, 26
202. *Lepadella rhomboidula* Bryce, 1832: RW- 2, 26
203. *Lepadella* sp.: RW- 19, 26
204. *Lepadella triba* Myers, 1934: RW- 2
205. *Lepadella triptera alata* Myers, 1934: RW- 2, 3
206. *Lepadella triptera* Ehrenberg, 1832: RW- 2, 3, 26
207. *Lepadellavandenbrandei* Gillard, 1952: RW- 2, 3
208. *Squatinella mutica* Ehrenberg, 1832: RW- 2 ,3, 22

Family NOTOMMATIDAE

209. *Cephalodella auriculata* O.F. Muller, 1773: RW- 26
210. *Cephalodella catellina* O.F. Muller. 1786: RW- 26
211. *Cephalodella forficula* Ehrenberg, 1830: RW- 2, 3, 26, 39
212. *Cephalodella gibba* Ehrenberg, 1830: RW- 2, 3, 22, 26
213. *Cephalodella mucronata* Myaers, 1934: RW- 2, 3, 26
214. *Cephalodella* sp.: RW- 19, 22
215. *Monommata longiseta* O.F. Muller, 1786: RW- 2, 3
216. *Monommata maculata* Harring and Myers, 1924:

RW- 3

217. *Notommata spinat*a Koste and Shiel, 1991: RW- 2, 3

Family SCARIDIIDAE

218. *Scaridium longicaudum* O.F. Muller, 1786 2, 3, 14, 26

Family TRICHOCERCIDAE

219. *Trichocerca abilioi* Segers and Sarma, 1993: RW- 3

220. *Trichocerca bicristnta* Gosse, 1887: RW- 2, 3, 14

221. *Trichocerca bidens* Lucks, 1912: RW- 2

222. *Trichocerca capucina* Wierzejski and Zacharias, 1893: RW- 2, 3

223. *Trichocerca cylindrica* Imhof, 1891: RW- 2, 3, 26, 39

224. *Trichocerca edmondsoni* Myers, 1936: RW- 3

225. *Trichocerca elongata* Gosse, 1886: RW- 2, 3

226. *Trichocerca flagellam* Hauer, 1937: RW- 2, 3

227. *Trichocerca hollaerti* De Smet, 1990: RW- 3

228. *Trichocerca iernis* Gosse, 1887: RW- 2

229. *Trichocerca insignis* Herrick, 1886: RW- 2, 3

230. *Trichocerca longiseta* Schrank, 1802: RW- 2, 3

231. *Trichocerca maior* Hauer, 1936: RW- 3

232. *Trichocerca porcellus* Gosse, 1851: RW- 2

233. *Trichocerca pusilla* Jennings, 1903: RW- 2

234. *Trichocerca rattus* O.F. Miiller, 1776: RW- 2, 3, 26

235. *Trichocerca scipio* Gosse, 1886: RW- 2, 3

236. *Trichocerca similis* Wierzejski, 1893: RW- 2, 3, 14, 26, 39

237. *Trichocerca* sp.: RW- 14, 22

238. *Trichocerca sulcata* Jennings, 1894: RW- 2

239. *Trichocerca tenuior* Gosse, 1886: RW- 3

240. *Trichocerca tigris* O.F. Muller, 1786: RW- 2

241. *Trichocerca weberi* Jennings, 1903: RW- 2, 3, 26

Family SYNCHAETIDAE

242. *Ploesoma lenticulare* Herrick, 1855: RW- 3

243. *Ploesoma* sp.: RW- 19

244. *Polyartha* sp.: RW- 15, 22

245. *Polyarthra indica* Segers and Babu, 1999: RW- 14

246. *Polyarthra remata* Skorikov, 1896: RW- 1

247. *Polyarthra vulgaris* Carlin, 1943: RW- 2, 3,10, 26

248. *Synchaetapectinata* Ehrenberg, 1832: RW- 3

249. *Synchaeta*sp.: RW- 39

Family DICRANOPHORIDAE

250. *Dicranophoroides caudatus* Ehrenberg, 1834: RW- 2, 3

251. *Dicranophorus forcipatus* O.F. Müller, 1786: RW- 2, 3, 26

252. *Dicranophorus lutkeni* Bergendal, 1892: RW- 26

Family GASTROPODIDAE

253. *Ascomorpha ecaudis* Perty, 1850: RW- 3

254. *Ascomorpha ovalis* Bergendal, 1892: RW- 3

255. *Ascomorpha saltans* Bartsch, 1870: RW- 2

256. *Gastropus* sp.: RW- 14

Order FLOSCULARIACEA

Family FLOSCULARIIDAE

257. *Floscularia ringens* Linnaeus, 1758: RW- 2, 3

258. *Lacinularia flosculosa* O.F. Müller, 1773: RW- 2

259. *Limnias ceratophylli* Schrank, 1803: RW- 2

260. *Sinantherina semibullata* Thorpe, 1893: RW- 3

261. *Sinantherina socialis* Linne, 1758: RW- 2, 3

262. *Sinantherina spinosa* Thorpe, 1893: RW- 2, 3

Family CONOCHILIDAE

263. *Conochilus unicornis* Rousselet, 1892: RW- 2, 3, 14

264. *Conochilus* sp.: RW- 10

Family HEXARTHRIDAE

265. *Hexarthra intermedia* Wiszniewski, 1929: RW- 14

266. *Hexarthra mira* Hudson, 1871: RW- 2, 10, 15, 26

267. *Hexathra* sp.: RW- 1, 22

Family TESTUDINELLIDAE

268. *Pompholyx sulcata* Hudson, 1885: RW- 2, 8, 26

269. *Testudinella amphora* Hauer, 1938: RW- 3

270. *Testudinella brevicaudata* Yamamoto, 1951: RW- 2, 3

271. *Testudinella emarginuia* Stenroos, 1898: RW- 2, 3

272. *Testudinella greeni* Koste, 1981: RW- 2

273. *Testudinella parva* Ternetz, 1892: RW- 2, 14

274. *Testudinella patina* Hermann, 1783: RW- 2, 3, 10, 14, 26

275. *Testudinella* sp.: RW- 19, 22

276. *Testudinella tridentata* Smirnov, 1931: RW- 3

Family TROCHOSPHAERIDAE

277. *Filinia brachiata* Rousselet, 1901: RW- 2, 3

278. *Filinia camascela* Myers, 1938: RW- 2, 3

279. *Filinia longiseta* Ehrenberg, 1834: RW- 1, 2, 3, 10, 14, 15, 19, 22, 26

280. *Filinia opoliensis* Zacharias, 1898: RW- 2,14, 26

281. *Filinia opoliensis* Zacharias, 1898: RW- 2, 3

282. *Filinia pejleri* Hutchinson, 1964: RW- 2

283. *Filinia saltator* Gosse, 1886: RW- 3

284. *Filinia* sp.: RW- 1, 22, 26

285. *Horaella brehmi* Donner, 1949: RW- 26

286. *Trochosphaera aequatorialis* Semper, 1872: RW- 2, 3

Order BDELLOIDEA

Family PHILODINIDAE

287. *Philodina citrina* Ehrenberg, 1830: RW- 26

288. *Philodina* sp.: RW- 22, 26

289. *Rotaria macroceros* Gosse, 1851: RW- 3

290. *Rotaria neptunia* Ehrenberg, 1832: RW- 2, 3, 14, 22, 26

291. *Rotaria rotatoria* Pallas, 1766: RW- 2, 14, 22

292. *Rotaria* sp.: RW- 26

293. *Rotaria tardigrada* Ehrenberg, 1830: RW- 3

ANNELIDA

The phylum Annelida includes three classes, i.e., Hirudinea, Polychaeta, and Oligochaeta. In general, annelids are true worms that possess body segments, marked externally by inter-segmental grooves and internally corresponding transverse muscular partitions (septa), formed by subdivisions that partially transects the body cavity. Segmentation is also known as metamerism, each of the segments contains body systems such as nervous, circulatory, and excretory tracts (nephridia). The metamerism promotes the body movement by allowing the extremely localised muscle contraction. The well-developed internal organs of annelids includes a closed, segmentally-arranged circulatory systems. Exchange of gases takes place through the skin or sometimes with the help of specialized gills or modified parapodia. The digestive system is in the form of complete tube starting from mouth to anus. The nervous system comprise of a pair of cephalic ganglia that is attached to the double nerve cord which runs the entire body length on the ventral body wall. The group possess some combination of tactile organs, chemoreceptors, balance receptors, and photoreceptors, some of forms have been reported with decently well-developed eyes, including lenses (Brusca and Brusca 1990; Hickman and Roberts 1994). Annelids have been reported from all over the world, i.e., freshwater, marine, and terrestrial environments, and thus are good candidate for biology experiments in research and at colleges/universities due to their easy availability. They have a feeding behaviour that includes passive filters feeders to voracious and active predators. They have been extensively employed in medicine biology due to extraction of various valuable compounds that is being used for treatment of variety of ailments e.g., haemorrhoids, jaundice, rheumatism, etc. Leeches have been used as remedies for throat infection and their blood sucking property make them useful in inflammatory swellings in human beings. Leeches have also been utilized in understanding the mechanism of blood clotting and dissolving the blood clots.

HIRUDINEA

Leeches (Hirudinea) lack setae or parapodia and are characterised by the presence of suckers at one or both end of the body. They are predatory parasitic annelids with terminal suckers serving in attachment, locomotion and feeding. They are closely related to the Oligochaeta and reasonable the epizoic Branchiobdellidae in possession of suckers, median genital orifice and analogous jaws in the absence of setae (Moore, 1959). They are characteristically modified for procuring and digesting their peculiar food, which consists typically of blood and other animal juices but also of smaller annelids, snails, insect larvae and organic ooze. They are both terrestrial and aquatic. Species have been recorded from freshwater (ponds, lakes, streams, paddy fields), brackish and marine water. Marine and brackish water leeches usually remain attached at the ventral region of the animals (Harding and Moore, 1927). Leeches are found sometimes attached with animal body surface (feeding on their blood) and with plants (lower leaf of plant, stem and root of the floating plants being the favourite resting sites).

About 700 species of leeches are known from the world, whereas only 70 species have so far been recorded from India. The present document reports 31 species of leeches from Ramsar wetlands of India (Table 15). Most of the leeches inhabit freshwater ecosystems. As many as 55 species under 24 genera and 5 families are recorded from the freshwater bodies of India and 36 of them are Endemic. The coloured and ornamented leeches are also used as decorative pieces. Both venomous (menace to human beings and cattles) and non-venomous (used as remedies for the throat and inflammatory swelling in humans due to their property of sucking blood) leeches have been reported. *Hirudo medicinalis* a medically important species that have also been used for releasing the blood pressure in human beings. Harding and Moore (1927) described 38 species and 6 subspecies of leeches in the Fauna of British India-Hirudinea. Further work studies were performed by Bhatia (1930, 1934 and 1939), Chelladurai (1934), Sanjeeva Raj (1951 and 1974) and Baugh (1960). It has been reported that vegetation and altitude play a vital role in the life of Wetland leeches. The water hyacinth has been known for controlling the population density and supports variety of leech species.

Table 15. Diversity of Hirudinea from Ramsar Wetlands of India.

Order RHYCHOBDELLIDA
Family GLOSSIPHONIIDAE
1. *Alboglossiphonia weberi* Blanchard, 1897: RW- 5
2. *Batracobdelloides reticulata* Kaburaki, 1921: RW- 5
3. *Hemiclepsis marginata asiatica* Moore, 1924: RW- 5, 26
Family PISCICOLJDAE
4. *Piscicola olivacea* Harding, 1920: RW- 16
5. *Piscicola caeca* Kaburaki, 1921: RW- 16
6. *Pterobdella amara* Kaburaki, 1921: RW- 16
Family OZOBRANCHIDAE
7. *Ozobranchus shipleyi* Harding, 1909: RW- 26
FAMILY ICHTHYOBELLIDAE
8. *Pontobdella aculeata* Harding, 1924: RW- 27
Class HIRUDINEA
Family HIRUDUNIDAE
9. *Hirudinaria* sp.: RW- 39
Order ARHYNCHOBDELLIDA
Family SALIFIDAE
10. *Barbronia weberi* Blanchard, 1897: RW- 16
11. *Salifa indica* Kaburaki, 1921: RW- 5
Family GLOSSIPHONIDAE
12. *Erpobdella* sp. RW- 7
13. *Glossiphonia annandalei* Oka, 1921: RW- 16
14. *Glossiphonia ceylanica,* Harding, 1909: RW- 16
15. *Glossiphonia* sp.: RW- 7
16. *Glossiphonia weberi* Blanchard, 1897: RW- 15, 16, 26, 27, 39
17. *Helobdella nociva* Harding, 1924: RW- 26, 27
18. *Herpobdelloidea lateroculata* Kaburaki, 1921: RW- 15, 26
19. *Nematobdella indica* Kaburaki, 1921: RW- 15
20. *Paraclepsis gardensi* Mandal, 2004: RW- 26
21. *Placobdella ceylanica* Harding, 1909: RW- 16
22. *Placobdella chandrakantai* Mandal, 2002: RW- 26
23. *Placobdella emydae* Harding, 1934: RW- 16, 26
24. *Placobdella harasundarai* Mandal, 2004: RW- 26
25. *Placobdella* sp.: RW- 7
26. *Theromyzon sexoculata* Moore, 1898: RW- 15
Family HIRUDIDAE
27. *Hirudo* sp.: RW- 26
28. *Poecilobdella granulosa* Savingny, 1822: RW- 16, 32, 36, 38
29. *Poecilobdella manillenasis* Lesson: RW- 38
30. *Poecilobdella* sp.: RW- 26, 38

Polychaetes

The polychaetes or bristleworms comprise both free-living and sedentary forms and are widely distributed throughout marine and estuarine environments, although there are a few freshwater species. Availability of polychaetes in diverse ecological niches is due to their high degree of adaptability to a wide range of environmental factors. Among all the marine benthic organisms, polychaetes constitute the most important component of the macro-invertebrates since their variety and abundance can often be used as an indication of the cleanliness of the environment in which they live (Wilheloni 1916, Jones 1969 Moore 1972). The majority of the species are benthic, only a few are pelagic. Most of the benthic polychaetes prefer sandy or muddy substrata extending from the sea shore to the greatest depths of the hadal zone; some are found to be comfortable in the crevices of rocks or coral reefs. They are particularly abundant in coastal areas of Andaman and Nicobar Islands, West Bengal, Odisha and Gujarat, Gulf of Mannar, Chilka and Pulicat lakes, and Hugli-Matla, Mahanadi and Godavari estuaries. They are most common between tide marks and on coral reefs and in shallow littoral waters as far as 200 fathoms. They are characterized by a distinct head, bearing eyes and a number of appendages. Each segment following the head is usually furnished with a pair of lateral bristle-bearing fleshy lobes called parapodia. Sexes are separate in most polychaetes. The present document reports 103 species of polychaetes from the Ramsar wetlands of India (Table 16).

Table 16. Diversity of Polychaetes from Ramsar Wetlands of India.

Class POLYCHAETA

Family SIGALIONIDAE

1. *Sthenelais boa* Johnston, 1833: RW- 13

Family GLYCERIDAE

2. *Glycera alba* O.F. Müller, 1776: RW- 13, 27

3. *Glycera convoluta* Keferstein, 1862: RW- 13

4. *Glycera lancadive* Schmarda: RW- 27

5. *Glycera longipinnis* Grube, 1878: RW- 13

6. *Glycera rouxi* Audouin and Milne Edwards, 1833: RW- 27

7. *Glycinde oligodon* Southern, 1921: RW- 16

Family GONIADIDAE

8. *Goniada emerita* Audouin and Milne Edwards, 1833: RW- 27

Family ONUPHIDAE

9. *Diopatra cuprea* Bosc, 1802: RW- 27

10. *Diopatra neapolitana* Delle Chiaje, 1841: RW- 13, 16, 27

Family EUNICIDAE

11. *Eunice aphroditois* Pallas,1788: RW- 27

12. *Lysidice collaris* Grube, 1870: RW- 27

13. *Maphysa macintoshi* Crossland, 1903: RW- 27

14. *Marphysa fallax* Marion and Bobretzky, 1875: RW- 16

15. *Marphysa gravelyi* Southern,1921: RW- 16

16. *Marphysa mossambica* Peters, 1854: RW- 16, 27

17. *Marphysa sanguinea* Montagu, 1813: RW- 27

Family LUMBRINERIDAE

18. *Lumbrilleris polydesma* Southern, 1921: RW- 16, 27

19. *Lumbrinereis latreilli* Audouin and Milne Edwards, 1834: RW- 13

20. *Lumbrinereis notocirrata* Fauvel, 1932: RW- 13, 16, 27

21. *Lumbrinereis pseudobifilaris* Fauvel, 1932: RW- 13

22. *Lumbrinereis simplex* Southern, 1921: RW- 13, 16

23. *Lumbrinereis* sp.: RW- 13

24. *Lumbrineris heteropoda* Marenzeller, 1879: RW- 27

Family MALDANIDAE

25. *Euclynlene annandalei* Southern, 1921: RW- 16

26. *Axiothella obockensis* Gravier, 1905: RW- 13

Family NEPHTYIDAE

27. *Nephtys oligobranchia* Southern, 1921: RW- 13, 16, 27

28. *Nephtys polybranchia* Southern, 1921: RW- 13, 16

Family NEREIDIDAE

29. *Ceratonereis costae* Grube, 1840: RW- 13

30. *Ceratonereis mirabilis* Kingberg, 1865: RW- 13

31. *Ceratonereis* sp.: RW- 13

32. *Dendronereides heteropoda* Southern, 1921: RW- 13, 27

33. *Dendronereis aestuarina* Southern, 1921: RW- 13, 27

34. *Dendronereis arborifera* Peters, 1854: RW- 13, 27

35. *Dendronereis* sp.: RW- 13

36. *Ganganereis sootai* Misra, 1999: RW- 27

37. *Lycastonereis indica* Rao, 1981: RW- 27

38. *Namalycastis fauveli* Rao, 1981: RW- 16

39. *Namalycastis indica* Southern, 1921: RW- 13, 16, 27

40. *Neanthes chingrighattensis* Fauvel, 1932: RW- 13, 27

41. *Neanthes cricognatha* Ehlers, 1904: RW- 27

42. *Neanthes glandicincta* Southern, 1921: RW- 13, 16

43. *Nereis chilkaensis* Southern, 1921: RW- 13, 16

44. *Nereis kauderni* Fauvel, 1921: RW- 13

45. *Nereis persica* Fauvel, 1911: RW- 16
46. *Nereis reducta* Southern, 1921: RW- 16
47. *Perenereis* sp.: RW- 13
48. *Perinereis cavifrons* Ehlers, 1920: RW- 13
49. *Perinereis cultifera* Grube, 1840: RW- 27
50. *Perinereis nigropunctata* Horst, 1889: RW- 16, 27
51. *Perinereis nuntia* Savigny, 1818: RW- 13
52. *Tylonereis fauveli* Southern, 1921*:* RW- 16

Family CAPITELLIDAE

53. *Barantolla sculpta* Southern, 1921: RW- 16
54. *Branchiocapitella singularis* Fauvel, 1932: RW- 13
55. *Capitella capitata* Fabricius, 1780: RW- 13, 16
56. *Capitella* sp.: RW- 13
57. *Heteromastides bifidus* Augener, 1914: RW- 13
58. *Heteromastus similis* Southern, 1921: RW- 13, 16, 27
59. *Maslobranchus indicus* Southern: RW- 27
60. *Notonzastus latericeus* Sars.: RW- 16
61. *Paraheteromastus tenuis* Monro, 1937: RW- 13
62. *Pulliella armata* Fauvel, 1929: RW- 13, 16
63. *Scyphoproctus djiboutiensis* Gravier, 1904: RW- 13

FAMILY STERNASPIDAE

64. *Slenaspis scutala* Ranzani: RW- 27

Family SPIONIDAE

65. *Minuspio cirrifera* Loew, 1869: RW- 13, 16, 27
66. *Minuspio cirrifera* Wiren, 1883: RW- 13
67. *Polydora* sp.: RW- 13
68. *Prionospio pinnata* Ehlers, 1901: RW- 13
69. *Prionospio polybranchiata* Fauvel, 1929: RW- 13
70. *Prionospio* sp.: RW- 13
71. *Pseudopolydora kempi* Southern, 1921: RW- 13
72. *Spio bengalensis* Willey, 1908*:* RW- 27

Family PILARGIDAE

73. *Ancistrosyllis constricta* Southern, 1921: RW- 13, 16, 27
74. *Talehsapia annandalei* Fauvel, 1932: RW- 27

Family SYLLIDAE

75. *Odontosyllis gravelyi* Fauvel, 1930: RW- 13

Family SIGALIONIDAE

76. *Sthenelais boa* Johnston, 1833: RW- 13

Family EUNICIDAE

77. *Eunice* sp.: RW- 13
78. *Eunice tubifex* Crossland, 1904: RW- 13
79. *Marphysa gravelyi* Southern, 1921: RW- 13, 16
80. *Marphysa stragulum* Grube, 1878: RW- 13

Family GONIADIDAE

81. *Goniada emerita* Audouin and Milne Edwards, 1833: RW- 13

Family TEREBELLIDAE

82. *Loimia medusa* Savignyi, 1818: RW- 13, 16, 27
83. *Pista indica* Fauvel, 1940: RW- 13

Family OWENIIDAE

84. *Owenia* sp.: RW- 13

Family ORBINIIDAE

85. *Scoloplos marsupialis* Southern, 1921: RW- 16

Family PECTINARIIDAE

86. *Amphictene crassa* Grube, 1870: RW- 13
87. *Lagis abranchiata* Fauvel, 1932: RW- 13

Family AMPHINOMIDAE

88. *Notopygos* sp.: RW- 13

Family POLYNOIDAE

89. *Gaudichaudius cimex* Quatrefages, 1866: RW- 13
90. *Lepidonotus tenuisetosus* Gravier, 1901: RW- 13, 27

Family SABELLIDAE

91. *Laonome indica* Southern, 1921: RW- 16, 27

Family SABELLARIIDAE

92. *Sabellaria cementarium* Moore, 1906: RW- 13

Family SERPULIDAE

93. *Ficopomatus macrodon* Southern, 1921: RW- 13, 16
94. *Mercierella enigmatica* Fauvel, 1923: RW- 13
95. *Serpula vermicularis* Linnaeus, 1767: RW- 13

Family TALEHSAPIIDAE

96. *Talehsapia annandalei* Fauvel, 1932 13

Family PHYLLODOCIDAE

97. *Eteone barantollae* Fauvel, 1932: RW- 27
98. *Phyllodoce modeirensis* Langerhans, 1880: RW- 27
99. *Phyllodoce* sp.: RW- 13

Family AMPHARETIDAE

100. *Amage bioculata* Moore: RW- 16
101. *Amphicteis gunneri* Sars, 1835: RW- 13

Family HESIONIDAE

102. *Ophicdronlus angustrifrons* Grube: RW- 16

Family PARAONIDAE

103. *Aricidea fauveli* Hartman, 1957: RW- 16

Oligochaetes

Earthworms play a significant role in the disappearance of surface plant litter, and its breakdown, redistribution and incorporation in the soil. Organic matter is pulverized and subjected to digestive enzymes in their alimentary canal. Their castings (excreta) are rich in plant nutrients (Julka, 1988). The burrowing activity of earthworms enhances aeration and porosity of soil, thereby improving its water holding capacity. Oligochaetes are found in all aquatic and terrestrial habitats with sufficient moisture and food. Aquatic oligochaetes constitute an important component in the complex food web of wetlands and other water bodies, since they improve the quality of detritus deposited at the bottom of freshwater ecosystems. Some species of aquatic oligochaetes have been recognized as good indicators of organic pollution. They are cylindrical, bilaterally symmetrical coelomate worms with internal and external metameric segmentation. They lack any appendages and suckers but possess a few hook-like chaetae embedded in the skin with which they gain hold on the substratum.

They are divided into two convenient groups on the basis of their body size, i.e., Microdrili and Megadrili. The Microdrili are small, mainly aquatic worms including terrestrial pot worms of the family Enchytraeidae whereas Megadrili are large, mostly terrestrial worms).

Annandale (1905) was the pioneer to put forth a note on Indian oligochate, with a description of an aquatic oligochate, *Chaetogaster bengalensis*, from India. Taxonomic monographs on the Indian Oligochaeta have been published by Stephenson (1923), Brinkhurst and Jamieson (1971), Gates (1972) and Julka (1988). The study of Oligochaeta diversity in wetlands has not attracted much attention in our country. Julka and Paliwal (2000) published a detailed account on the Oligochaeta of Renuka wetland, Himachal Pradesh, Paliwal and Julka (2005) listed earthworms of western Himalaya, Paliwal and Julka (2009) explored earthworm diversity of Pong Dam, Himachal Pradesh. Mitra and Roy (2010) reported *Lumbrineris psedobifilaris* from the East Kolkata wetlands (Glasby *et al*., 2009). Aquatic Oligochaete fauna is poorly known in India, and most of the species are recorded from littoral zones of small freshwater bodies like ponds, tanks, pools, ditches, etc., all over the country. This document compiles a total of 65 species of Oligochaetes from Ramsar wetlands of India (Table 17).

Table 17. Diversity of Oligochaetes from Ramsar Wetlands of India.

Class OLIGOCHAETA

Family TUBIFICIDAE

1. *Aulodrilus pigueti* Kowalewski, 1914: RW- 13

2. *Aulodrilus pluriseta* Piguet, 1906: RW- 13

3. *Aulodrilus remex* Stephenson,1 921: RW- 13

4. *Aulodrilus* sp.: RW- 13

5. *Limnodrilus hoffmeisteri* Claparede, 1862: RW- 5, 7, 13

6. *Limnodrilus* sp.: RW- 39

7. *Monopylepborus parvus* Ditlevsen, 1904: RW- 16

8. *Tubifex* sp.: RW- 13

9. *Tubifex tubifex* Muller, 1774: RW- 7, 18, 39

Family OCTOCHAETIDAE

10. *Dichogaster bolaui* Michaelsen, 1891: RW- 4, 5, 38

11. *Eutyphoeus incommodus* Beddard, 1901: RW- 4, 20

12. *Eutyphoeus orientalis* Beddart, 1833: RW- 27, 38

13. *Eutyphoeus waltoni* Michaelsen, 1907: RW- 4, 20

14. *Lennogaster chittagongensis* Stephenson, 1917: RW- 4, 5

15. *Lennogaster pusillus* Stephenson: RW- 38

16. *Octochaetona beatrix* Beddard, 1902: RW- 4, 5, 20, 38

Family MEGASCOLECIDAE

17. *Amynthas corticis* Kinberg, 1867: RW- 4, 5, 20

18. *Amynthas diffringens* Baird: RW- 38

19. *Lampito mauritti* Kinlerg, 1867 : RW- 26, 27

20. *Metaphire birmanica* Rosa, 1888: RW- 5, 38

21. *Metaphire houlleti* Perrier, 1872: RW- 4, 5, 38

22. *Metaphire posthuma* Vaillant, 1868: RW- 4, 5, 20, 26, 27, 32, 36, 39

23. *Metaphire* sp.: RW- 39

24. *Perionyx bainii* Stephenson, 1915: RW- 5

25. *Perionyx excavatus* Perrier: RW- 4, 5, 26, 27

26. *Perionyx millardi* Stephenson, 1915: RW- 16

27. *Perionyx sansibaricus* Michaelsen, 1891: RW- 4

28. *Perionyx simlaensis* Michaelsen, 1907: RW- 5, 38

29. *Perionyx* sp.: RW- 38

30. *Polypheretima elongala* Perrier, 1872: RW- 27

Family LUMBRICIDAE

31. *Allolobophora parva* Eisen, 1874: RW- 4, 5

Family LUMBRICULIDAE

32. *Aporrectodea caliginosa caliginosa* Savigny, 1826: RW- 6

33. *Aporrectodea rosea rosea* Savigny, 1826: RW- 6

34. *Bimastos parvus* Eisen, 1874: RW- 6

35. *Dendrodrilus rubidus* Savigny, 1826: RW- 6

36. *Eisenia andrei* Bouché, 1972: RW- 6

37. *Eisenia fetida* Savigny, 1826: RW- 6

38. *Lumbriculus variegates* Muller, 1773: RW- 13

39. *Octolasion tyrtaeum* Savigny, 1826: RW- 6

Family OCNERODRILIDAE

40. *Ocnerodrilus occidentalis* Eisen, 1878: RW- 4

Family ACANTHODRILIDAE

41. *Pontodrilus bermudensis* Beddard, 1891: RW- 16, 27

Family AELOSOMATIDAE

42. *Aelosoma bengalensis*: RW- 19

43. *Aelosoma hemprichi* Ehrenberg, 1828: RW- 18

44. *Aelosoma* sp.: RW- 7

Family NAIDIDAE

45. *Allonais gwaliorensis* Stephenson, 1920: RW- 13

46. *Allonais paraguayensis* Michaelsen, 1905: RW- 13, 16

47. *Branchiuria sowerbyi* Beddard, 1892: RW- 7, 19

48. *Branchodrilus hortensis* Stephenson, 1910: RW- 13

49. *Branchodrilus semperi* Bourne, 1890: RW- 13

50. *Branchodrilus* sp.: RW- 39

51. *Chaetogaster* sp.: RW- 18, 19

52. *Dero cooperi* Stephenson, 1932: RW- 13

53. *Dero* sp.: RW- 13, 39

54. *Dero zeylanica* Stephenson, 1913: RW- 13

55. *Hanochaeta* sp.: RW- 13

56. *Homochaeta* sp.: RW- 13

57. *Nais* sp.: RW- 7, 39

58. *Pristina menoni* Aiyer, 1929: RW- 13

59. *Pristina* sp.: RW- 7

60. *Pristinella accuminata* Liang, 1958: RW- 13

61. *Pristinella jenkinae* Stephenson, 1931: RW- 13

62. *Pristinella minuta* Stephenson, 1914: RW- 13

63. *Stephansonia trivandriana* Aiyer, 1926: RW- 13

64. *Stylaria lacustris* Linnaeus, 1767 : RW- 18

Order ENCHYTRAEIDA

Family ENCHYTRAEIDAE

65. *Stephensoniella barkudensis* Stephenson, 1915**:** RW- 26

Arachnida

Arachnids are arthropods that are easil recognizable due to the eight-legs a feature differentiates them from insects apart from the two (vs. three) body segments. Each legs have seven segments, namely, coxa, trochanter, femur, patella, tibia, metatarsus and tarsus. Another striking characteristics of the arachnids is the absence of true jaw. Of the total six pair of cephalothoracic appendages, the prey is capture and crushed by the first two pairs and the rest four pairs are legs. They possess eight simple eyes that varies greatly in their position. Respiration takes place with the help of book lungs or trachea or both. Male and female are present with remarkable sexual dimorphism in certain cases. They are viviparous or oviparous, the young ones hatch from the eggs but undergo a series of successive moults.

Arachnids are generally terrestrial in habit with the most frequently seen 'orb weavers' which make the commonly-encountered spider webs among the vegetation and other structures. The Arachnida includes families Araneae (spiders), Scorpionidae (scorpions), Pseudoscorpionidae (Pseudoscorpion), Solufigidae (Solu-figids), Opilionida (Marvestmee), Pedipalpida (Whip scorpions), acarina (ticks, mites etc.,). The orders Microthelyphonida and Ricinulei are not recorded thus from the Indian subcontinent.

Spiders are the largest order of arachnids and rank seventh in total species diversity among all orders of organisms. Spiders are found worldwide on every continent except for Antarctica, and have become established in nearly every habitat with the exceptions of air and sea colonization (Alexandar, 2013). They have been researched for commercially important products such as Spider silk that is found to be superior to that of synthetic materials, the use of spider venom in medicine and as non-polluting pesticides. Their genes have also been identified and inserted in other organisms for better production of these compounds. They play an important role in maintaining biological balance in nature. As a result of their wide range of behaviors, spiders have become common symbols in art and mythology.

Spiders are among the more obvious yet elusive of the wetland species. The contribution on the taxonomy of Indian spiders ways backs during 19th century by Stoliczka (1869), Blackwall (1867), Karsch (1873), Simon (1887), Thorell (1895) and Pocock (1900) with description of many Indian species. Tikader (1980, 1982), Tikader, and Malhotra (1980) described spiders from India. Tikader (1980) compiled a book on Thomisid spiders of India that included 23 species new to science. Further contribution were made by Tikader and Biswas (1981) from Calcutta and surrounding areas, Pocock (1900) and Tikader (1980, 1987) highlighted spider studies to the notice of other researcher, Gajbe (1978-2009) described 147 new spider species from different habitats of India (Keswani *et al*., 2012). The spiders of Indian wetlands were studied by Black (1867), Biswas (2000), Chandra *et al*. (2017), Dhali *et al*. (2016), Lawania and Trigunayat (2015), Majumder (2007), Majumder and Mridha (2004), Mandal and Nandi (1989), Nandi (2009), Sharma and Sharma (2015), and Talukdar and Majumder (2007, 2008), Tikader and Biswa (1981). The present document compiles a total of 240 species of arachnids from the Ramsar wetlands of India (Table 18).

Table 18. List of Arachnids from Ramsar Wetlands of India.

CLASS ARACHNIDA
ORDER ARANEAE
FAMILY ARANEIDAE

1. *Araneus anantnagensis* Tikader and Bal, 1981: RW- 27
2. *Araneus bivittatus* Walckenaer, 1841: RW- 27
3. *Araneus ellipticus* Tikader and Bal, 1981: RW- 27
4. *Araneus mitificus* Simon,1886: RW- 26, 27
5. *Araneus nympha* Simon, 1889: RW- 27
6. *Araneus panchganiensis* Tikader and Bal, 1981: RW- 27
7. *Araneus*sp.: RW- 41
8. *Argiope aemula* Walckenaer, 1841: RW- 22, 27, 41
9. *Argiope anasuja* Thorell 1887: RW- 22, 27
10. *Argiope arcuata* Simon, 1772: RW- 27
11. *Argiope caesarea* Thorell, 1897: RW- 27
12. *Argiope catenulata* (Doleschall, 1859): RW- 26
13. *Argiope kalimpongensis* Sinha, 1952: RW- 27
14. *Argiope minuta* Karsch, 1879: RW- 27

15. *Argiope pulchella* Thorell, 1881: RW- 22, 27

16. *Argiope shillongensis* Sinha, 1951: RW- 27

17. *Argiope* sp.: RW- 26, 27

18. *Cyclosa insulana* Costa, 1834: RW- 22

19. *Cyclosa neilensis* Tikader, 1977: RW- 26

20. *Cyrtophora bidenta* Tikader, 1970: RW- 27

21. *Cyrtophora cicatrosa* Stoliczka, 1869: RW- 22, 27

22. *Cyrtophora citricola* Forsskål, 1775: RW- 22

23. *Cyclosa hexatuberculata* Tikader: RW- 41

24. *Chorizopes anjanes* Tikader: RW- 41

25. *Eriovixia excelsa* Simon, 1889: RW- 22, 27

26. *Eriovixia* sp.: RW- 26

27. *Gasteracantha hasselti* C.L. Koch, 1837: RW- 27

28. *Gibbaranea bituberculata* Walckenaer, 1802: RW- 27

29. *Larinia chloris* Audouin, 1826: RW- 22

30. *Larinia emertoni* Gajbe and Gajbe, 2004: RW- 22

31. *Larinia phthisica* C.L. Koch,1871: RW- 27, 41

32. *Larinia* sp.: RW- 27

33. *Neoscoma theisi* Walekenaer,1841: RW- 27

34. *Neoscona molemensis* Tikader and Bal, 1981: RW- 27

35. *Neoscona mukerjei* Tikader, 1980: RW- 22, 27, 41

36. *Neoscona nautica* C.L. Koch, 1875: RW- 27

37. *Neoscona pavida* Simon, 1906: RW- 27

38. *Neoscona punctigera* Doleschall, 1857: RW- 27

39. *Neoscona rumpfi* Thorell 1899: RW- 27

40. *Neoscona shillongensis* Tikader and Bal, 1981: RW- 27

41. *Neoscona* sp.: RW- 22, 27, 41

42. *Neoscona vigilans* Blackwall, 1865: RW- 27

43. *Nephila kuhlii* Doleschall, 1859: RW- 22

44. *Nephila maculata* Fabricius: RW- 5

45. *Nephila pilipes* Fabricius, 1793: RW- 22

46. *Nephila* sp.: RW- 22

47. *Parawixia dehaani* Doleschall, 1859: RW- 27

48. *Poltys nagpurensis* Tikader, 1982: RW- 27

49. *Singa chota* Tikader, 1970: RW- 27

50. *Zygiella indica* Tikader and Bal, 1980: RW- 22

51. *Zygiella melanocrania* Thorell: RW- 41

Family ARGYRONECTIDAE

52. *Argyronecta aquatica*: RW- 39

FAMILYCORINNIDAE

53. *Castianeira* sp.: RW- 22, 27

54. *Castianeira tinae* Patel and Patel, 1973: RW- 27

55. *Castianeira himalayansis* Gravely, 1931: RW- 27

FAMILY CLUBIONIDAE

56. *Cheiracanthium himalayense* Gravely, 1931: RW- 27

57. *Cheiracanthium melanostomum* Thorell, 1895: RW- 27

58. *Cheiracanthium mysorense* Majumder and Tikader, 1991: RW- 27

59. *Cheiracanthium* sp.: RW- 22, 27

60. *Cheiracanthium triviale* Thorell, 1895: RW- 27

61. *Clubiona drassodes* O. Pickard-Cambridge, 1847: RW- 27

62. *Clubiona filicata* O. Pickard-Cambridge, 1847: RW- 26, 27

63. *Clubiona* sp.: RW- 27

FAMILY DICTYNIDAE

64. *Nigma shiprai* Tikader, 1966: RW- 22

FAMILYGNAPHOSIDAE

65. *Callilepis lambai* Tikader and Gajbe, 1977: RW- 22

66. *Callilepis rukminiae* Tikader and Gajbe, 1977: RW- 22

67. *Drassodes* sp.: RW- 22

68. *Geodrassus sirmourensis* Tikader and Gajbe, 1977: RW- 5

69. *Geodrassus* sp.: RW- 41

70. *Poecilochora barmani* Tikader: RW- 27

71. *Scopoides kuljitae* Tikader, 1982: RW- 27

FAMILY HERSILIIDAE

72. *Hersilia savignyi* Lucas, 1836: RW- 22, 26, 27

FAMILY SPARASSIDAE

73. *Bhutaniella sikkimensis* Gravely, 1931: RW- 27

74. *Heteropoda venatoria* Linnaeus, 1767: RW- 27

75. *Heteropoda* sp.: RW- 41

76. *Spariolenus petricola* Gravely, 1931: RW- 27

77. *Spariolenus tigris* Simon, 1880: RW- 27

Family STENOCHILIDAE

78. *Stenochilus crocatus* Simon: RW- 41

FAMILYLY COSIDAE

79. *Arctosa himalayensis* Tikader and Malhotra, 1980: RW- 27

80. *Arctosa indica* Tikader and Malhotra, 1980: RW- 27

81. *Arctosa khudiensis* Sinha, 1951: RW- 27

82. *Arctosa mulani* Dyal, 1935: RW- 27

83. *Arctosa sandeshkhaliensis* Majumder, 2004: RW- 27

84. *Arctosa* sp.: RW- 27

85. *Draposa leucopalpis* Gravely, 1924: RW- 27

86. *Draposa lyrivulva* Bösenberg and Strand, 1906: RW- 27

87. *Draposa minutus* Tikader and Malhotra, 1976: RW- 27

88. *Draposa oakleyi* Gravely, 1924: RW- 27

89. *Evippa* sp.: RW- 41

90. *Geolycosa urbana* O. Pickard-Cambridge, 1876: RW- 22

91. *Hippasa greenalliae* Blackwall, 1867: RW- 27

92. *Hippasa holmerae* Thorell, 1895: RW- 27

93. *Hippasa madhuae* Tikader and Malhotra, 1980: RW- 22, 41

94. *Hippasa olivacea* Thorell, 1887: RW- 27, 41

95. *Hippasa partita* O. Pickard-Cambridge, 1876: RW- 27

96. *Hippasa pisaurina* Pocock, 1900: RW- 22

97. *Hippasa* sp.: RW- 27, 41

98. *Hogna himalayensis* Gravely, 1924: RW- 27

99. *Lycosa bistriata* Gravely, 1924: RW- 26

100. *Lycosa chaperi* Simon, 1885: RW- 27

101. *Lycosa choudhuryi* Tikader and Malhotra, 1980: RW- 27

102. *Lycosa himalayensis* Gravely, 1924: RW- 27

103. *Lycosa kempi* Gravely, 1924: RW- 27

104. *Lycosa mackenziei* Gravely, 1924: RW- 22, 27

105. *Lycosa mahabaleshwarensis* Tikader and Malhotra, 1980: RW- 27

106. *Lycosa masteri* Pocock, 1901: RW- 27

107. *Lycosa nigrotibialis* Simon: RW- 41

108. *Lycosa phipsoni* Pocock, 1899: RW- 27

109. *Lycosa pictula* Pocock, 1901: RW- 22, 27

110. *Lycosa poonaensis* Tikader and Malhotra, 1980: RW- 27

111. *Lycosa shillongensis* Tikader and Malhotra, 1980: RW- 27

112. *Lycosa* sp.: RW- 13, 27

113. *Lycosa tista* Tikader,1970: RW- 27

114. *Ocyale atalanta* Audouin, 1826: RW- 27

115. *Pardosa alii* Tikader, 1977: RW- 27

116. *Pardosa amkhasensis* Tikader and Malhotra, 1976: RW- 27

117. *Pardosa annandalei* Gravely, 1924: RW- 27

118. *Pardosa atropalpis* Gravely, 1924: RW- 27

119. *Pardosa birmanica* Simon, 1884: RW- 5, 22, 27, 41

120. *Pardosa burasantiensis* Tikader and Malhotra, 1976: RW- 27

121. *Pardosa chambaensis* Tikader and Malhotra, 1976: RW- 27

122. *Pardosa debolinae* Majumder, 2004: RW- 27

123. *Pardosa heterophthalmus* Simon, 1898: RW- 27

124. *Pardosa kupupa* Tikader, 1970: RW- 27

125. *Pardosa mysorensis* Tikader and Malhotra, 1971: RW- 27

126. *Pardosa pseudoannulata*Bösenberg and Strand, 1906: RW- 22, 26

127. *Pardosa pusiola* Thorell, 1891: RW- 27

128. *Pardosa rhenockensis* Tikader, 1970: RW- 27

129. *Pardosa shyamae* Tikader, 1970: RW- 27

130. *Pardosa songosa* Tikader and Malhotra, 1976: RW- 22, 27

131. *Pardosa* sp.: RW- 27

132. *Pardosa suchismitae* Majumder, 2004: RW- 27

133. *Pardosa sumatrana* Thorell, 1890: RW- 26, 27

134. *Pardosa sutherlandi* Gravely, 1924: RW- 27

135. *Trochosa punctipes* Gravely, 1924: RW- 26, 27

136. *Trochosa* sp.: RW- 26

137. *Wadicosa quadrifera* (Gravely, 1924): RW- 26

138. *Zoica puellula* Simon, 1898: RW- 27

FAMILYLINYPHIIDAE

139. *Linyphia* sp.: RW- 22

FAMILY ERESIDAE

140. *Stegodyphus sarasinorum* Karsch, 1892: RW- 27, 41

FAMILY OXYOPIDAE

141. *Oxyopes javanus* Thorell, 1887: RW- 22

142. *Oxyopes sunandae* Tikader, 1970: RW- 27

143. *Oxyopes sakuntalae* Tikader, 1970: RW- 27

144. *Oxyopes reddyi* Majumder, 2004: RW- 27

145. *Oxyopes ratnae* Tikader, 1970: RW- 22, 27

146. *Oxyopes shweta* Tikader, 1970: RW- 5, 22, 27, 41

147. *Oxyopes sitae* Tikader, 1970: RW- 27

148. *Oxyopes birmanicus* Thorell, 1887: RW- 22

149. *Oxyopes chittriae* Tikader: RW- 27

150. *Oxyopes sikkimensis* Tikader, 1970: RW- 27

151. *Oxyopes pandae* Tikader, 1969: RW- 27

152. *Oxyopes pankaji* Gajbe and Gajbe, 2000: RW- 22

153. *Oxyopes assamensis* Tikader, 1969: RW- 22

154. *Oxyopes rufisternis* Pocock, 1901: RW- 22

155. *Oxyopes sertatus* C.L. Koch, 1878: RW- 22

156. *Oxyopes viridana* Hentz, 1845: RW- 22

157. *Oxyopes hindostanicus* Pocock, 1901: RW- 26

158. *Oxyopes* sp.: RW- 22, 27, 41

159. *Peucetia latikae* Tikader, 1970: RW- 27

160. *Peucetia yogeshi* Gajbe: RW- 41

161. *Hamadruas sikkimensis* Tikader, 1970: RW- 27

FAMILY PHOLCIDAE

162. *Artema atlanta* Walckenaer, 1837: RW- 22

163. *Crossopriza lyoni* Blackwall, 1867: RW- 22, 41

164. *Pholcus phalangioides* Fuesslin, 1775: RW- 22

165. *Pholcus* sp.: RW- 22

FAMILY PHILODROMIDAE

166. *Philodromus* sp.: RW- 22

FAMILY SALTICIDAE

167. *Acemonea tenuipes* O. Pickard-Cambridge, 1869: RW- 22

168. *Bavia* sp.: RW- 22

169. *Binor albobimaculatus*: RW- 22

170. *Binor pseudomaculatus*: RW- 22

171. *Carrhotus viduus* C.L. Koch, 1846: RW- 27

172. *Cosmophasis umbratica* Simon, 1903: RW- 22

173. *Hasarius adansoni* Audouin 1826: RW- 22

174. *Hyllus semicupreus* Simon, 1885: RW- 22, 26, 27

175. *Marpissa bengalensis* Tikader and Biswas, 1981: RW- 27

176. *Marpissa dayapurensis* Majumder, 2004: RW- 27

177. *Marpissa decorata* Tikader, 1974: RW- 27

178. *Marpissa gangasagarensis* Majumder, 2005: RW- 27

179. *Marpissa lakshmiktlntapurensis* Majumder, 2004: RW- 27

180. *Marpissa mandala* Tikader: RW- 27

181. *Marpissa* sp.: RW- 27

182. *Menemerus bivittatus* (Dufour, 1831): RW- 26

183. *Myrmarachne mathewei* Mathew, 2007: RW- 22

184. *Myrmarachne melanocephala* MacLeay, 1839: RW- 22, 26, 27

185. *Phaeacius lancearius* (Thorell, 1895): RW- 26

186. *Phiddipus* sp.: RW- 27

187. *Phidippus bengalensis* Tikader, 1977: RW- 27

188. *Phidippus indicus* Tikader, 1974: RW- 22, 27

189. *Phidippus yashdharae*: RW- 22

190. *Phidipus pateli* Tikader, 1974: RW- 22, 27

191. *Phintella vittata* C.L. Koch, 1846: RW- 22

192. *Phlegra dhakuriensis* Tikader, 1974: RW- 27

193. *Plexippus andamanensis* Tikader, 1977: RW- 27

194. *Plexippus calcutaensis* Tikader, 1974: RW- 27

195. *Plexippus paykulli* Audouin, 1826: RW- 22, 26, 27

196. *Plexippus* sp.: RW- 27

197. *Portia assamensis* Wanless, 1978: RW- 22

198. *Portia* sp.: RW- 22

199. *Ptocasius strupifer* Simon, 1901: RW- 22

200. *Rhene rubrigera* (Thorell, 1887): RW- 26

201. *Rhene* sp.: RW- 26

202. *Salticus runjitus*: RW- 22

203. *Telamonia dimidiata* Simon, 1899: RW- 22, 27

204. *Zygoballus* sp.: RW- 13, 27

FAMILY SELENOPIDAE

205. *Selenops* sp.: RW- 22

FAMILY SPARASSIDAE

206. *Bhutaniella sikkimensis* Gravely, 1931: RW- 27

207. *Heteropoda venatoria* Linnaeus, 1767: RW- 27

208. *Olios tener* Thorell, 1891: RW- 27

209. *Spariolenus tigris* Simon, 1880: RW- 27

FAMILY TETRAGNATHIDAE

210. *Guizgiella melanocrania* Thorell, 1887: RW- 26, 27

211. *Guizgiella* sp.: RW- 26

212. *Leucauge decorata* Blackwall, 1864: RW- 5, 22, 27

213. *Leucauge* sp.: RW- 22, 27

214. *Leucauge tessellata* Thorell, 1887: RW- 27

215. *Tetragnatha andamanensis* Tikader, 1977: RW- 27

216. *Tetragnatha hasselti* Thorell, 1890: RW- 27

217. *Tetragnatha javana* (Thorell, 1890): RW- 26

218. *Tetragnatha keyserlingi* Simon, 1890: RW- 26

219. *Tetragnatha mandibulata* Walckenaer, 1841: RW- 27, 41

220. *Tetragnatha nitens* (Audouin, 1826): RW- 26

221. *Tetragnatha* sp.: RW- 13, 26, 27

222. *Tetragnatha vermiformis* Emerton, 1884: RW- 26

FAMILY THERIDIIDAE

223. *Argyrodes argentatus* O. Pickard-Cambridge, 1880: RW- 26

224. *Chikunia nigra* O. Pickard-Cambridge, 1880: RW- 22

225. *Chrysso pulcherrima* Mello-Leitão, 1917: RW- 22

226. *Parasteatoda mundula* C.L. Koch, 1872: RW- 22

227. *Steatoda* sp.: RW- 22

228. *Theridion indica* Tikader, 1977: RW- 27

229. *Theridion*sp.: RW- 41

FAMILY THOMISIDAE

230. *Camaricus formosus* Thorell, 1877: RW- 26, 27

231. *Indoxysticus minutus* Tikader,1960: RW- 22

232. *Runcinia insecta* (L. Koch, 1875): RW- 26

233. *Thomisus andamanensis* Tikader, 1980: RW- 27

234. *Thomisus lobosus* Tikader, 1965: RW- 22

235. *Thomisus projectus* Tikader,1960: RW- 22

236. *Thomisus pooneus* Tikader: RW- 41

237. *Thomisus sarojaii* Basu: RW- 41

238. *Thomisus* sp.: RW- 26

FAMILY ULOBORIDAE

239. *Uloborus danolius* Tikader, 1969: RW- 22, 27

Family OONOPIDAE

240. *Triaeris nagarellsis* Tikader and Malhotra: RW- 41

CRUSTACEAN

Crustaceans are the most diverse of any group of arthropods with its presence in wide variety of habitats. Most species occur mainly in aquatic habitats but some are adapted to live on land. They are extremely important members of the planktonic and benthic communities in almost all inland water ecosystems, including wetlands, freshwater and saline lakes, caves, and rivers. They are a vital food web link between primary producers (algae and aquatic weeds) and higher trophic levels. They obtain food as detritivores, herbivores, omnivores, and carnivores, and range in size from 0.1 mm long up to 400 mm (e.g., giant crayfish). Crustaceans are anatomically disparate with highly specialized body segments and appendages including various fused segments. They are bilateral, having internal and external segmentation, and an open hemocoel. They have a rigid, chitinous exoskeleton composed of a thin epicuticle and a thick procuticle that may or may not be reinforced with calcium carbonate. Their bodies are generally divided into the cephalon (head), thorax, and abdomen. The many jointed appendages are biramous (or secondarily uniramous), may occur in all regions of the body, and these arthropods possess paired antennules (uniramous in all crustaceans except malacostracans), antennae, mandibles, and maxillae.\

The inland water representatives of this subphylum includes about 15% of the nearly 68,000 described species worldwide in the subphylum [e.g., water fleas, tadpole shrimp, fairy shrimp (branchiopods), copepods, seed shrimp (ostracods), scuds (amphipods), water sow bugs (isopods), shrimp, crayfish, and crabs], the rest of the species are marine.

Cladocera

Cladocera or `Water fleas' are a group of small-sized, mostly microscopic branchiopods representing one of the most primitive groups of lower Crustacea. They are a diverse group of small crustaceans common in aquatic habitats, ranging from shallow temporary ponds to deep lakes and large rivers. Cladocera is one of the rare groups of animals which, together with aphids and some hymenopterans, reproduce principally through parthenogenesis. Most cladocerans reproduce by cyclic parthenogenesis, alternating long periods of asexual reproduction with infrequent sex, and resting egg formation. They serve as an important food for small fish, aquatic insects, and other zooplankton. Maximum body size ranges across two orders of magnitude, affecting a variety of physiological and ecological characteristics.

Their small size and flattened shape is helpful in rapid diffusion of gases and solutes between environment and internal spaces that eventually minimize the use of vascular systems. While some species are cosmopolitan, most cladocerans are restricted to single continents and recent invasions appear linked to human-mediated introductions.

The Indian freshwater cladocerans systematic was initiated by Baird (1859), the recent annotated checklist of Indian cladocera by Chatterjee *et al.* (2013) found about 131 species valid species from India. Their taxonomy has come from a long three centuries of global contributions which has advanced significantly over the years, especially with the inclusion of molecular techniques. Frequent contributions on cladoceran diversity has been provided by Sewell (1919), George (1958), Rao (1968), Sankarankutty (1969, 1975), Rao and Kathirvel (1972), Achuthankutty and George (1973), Radhakrishnan and Samual (1982), Sharma and Michael (1987), Michael and Sharma (1978, 1988, 1991, 2008), Sharma and Sharma (1985, 1999, 2001, 2008, 2009, 2010, 2013, 2014), Venkataraman (1999), Venkataraman and Das (2000), Chatterjee *et al*. (2013). A total of 144 cladocerans have been documented in the present study from the Ramsar wetlands of India (Table 19).

Table 19. Diversity of Cladocerans from Ramsar Wetlands of India.

Superclass CRUSTACEA
Class BRANCHIOPODA
Superorder CLADOCERA
Order CTENOPODA
Family SIDIDAE

1. *Diaphanosoma brachyurum*Liévin, 1848: RW- 7
2. *Diaphanosoma excisum* Sars, 1885: RW- 1, 2, 15, 21, 22, 26
3. *Diaphanosoma sarsi* Richard, 1894: RW- 2, 11, 15, 21, 22, 26, 39
4. *Diaphanosoma senegal* Gauthier, 1951: RW- 2, 15
5. *Diaphanosoma* sp.: RW- 19, 27
6. *Latonopsis australis* Sars, 1888: RW- 21
7. *Penilia avirostris* Dana, 1852: RW- 11, 13
8. *Pseudosida bidentata* Herrick, 1884: RW- 2, 15, 22, 26, 39
9. *Sarsilatona serricauda* Sars, 1901: RW- 2
10. *Sida crystallina* O.F. Milller, 1776: RW- 2, 7, 15

Family PODONIDAE

11. *Evadne tergestina* Claus, 1877: RW- 11, 13
12. *Evadne* sp.: RW- 27
13. *Podon* sp.: RW- 13

Order ANOMOPODA
Family DAPHNIIDAE

14. *Ceriodaphnia cornuta* Sars, 1885: RW- 1, 2, 3, 5, 11, 15, 21, 22, 26, 27
15. *Ceriodaphnia laticaudata* P.E. Muller, 1867: RW- 15
16. *Ceriodaphnia quadrangular* O.F. Müller, 1785: RW- 7
17. *Ceriodaphnia reticulata* Jurine, 1820: RW- 2, 22
18. *Ceriodaphnia rigaudi* Richard, 1894: RW- 21
19. *Ceriodaphnia* sp.: RW- 19, 26, 27
20. *Daphnia carinata* King, 1853: RW- 3, 21, 26, 30
21. *Daphnia laevis* Birge, 1878: RW- 7
22. *Daphnia lumholtzi* Sars, 1885: RW- 2, 3, 21, 26, 39
23. *Daphnia magna* Straus, 1820: RW- 7
24. *Daphnia pulex* Leydig, 1860 emend. Scourfield, 1942: RW- 2, 7
25. *Daphnia retrocurva* Forbes, 1882: RW- 7
26. *Daphnia rosea* Sars, 1862: RW- 7
27. *Daphnia* sp.: RW- 1, 8, 26, 27
28. *Scapholeberis kingi* Sars, 1903: RW- 2, 3, 15, 21, 22, 26, 39
29. *Simocephalus (Coronocephalus) serrulatus* Koch, 1841: RW- 2, 15
30. *Simocephalus (Echinocaudus) acutirostratus* King, 1853: RW- 2, 15
31. *Simocephalus (Simocephalus) mixtus* Sars, 1903: RW- 2, 15
32. *Simocephalus exspinosus* Koch, 1841: RW- 22, 26
33. *Simocephalus heilongjiangensis* Shi and Shi, 1994: RW- 15
34. *Simocephalus vetuloides* Sars, 1898: RW- 15
35. *Simocephalus vetulus* Muller,1776: RW- 5, 21, 22, 26, 39

Family BOSMINIDAE

36. *Bosmina coregoni* Baird, 1857: RW- 7
37. *Bosmina longirostris* O. F. Milller, 1785: RW- 2, 7, 15, 26, 39
38. *Bosmina* sp.: RW- 19, 26, 27
39. *Bosminopsis deitersi* Richard, 1895: RW- 2, 11, 15, 22, 39
40. *Bosminopsis* sp. : RW- 27

Family MOINIDAE

41. *Moina affinis* Birge, 1893: RW- 7
42. *Moina brachiata*Jurine, 1820: RW- 7, 21, 39
43. *Moina macrocopa* Straus, 1820: RW- 21, 22
44. *Moina micrura* Kurz, 1875: RW- 1, 2, 3, 11, 15, 21, 22, 26
45. *Moina* sp.: RW- 1, 26, 27
46. *Moinodaphnia macleayi* King, 1853: RW- 2, 5, 22, 26
47. *Moinodaphnia* sp.: RW- 7, 26

Family MACROTHRICIDAE

48. *Echinisca triserialis* Brady, 1886: RW- 22, 26
49. *Grimaldina brazzai* Richard, 1892: RW- 2
50. *Guernella raphaelis* Richard, 1892: RW- 2, 15
51. *Macrothrix goeldi* Richard, 1897: RW- 22, 26, 39
52. *Macrothrix laticornis* Jurine, 1820: RW- 2, 15, 22
53. *Macrothrix odiosa* Gurney, 1907: RW- 15, 39
54. *Macrothrix rosea* Jurine, 1820: RW- 7
55. *Macrothrix* sp.: RW- 19, 27
56. *Macrothrix spinosa* King, 1853: RW- 2, 3, 5, 15, 21, 22, 39
57. *Macrothrix triserialis* Brady, 1886: RW- 2, 15
58. *Streblocerus serricaudatus* Fischer, 1849: RW- 2, 15

Family ILYOCRYPTIDAE

59. *Ilyocryptus spinifer* Herrick, 1882: RW- 2, 15, 21,

22, 39

Family CHYDORIDAE

60. *Acroperus harpae* Baird, 1834: RW- 2, 15
61. *Alona affinis* Leydig, 1860: RW- 2, 7, 15, 26
62. *Alona cheni* Sinev, 1862: RW- 2
63. *Alona coastata* Sars, 1862: RW- 7, 15
64. *Alona davidi davidi*, Richard, 1895: RW- 8, 15, 26, 39
65. *Alona globulosa* Daday, 1898: RW- 15
66. *Alona guttata guttata* Sars, 1862: RW- 2, 7, 15
67. *Alona guttata tuberculata* Kurz, 1875: RW- 2, 8
68. *Alona intermedia* Sars, 1862: RW- 15
69. *Alona karua* King, 1853: RW- 26
70. *Alona ladacensis* Brehm, 1936: RW- 8
71. *Alona macronyx* Daday, 1898: RW- 2
72. *Alona monocantha tridentate* Stingelin, 1906: RW- 15
73. *Alona pulchella* King, 1853: RW- 5, 21, 26
74. *Alona quadrangularis* O. F. Muller, 1785: RW- 2, 3, 15, 26
75. *Alona rectangula richardi* Stingelin, 1895: RW- 8, 12, 14, 21, 39
76. *Alona rectangula* Sars, 1862: RW- 3, 7, 8,15, 22, 26, 39
77. *Alona* sp.: RW- 19, 21, 26
78. *Alona verrucosa* Sars, 1901: RW- 15
79. *Alonella clathratula* Sars, 1896: RW- 2, 15
80. *Alonella dentifera*Sars, 1901: RW- 7
81. *Alonella excisa* Fischer, 1854: RW- 2, 7, 15, 39
82. *Alonella exigua* Lilljeborg, 1853: RW- 7
83. *Alonella nana* Baird, 1850: RW- 2
84. *Anthalona harti* Van Damme, Sinev and Dumont, 2011: RW- 2
85. *Bipertura affinis* Leydig, 1860: RW- 39
86. *Biapertura karua* King, 1853: RW- 22, 26, 39
87. *Camptocercus rectirostris* Schoedler, 1862: RW- 7
88. *Camptocercus uncinatus* Smirnov, 1971: RW- 1, 22
89. *Chydorus barroisi* Richard, 1894: RW- 3, 11, 22, 26, 39
90. *Chydorus denticulatus* Henry: RW- 21
91. *Chydorus faviformis* Birge, 1893: RW- 2, 15, 39
92. *Chydorus parvus* Daday, 1898: RW- 39
93. *Chydorus ovalis*: RW- 7
94. *Chydorus reticulatus* Daday, 1898: RW- 2, 21, 22, 39
95. *Chydorus* sp.: RW- 1, 19
96. *Chydorus sphearicus* O.F.Muller, 1776: RW- 2, 3, 5, 7, 15, 26, 39
97. *Chydorus ventricosus* Daday, 1898: RW- 15, 21, 22, 39
98. *Cladoceran neonates*: RW- 26
99. *Coronatella anodonta* Daday, 1905: RW- 2
100. *Coronatella rectangula* Sars, 1862: RW- 2, 26
101. *Dadaya macrops* Daday, 1898: RW- 2, 15
102. *Disperalona caudata* Smirnov, 1996: RW- 2, 15
103. *Dunhevedia crassa* King, 1853: RW- 2, 3, 5, 15, 21
104. *Dunhevedia serrata* Daday, 1898: RW- 2
105. *Ephemeroporus barroisi* Richard, 1894: RW- 2, 15
106. *Eryalona orientalis* Daday, 1848: RW- 22
107. *Euryalona orientalis* Daday, 1898: RW- 2, 15, 26
108. *Graptoleberis testudinaria* Fischer, 1851: RW- 2
109. *Karualona karua* King, 1853: RW- 2, 15
110. *Kurzia (Rostrokurzia) brevilabris* Rajapaksa and Fernando, 1986: RW- 2
111. *Kurzia (Rostrokurzia) longirostris* Daday, 1898: RW- 2, 15, 22, 26
112. *Kurzia latissima* Kurz, 1875: RW- 15, 26
113. *Kurzia* sp.: RW- 26
114. *Leberis diaphanus* King, 1853: RW- 2
115. *Leydigia acanthocercoides* Fischer, 1854: RW- 2, 15, 21, 26
116. *Leydigia laevis* Gurney, 1927: RW- 21
117. *Leydigia* sp.: RW- 21
118. *Leydigiopsis curvirostris* Sars, 1901 : RW- 2
119. *Notolona globulosa* Daday, 1898: RW- 2, 26
120. *Oxyurella sinhalensis* Daday, 1898: RW- 2, 15, 22, 26, 39
121. *Picripleuroxus laevis* Sars, 1861: RW- 15
122. *Picripleuroxus similis* Vavra, 1900: RW- 2, 15
123. *Pleuroxus aduncus* Jurine, 1820: RW- 22, 39
124. *Pleuroxus denticulatus* Birge, 1879: RW- 26
125. *Pleuroxus similis* Varva, 1900: RW- 5, 22, 26
126. *Pleuroxus triogonellus* O.F. Muller, 1776: RW- 39
127. *Pleuroxus* sp.: RW- 3, 19
128. *Pseudochydorus globosus* Baird, 1843: RW- 2, 15

Family POLYPHEMIDAE

129. *Polyphemus pediculus* Limne, 1761: RW- 39

Order ANOSTRACA

Family ARTEMIIDAE

130. *Artemia salina* Linnaeus, 1758: RW- 21,27

Family STREPTOCEPHALIDAE

131. *Streptocephalus simplex* Gurney, 1906: RW- 21

Family THAMNOCEPHALIDAE

132. *Branchinella biswasi* Tiwari, 1958: RW- 21

Order CALANOIDA
Family CALANIDAE
133. *Calanoid nauplii*: RW- 26
134. *Calanus* sp.: RW- 1
135. *Canthocalanus pauper* Giesbrecht, 1888: RW- 27
136. *Undinula darwini* Lubbock, 1860: RW- 27
Order SPINICAUDATA
Family CYCLESTHERIIDAE
137. *Cyclestherina hislopi* Baird, 1859: RW- 27, 39
Order CONCHOSTRACA
Family CYZICIDAE
138. *Bairdestheria boysii* (Baird): RW- 21
Family CAENESTHERIIDAE
139. *Caenestheriella indica* Gurney, 1906: RW- 39
140. *Eocyzicus polltus* (Baird): RW- 21
Family LEPTESTHERIIDAE
141. *Leptestheria biswasii* Tiwari, 1965: RW- 21
142. *Leptestheria laevis* Gurney: RW- 21
143. *Leptestheriella sp. prox gigas* Karande and Inamdar: RW- 21
144. *Sevellestheria sambharensis* Tiwari, 1966: RW- 21

Copepoda

The copepods form an important constituent of the crustacean fauna. Among the zooplankton, they comprise 70-80% of the total population. Copepods occur in almost all freshwater habitats such as temporary pools and ponds, lakes, slowing-flowing rivers and streams, hot springs, small pools of water within or upon plants (phytotelmata), and even in semi-terrestrial situations such as damp moss and leaf litter in humid forests. They are extremely abundant in freshwater, often constituting a major component of most planktonic, benthic and groundwater communities. Of about 13,000 nominal species so far known in the world, most of them are found in the marine environment, and only about 3,000 species inhabit freshwaters. Ecologically, the planktonic copepods as primary and secondary consumers constitute a significant trophic link between the algal cells (phytoplankton: primary producers) and the juvenile fish to whales (planktivores) in aquatic food chains. They contribute a major portion of the biomass and secondary production in many aquatic communities. Free-living copepods in general have the potential to be used by mankind in different ways. For example, while some species can be easily cultivated under laboratory conditions and used as live feed for fish and prawn larvae in aquaculture industry, the predatory species, especially certain cyclopoid copepods, are employed as biological agents in mosquito control and also as biological indicators for environmental monitoring purposes, both in the field and laboratory. Some of them are also known to act as intermediate hosts of many of human and animal parasites as well.

Of the nine orders known under the subclass Copepoda, viz. Platycopioida Fosshagen, Calanoida Sars, Misophrioida Gurney, Harpacticoida Sars, Mormonilloida Boxshall, Gelyelloida Huys, Cyclopoida Burmeister, Poecilostomatoida Thorell, Siphonostomatoida Thorell, and Monstrilloida Sars, the free-living freshwater copepods generally belong to three orders: Calanoida, Cyclopoida, and Harpacticoida. All other orders contain predominantly brackish water, marine and/or parasitic forms.The present document reports the presence of 182 copepods from the Ramsar wetlands of India (Table 20).

Table 20. Diversity of Copepods from Ramsar Wetlands of India.

Phylum ARTHROPODA
Superclass CRUSTACEA
Class COPEPODA
Order CALANOIDA
Family DIAPTOMIDAE
1. *Acartia* (*Acanthacartia*) *chilkaensis* Sewell, 1919: RW- 1, 16
2. *Acartia* (*Acanthacartia*) *plumosa* T. Scott, 1894: RW- 1, 11, 13
3. *Acartia* (*Acartiella*) *major* Sewell, 1919: RW- 1
4. *Acartia* (*Acartiella*) *minor* Sewell, 1919: RW- 1
5. *Acartia bilobata* Abraham, 1979: RW- 11, 13

6. *Acartia centrusa* Giesbrecht, 1889: RW- 11, 13, 27
7. *Acartia erythraea* Giesbrecht, 1889: RW- 13, 27
8. *Acartia pacifica* Steuer, 1915: RW- 13
9. *Acartia plumosa* T. Scott, 1894: RW- 13
10. *Acartia southwelli* Sewell, 1914: RW- 11
11. *Acartia* sp.: RW- 11, 27
12. *Acartia spinicauda* Giesbrecht, 1889: RW- 13, 27
13. *Acartia tropica* Ueda and Hiromi, 1987: RW- 11
14. *Acartiella gravelyi* Sewell, 1919: RW- 13
15. *Acartiella keralensis* Wellershaus, 1969: RW- 13, 27
16. *Acartiella major* Sewell, 1919: RW- 1, 27
17. *Acartiella minor* Sewell, 1919: RW- 1, 16
18. *Acartiella sewelli* Steuer, 1934: RW- 13, 27
19. *Acartiella tortaniformes* Sewell, 1912: RW- 27
20. *Allodiaptomus mirabilipes* Kiefer, 1936: RW- 13
21. *Allodiaptomus raoi* Kiefer, 1936: RW- 1
22. *Arctodiaptomus* (*Stenodiaptomus*) *stewartianus* Brehm: RW- 8
23. *Diaptomus* sp.: RW- 1, 3, 7, 11, 26, 27
24. *Diaptomus virginiensis* Marsh, 1915: RW- 7
25. *Halicyclops tenuispina* Sewell, 1924: RW- 13, 27
26. *Heliodiaptomus cinctus* Gurney, 1907: RW- 1, 13, 16, 27
27. *Heliodiaptomus contortus* Gurney, 1907: RW- 1, 2, 16, 26, 27
28. *Heliodiaptomus kolleruensis* Reddy and Radhakrishna, 1981: RW- 1
29. *Heliodiaptomus* sp.: RW- 1, 39
30. *Heliodiaptomus viduus* Gurney, 1916: RW- 1, 2, 26, 27, 39
31. *Neodiaptomus schmackeri* Poppe and Richard, 1892: RW- 2, 27
32. *Neodiaptomus strigilipes* Gurney, 1907: RW- 13, 27
33. *Paradiaptomus* sp.: RW- 11
34. *Phyllodiaptomus blanci* Gurne and Richard, 1896: RW- 1, 27, 39
35. *Pseudodiaptomus annandalei* Sewell, 1919: RW- 1, 13, 26, 27
36. *Pseudodiaptomus aurivilli* Cleve, 1901: RW- 13, 26, 27
37. *Pseudodiaptomus binghami malayalus* Wellershaus, 1969: RW- 13, 26
38. *Pseudodiaptomus binghami* sewell, 1912: RW- 1, 13, 27
39. *Pseudodiaptomus dauglishi* Sewell, 1932: RW- 1, 27
40. *Pseudodiaptomus hickmani* Sewell, 1912: RW- 1, 13, 27
41. *Pseudodiaptomus jonesi* Pillai, 1970: RW- 13
42. *Pseudodiaptomus lobipes* Gurney, 1907: RW- 27
43. *Pseudodiaptomus masoni* Sewell, 1932: RW- 13, 27
44. *Pseudodiaptomus mertoni* Frtichtl, 1924: RW- 13
45. *Pseudodiaptomus serricaudatus* T. Scott, 1894: RW- 13, 27
46. *Pseudodiaptomus* sp.: RW- 11, 27
47. *Pseudodiaptomus tollingeri* Sewell, 1919: RW- 1, 13, 27
48. *Rhinediaptomus indicus* Kiefer, 1936: RW- 1
49. *Tropodiaptomus informis* Kiefer, 1936: RW- 1

Family PONTELLIDAE

50. *Calanopia elliptica* Dana, 1849: RW- 27
51. *Labidocera acuta* Dana, 1849: RW- 13, 27
52. *Labidocera euchaeta* Giesbrecht, 1889: RW- 13, 27
53. *Labidocera kroyeri* Brady, 1883: RW- 13
54. *Labidocera minutum* Giesbrecht, 1889: RW- 13, 27
55. *Labidocera orsinii* Giesbrecht, 1889: RW- 13
56. *Labidocera pavo* Giesbrecht, 1889: RW- 13, 16, 27
57. *Labidocera pectinata* Thompson and Scott, 1903: RW- 13, 27
58. *Pontella andersoni* Sewell,1912: RW- 27
59. *Pontellopsis herdmani* Thompson and Scott, 1903: RW- 27

Family TEMORIDAE

60. *Temora discaudata* Giesbrecht, 1889: RW- 13, 27
61. *Temora stylifera* Dana, 1849: RW- 13
62. *Temora turbinata* Dana, 1849: RW- 13, 27
63. *Temora undulata* Dana, 1849: RW- 13

Family TORTANIDAE

64. *Tortanus forcipatus* Giesbrecht, 1889: RW- 13, 27
65. *Tortanus gracilis* Brady, 1883: RW- 13, 27

Family EUCALANIDAE

66. *Eucalanus crassus* Giesbrecht, 1888: RW- 13
67. *Eucalanus elongatus* Dana, 1848: RW- 13, 27
68. *Eucalanus subcrassus* Giesbrecht, 1888: RW- 13, 27
69. *Euchaeta concinna* Dana, 1849: RW- 13, 27
70. *Euchaeta marina* Prestandrea, 1833: RW- 13, 27
71. *Euchaeta tenuis* Esterly, 1906: RW- 13, 27
72. *Euchaeta wolfendeni* Scott, 1909: RW- 13, 27

Family CALOCALANIDAE

73. *Acrocalanus inermis* Sewell, 1912: RW- 27
74. *Acrocalanus monachus* Giesbrecht, 1888: RW- 13
75. *Acrocalanus similis* Sewell, 1914: RW- 11, 27
76. *Acrocalanus* sp.: RW- 11, 27
77. *Acrocalanus undulata* Sewell, 1914: RW- 13
78. *Calocalanus pavo* Dana, 1852: RW- 13
79. *Paracalanus aculeatus Giesbrecht f. major* Sewell, 1929: RW- 13
80. *Paracalanus crassirostris Dahl f. cochinensis* Wellershaus, 1969: RW- 13
81. *Paracalanus dubia* Sewell, 1912: RW- 27
82. *Paracalanus parvus* Clais, 1863: RW- 27
83. *Paracalanus* sp.: RW- 11, 27

Family EUTEROPINIDAE

84. *Euterpina acutifrons* Dana, 1847: RW- 13, 26, 27
85. *Euterpina* sp.: RW- 11

Family LAOPHONTIDAE

86. *Laophonte* sp.: RW- 13, 27

Family CANDACIDAE

87. *Candacia bradyii* A. Scott, 1902: RW- 13, 27

Family CENTROPAGIDAE

88. *Centropages alcocki* Sewell, 1912: RW- 13, 27
89. *Centropages dorsispinatus* Thompson and Scott, 1903: RW- 27
90. *Centropages furcatus* Dana, 1849: RW- 13, 27
91. *Centropages tenuiremis* Thompson and Scott, 1903: RW- 13
92. *Centropages trispinosus* Sewell, 1914: RW- 13
93. *Isias cochinensis* Pillai, 1975: RW- 13
94. *Isias tropica* Sewell, 1924: RW- 16

Order CYCLOPOIDA

Family CYCLOPIDAE

95. *Acanthocyclops bicuspidatus* Claus, 1857: RW- 7
96. *Cyclopoid copepodite*: RW- 26
97. *Cyclopoid nauplii* : RW- 26
98. *Cyclops bicolor* Sars, 1863: RW- 7
99. *Cyclops bicuspidatus* Claus, 1857: RW- 7
100. *Cyclops bisetosus* Rehberg, 1880: RW- 7
101. *Cyclops kukarti*: RW- 27
102. *Cyclops ladakanus* Kiefer, 1936: RW- 8
103. *Cyclops latipes* Lowndes, 1927: RW- 7
104. *Cyclops nauplius* Müller, 1776: RW- 26
105. *Cyclops panamensis* Marsh, 1913: RW- 7
106. *Cyclops scutifer* Sars, 1863: RW- 7
107. *Cyclops* sp.: RW- 1, 3, 11, 19, 27
108. *Cyclops vicinus*Ulyanin, 1875: RW- 7
109. *Ectocyclops phaleratus* medius Kiefer, 1930: RW- 1
110. *Eucyclops productus* Kiefer: RW- 8
111. *Eucyclops agilis*Koch, 1838: RW- 7
112. *Eucyclops serrulatus* Fischer, 1851: RW- 1, 8
113. *Eucyclops* sp.: RW- 26
114. *Macrocyclops distinctus* Richard, 1887: RW- 1
115. *Macrocyclops fuscus* Jurine, 1820: RW- 7
116. *Megacyclops viridis* Jurine, 1820: RW- 7, 8
117. *Mesocyclops cj leuckarri* Claus, 1857: RW- 1, 5, 26
118. *Mesocyclops hyalinus* (Rehberg, 1880): RW- 26
119. *Mesocyclops leuckarti* Claus, 1857: RW- 2, 5, 16, 19, 26, 27
120. *Mesocyclops* sp.: RW- 1, 13, 16, 19,27
121. *Mesocyclops varicans* Sars, 1863: RW- 3
122. *Microcyclops varicans* Sars, 1863: RW- 1, 2, 3, 26
123. *Oithona brevicornis* Giesbrecht, 1891: RW- 1
124. *Oithona hebes* Giesbrecht, 1891: RW- 1
125. *Oithona* sp.: RW- 11
126. *Paracyclopina intermedia* Sewell, 1924: RW- 1
127. *Paracyclopina longifurca* Sewell, 1924: RW- 1
128. *Paracyclops affinis* Sars, 1863: RW- 7
129. *Paracyclops fimbriatus* Fischer, 1853: RW- 3
130. *Paracyclops vagus* Lindberg, 1939: RW- 1
131. *Thermocyclops crassus* Fischer, 1853: RW- 1
132. *Thermocyclops decipiens* Kiefer, 1929: RW- 2
133. *Thermocyclops rylovi rylovi* (Smirnov, 1928): RW- 26
134. *Tropocyclops prasinus* Fischer, 1860: RW- 2
135. *Tropocyclops prasinus multicolour* Lindberg, 1935: RW- 1

Family CYCLOPINNIDAE

136. *Cyclopina* sp.: RW- 13

Family AMEIRIDAE

137. *Nitocra spinipes* Boeck, 1864: RW- 13

Family OITHONIDAE

138. *Oithona attenuata* Farran, 1913: RW- 13
139. *Oithona brevicornis* Giesbrecht, 1892: RW- 13
140. *Oithona hebes* Giesbrecht, 1891: RW- 13
141. *Oithona nana* Giesbrecht, 1892: RW- 13
142. *Oithona oculata* Farran, 1913: RW- 13
143. *Oithona plumifera* Baird, 1843: RW- 13
144. *Oithona rigida* Giesbrecht, 1896: RW- 13
145. *Oithona similis* Claus, 1866: RW- 13
146. *Oithona simplex* Farran, 1913: RW- 13

Order POECILOSTOMATOIDA

Family CORYCAEIDAE

147. *Corycaeus* (*Agetus*) *typicus* Kroyer, 1849: RW- 13
148. *Corycaeus* (*Corycaeus*) *crassiusculus* Dana, 1849: RW- 13, 27
149. *Corycaeus* (*Corycaeus*) *speciosus* Dana, 1849: RW- 13
150. *Corycaeus* (*Ditrichocorycaeus*) *affinis* McMurrich, 1916: RW- 13
151. *Corycaeus* (*Ditrichocorycaeus*) *andrewsi* Farran, 1911: RW- 13
152. *Corycaeus* (*Ditrichocorycaeus*) *asiaticus* F. Dahl, 1894: RW- 13
153. *Corycaeus* (*Ditrichocorycaeus*) *dubius* Farran, 1911: RW- 13
154. *Corycaeus* (*Ditrichocorycaeus*) *subtilis* M. Dahl, 1912: RW- 13
155. *Corycaeus* (*Ditrichocorycaeus*) *undula* Tanaka, 1957: RW- 13
156. *Corycaeus* (*Onychocorycaeus*) *agilis* Dana, 1849: RW- 13, 27
157. *Corycaeus* (*Onychocorycaeus*) *giesbrechti* F. Dahl, 1894: RW- 13
158. *Corycaeus* (*Onychocorycaeus*) *ovalis* Claus, 1863: RW- 13
159. *Corycaeus* (*Onychocorycaeus*) *pacificus* F. Dahl, 1894: RW- 13
160. *Corycaeus* (*Onychocorycaeus*) *pumilus* M. Dahl, 1912: RW- 13
161. *Corycaeus catus* Dahl F., 1894: RW- 27
162. *Corycaeus danae* Giesbrecht, 1891: RW- 27
163. *Farranula gibbulus* Giesbrecht, 1891: RW- 13

Family ONCAEIDAE

164. *Oncaea clevi* Fruchtl, 1923: RW- 13
165. *Oncaea concifera* Giesbrecht, 1891: RW- 13
166. *Oncaea media* Giesbrecht, 1891: RW- 13

167. *Oncaea mediterranea* Claus, 1863: RW- 13
168. *Oncaea venusta* Philippi, 1843: RW- 13, 27
Family SAPPHIRINIDAE
169. *Copilia mirabilis* Dana, 1849: RW- 13
170. *Copilia quadrata* Dana, 1849: RW- 13
171. *Sapphirina intestinata* Giesbrecht, 1891: RW- 13
172. *Sapphirina metallina* Dana, 1849: RW- 13
173. *Sapphirina nigromaculata* Claus, 1863: RW- 13
174. *Sapphirina opalina* Dana, 1849: RW- 13
175. *Sapphirina ovatolanceolata* Dana, 1849: RW- 13
176. *Sapphirina scarlata* Giesbrecht, 1891: RW- 13
177. *Sapphirina stellata* Giesbrecht, 1891: RW- 13

Order HARPACTICOIDA
Family TACHIDIUS
178. *Tachidius* (*Tachidius*) *discipes* Giesbrecht, 1881: RW- 27
Family HARPACTICIDAE
179. *Harpacticus* sp.: RW- 27
Family DIOSACCIDAE
180. *Cladorostrata brevipoda* Shen andTai, 1963: RW- 27
Family PELTIDIIDAE
181. *Clytemnestra scutellata* Dana, 1847: RW- 27
Family MIRACIINAE
182. *Macrosetella gracilis* Dana, 1846: RW- 27

Ostracods

Ostracods are commonly known as “seed shrimps”. They are microscopic and one of the most diverse organisms in Crustacean and exist in all aquatic ecosystems, viz. marine, brackish and freshwater including subterranean waters. Their most important feature is presence of a bivalve carapace that can completely enclose a laterally compressed and weakly segmented body. Globally, 2103 species of freshwater ostracods were documented (Martens and Savatenalinton, 2011). They play a vital role in food chain and energy flow in the aquatic ecosystem (Altmsach *et al.,* 2014). Ostracod taxonomy has been of great interest because of their possible use as indicators in climate and environmental change, due to their specific ecological preference and tolerance (Kulkoyluoglu, 2003). Their diversity, abundance and seasonal fluctuations have a direct link with water quality (Tiwari and Mishra, 1985; Padmanabha and Belagali, 2008).

Ostracods live in all aquatic environments like rivers, lakes, ponds, rice fields, small pools and puddles, ground waters, springs, and wet leaf litter. They are mainly colonized benthic and periphytic habitats and feed on both living and detrital particles including organic detritus, algae, plant material, dead animals and sometimes live animals such as young snails, worms and larvae of other crustaceans. More rarely, they can be predators or parasites (Rossettil *et al.,* 2006). Stagnant water especially, lakes, reservoirs, temporary water and small pools hold more diversity. Ostracods use their antennae, mandibles, maxillulae and in some groups, the fifth limbs to feed. They are bisexual, even through parthenogenesis is a very common way of reproduction. Growth is characterized by a number of molts. Podocopids have nine instars (Karanovic, 2012).

The taxonomic study on Indian Ostracods was first initiated by Baird (1859).Later Victor and Fernando (1979) listed about 56 freshwater ostracod species from India. Subsequently, Venkataraman and Krishnamoorthy (1998) reported 120 species of ostracods from freshwater and marine habitats, which include four families and 24 genera. The literature analysis reveals that there are several new species described in the past few decades from the Indian subcontinent by various workers like Baird (1859), Gurney (1907), Klie (1927), Arora (1931), Brehm (1950), Hartmann (1964), Deb (1972, 1973a,b,c, 1983), Victor and Michael (1975), Victor and Fernando (1979, 1981), Battish (1978, 1998, 2000), Harsheyand Victor (1983), Harshey and Shrivastava (1983), Gupta (1984, 1988 and 1991), Harshey and Srinivasan (1984), Harshey *et al*. (1987), Harshey and Patil (1988), Harshey (1996, 2008), George *et al.* (1993), Jayasree *et al*. (1994) Venkataraman and Krishnamoorthy (1998), Patil (2002), George and Martens (2002, 2003, 2004), Patil and Talmale (2005a,b, 2012), Karanovic and Reddy (2008) and Harshey and Thilak (2011). The current status of the species nomenclature and their validity was reviewed by Kauthapandi *et al.*(2014). The present communication provided a compiled valid list, diversity and distribution of Indian freshwater Ostracods (Table 21).

Table 21. Diversity of ostracods from Ramsar Wetlands of India.

Superclass CRUSTACEA
Class OSTRACODA
Order PODOCOPODA
Family CYPRIDIDAE
1. *Candocypria* sp.: RW- 13
2. *Cypris* sp.: RW- 3, 7, 13,19, 21, 26, 27, 39
3. *Cypris subglobulosa* Sowerby, 1840: RW- 2, 5, 26, 39, 41
4. *Cypricercus* sp.: RW- 39
5. *Cypretta* sp.: RW- 39
6. *Hemicypris anomala* Klie, 1838: RW- 2
7. *Ilyocypris biplicate* Koch, 1838: RW- 21
8. *Stenocypris derupta* Vavra, 1906: RW- 39
9. *Stenocypris hislopi* Ferguson, 1969: RW- 5, 39
10. *Stenocypris fulleborni* Daday: RW- 21
11. *Stenocypris major* Baird, 1859: RW- 2, 26, 39, 41
12. *Stenocypris sewelli* Klie, 1838: RW- 2
13. *Stenocypris* sp.: RW- 5, 13
14. *Strandesia indica* Hartmann, 1964: RW- 2
15. *Strandesia purpurescens* Brady, 1886: RW- 39
16. *Strandesia* sp.: RW- 26
17. *Eucypris hystrix* Furtos, 1933: RW- 7
Order ARGULOIDA
Family ARGULIDAE
18. *Argulus indicus* Linnaeus: RW- 39
Order MYODOCOPIDA
Family CYPRIDINIDAE
19. *Cypridina dentata* Muller, 1906: RW- 13
Family CYPRIDOPSIDAE
20. *Cypretta fontinalis* Hartmann, 1965: RW- 2
21. *Cypretta*sp.: RW- 39
22. *Cypridopsis dispar* Hartmann, 1964: RW- 2
23. *Cypridopsis newtoni* Brady and Robertson, 1870: RW- 21
24. *Onchocypris pustulosa* Gurney, 1926: RW- 2
25. *Pseudocypretta maculata* Klie, 1932: RW- 2
Family CYCLOCYPRIDIDAE
26. *Cyclocypris* sp.: RW- 7, 30
27. *Physocypria crenulata* Sars, 1961: RW- 21
28. *Physocypria megalops* Sars, 1903: RW- 21
Family CYPRIDAE
29. *Centrocypris* sp.: RW- 21, 39
30. *Cyprinotus gunningi* Methuen, 1910: RW- 21
31. *Cyprinotus makua* Tressler, 1937: RW- 21
32. *Cyprinotus megalops* Sars, 1903: RW- 21
33. *Cyprinotus ovatus* Sars, 1903: RW- 21
34. *Cyprinotus sulinus* Brady: RW- 21
35. *Heterocypris* sp.: RW- 21
Family EUCANDONIDAE
36. *Candonopis* sp.: RW- 39
Order MYODOCOPIDA
Family PHILOMEDIDAE
37. *Philomedes* sp.: RW- 27

Decapoda

The order Decapoda is a remarkably diverse group of the class Malacostracans both morphologically and ecologically and is a group of great economic and environmental importance (Dixon, 2003). The decapod crustaceans possess ten pairs of thoracic legs. The first one to 3 pairs of legs are modified in different groups to carryout some specialized functions and they are often considered as important taxonomic characters to differentiate allied taxa.The order Decapoda which comprises the familiar crustaceans like shrimps and crabs are an important group of the class Malacostraca. A global estimate accounts 655 species of caridean shrimps and 1,476 species of brachyuran crabs are available in freshwater. In India two families of the Caridean shrimps namely Atyidae and Palaemonidae are well represented by 118 species and 14 genera.The decapod crustaceans are available in most of the lentic and lotic freshwater ecosystems like rivers, lakes, ponds, streams etc. They are mostly nocturnal and during the day they hide themselves under the small boulders, crevices, under the soil, vegetation debris etc. They are part of the macrobenthos and live among the aquatic vegetation, leaf litter etc. Shrimps are exclusively aquatic whereas the crabs are adapted to a semi terrestrial mode of life.Freshwater decapods have many potential candidates which can be utilized in aquaculture, local wild fishing industries, aquarium trade, medicinal purpose etc. Holthuis (1912) identified many decapod custaceans which have commercial value.Recently Jayachandran (2006) and Jayachandran *et al.* (2005, 2006) have introduced the prawns and shrimps of ornamental value to the aquarium. Caridea: As for as the Caridean shrimps are concerned Fabricius (1798) described three new species of

Palaemon (=Macrobrachium) from Southern India. Much later Henderson and Matthai (1910) reported the distribution of 9 species ofPalaemon (=Macrobrachium) including three new species from Southern India. Kemp (1913, 1917, 1918, 1924 and 1925) made a significant contribution to the decapod crustaceans,

Indian decapod taxonomy and described many new species. Chopra and Tiwari (1947) reported the distribution of 3 species of Caridina including a new species and 3 species of Macrobrachium from then Patna State. Subsequently, Tiwari (1947) provided preliminary description of major characters of the two new species of Palaemon (=Macrobrachium) collected from Bengal. The contribution made by Tiwari (1949a, b, 1952, 1955a, b and 1963) is highly commendable which resulted in addition of many new species of freshwater shrimps from India and adjoining countries. Pillai (1964) reported four species of Atyid shrimps from Kerala and later a new species Caridina natarajani was described by Tiwari and Pillai (1968). While investigating the faunal resources of West Bengal (North & South 24 Parganas districts) Nandi *et al.* (1993, 1999) reported some Atyid and Palaemonid shrimps from West Bengal. Richard and Chandran (1994) studied the freshwater prawns of the family Atyidae from Chennai (Madras) and reported the occurrence of four species of Caridina. The faunal inventory of Meghalayan Palaemonid prawns by Ghosh and Ghattak, (1999) revealed the distribution of 9 species of *Macrobrachium.*A total of 347 decapods have been reported thus far from the Ramsar wetlands of India (Table 22).

Table 22. Diversity of decapods from Ramsar Wetlands of India.

Class CRUSTACEA
Order DECAPODA
Family PALAEMONIDAE

1. *Arachnochium mirabile* Kemp, 1917: RW- 27
2. *Exopalaemon styliferus* H. Milne Edwards, 1840: RW- 16, 27
3. *Leander styliferus* H. Milne Edwards, 1840: RW- 16
4. *Leandrites celebensis* De Man, 1881: RW- 13
5. *Leptocarpus fluminicola* Kemp, 1917: RW- 13, 26
6. *Leptocarpus kempi* Jayachandran, 1992: RW- 13
7. *Leptocarpus potamiscus* Kemp, 1917: RW- 13
8. *Macrobrachium assamensis assamensis* Tiwari, 1958: RW- 15
9. *Macrobrachium choprai* Tiwari, 1949: RW- 24
10. *Macrobrachium divakarani* Jayachandran, 2001: RW- 13
11. *Macrobrachium equidens* Dana, 1852: RW- 13, 27
12. *Macrobrachium hendersoni platyrostris* Tiwari, 1952: RW- 24
13. *Macrobrachium idae* Heller, 1862: RW- 13
14. *Macrobrachium idella idella* Hilgendorf, 1878: RW- 13
15. *Macrobrachium javanicum* Heller: RW- 27
16. *Macrobrachium lamarrei* H. M. Edwards, 1937: RW- 16, 26, 27
17. *Macrobrachium lamarrei lamarroides* Tiwari, 1952: RW- 15
18. *Macrobrachium malcomsonii* H. Milne Edwards, 1844: RW- 16, 26, 27, 28
19. *Macrobrachium mirabile* Kemp: RW- 27
20. *Macrobrachium rosenbergii* De man, 1879: RW- 11, 13, 24, 26, 27, 28
21. *Macrobrachium rude* Heller, 1862: RW- 16, 24, 26, 27
22. *Macrobrachium scabriculum* Heller, 1862: RW- 27
23. *Macrobrachium* sp.: RW- 3, 26
24. *Macrobrachium sulcatus* Henderson and Matthai, 1910: RW- 13
25. *Macrobrachium sundaicum* Heller, 1862: RW- 27
26. *Macrobrachium veliense* Jayachandra and Joseph, 1985: RW- 13
27. *Nematopalaemon tenuipes* Henderson, 1893: RW- 27
28. *Palaemon lamarrei* H. Milne Edwards, 1837: RW- 16, 27
29. *Palaemon malcolmsoni* H. Milne Edwards, 1844: RW- 16, 27
30. *Palaemon rudis* Heller, 1862: RW- 16, 24
31. *Palaemon scabriculus* Heller, 1862: RW- 16
32. *Palaemon serratus*: RW- 24
33. *Palaemon styliferus* H. Milne Edwards, 1840: RW- 26, 27
34. *Palaemon tenuipes* Henderson: RW- 27
35. *Palaemonetes hornelli* Kemp, 1925: RW- 13
36. *Periclimenes demani* Kemp, 1915: RW- 16
37. *Periclimenes grandis* Stimpson, 1860: RW- 13
38. *Urocaris indica* Kemp, 1915: RW- 16

Family PORCELLANIDAE

39. *Porcellanella picta* Stimpson, 1858: RW- 23

Family ALPHEIDAE

40. *Alpheus crassimanus* Heller, 1865: RW- 16, 27

41. *Alpheus edwardsii* Audouin, 1826: RW- 27
42. *Alpheus lobidens* De Haan, 1849: RW- 27
43. *Alpheus malabaricus* Fabricius, 1775: RW- 13, 16
44. *Alpheus paludicola* Kemp, 1915: RW- 16, 27
45. *Alpheus* sp.: RW- 13
46. *Alpheus strenuus* Dana, 1952: RW- 13, 24
47. *Athanas polymorphus* Kemp, 1915: RW- 16
48. *Ogyrides striaticauda* Kemp, 1915: RW- 16
49. *Synalphaeus acanthitelsonis* Bate, 1888: RW- 13

Family HIPPOLYTIDAE

50. *Exhippolysmata ensirostris ensirostris* Kemp, 1914: RW- 27
51. *Saron marmoratus* Olivier, 1811: RW- 27

Family CRANGONIDAE

52. *Pontocaris pennata* Bate, 1888: RW- 27

Family CALLIANASSIDAE

53. *Callianassa (Callichirus) maxima* A. Milne Edwards, 1870: RW- 16

Family MATUTIDAE

54. *Ashtoret lunaris* Forskal, 1775: RW- 27
55. *Matuta planipes* Fabricius, 1798: RW- 16, 27
56. *Matuta victor* Fabricius, 1781: RW- 16, 27

Family CORYSTIDAE

57. *Jonas indicus* Chopra, 1935: RW- 27

Family LEUCOSIIDAE

58. *Arcania crinacea* Fabricius, 1787: RW- 27
59. *Arcania septemspinosa* Fabricius, 1787: RW- 27
60. *Ebalia malefactrix* Kemp, 1915: RW- 13, 16
61. *Euclosiana rotundifrons* Chopra, 1933: RW- 27
62. *Ixa cylindrus* Fabricius, 1777: RW- 27
63. *Ixa inermis* Leach, 1817: RW- 27
64. *Leucosia craniolaris* Linnaeus, 1758: RW- 27
65. *Leucosia rhomboidolis* de Haan, 1841: RW- 26, 27
66. *Myra elegans* Bell, 1855: RW- 27
67. *Myra fugax* Fabricius, 1798: RW- 27
68. *Philyra alcocki* Kemp, 1915: RW- 16
69. *Philyra globulosa* Edw.: RW- 27
70. *Philyra globus* Fabricius, 1775: RW- 27

Family HYMENOSOMATIDAE

71. *Elamena (Trigonoplax) cimex* Kemp,1915: RW- 16
72. *Elamena* sp.: RW- 27
73. *Hymenicoides carteri* Kemp, 1917: RW- 26
74. *Rhychoplax nasalis* Kemp, 1917: RW- 26
75. *Rhynchoplax inachoides* Alcock, 1900: RW- 26, 27
76. *Rhynchoplax wood masoni* Alcock, 1900: RW- 26, 27
77. *Trigonoplax unguiformis* De Haan, 1839: RW- 27

Family PASIPHAEIDAE

78. *Leptochela aculeocaudata* Paul'son, 1875: RW- 16

Family POTAMONIDAE

79. *Barytelphusa (Barytelphusa) cunicularis* Westwood and Sykes, 1836: RW- 16, 28
80. *Barytelphusa (Maydelliathelphusa) luqubris* Wood-Mason, 1871: RW- 15
81. *Barytelphusa guerini* (H.Milne Edwards 1853): RW- 28
82. *Liotelphusa campestris* Alcock, 1909: RW- 26
83. *Potamon koollooense* Rathbun: RW- 5

Family ATYIDAE

84. *Caridina nilotica var. bengalensis* de Man, 1908: RW- 16
85. *Caridina propinqua* de Man, 1908: RW- 16

Family EPIALTIDAE: RW- 16

86. *Doclea armata* De Haan, 1839: RW- 27
87. *Doclea canalifera* Stimpson, 1857: RW- 27
88. *Doclea hybrida* Fabricius: RW- 16
89. *Doclea japonica* Ortman, 1893: RW- 27
90. *Doclea muricata* Fabricius, 1787: RW- 27
91. *Doclea ovis* Fabricius, 1787: RW- 27
92. *Doclea rissoni* Leach, 1815: RW- 27
93. *Doclea tetraptera* Walker, 1887: RW- 27

Family DIOGENIDAE

94. *Clibanarius clibanarius* Herbst, 1791: RW- 16, 27
95. *Clibanarius infraspinatus* Hilgendorf, 1869: RW- 27
96. *Clibanarius longitarsus* De Haan, 1849: RW- 16
97. *Clibanarius olivaceus* Henderson, 1915: RW- 16, 27
98. *Clibanarius padavensis* De Man, 1888: RW- 16, 26, 27
99. *Dardanus hessii* Miers, 1884: RW- 27
100. *Diogenes affinis* Henderson, 1893: RW- 16
101. *Diogenes avarus* Heller, 1865: RW- 16, 27
102. *Diogenes costatus* Henderson, 1893: RW- 27
103. *Diogenes custos* Fabricius, 1798: RW- 27
104. *Diogenes investigatoris* Alcock, 1905: RW- 16, 27
105. *Diogenes miles* Fabricius, 1787: RW- 27
106. *Diogenes planimanus* Henderson, 1893: RW- 27
107. *Hyastenus diacanthus* De Haan, 1839: RW- 27
108. *Phalangipus longipes* Linnaeus, 1758: RW- 27

Family PAGURIDAE

109. *Spiropagurus spiriger* De Haan, 1849: RW- 27

Family DROMIIDAE

110. *Conchoecetes artificiosus* Fabricius, 1798: RW- 27

Family RANINIDAE

111. *Notopus dorsipes* Linnaeus, 1758: RW- 27
112. *Raninoides personatus* Henderson, 1888: RW- 27

Family AETHRIDAE

113. *Drachiella morum* Alcock, 1896: RW- 27

Family CALAPPIDAE

114. *Calappa lophos* Herbst, 1782: RW- 27
115. *Calappa pustulosa* Alcock, 1896: RW- 27

Family COENOBITIDAE

116. *Coenobita cavipes* Stimpson, 1859: RW- 16, 27
117. *Coenobita rugosus* Milne Edwards, 1837: RW- 16

Family OCYPODIDAE

118. *Camptandrium sexdentatum* Stimpson, 1858: RW- 16
119. *Dotilla blanfordi* Alcock, 1900: RW- 26, 27
120. *Dotilla clepsydrodactylus* Alcock, 1900: RW- 16
121. *Dotilla inermis* de Man, 1888: RW- 13
122. *Dotilla intermedia* de Man, 1888: RW- 13, 16, 26
123. *Dotilla myctiroides* Edwards, 1852: RW- 16
124. *Dotilla pertinax* Kemp ,1915: RW- 16

125. *Dotilla* sp.: RW- 13
126. *Dotillopsis brevitarsis* de Man, 1888: RW- 26, 27
127. *Gelasimus annulipes* Milne Edwards, 1837: RW- 16
128. *Ilyoplax gangetica* Kemp, 1919: RW- 26, 27
129. *Ilyoplax stapletoni* de Man, 1908: RW- 26
130. *Leipocten sordidulum* Kemp, 1915 : RW- 16
131. *Macrophthalmus depressus* Rüppell, 1830: RW- 26
132. *Macrophthalmus erato* de Man, 1888: RW- 26
133. *Macrophthalmus gastrodes* Kemp, 1915: RW- 16
134. *Macrophthalmus pacificus* Dana, 1851: RW- 26
135. *Macrophthalmus pectinipes* Guérin-Méneville, 1838: RW- 26
136. *Macrophthalmus* sp.: RW- 13
137. *Macrophthalmus teschi* Kemp, 1919: RW- 26
138. *Macropthalmus brevis* Herbst, 1804: RW- 26
139. *Macropthalmus tomentosus* Eydoux and Souleyet, 1842: RW- 26
140. *Macropthalmus transversus* Latreille, 1817: RW- 26
141. *Ocypoda ceratophthalma* Pallas, 1772: RW- 16, 27
142. *Ocypoda macrocera* H. Milne Edwards, 1837: RW- 16, 27
143. *Ocypoda platytarsis* Edwards, 1852: RW- 16, 27
144. *Scopimera globosa* de Haan, 1835: RW- 26, 27
145. *Scopimera investigatoris* Alcock, 1900: RW- 26
146. *Scopimera proxima* Kemp, 1919: RW- 26
147. *Uca (Austruca) annulipes* Edwards, 1837: RW- 16, 27
148. *Uca (Celuca) lactea* de Haan, 1835: RW- 13, 26
149. *Uca (Celuca) triangularis* H. Milne Edwards, 1873: RW- 26
150. *Uca (Deltuca) dussumieri* H. Milne Edwards, 1852: RW- 26, 27
151. *Uca (Deltuca) rosea* Tweedie, 1937: RW- 27
152. *Uca (Thalassuca) vocans hesperiae* Crane: RW- 26, 27
153. *Uca acuta acuta* Stimpson, 1858: RW- 26, 27
154. *Uca* sp.: RW- 13
155. *Venitus dentipes* Lucas in Guérin-Méneville, 1836: RW- 26

Family THALASSINIDAE

156. *Thalassina anomala* Herbst, 1804: RW- 26, 27

Family PINNOTHERIDAE

157. *Nepinnotheres cardii* Bürger, 1895: RW- 26
158. *Pinnotheres mactricola* Alcock, 1900: RW- 26

Family PORTUNIDAE

159. *Charybdis (Charybdis) annulata* Fabricius, 1798: RW- 27
160. *Charybdis (Charybdis) callianassa* Herbst, 1803: RW- 26, 27
161. *Charybdis (Charybdis) cruciata* Herbst, 1794: RW- 26
162. *Charybdis (Charybdis) feriata* Linnaeus, 1758: RW- 27
163. *Charybdis (Charybdis) helleri* A. Milne-Edwards, 1867: RW- 27
164. *Charybdis (Charybdis) lucifera* Fabricius, 1798: RW- 13
165. *Charybdis (Charybdis) miles* De Haan, 1835: RW- 26, 27
166. *Charybdis (Charybdis) orientalis* Dana, 1852: RW- 27
167. *Charybdis (Charybdis) variegata* Fabricius, 1798: RW- 26, 27
168. *Charybdis (Goniohellenus) vadorum* Alcock, 1899: RW- 26, 27
169. *Charybdis (Goniosoma) affinis* Dana, 1852: RW- 26, 27
170. *Charybdis (Goniosoma) rostrata* A. Milne Edwards, 1861: RW- 26, 27
171. *Charybdis (Goniosoma) trancata* Fabricius, 1798: RW- 27
172. *Charybdis merguiensis* de Man, 1887: RW- 26, 27
173. *Charybdis ornate* A. Milne Edwards, 1861: RW- 27
174. *Lissocarcinus arkati* Kemp, 1923: RW- 26, 27
175. *Portunus gladiator* Fabricius, 1798: RW- 26, 27
176. *Portunus gracilimanus* Stimpson, 1858: RW- 27
177. *Portunus hastatoides* Fabricius, 1798 : RW- 26, 27
178. *Portunus pelagicus* Linnaeus, 1758: RW- 13, 16, 27
179. *Portunus pubescens* Dana, 1852: RW- 26, 27
180. *Portunus pulchricristatus* Gordon, 1931: RW- 27
181. *Portunus sanguinolentus* Herbst, 1783: RW- 26, 27
182. *Scylla serrata* Forskal, 1775: RW- 13, 16, 26, 27
183. *Scylla tranquebarica* Fabricius, 1798: RW- 13, 26, 27
184. *Thalamita crenata* Rüppell, 1830: RW- 16, 27

Family SQUILLIDAE

185. *Clorida latreillei* Eydoux and Souleyat, 1841: RW- 27
186. *Cloridopsis immaculata* Kemp, 1913: RW- 16, 27
187. *Cloridopsis scorpio* Latreille, 1828: RW- 16, 27
188. *Harpiosquilla annandalei* Kemp, 1911: RW- 27
189. *Harpiosquilla raphidea* Fabricius, 1798: RW- 27
190. *Oratosquilla holoschista* Kemp, 1911: RW- 27
191. *Oratosquilla inornata* Tate, 1883: RW- 27
192. *Oratosquilla interrupta* Kemp, 1911: RW- 16, 27
193. *Oratosquilla nepa* Latreille, 1825: RW- 27
194. *Oratosquilla woodmasoni* Kemp, 1911: RW- 27
195. *Squilla decorata* Wood-Mason, 1875: RW- 27
196. *Squilloides gilesi* Kemp, 1911: RW- 27

Family LYSIOSQUILLIDAE

197. *Lysiosquilla acanthocarpus* Claus, 1871: RW- 27
198. *Lysiosquilla maculata* Fabricius, 1793: RW- 27

Family BALANIDAE

199. *Balanus amphitrite amphitrite* Darwin, 1854: RW- 13
200. *Balanus amphitrite cirratus* Darwin: RW- 27
201. *Balanus amphitrite cochinensis* Nilsson-Cantell, 1938: RW- 13
202. *Balanus amphitrite communis* Darwin, 1854: RW- 13
203. *Balanus amphitrite* Darwin, 1854: RW- 13, 27

204. *Balanus amphitrite insignis* Nilsson-Cantell, 1938: RW- 13
205. *Balanus amphitrite variegatus* Darwin: RW- 27
206. *Balanus patellaris* Spengler: RW- 27
207. *Balanus tintinabulum tintinabulum* Linnaeus,1758: RW- 13, 27
208. *Megabalanus tintinnabulum* Linnaeus, 1758: RW- 27
Family LEPADIDAE
209. *Conchoderma virgatum* Spengler, 1789: RW- 27
210. *Lepas anserifera* Linnaeus, 1767: RW- 27
211. *Lepas* sp.: RW- 13
Family VARUNIDAE
212. *Metaplax crenulata* Gerstaecker, 1856: RW- 26, 27
213. *Metaplax dentipes* Heller, 1865: RW- 26, 27
214. *Metaplax distincta* H. Milne Edwards, 1852: RW- 27
215. *Metaplax elegans* de Man, 1892: RW- 27
216. *Metaplax indica* H. Milne Edwards, 1852: RW- 26, 27
217. *Metaplax intermedia* de Man, 1888: RW- 26, 27
218. *Varuna litterata* Fabricius, 1798: RW- 16, 26, 27
Family GRAPSIDAE
219. *Clistocoeloma merguiense* de Man, 1888: RW- 26, 27
220. *Grapsus albolineatus* Lamarck, 1818: RW- 13
221. *Metopograpsus messor* Forskal, 1775: RW- 13
222. *Neosarmatium smithi* H. Milne Edwards, 1853: RW- 27
223. *Pachygrapsus propinquus* de Man, 1908: RW- 16, 26, 27
224. *Parapyxiodognathus deianira*: RW- 27
225. *Plagusia depressa tuberculata* Lamarck, 1818: RW- 16
226. *Ptychognathus dentatus* de Man, 1892: RW- 26, 27
227. *Ptychognathus onyx* Alcock, 1900: RW- 16, 26, 27
228. *Pyxidognathus fluviatilis* Alcock, 1900: RW- 26, 27
Family PENAEIDAE
229. *Fenneropenaeus indicus* H. Milne Edwards, 1837: RW- 11, 13
230. *Metapenaeus affinis* H. Milne Edwards, 1837: RW- 13, 27
231. *Metapenaeus brevicornis* H. Milne Edwards, 1837: RW- 26, 27
232. *Metapenaeus dobsoni* Miers, 1878: RW- 11, 13, 16, 27
233. *Metapenaeus japonicas Spence* Bate, 1888: RW- 11
234. *Metapenaeus lysianasa* de Man, 1888: RW- 27
235. *Metapenaeus monoceras* Fabricius, 1798: RW- 11, 13, 16, 27
236. *Parapenaeopsis sculptilis* Heller, 1862: RW- 27
237. *Parapenaeopsis stylifera* H. Milne Edwards, 1837: RW- 11, 13, 27
238. *Parapenaeus longipes* Alcock: RW- 27
239. *Penaeopsis affinis* H. Milne Edwards, 1837: RW- 16
240. *Penaeopsis dobsoni* Miers, 1878: RW- 16
241. *Penaeopsis monoceros* Fabricius, 1798: RW- 16
242. *Penaeus canaliculatus* Oliver, 1811: RW- 11
243. *Penaeus carinatus* Dana, 1852: RW- 16
244. *Penaeus indicus* H. Milne-Edwards, 1837: RW- 11, 13, 16, 26, 27
245. *Penaeus japonicus* Bate, 1888: RW- 27
246. *Penaeus latisulcatus* Kishinouye, 1896: RW- 11
247. *Penaeus merguiensis* De Man, 1888: RW- 26, 27
248. *Penaeus monodon* Fabricius, 1798: RW- 11, 16, 27
249. *Penaeus penicillatus* Alcock, 1905: RW- 27
250. *Penaeus semisulcatus* De Haan, 1844: RW- 11, 13, 16, 26, 27
Family SERGESTIDAE
251. *Acetes erythraeus* Nobili, 1905: RW- 27
252. *Acetes indicus* H. Milne Edwards, 1830: RW- 13, 27
253. *Acetes japonicus* Kishinouye, 1905: RW- 13
254. *Acetes sibogae* Hansen, 1919: RW- 13
255. *Acetes sibogalis* Achuthankutty and George, 1973: RW- 13
256. *Lucifer hanseni* Nobili, 1905: RW- 16, 27
257. *Pontophilus hendersoni* Kemp, 1915: RW- 16
Family ATYIDAE
258. *Caridina gracilipes* De Man, 1892: RW- 26, 27
259. *Caridina gracilirostris* de Man, 1892: RW- 26
260. *Caridina nilotica* Roux, 1833: RW- 13
261. *Caridina propinqua* De Man, 1908: RW- 26
262. *Caridina pseudogracilirostris* Thomas, Pillai and Pillai, 1973: RW- 13
263. *Caridina weberi var. sumatrensis* De Man, 1892: RW- 13
Family LUCIFERIDAE
264. *Lucifer hanseni* Nobili, 1905: RW- 13
265. *Lucifer typhus* H. Milne Edwards, 1837: RW- 13
Family OGYRIDIDAE
266. *Ogyrides striaticauda* Kemp, 1915: RW- 13
Family PANULIRIDAE
267. *Panulirus homarus* Linnaeus, 1758: RW- 16, 27
268. *Panulirus polyphagus* Herbst, 1793: RW- 13, 16, 27
Family ERIPHIIDAE
269. *Eriphia smithi* MacLeay, 1838: RW- 13
Family GONEPLACIDAE
270. *Litochira* sp.: RW- 13
Family HYMENOSOMATIDAE
271. *Elamenopsis alcocki* Kemp, 1917: RW- 13
272. *Elamenopsis tuberculata* Chopra and Das, 1930: RW- 13
273. *Elamina* sp.: RW- 27
274. *Halicarcinus* sp.: RW- 13
275. *Hymenicoides carteri* Kemp, 1917: RW- 27
276. *Neorhynchoplax inachoides* Alcock, 1900: RW- 27
277. *Neorhynchoplax nasalis* Kemp, 1917: RW- 27
278. *Neorhynchoplax woodmasoni* Alcock, 1900: RW- 27
279. *Trigonoplax unguiformis* De Haan, 1839: RW- 27
Family PARTHENOPIDAE
280. *Cryptopodia angulata* Edwards and Lucas, 1841: RW-

27

281. *Enoplolambrus pransor* Herbst, 1796: RW- 27

Family GALENIDAE

282. *Galene bispinosa* Herbst, 1783: RW- 27

283. *Halimede fragifer* De Haan, 1835: RW- 27

284. *Halimede tyche* Herbst, 1801: RW- 27

285. *Parapanope euagora* De Man, 1895: RW- 27

Family PILUMNIDAE

286. *Benthopanope indica* De Man, 1887: RW- 13, 26

287. *Eurycarcinus bengalensis* Deb, 1999: RW- 27

288. *Eurycarcinus natalensis* Krauss, 1843: RW- 27

289. *Eurycarcinus orientalis* A. Milne-Edwards, 1867: RW- 27

290. *Heteropanope glabra* Stimpson, 1858: RW- 27

291. *Heteropanope neolaevis* Deb, 1998: RW- 27

292. *Heteropilumnus ciliatus* Stimpson, 1858: RW- 27

293. *Typhlocarcinus nudus* Stimpson, 1858: RW- 27

294. *Viaderiana* sp.: RW- 13

Family SESARMIDAE

295. *Clistocoeloma balansae* A. Milne Edwards, 1873: RW- 13

296. *Episesarma mederi* H. Milne Edwards, 1853: RW- 27

297. *Metapograpsus messor* Forskal, 1775: RW- 13, 16, 26, 27

298. *Metasesarma obesum* Dana, 1851: RW- 27

299. *Metasesarma rousseauxii* H. M. Edwards, 1853: RW- 26

300. *Metopograpsus latifrons* White, 1847: RW- 27

301. *Metopograpsus maculatus* H. M. Edwards, 1853: RW- 26, 27

302. *Muradium tetragonum* Fabricius, 1798: RW- 27

303. *Parasesarma plicatum* Latreille, 1803: RW- 13, 27

304. *Perisesarma bidens* De Haan, 1835: RW- 27

305. *Pseudosesarma edwardsi* de Man, 1887: RW- 13

306. *Seasarma quadrata* Fabricius, 1798: RW- 26

307. *Sesanna taeniolatum* White, 1847: RW- 26, 27

308. *Sesarma batavicum* Moreina, 1903: RW- 16

309. *Sesarma bidens* De Haan, 1835: RW- 26, 27

310. *Sesarma edwardsi* de Man, 1887: RW- 26, 27

311. *Sesarma intermedia* De Haan: RW- 26, 27

312. *Sesarma kraussi* de Man, 1887 : RW- 26, 27

313. *Sesarma longipes* Krauss, 1843: RW- 26, 27

314. *Sesarma plicatum* Latreille, 1803: RW- 16

315. *Sesarma raticulatum* Say: RW- 27

316. *Sesarma smithi* H. Milne Edwards, 1853: RW- 26

317. *Sesarma tetragona* H. Milne Edwards, 1837: RW- 16, 26, 27

318. *Sesarmoides longipes* Krauss, 1843: RW- 27

319. *Sesarmops impressum* H. Milne Edwards, 1837: RW- 27

Family UPOGEBIIDAE

320. *Upogebia (Upogebia) heterocheir* Kemp : RW- 16

Family XANTHIDAE

321. *Eurycarcinus bengalensis* Deb, 1999: RW- 27

322. *Eurycarcinus grandidieri* Milne-Edw.: RW- 27

323. *Eurycarcinus maculatus* A. Milne Edwards,1867: RW- 27

324. *Heteropanope indica* de Man, 1887: RW- 16

325. *Liagore erythematica* Guinot, 1971: RW- 27

326. *Orphnoxanthus microps* Alcock and Anderson, 1894: RW- 27

Family XENOPHTHALMIDAE

327. *Neoxenophthalmus garthii* Sankarankutty, 1969: RW- 13

Family PARATHELPHUSIDAE

328. *Spiralothelphusa hydrodroma* Herbst, 1794: RW- 13, 27

329. *Paratelphusa jacquemontii* Rathbun: RW- 27

Family GECARCINIDAE

330. *Cardiosoma carnifex* Herbst, 1796: RW- 16

Family GECARCINUCIDAE

331. *Sartoriana spinigera* Wood-Mason 1871: RW- 26, 27

Family SCALOPIDIIDAE

332. *Scalopidia spinosipes* Stimpson, 1858: RW- 27

Family IPHICULIDAE

333. *Iphiculus spingiosus* Adams and White, 1848: RW- 27

334. *Pariphiculus mariannae* Herklots, 1852: RW- 27

Family PLAGUSIIDAE

335. *Plagusia depressa* Fabricius, 1775: RW- 16

Family PORTUNIDAE

336. *Neptunus pelagicus* Linnaeus, 1758: RW- 16

337. *Portunus gladiator* Fabricius, 1758: RW- 27

338. *Thalamita crenata* Rüppell, 1830: RW- 16

Family ETHUSIDAE

339. *Ethusa indica* Alcock, 1894: RW- 27

Family MENIPPIDAE

340. *Menippe rumphii* Fabricius, 1798: RW- 27

341. *Myomenippe hardwickii* Gray, 1831: RW- 27

Family DORIPPIDAE

342. *Dorippe dorsipes* Linnaeus, 1758: RW- 27

343. *Dorippe facchino* Herbst, 1785: RW- 26, 27

344. *Dorippe quadridens* Fabricius, 1793: RW- 26

345. *Dorippoides facchino* Herbst, 1785: RW- 27

346. *Neodorippe callida* Fabricius, 1798: RW- 27

Family CAMBARIDAE

347. *Procambarus clarkii* Girard, 1852: RW- 33

INSECTA (HEXAPODA)

Insects are among the largest animal group that comprises over half of all metazoan species, considering that only about 20 % of the insects have been described thus far. The aquatic insects play an important role not only in the trophic dynamics of the ecosystem but are also indicator of the quality of water due to their ability to respond to any change in the environment. While most of the aquatic insect species constitute the food of many commercially important fishes, some others are predaceous, feeding upon spawn and frys or competing with them directly for natural food. According to Debnath *et al.* (2013) some insects are known to predate heavily upon the mosquito arvae and thereby limiting their population size.

As per Cheng (1976) about 3% of the total insects are aquatic, spending atleast a part of their life cycles in the water and these comprise about 25,000 to 30,000 species. A large number of species belonging to several orders have adapted to aquatic mode of life, completely or partially. It is estimated that over 60% of all insect species are parasites indicating the presence of at least 600,000 parasitic insect species in the modern faunal diversity. Since insects occupy almost every possible terrestrial habitat, they interact with humans in countless ways that accord them status as "pests." This same diversity bestows on insects essential roles in the functioning of the biosphere as a sustainable biological system. Considering the countless interactions between humans and insects, they have become important components of our art, language, literature, music, philosophy, and religion. In addition, insects are ideal models for the study of biological processes, including genetics, physiology, and molecular biology.

Ephemeroptera

Ephemeropterans, which are commonly known as mayflies, are among the oldest known winged insects still extant. They are characterized by a strict larval fidelity to freshwaters (standing or running) and by a very short adult stage devoted solely to reproduction. Mayflies are unique among extant insects by having an intermediate winged stage between the aquatic nymph and the reproductive imaginal stage, called the subimago. Major part of their life cycle is spent in various freshwater ecosystems in their egg and larval stages. Adults are extremely short lived - 'ephemeral', hence the ordinal name 'Ephemeroptera'. Ephemeroptera represents one of the Paleoptem insect orders, which have an independent line of evolution from earlier Pterygote insects. Their earliest fossil records are known from Devonian in Paleozoic. Carpenter (1933) recognized after restoration of fossil mayfly from Kansas shales - *Protereisma permianum*, the earliest well preserved mayfly from Permian. Mayflies, as a group of insects, seemingly reached their maximum relative abundance in the Pemian. Subramanian *et al*. (2018) reported about 146 species belonging to 58 genera and 13 families from India. The document reports 17 species of ephemeropterans present in Ramsar wetlands of India (Table 23).

Table 23. Diversity of Ephemeropterans from Ramsar Wetlands of India.

Phylum ARTHROPODA
Class INSECTA
Order EPHEMEROPTERA
Family BAETIDAE
1. *Baetis festivus* Kapur and Kripalani, 1963*:* RW- 14
2. *Baetis* sp.: RW 10, 13, 19, 31
3. *Baetis tigroides* Gillies, 1949: RW- 2
4. *Cloeon kimminsi* Hubbard, 1974: RW- 5
5. *Cloeon marginale* Hagen, 1859: RW- 2, 5
6. *Cloeon* sp.*:* RW 31
7. *Procloeon bimaculatum* Eaton, 1885: RW- 5
8. *Procloeon harveyi* Kimmins, 1947: RW- 2
Family CAENIDAE
9. *Caenis perpusilla* Walker, 1853: RW- 2
10. *Caenis picea* Kimmins, 1971: RW- 5
11. *Caenis* sp.: RW- 10, 32, 36
Family HEPTAGENIIDAE
12. *Ecdyonurus indicus* Hubbard, 1937: RW- 2
13. *Heptagenia* sp.*:* RW 31
14. *Rithrogenia* sp.*:* RW 31
Family EPHEMERIDAE
15. *Ephemera (E.) consors* Eaton, 1891: RW- 5
16. *Ephemera (E.) remensa* Eaton, 1891: RW- 5
17. *Ephemerella* sp.: RW- 31
For details of the wetland names, kindly refer Table 6, page xx.

Odonata

Odonates, which are commonly known as damselfly (Zygoptera) or dragonfly (Anisoptera), are amphibiotic insects. They are relatively well known to the average person because the adults are colorful, relatively large, and easily visible as they flit about all freshwater ecosystems and nearby lands in pursuit of insect prey, including pesky mosquitoes, blackflies, and deer flies. Major part of their life cycle is spent in freshwater ecosystem. This includes oviposition (exophytic and endophytic, amongst aquatic plants), prolarvae and larval stages upto ultimate stage. They complete their cycle in wetlands and its riparian landscape. Odonate nymphs are easy to distinguish from all other aquatic insects based on the labium, a prominent hinged mouthpart located below and at the anterior end of the head which is extended rapidly to grasp and sometimes impale prey. Adults are flying insects, but relatively of short life. All members of which undergo aquatic phase wholly or partially for completion of their life cycle. They are predators for a large number of aquatic and terrestrial invertebrates and also form prey to many species. They are sensitive to the changes in habitat quality and reliably indicate ecosystem health making them an important group of organisms in environmental monitoring. A total of 87 odonates have been reported thus far from the Ramsar wetlands of India (Table 24).

Table 24. Diversity of Odonata from Ramsar Wetlands of India.

Class INSECTA
Order ODONATA
Family PLATYCNEMIDIDAE

1. *Caconeura ramburi* Fraser, 1922*:* RW- 14
2. *Calicnemia eximia* Selys, 1863: RW- 5, 38
3. *Copera annulata* Selys, 1863: RW- 5
4. *Copera marginipes* Rambur, 1842: RW- 5, 32, 36
5. *Copera vittata* Selys, 1863: RW- 5
6. *Disparoneura quadrimaculata* Rambur, 1842*:* RW-14
7. *Onychargia atrocyana* (Selys)*:* RW- 26
8. *lschnura senegalenis* Rambur*:* RW- 39, 41

Family GOMPHIDAE

9. *Buragomphus sivalikensis* Laidlaw, 1922*:* RW- 38
10. *Ictinogomphus angulosus* Selys, 1854*:* RW- 14
11. *lctinogomphus rapax* (Rambur, 1842): RW- 5, 14, 26, 27, 32, 36, 39
12. *Nepogomphus modestus* Selys: RW- 5
13. *Paragomphus lineatus* Selys, 1850*:* RW- 14, 32, 36, 38
14. *Onychogomphusduaricus* Fraser, 1924*:* RW- 38

Family COENAGRIONIDAE

15. *Agriocnemis pygmaea* (Rambur, 1842): RW- 5, 14, 26, 27, 38, 41
16. *Agriocnemisclauseni* Fraser, 1922*:* RW- 38
17. *Amphiallagma parvum* Selys, 1776*:* RW- 14
18. *Cercion malayanum* (Selys, 1870)*:* RW- 27
19. *Cercion calamorum* Ris, 1916*:* RW- 38
20. *Ceriagrion cerinorubellum* (Brauer, 1865): RW- 5, 26, 27, 38
21. *Ceriagrion coromandelianum* (Fabricius, 1798): RW- 4, 26, 27, 32, 36, 38
22. *Ceriagrion fallax* Ris, 1914: RW- 5
23. *Coenagrion dyeri* Fraser: RW- 5
24. *Enallagmaparvum* Selys, 1876*:* RW- 38
25. *Ischnura aurora* (Brauer, 1865): RW- 14, 26, 27, 32, 36, 38
26. *Ischnura delicata* Hagen: RW- 5
27. *Ischnura forcipata* Morton, 1907: RW- 5, 38
28. *Ischnura nursei* Morton,1907*:* RW- 14
29. *Ischnura senegalensis* (Rambur, 1842): RW- 5, 14, 26, 27, 39
30. *Onychorgia atrocyana* (Selys, 1865)*:* RW- 27
31. *Paracercion calamorum* Ris, 1916*:* RW- 14
32. *Pseudagrion australasiae* Selys, 1876*:* RW- 27
33. *Pseudagrion decorum* (Rambur, 1842)*:* RW- 5,14, 27, 38
34. *Pseudagrion microcephalum* (Rambur, 1842)*:* RW-26, 32, 36
35. *Pseudagrion rubriceps rubriceps* Selys, 1876: RW- 5, 14, 26, 38
36. *Rhodiscurna nursei* Morton, 1907*:* RW- 38

Family AESHNIDAE

37. *Aeschna* sp.*:* RW- 15
38. *Anax guttatus* Burmeister, 1839: RW- 5, 26, 32, 36, 38
39. *Anax immaculifrons* Rambur, 1842*:* RW- 14, 32, 36
40. *Anaxparthenope parthenope* Selys, 1839*:* RW- 38

Family LIBELLULIDAE

41. *Acisoma panorpoides* Rambur, 1842: RW- 5, 14,15, 27, 32, 36, 38
42. *Anaciaeschna jaspidea* Burmeister, 1839*:* RW- 32, 36
43. *Brachydiplax chalybea* (Brauer, 1868)*:* RW- 26
44. *Brachydiplax sobrina* (Rambur, 1842)*:* RW- 14, 27, 38
45. *Brachythemis contaminata* (Fabricius, 1798)*:* RW- 4, 5, 26, 27, 32, 36, 38, 41
46. *Bradinopyga geminata* (Rambur, 1842): RW- 14, 26, 27, 32, 36, 41
47. *Crocothemis servilia* (Drury, 1770): RW- 4, 5, 14, 15, 26, 27, 38, 39, 41
48. *Diaplacodes trivialis* (Rambur, 1842)*:* RW- 14, 26, 27, 38, 39, 41
49. *Diplacodes lefebvrii* Rambur, 1842*:* RW- 14, 38
50. *Diplaeodes nebulosa* Fabricius, 1793: RW- 5, 14, 38
51. *Lathrecista asiatica asiatica* (Fabricius, 1798)*:* RW-26, 27, 32, 36
52. *Macrodiplax cora* (Brauer, 1867)*:* RW- 26, 27
53. *Neurothemis fulvia* (Drury, 1773): RW- 5, 27, 32, 36, 38
54. *Neurothemis intermedia* Rambur, 1842*:* RW- 32, 36
55. *Neurothemis tullia* (Drury, 1773): RW- 4, 5, 15, 26, 27, 32, 36, 38
56. *Orthetrum brunneum brunneum* Fonscolombe, 1837: RW- 5
57. *Orthetrum chrysostigma luzonicum* Brauer, 1868: RW- 5
58. *Orthetrum glaucum* Brauer, 1865: RW- 4, 5, 14, 32, 36
59. *Orthetrum japonicum internum* MacLachlan, 1894: RW- 4
60. *Orthetrum pruinosum* (Burmeister, 1839)*:* RW- 26
61. *Orthetrum pruinosum neglectum* Rambur, 1842: RW- 4, 5, 14, 15, 38, 41
62. *Orthetrum sabina* (Drury, 1770): RW- 4, 5, 14, 26, 27, 38, 41
63. *Orthetrum triangulare triangulare* Selys, 1878: RW- 5, 38

64. *Orthetrum luzonicm* Brauer, 1868*:* RW- 38
65. *Palpopleura sexmaculata sexmaculata* Fabricius, 1787: RW- 4, 38
66. *Pantala flavescens* (Fabricius, 1798): RW- 26, 27, 38, 39
67. *Rhodothemis rufa* Rambur, 1842*:* RW- 14, 26
68. *Rhyothemis variegata* (Linnaeus, 1763): RW- 4, 14, 15, 26, 38, 39
69. *Sympetrum striolatum* Charpentier, 1840*:* RW- 15
70. *Tholymis tillarga* (Fabricius, 1798): RW- 14, 27, 32, 36, 38, 41
71. *Tramea basilaris burmeisteri* Kirby,1889*:* RW- 14
72. *Tramea virginia* (Rambur, 1842): RW- 27, 38
73. *Trithemis aurora* Burmeister, 1839*:* RW- 4, 5, 14, 26, 38
74. *Trithemis festiva* Rambur, 1842: RW- 4, 5, 14, 26, 38
75. *Trithemis kirbyi kirbyi* Selys: RW- 4, 14
76. *Trithemis pallidinervis* (Kirby, 1889)*:* RW- 5, 14, 26, 27, 38
77. *Urothemis signata* (Rambur, 1842)*:* RW- 14, 26, 27, 38

Family SYNLESTIDAE

78. *Libellago lineata lineata* Burmeister, 1839: RW- 5
79. *Megalestes major* Selys, 1862: RW- 5
80. *Rhinocypha quadrimaculala quadrimaculata* Selys, 1853: RW- 5

Family EPALLAGIDAE

81. *Bayadera indica* Selys, 1853: RW- 5

Family CALOPTERYGIDAE

82. *Neurobasis chinensis chinensis* Linnaeus, 1758: RW- 4, 5, 38

Family CHLOROCYPHIDAE

83. *Rhinocypha quadrimaculata* Selys, 1853: RW- 4

Family LESTIDAE

84. *Lestes umbrinus* Selys, 1891*:* RW- 14
85. *Lestes viridulus* Rambur, 1842*:* RW- 14
86. *Lestes praemorsa praemorsa* Selys, 1862*:* RW- 38

Family MACROMIIDAE

87. *Macromia* sp.*:* RW- 31

Orthoptera

The Orthoptera include terrestrial insects commonly known as short-horned grasshoppers, katydids, bush crickets, crickets, and locusts. Orthopterans occur all over the world, except in the coldest areas. Most of them live on vegetation or are hidden under surface of ground and others burrow in the soil.They are medium-sized to large insects with hind legs often enlarged for jumping (saltation). The compound eyes are well developed, the antennae are elongate and multisegmented, and the prothorax is large with a shield-like pronotum curving downward laterally. The fore wings form narrow, leathery tegmina, and the hind wings are broad, with numerous longitudinal and cross-veins, folded beneath the tegmina by pleating; aptery and brachyptery are frequent. The abdomen has 8–9 annular visible segments, with the 2 or 3 terminal segments reduced, and 1-segmented cerci. The female has a well-developed ovipositor formed from highly modified abdominal appendages. Orthopterans belong to at least 30 families and more than 20,000 species known worldwide. From the Ramsar wetlands of India a total of 206 species of Orthopterans have been documented (Table 25).

Table 25. Diversity of Orthopterans from Ramsar Wetlands of India.

Class INSECTA
Order ORTHOPTERA
Family GRYLLIDAE

1. *Acheta domesticus* Linnaeus*:* RW- 15, 21, 26
2. *Brachytrypes portentsus* Lichtenstein, A.A.H., 1796*:* RW- 15
3. *Dianemobius fascipes* Walker, 1869*:* RW- 14,16, 26, 27
4. *Euscyrtus (Osus) concinnus* Haan, 1842*:* RW- 16, 26
5. *Euscyrtus (Osus) hemelytrus* (Haan, 1842)*:* RW- 26
6. *Gryllodes sigillatus* Walker, 1869: RW- 3, 5, 16, 26
7. *Gryllus bimaculatus* De Geer, 1773: RW- 3, 4, 5, 26, 27
8. *Gryllus compestris:* RW- 15
9. *Gymnogryllus minor* Chopard: RW- 21
10. *Loxoblemmus detectus* Serville: RW- 4, 5
11. *Loxoblemmus equestris* Saussure, 1839: RW- 5, 26
12. *Loxoblemmus macrocephalus* Chopard: RW- 5
13. *Loxoblemmus taicoun* Saussure: RW- 5
14. *Modicogryllus (Modicogryllus) consobrinus* Saussure, 1877*:* RW- 16
15. *Modicogryllus blennus* Saussure: RW- 5
16. *Modicogryllus confirmatus* (Walker, 1859): RW- 4, 14, 16, 21, 26, 27
17. *Modicogryllus facialis* Walker, 1871: RW- 5, 16
18. *Nemobius strigipennis* (Chopard, 1928)*:* RW- 26
19. *Nemobius sylvestris:* RW- 15
20. *Oecanthus rufescence* Serville, 1839*:* RW- 26

21. *Phonarellus minor* (Chopard, 1959)*:* RW- 14, 27
22. *Plebeiogryllus guttiventris* Walker, 1871: RW- 3, 4, 5, 21, 26
23. *Polionemobius taprobanensis* (Walker, 1869)*:* RW- 26, 27
24. *Pteronemobius (Pteronemobius) heydenii concolor* (Walker, 1871)*:* RW- 16, 26, 27
25. *Pteronemobius (Pteronemobius) montanus* Chopard, 1933*:* RW- 27
26. *Pteronemobius csikii* Bolivar: RW- 5
27. *Pteronemobius fascipes* Walker: RW- 4, 5
28. *Pteronemobius pantelchopardorum* Shishodia & Varshney: RW- 5
29. *Pteronemobius taprobanensis* Walker, 1869: RW- 5, 16
30. *Teleogryllus (Macroteleogryllus) mitratus* Burmeister, 1838*:* RW- 14
31. *Teleogryllus occipitalis* (Serville, 1838): RW- 4, 5, 15, 16, 27
32. *Teleogryllus testaceus* Chopard: RW- 4
33. *Turanoqryllus rufoniger* Chopard: RW- 5
34. *Velarifictorus dehradunensis* Tandon & Shishodia: RW- 5
35. *Velariflctorus (Velariflctorus)aspersus* (Walker, 1869)*:* RW- 26
36. *Xenogryllus marmoratus marmoratus* Haan, 1844*:* RW- 16

Family GRYLLOTALPIDAE

37. *Derectaotus leucopygus* Chopard, 1924b*:* RW- 16
38. *Gryllotalpa africana* Beauvois, 1805: RW- 3, 4, 15, 16, 21, 26, 27
39. *Gryllotalpa brachyptera:* RW- 29
40. *Gryllotalpa fossor scudder:* RW- 15
41. *Gryllotalpa gryllotalpa:* RW- 15
42. *Micrornebius annandalei* Chopard, 1924b*:* RW- 16

Family GRYLLACRIDIDAE

43. *Haplogryllacris hieroglyphicoides* Chopard, 1924: RW- 16
44. *Niphetogryllacris barkudensis* Chopard, 1924*:* RW- 16

Family ACRIDIDAE

45. *Acrida cinerea:* RW- 32, 36
46. *Acrida exaltata* (Walker, 1859)*:* RW- 4, 5, 14, 15, 16, 20, 26, 27, 32, 36, 40
47. *Acridium melanocorne:* RW- 15
48. *Acrotylus humbertianus* Saussure,1884*:* RW- 4, 16, 21
49. *Acrotylus insubricus inficitus* Walker, 1870*:* RW- 16
50. *Acorypha glaucopsis* Walker*:* RW- 40
51. *Aiolopus simulatrix simulatrix* Walker, 1870*:* RW- 16
52. *Aiolopus* sp.*:* RW- 20
53. *Aiolopus thalassinus tamulus* (Fabricius, 1798)*:* RW- 4, 16, 20, 21, 26, 27, 40
54. *Anacridium flavescens* Fabricius, 1793*:* RW- 16
55. *Aulacobothrus luteipes luteipes* Walker, 1871*:* RW- 14, 26
56. *Catantops pinguis innotabilis* Walker*:* RW- 16, 20
57. *Ceracris nigriconis* Walker, 1870*:* RW- 14, 20
58. *Ceracrisstriata* Uvarov**:** RW- 5
59. *Chondracris rosea* De geer*:* RW- 15
60. *Choroedocus capensis* (Thunberg, 1815)*:* RW- 26
61. *Choroedocus illustris* Walker, 1870*:* RW- 5, 16, 20
62. *Choroedocus robustus* (Serville, 1839)*:* RW- 26, 40
63. *Chorthippus parallelus* Zetterstedt, 1821*:* RW- 15
64. *Cyrtacanthacris tatarica tatarica* Linnaeus, 1758*:* RW- 16, 26, 32, 36
65. *Diabolocatantops innotabilis* Walker, 1870*:* RW- 5, 14,16, 26, 40
66. *Dittopternis venusta* Walker, 1870*:* RW- 16, 26
67. *Dnopherula (Aulacobothrus) socius* I. Bolivar: RW- 4
68. *Dnopherula (Aulacobothrus)* sp.: RW- 4
69. *Epistaurus sinetyi* Bolivar, 1902*:* RW- 26
70. *Eucoptacra saturata* Walker: RW- 4, 5, 26
71. *Eupreponotus inflatus* Uvarov, 1921*:* RW- 26
72. *Eyprepocnemis alacris alacris* (Serville, 1839)*:* RW- 20, 26, 27, 40
73. *Eyprepocnemis rosea* Uvarov: RW- 5
74. *Gastrimargus africanus africanus* Saussure, 1888*:* RW- 4, 16, 20, 26
75. *Gastrimargus marmoratus* Thumb*:* RW- 20
76. *Gelastorrhinus* sp.*:* RW- 20
77. *Gesonula punctifrons* (Stal, 1861)*:* RW- 15, 26, 27
78. *Gonista sagitta* Uvarov*:* RW- 20
79. *Heteracris pulchra* Bolivar, 1902*:* RW- 16, 26, 40
80. *Heteropternis respondens* Walker: RW- 4, 26
81. *Hieroglyphus banian* Fabricius, 1798*:* RW- 16, 26
82. *Hieroglyphus concolar* Walker*:* RW- 20
83. *Hieroglyphus nigrorepletus* Bolivar: RW- 3, 40
84. *Holopercna* sp.: RW- 5
85. *Leva indica* (Bolivar, 1902)*:* RW- 21, 26, 27
86. *Locusta migratoria migratoria* (Linnaeus, 1758)*:* RW- 26
87. *Locusta migratoria migratoriodes* R. & F.*:* RW- 21
88. *Mesopsis cylindricus* Kirby: RW- 20
89. *Morphacris citrina* Kirby, 1910*:* RW- 16
90. *Morphacris fasciata sulcata* Thunberg*:* RW- 16
91. *Morphacris fasciata* Thunberg, 1815*:* RW- 16, 26
92. *Oedaleus abruptus* (Thunberg, 1815)*:* RW- 4, 5, 16, 20, 26, 27, 40
93. *Oedaleus senegalensis* (Krauss, 1877)*:* RW- 26
94. *Oxya chinensis* Thunberg, 1815*:* RW- 16
95. *Oxya fuscovittata* (Marschall, 1836)*:* RW- 4, 20, 26, 27, 40
96. *Oxya hyla hyla* Serville, 1831*:* RW- 4, 20, 26, 27
97. *Oxya nitidula* (Walker, 1870)*:* RW- 16, 26, 27
98. *Oxya velox* (Fabricius, 1787) *:* RW- 16, 26, 27
99. *Oxyrrhepes obtusa* (Haan, 1842)*:* RW- 26
100. *Pachyacris vinosa* Walker: RW- 4, 26
101. *Pachyacris violascens* Walker, 1870*:* RW- 16
102. *Paraconophyma scabra* Walker: RW- 5, 26, 40
103. *Patanga succincta* (Johansson, 1763)*:* RW- 26
104. *Phlaeoba infumata* Brunner von Wattenwyl, 1893*:* RW- 4, 15, 20, 26, 27, 40
105. *Phlaeoba panteli* Bolivar: RW- 5, 26
106. *Pternoscirta bimaculata* Thunberg, 1815*:* RW- 16
107. *Pusana laevis* Uvarov: RW- 4

108. *Schistocerca gregaria* (Forskal, 1775)*:* RW- 26
109. *Schistocerca* sp.*:* RW- 32, 36
110. *Spathosternum prasiniferum prasiniferum* Walker, 1871*:* RW- 4, 5, 14,15, 16, 20, 26, 27, 40
111. *Sphingonotus lonqipennis* Saussure: RW- 4, 5
112. *Trilophidia annulata* (Thunberg, 1815)*:* RW- 4, 14, 15, 16, 26, 27, 20, 40
113. *Trilophidia turpis* Walker, 1870*:* RW- 16
114. *Tristria pulvinata* Uvarov, 1921*:* RW- 16, 26
115. *Tropidopola longicornis* (Fieber, 1853)*:* RW- 26
116. *Truxalia* sp.*:* RW- 21
117. *Truxalis nasuta* Linnaeus, 1758*:* RW- 16
118. *Tylotropidius varicornis* Walker, 1870*:* RW- 16, 26
119. *Xenocatantops humills* Serville, 1839: RW- 5, 26
120. *Xenocatantops karnyi* Kirby, 1910*:* RW- 5, 16, 40

Family TRIGONIDIIDAE

121. *Amusurgus fulvus* Chopard, 1969*:* RW- 26, 27
122. *Amusurgus oedemeroides* (Walker, 1871)*:* RW- 26, 27
123. *Anaxipha longipennis* (Serville, 1839): RW- 5, 27
124. *Homoeoxipha lycoides* (Walker, 1869)*:* RW- 26, 27
125. *Natula longipennis* Serville, 1838*:* RW- 16, 26
126. *Trigonidium (Trigonidium) humbertianum* Saussure, 1878: RW- 16
127. *Trigonidium cicindeloides* Rambur: RW- 4, 5

Family PHANEROPTERIDAE

128. *Elimaea securigera* Brunner: RW- 5
129. *Himertula kinnaeri* Uvarov: RW- 5
130. *Letana despecta* Brunner: RW- 5

Family CONOCEPHALIDAE

131. *Conocephalus maculatus* Le Guillou: RW- 5

Family MECOPODIDAE

132. *Mecopoda elongata* Linnaeus: RW- 5

Family PSEUDOPHYLLIDAE

133. *Acanthoprion suspectum* (Brunner von Wattenwyl, 1895)*:* RW- 26
134. *Meroncidius ochraceus* (Stoll, 1813)*:* RW- 26
135. *Onomarchus leuconotus* (Serville, 1839)*:* RW- 26
136. *Onomarchus* sp.: RW- 5

Family LISTROSCELIDINAE

137. *Phisis pectinata* (Guérin, 1832)*:* RW- 26

Family MECONEMATINAE

138. *Xiphidiopsis (Xiphidiopsis) straminula* (Walker, 1871)*:* RW- 26

Family PYRGOMORPHIDAE

139. *Atractomorpha burri* Bolivar*:* RW- 15
140. *Atractomorpha crenulata* Fabricius, 1793: RW- 4, 5,14,15, 16, 20, 26, 27, 40
141. *Atractomorpha psittacina* De Hann*:* RW- 15, 26
142. *Aularches miliaris* Linnaeus, 1758: RW- 4, 5, 16
143. *Chrotogonus (Chrotogonus) brachypterus* Bolivar, 1902: RW- 16
144. *Chrotogonus (Chrotogonus) oxypterus* Blanchard, 1836: RW- 16
145. *Chrotogonus (Chrotogonus) tr. trachypterus* (Blanchard, 1836): RW- 4, 5, 14,16, 20, 26, 27, 40
146. *Poekilocerus pictus* Fabricius, 1775: RW- 4, 16
147. *Pyrgomorpha bispinosa deserti* Bei-Bienko*:* RW- 21
148. *Pyrgomorpha* sp.: RW- 4
149. *Tagasta indica* Bolivar, 1905*:* RW- 15, 26

Family TETRIGIDAE

150. *Coptotettix artolobus* Hancock*:* RW- 15
151. *Coptotettix fossulatus* Bolivar,1887*:* RW- 16
152. *Coptotettix hancockus* Shishodia & Varshney, 1987*:* RW- 26
153. *Coptotettix testaceus* Bolivar, 1887*:* RW- 16
154. *Criotettix bispinosus* (Dalman, 1818)*:* RW- 26
155. *Criotettix inornatus* Walker, 1871: RW- 16, 26
156. *Ergatettix dorsiferus* Walker: RW- 4, 5, 14, 26
157. *Ergatettix guentheri* Steinmann: RW- 5
158. *Ergatettix interruptus* (Brunner von Wattenwyl, 1893): RW- 26
159. *Eucriotettix grandis* Hancock: RW- 5
160. *Eucriotettix rufescens* (Kirby, 1914): RW- 26
161. *Euparatettix histricus* (Stal, 1861): RW- 16, 27
162. *Euparatettix indicus* Bolivar, 1887: RW- 16, 26
163. *Euparatettix personatus* (Bolívar, 1887): RW- 26
164. *Euparatettix scabripes* Bolivar, 1898: RW- 16
165. *Euparatettix tenuis* Hancock: RW- 5, 21
166. *Euparatettix tricarinatus* Bolivar, 1887: RW- 16, 26
167. *Hedotettix attenuatus* Hancock: RW- 4, 5
168. *Hedotettix costatus* Hancock, 1912: RW- 26
169. *Hedotettix gracilis* (de Haan, 1842): RW- 4, 5, 14,16, 21, 26, 27
170. *Hedotettix grossus* Hancock, 1915: RW- 27
171. *Indoscelimena angulata* (Hancock, 1915): RW- 26
172. *Indoscelimena flavopicta* (Bolivar, 1909): RW- 26
173. *Indoscelimena saussurei* (Hancock, 1915): RW- 26
174. *Loxilobus striatus* Hancock, 1915: RW- 26
175. *Mazarredia (Mazarredia) cristulata* Bolivar, 1902: RW- 16
176. *Paratettix cingalensis* Walker,1871: RW- 16
177. *Paratettix histricus* (Stål, 1861): RW- 26
178. *Paratettix scaber* Thunberg, 1815: RW- 16
179. *Paratettix variabilis* Bolivar, 1887: RW- 16, 26
180. *Teredorus frontalis* Hancock: RW- 5
181. *Thoradonta bengalensis* Shishodia, 1991: RW- 26
182. *Thoradonta nodulosa* (Stål, 1860): RW- 26
183. *Thoradonta spiculoba* Hancock, 1912: RW- 26

Family TRIDACTYLIDAE

184. *Asiotridactylus fasciatus* Guerin, 1844: RW- 16
185. *Tridactylus thoracicus* Guerin, 1844: RW- 5, 16
186. *Xya riparia* Saussure, 1877: RW- 16
187. *Xya* sp.: RW- 5

Family PHALANGOPSIDAE

188. *Homoegryllus cincticornis* Walker: RW- 4
189. *Cacoplistes (Laminogryllus)rogenhoferi* Saussure, 1877: RW- 26

Family TETTIGONIIDAE

190. *Alloteratura delicatula* Chopard, 1924: RW- 16
191. *Concocephalus (Anisoptera) longipennis* (Hann, 1842): RW- 27

192. *Ducetia japonica* Thunberg: RW- 4
193. *Elimaea securigera Brunner von* Wattenwyl, 1878: RW- 27
194. *Euconocephalus incertus* Walker, 1869: RW- 14, 16, 21, 26
195. *Euconocephalus pallidus* (Redtenbacher, 1891): RW- 26, 27
196. *Holochlora albida* Brunner von Wattenwyl, 1878: RW- 14
197. *Holochlora indica* Kirby, 1906: RW- 16, 27
198. *Isopsera pedunculata* Brunner von Wattenwyl, 1878: RW- 16
199. *Letana inflata* Brunner von Wattenwyl, 1878: RW- 16
200. *Letana megastridula* Ingrisch: RW- 16
201. *Letana pyrifera* Bey Bienko, 1956: RW- 27
202. *Mecopoda elangota* Linnaeus, 1758: RW- 4, 16
203. *Sathrophyllia femorata* (Fabricius, 1787): RW- 26
204. *Sathrophyllia rugosa* (Linnaeus, 1758): RW- 27
205. *Tettigonia viridissima* Linnaeus, 1758: RW- 15
206. *Trigonocorypha unicolor* (Stoll, 1787): RW- 16, 26, 27

Dermaptera

Dermaptera, commonly known as earwigs, constitute a small, relatively old, hemimetabolous order of insects characterized in their external anatomy by paired cerci (forceps) at the posterior end, and (in winged forms) short tegmina incompletely covering hind wings. They havean unstable family classification and with about 1900 species known worldwide. The earwigs are thigmotactic, nocturnal, and subsocial, in a system whereby the female parent broods, grooms, and defends eggs and young nymphs. They are spread all over the world, but attain their maximum development in terms of numbers in tropical and subtropical parts of the world. They inhabiting dead and decaying matter, bamboo scales, leafaxils, flowers, under loose bark of trees and occasionally in bird nests. Economically these insects are not of much importance, except that a few species act as pollinators when they inhabit flowers, or feed on pollen grains, and destroy tender parts of plants. Cherian and Basheer (1940) reported the species *Euborellia stali* (Dobm) that causes damage to groundnut by boring through the pods and completing life cycle inside it. The document reports the presence of 17 species of dermapterans from Ramsar wetlands of India (Table 27).

Table 27. Diversity of Dermaptera from Ramsar Wetlands of India.

Class INSECTA

Order DERMAPTERA

Family ANISOLABIDIDAE

1. *Euborellia annulipes* Lucas, 1847: RW- 3, 5
2. *Euborellia stali* (Dohrn, 1864)*:* RW- 27

Family LABIDURIDAE

3. *Forcipula indica* Brindle, 1966: RW- 3
4. *Forcipula quadrispinosa* Dohrn, 1863: RW- 3, 5, 16, 21, 27
5. *Forcipula trispinosa* Dohrn, 1863: RW- 3, 5,
6. *Labidura riparia* Pallas, 1773: RW- 3, 5, 16, 21, 27
7. *Nala lividipes* Dufour, 1828: RW- 3, 5, 21, 27
8. *Nala nepalensis* Burr, 1907: RW- 5

Family SPONGIPHORIDAE

9. *Labia minor* Linnaeus, 1758*:* RW- 15
10. *Paralabella curvicauda* (Motschulsky, 1863)*:* RW- 27

Family FORFICULIDAE

11. *Forficula auricularia:* RW- 15

Family CHELISOCHIDAE

12. *Proreus ahdominalis* Ramamurthi: RW- 5, 27
13. *Proreus simulans abdominalis* Ramamurthi*:* RW- 27

Family PYGIDICRANIDAE

14. *Cranopygia picta* Guerin-Mineville: RW- 27
15. *Diplatys flavobrunneus* Chopard: RW- 16
16. *Paradiplatys gladiator* Burr: RW- 27

Family CARCINOPHORIDAE

17. *Euborellia stali* Dohrn: RW- 27

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6. *Labidura riparia* Pallas, 1773: RW- 3, 5, 16, 21, 27
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Mantodea

Mantids are sometimes called praying mantids or soothsayers (Greek, manti = soothsayer) because their forelegs are held in a supplicatory position resembling prayer. Mantids are hemimetabolous predators, with males generally smaller than females. The group is cosmopolitan in distribution but predominantly tropical or subtropical. The mantid body size is typically moderate to large. The head rotates, and live specimens can give a turn to the head that seems quizzical. The pronotum is elongate, narrow, and maneuverable on the mesothorax. The forelegs are raptorial, with the forefemur and tibia extended forward to capture prey. The prey is held between the femur and tibia with opposable spines on the venter of the femur and tibia when the forelegs are retracted toward the head. Their body is elongated, especially the prothorax and the forelegs are long and spinous for capturing prey. The abdomen is 11-segmented, and the cerci consist of many segments. Eggs are protected within an ootheca. They prefer warm moist climate of tropical and sub-tropical zones of the world. Mantids are considered beneficial for their role as predators of insect pests of field crops. Mantodea contains about 2300 species worldwide in 8–14 families. A total of 16 species of the order mantodea have been documented thus far from the Ramsar wetland of India (Table 28).

Table 28. Diversity of Mantodea from Ramsar Wetlands of India.

Class INSECTA

Order MANTODEA

Family HYMENOPODIDAE

1. *Creobroter laevicollis* Saussure: RW- 5
2. *Ephestiasula intermedia* Werner: RW- 5

Family MANTIDAE

3. *Cheddikulama straminea* Henry, 1932*:* RW- 14
4. *Hierodula (Hierodula) bipapilla* Servilla: RW- 21
5. *Hierodula tenuidentata* Saussure, 1869*:* RW- 14
6. *Hierodula westwoodi* : RW- 15
7. *Humbertiella indica* Saussure: RW- 5, 21
8. *Mantis indica* Mukherjee: RW- 5
9. *Mantis nobilis* Brunner: RW- 5
10. *Mantis religiosa:* RW- 15, 29
11. *Nanomantis lactea* Mukherjee: RW- 5
12. *Rhombodera tectiformmis* Saussure, 1970*:* RW- 14
13. *Sphodromantis viridis check family*Forsskål, 1775*:* RW- 32, 36
14. *Statiella nemoralis* Saussure: RW- 5

Family LITURGUSIDAE

15. *Humbertiella indica* Saussure, 1869*:* RW- 14

Family EMPUSIDAE

16. *Empusa guttula* (Thunberg, 1815)*:* RW- 14

Isoptera

Isoptera (commonly called as *termites*) is a small order of insects containing about 3,000 described species. The order name orginates from the fact that the adults has wings of equal size (*Isos* in Greek meaning the same and *ptera* menaing the wings). They are sometimes called as 'white ants' and can be easily confused with true ants (Hymenoptera). However, both can be easily identified, i.e., termites have straight antennae and a broad waist between the thorax and the abdomen, whereas ants have elbowed antennae and a narrow waist. Interestingly, termites are not closely related to ants but to the cockroaches and mantises. Termites are widely distributed in tropical and sub-tropical regions, spreading from humid forests to savannas and even arid areas. Termites are also one of the most prosperous animals on earth in regards to their evolutionary history and species abundance. The basis of this extraordinary prosperity of termites lies in their feeding habits, i.e., they consume cellulose, which is the most abundant organic matter on the earth. The ecological basis of their prosperity is their symbiosis with microorganisms and their highly developed social organization. The symbiosis between higher organisms and microorganisms often creates capabilities for exploiting new food resources such as dead plant material containing large amounts of cellulose, which is a potential energy source but difficult for most animals including human beings to utilize. They consume and transform a large amount of nitrogen-poor dead plant material into nitrogen-rich termite body, which is in turn consumed by a great variety of animals ranging from ants and spiders to chimpanzees and human beings. Thus they form the basis for a large food web in the ecosystems.By their ability to digest wood, they have become economic pests (agriculture and wooden building) of major importance in some regions of the world. From Ramsar wetlands of India, 15 species of Isopterans have been documented thus far (Table 29).

Table 29. Diversity of Isopterans from Ramsar Wetlands of India.

Class INSECTA

Order ISOPTERA

Family RHINOTERMITIDAE

1. *Coptotermes ceylonicus* Holmgren, 1911*:* RW- 26
2. *Coptotermes heimi* Wasmann: RW- 16, 27
3. *Coptotermes kishori* Roonwal and Chhotani, 1962*:* RW- 26
4. *Heterotermes indicola* Wasmann*:* RW- 26, 27

Family TERMITIDAE

5. *Angulitermes ramanii* G. Bose and B. C. Das: RW- 16
6. *Megaselia scalaris* (Loew, 1866)*:* RW- 26, 27
7. *Microcerotermes beesoni* Snyder: RW- 27
8. *Microcerotermes cameroni* Snyder: RW- 27
9. *Microtermes obesi* Holmgren, 1912*:* RW- 26
10. *Microtermes unicolor* Snyder, 1933*:* RW- 26
11. *Odontotermes assmuthi* Holmgren, 1913*:* RW- 26
12. *Odontotermes feae* (Wasmann, 1896)*:* RW- 26
13. *Termes (Odontotermes) obesus* Rambur*:* RW- 16

Family KALOTERMITIDAE

14. *Cryptotermes dudleyi* Banks: RW- 27
15. *Cryptotermes havilandi* Sjostedt: RW- 27

Hemiptera

Hemiptera one of the diverse group among hemimetabolous insects that are of great economic importance. Hemiptera comprises cicadas, leaf-hoppers, bugs, scale insects etc. It is divided into i) Heteroptera, which includes lace bugs, bed bugs, stink arid shield bugs, assassin bugs, and many families of water bugs and ii) Homoptera, which includes cicadas, mealy bugs, Aphids, Psyllids, Aleyrodids, Cicadellids, Membracids etc. Most of the species entail direct or indirect injury to various plants. Some are very destructive e.g. leaf hoppers (Cicadellids), the white flies (Aleyrodidae), the plant lice (Aphids) and scale insects (Coccids). According to Thirumalai (2002) about 80 genera and 275 species accommodated in 16 major families of aquatic and semi aquatic Hemiptera are known from India. From the Ramsar wetlands in India a total of 211 species of hemiterans have been reported (Table 30).

Table 30. Diversity of Hemipterans from Ramsar Wetlands of India.

Phylum ARTHROPODA
Class INSECTA
Order HEMIPTERA
Family NEPIDAE

1. *Cercometus asiaticus* Amyot and Serville, 1843: RW- 15
2. *Laccotrephes branchialis* Gerstaecker, 1873*:* RW- 15
3. *Laccotrephes griseus* Guerin-Meneville, 1844: RW- 2, 5, 13, 14,15, 26, 27, 39
4. *Laccotrephes maculates* Fabricius, 1775: RW- 10, 15, 26
5. *Laccotrephes ruber* Linnaeus, 1764: RW- 2, 15
6. *Laccotrephus elongatus* Montandon, 1907*:* RW- 14, 39
7. *Nepa cinerea* Linnaeus, 1758*:* RW- 15
8. *Nepa rubra* Linnaeus, 1758*:* RW- 15
9. *Ranatra digitata* Hafiz and Pradhan, 1947*:* RW- 14, 26, 27
10. *Ranatra elongata* Fabricius, 1790: RW- 2, 10, 13, 14,15, 26
11. *Ranatra filiformis* Fabricius, 1790: RW- 2, 3, 13, 26, 39
12. *Ranatra gracilis* Dallas, 1849: RW- 2, 15
13. *Ranatra lineraris* Linnaeus, 1758*:* RW- 15
14. *Ranatra longipes* Stal, 1861: RW- 2
15. *Ranatra sordidula* Dohrn, 1860: RW- 15
16. *Ranatra* sp.*:* RW- 29, 31
17. *Ranatra varipes* Stal, 1861: RW- 2, 15, 26, 27, 39

Family BELOSTOMATIDAE

18. *Belostama indicum* Lepeletier and Serville, 1825*:* RW- 15
19. *Diplonychus annulatum* Fabricius, 1803: RW- 3, 26, 27, 39
20. *Diplonychus molestus* Dufour, 1863: RW- 5, 15, 26, 27
21. *Diplonychus rusticus* Fabricius, 1781: RW- 3, 13, 14,15, 26, 27
22. *Diplonychus* sp.: RW- 13
23. *Diplonychus sphaerodema rusticum* Fabricius, 1781*:* RW- 15
24. *Lethocerus indicus* Lepeletier and Serville, 1825: RW- 2, 3, 13,14, 15, 27, 39
25. *Lethocerus* sp.*:* RW- 31

Family NOTONECTIDAE

26. *Anisops batilliforms* Lundblad, 1933: RW- 15
27. *Anisops bouvieri* Kirkaldy, 1904*:* RW- 14, 26
28. *Anisops breddini* Kirkaldy, 1904*:* RW- 26
29. *Anisops campbelli* Brooks, 1951: RW- 3
30. *Anisops cavifrons* Brooks, 1951: RW- 3
31. *Anisops kuroiwae* Matsumura, 1915*:* RW- 26
32. *Anisops sardeus* Herrich-Shaffer, 1850: RW- 2, 15, 26, 27
33. *Anisops* sp.: RW- 13
34. *Anisops tahitiensis* Lundblad, 1934*:* RW- 26
35. *Enithares ciliata* Fabricius, 1798: RW- 15, 26
36. *Enithares indica* Fabricius, 1798: RW- 10
37. *Enithares mandalayensis* Distant, 1910: RW- 15
38. *Notonecta glauca* Linnaeus, 1758*:* RW- 15
39. *Notonecta* sp.*:* RW- 31
40. *Nychia marshalli* Scott, 1872: RW- 2
41. *Nychia sappho* Kirkaldy, 1901*:* RW- 26
42. *Paranisops* sp. Hale, 1924: RW- 15

Family GERRIDAE

43. *Aquarius adelaidis* Dohrn, 1860: RW- 2, 3, 26, 27, 39
44. *Aquarius* sp.: RW- 15
45. *Asclepios annandalei* Distant, 1915*:* RW- 27
46. *Chimarrhometra orientalis* Distant, 1879: RW- 5
47. *Gerris gibbifer* Schummel, 1832*:* RW- 15

48. *Gerris najas* De Geer, 1773*:* RW- 15
49. *Gerris* sp.: RW- 15, 31, 32, 36
50. *Gerris spinolae* Lethierry and Severin, 1896: RW- 10, 39
51. *Halobates flaviventris* Eschscholtz, 1822*:* RW- 27
52. *Limlometra anadyomene* (Kirkaldy, 1901)*:* RW- 27
53. *Limlometra nitidus* (Mayr, 1865)*:* RW- 27, 39
54. *Limnogonus fossarum* Fabricius, 1775: RW- 3, 5, 15, 26
55. *Limnogonus nitidus* Mayr, 1865: RW- 2, 5, 13, 15, 26, 39
56. *Neogerris parvula* Stal, 1859: RW- 5, 26, 27, 39
57. *Ptilomera (Ptilomera) assamensis* Hungerford and Matsuda, 1965: RW- 5
58. *Ptilomera (Ptilomera) laticaudata* Hardwicke, 1823: RW- 5
59. *Rhagadotarsus (Rhagadotarsus) kraepelini* Breddin, 1905*:* RW- 26
60. *Zanna affinis:* RW- 32, 36

Family HYDROMETRIDAE

61. *Hydrometra butleri* Hungerford and Evans, 1934*:* RW- 27
62. *Hydrometra greeni* Kirkaldy, 1898: RW- 2, 5, 13, 15, 26, 39
63. *Hydrometra okinawana* Drake, 1951*:* RW- 26

Family PENTATOMIDAE

64. *Acrosternum gramineum* (Fabricius) 1787*:* RW- 26, 27
65. *Antestiopsis cruciata* Fabricius, 1775*:* RW- 14
66. *Bagrada hilaris* Burmeister, 1835*:* RW- 14
67. *Degonetus serratus* Distant, 1904*:* RW- 14
68. *Dolycoris indicus* Stal, 1876*:* RW- 27
69. *Dorpius indicus* Distant, 1900*:* RW- 14
70. *Eocanthecona furcellata* Wolff, 1851*:* RW- 14
71. *Erthesina fullo* Thunberg, 1783*:* RW- 14
72. *Eysarcoris distanti* Rider, 1998*:* RW- 27
73. *Eysarcoris guttiger*(Thunberg, 1783)*:* RW- 26
74. *Eysarcoris montivagus* (Distant, 1974)*:* RW- 14, 26, 27
75. *Eysarcoris ventralis* (Westwood, 1837)*:* RW- 26, 27
76. *Halyomorpha picus* Fabricius, 1784*:* RW- 14
77. *Halys dentatus* (Fabricius, 1803)*:* RW- 14, 27
78. *Nezara viridula* (Linnaeus, 1758)*:* RW- 14, 27
79. *Niphe subferruginea* Westwood, 1837*:* RW- 14
80. *Piezodorus rubrofasciatus* Fabricius, 1904*:* RW- 14
81. *Placosternum dama* Fabricius, 1794*:* RW- 14
82. *Placosternum taurus* Fabricius, 1781*:* RW- 14
83. *Plautia crossota* (Fabricius, 1787)*:* RW- 14, 27
84. *Storthecoris nigriceps* Horvath, 1883*:* RW- 27
85. *Zangis dorsalis* Dohrn, 1860*:* RW- 27

Family VELIIDAE

86. *Microvelia (Dilutovelia)leveillei leveillei* (Lethierry, 1877)*:* RW- 26
87. *Microvelia (Picaultia) douglasi* Scott, 1874*:* RW- 26, 39
88. *Microvelia annandalei* Distant, 1909: RW- 2, 27

Family STENOCEPHALIDAE

89. *Dicranocephala lateralis* (Signoret, 1879)*:* RW- 27

Family MESOVELLIDAE

90. *Mesovelia douglas* Scott, 1874: RW- 15
91. *Mesovelia easaci* Jehamalarand Chandra, 2017*:* RW- 26
92. *Mesovelia* sp.: RW- 15
93. *Mesovelia vittigera* Horvath, 1895: RW- 2, 13, 15, 26, 27, 39

Family CORIXIDAE

94. *Agraptocorixa (Agraptocorixa) hyalinipennis* Fabricius, 1803: RW- 15
95. *Corixa (Tropocorixa) choprai* Hutchinson, 1940: RW- 5
96. *Corixa (Tropocorixa) distorta* Distant, 1910*:* RW- 15
97. *Cymatia apparens* Distant, 1910: RW- 15, 26
98. *Limnometra fluviorum* (Fabricius, 1798)*:* RW- 14
99. *Micronecta (Basilonecta) scutellaris scutellaris* Stal, 1858: RW- 3, 14, 15, 26
100. *Micronecta (Dichaetonecta) haliploides* Horvath, 1904*:* RW- 15, 26
101. *Micronecta (Sigmonecta) quadristrigata* Breddin, 1905: RW- 3, 13, 26
102. *Micronecta haploides* Horvath, 1904: RW- 15
103. *Micronecta* sp.*:* RW- 31, 39
104. *Renatra varipes* stal, 1861*:* RW- 15
105. *Sigara distorta* Distant, 1910: RW- 15

Family PACHYGRONTHIDAE

106. *Horridipamera nietneri* (Dohrn, 1860)*:* RW- 27
107. *Pachygrontha bipunctata* Stal*:* RW- 27
108. *Pachygrontha lewisi* Distant, 1901*:* RW- 27
109. *Pamerana cuneata* Distant*:* RW- 27
110. *Paromius gracilis* (Rambur, 1839)*:* RW- 27

Family PLEIDAE

111. *Paraplea frontalis* (Fieber, 1844)*:* RW- 26
112. *Paraplea* sp.: RW- 15
113. *Plea* sp.*:* RW- 39

Family HEBRIDAE

114. *Hebrus* sp.: RW- 15
115. *Merragata pallescens* Distant*:* RW- 39

Family RHOPALIDAE

116. *Leptocornis augur* (Fabricius, 1781)*:* RW- 27

Family DINIDORIDAE

117. *Coridius brunneus* (Thunberg, 1783)*:* RW- 27
118. *Coridius ianus* Fabricius, 1775*:* RW- 14, 26

Family NAUCORIDAE

119. *Gastroiella insgnis* Distant, 1910: RW- 15
120. *Heleocoris vicinus* Montandon, 1910: RW- 5
121. *Heliocoris strabus* Montandon, 1897: RW- 15

Family COREIDAE

122. *Cletomorpha hastata* (Fabricius, 1787)*:* RW- 26
123. *Cletus bipunctatus* (Westwood, 1842)*:* RW- 26

124. *Cletus borealis* (Blotte.,1934)*:* RW- 26
125. *Cletus punctiger* (Dallas, 1852)*:* RW- 26
126. *Cletus punctulatus* (Westwood, 1842)*:* RW- 26
127. *Cletus pygophorus* Gupta and Singh, 2013*:* RW- 26
128. *Cletus trigonus* (Thumberg, 1783)*:* RW- 26
129. *Elasmomia granulipes* (Westwood, 1842)*:* RW- 14
130. *Leptocoris abdominalis* (Fabricius, 1803)*:* RW- 14
131. *Notobitus meleagris* (Fabricius, 1787)*:* RW- 14
132. *Plinachtus acicularis* (Fabricius, 1803)*:* RW- 27

Family DELPHACIDAE

133. *Nilaparvata lugens* (Stal, 1854)*:* RW- 27

Family OCHTERIDAE

134. *Ochterus marginatus* Latreille, 1804: RW- 15

Family REDUVIIDAE

135. *Acanthaspis fulvipes* (Dallas, 1850)*:* RW- 14
136. *Acanthaspis micrographa* Walker,1873*:* RW- 27
137. *Acanthaspis siva* Distant, 1902*:* RW- 14
138. *Androclus pictus* (Herrich-Schaeffer, 1848)*:* RW- 14
139. *Cosmoslestes annulipes* Distant, 1879*:* RW- 27
140. *Ectrychotes dispar* Reuter, 1881*:* RW- 14
141. *Lestomerus affinis* (Serville, 1831)*:* RW- 27
142. *Oncocephalus impudicus* Reuter, 1883*:* RW- 27
143. *Pasira perpusilla* (Walker, 1873)*:* RW- 27
144. *Pirates flavipes* (Walker, 1873)*:* RW- 27
145. *Polididus armatissimus* Stal, 1859*:* RW- 14
146. *Rhynocoris fuscipes* (Fabricius, 1787)*:* RW- 14
147. *Rhynocornis costalis* (Fabricius, 1866)*:* RW- 27
148. *Scadra annulipes* Reuter 1881*:* RW- 14
149. *Scipinia horrida* (Stål, 1859)*:* RW- 26
150. *Sirthenea flavipes* (Stal, 1955)*:* RW- 14
151. *Tribelocephala indica* (Walker, 1873)*:* RW- 14
152. *Vilius melanopterus* Stal, 1863*:* RW- 27

Family CICADELLIDAE

153. *Amritodus atkinsoni* (Lethierry, 1889)*:* RW- 26
154. *Cofana spectra* (Distant, 1908)*:* RW- 26
155. *Cofana unimaculata* (Distant, 1908)*:* RW- 27
156. *Exitianus indicus* Distant, 1908*:* RW- 16, 26
157. *Exitianus nanus* (Distant, 1975)*:* RW- 26
158. *Hecalus porrectus* (Walker, 1858)*:* RW- 26
159. *Idiocerus maculatus* Distant, 1912*:* RW- 16
160. *Idioscopus nitidulus* (Walker, 1870)*:* RW- 26
161. *Krisna strigicollis* (Spinola, 1852)*:* RW- 26
162. *Nephotettix nigropictus* (Stål, 1870)*:* RW- 26
163. *Nephotettix virescens* (Distant, 1908)*:* RW- 27
164. *Penthimia compacta* Walker, 1851*:* RW- 26
165. *Recilia dorsalis* Motschulsky, 1859*:* RW- 27

Family CICADIDAE

166. *Platypleura machadoi* Boulard, 1972*:* RW- 15
167. *Platypleura octoguttata* (Fabricius, 1798)*:* RW- 27

Family ALYDIDAE

168. *Leptocorisa acuta* (Fabricius, 1783)*:* RW- 27
169. *Leptocorisa oratorius* (Fabricius, 1794)*:* RW- 26, 27
170. *Leptocorisa varicornis* (Fabricius, 1803)*:* RW- 14, 26
171. *Riptortus fuscus* (Fabricius, 1798)*:* RW- 14
172. *Riptortus pedestris* (Fabricius, 1775)*:* RW- 27

Family APHROPHORIDAE

173. *Clovia conifer* (Walker, 1851)*:* RW- 26, 27
174. *Clovia puncta* (Walker, 1851)*:* RW- 26
175. *Ptyelus declaratus* Melich, 1903*:* RW- 26
176. *Ptyelus inconspicuus* Dist. 1908*:* RW- 26
177. *Ptyelus nebulosus* (Fabricius, 1794)*:* RW- 27

Family LYGAEIDAE

178. *Graptostethus argentatus* (Fabricius, 1803)*:* RW- 26
179. *Graptostethus quadrisignatus* Distant,1879*:* RW- 26
180. *Graptostethus servus* (Fabricius, 1787)*:* RW- 26
181. *Metochus uniguttattus* (Thunberg, 1822)*:* RW- 14
182. *Nysius ceylanicus* (Motschulsky, 1863)*:* RW- 26
183. *Oncopeltus nigriceps* (Dallas, 1852)*:* RW- 27
184. *Spilostethus hospes* (Fabricius, 1794)*:* RW- 14, 26, 27
185. *Spilostethus pandurus militaris* (Fabricius, 1763)*:* RW- 14, 26

Family MEMBRACIDAE

186. *Gargara mixta* (Buckton, 1903)*:* RW- 26, 27
187. *Gargara robusta* Distant, 1907*:* RW- 26
188. *Leptocentrus taurus* Fabricius, 1775*:* RW- 26, 27
189. *Otinotus oneratus* (Walker, 1858)*:* RW- 27
190. *Tricenrus cornutus* Anathasubrananian, 1980*:* RW- 27

Family RHYPAROCHROMIDAE

191. *Dieuches coloratus* (Distant, 1909)*:* RW- 27
192. *Dieuchus insignis* (Distant, 1904)*:* RW- 26
193. *Melanotelus bipunctata* (Dallas, 1852)*:* RW- 27
194. *Metochus uniguttatus* (Thunberg, 1822)*:* RW- 27
195. *Paraeucosmetus pallicornis* (Dallas, 1852)*:* RW- 26
196. *Paromius exiguous* (Distant, 1904)*:* RW- 26
197. *Pseudopachybrachius guttus* Malipatil, 1978*:* RW- 26

Family SCUTELLERIDAE

198. *Cantao ocellatus* (Thunbrg, 1784)*:* RW- 27
199. *Chrysocoris purpureus* (Westwood, 1781)*:* RW- 27
200. *Chrysocoris* sp.*:* RW- 15
201. *Chrysocoris stollii* (Wolf, 1901)*:* RW- 14, 26, 27
202. *Fitha ardens* Walker, 1867*:* RW- 26, 27

Family CERCOPIDAE

203. *Callitettix versicolor* (Fabricius, 1794)*:* RW- 14

Family LARGIDAE

204. *Antilochus coqueberti* (Fabricius, 1803)*:* RW- 14
205. *Physopelta gutta* (Burmeister, 1834)*:* RW- 14
206. *Physopelta quadriguttata* Bergr., 1894*:* RW- 14

Family PHYRRHOCORIDAE

207. *Dysdercus koenigii* (Fabricius, 1775)*:* RW- 14

Family CYDNIDAE

208. *Aethus indicus* Westwood, 1837*:* RW- 14
209. *Byrsinus varians* Fabricius, 1803*:* RW- 14

Family FLATIDAE

210. *Melicharia sinhalana* Kirkaldy,1900*:* RW- 26

Family GEOCORIDAE

211. *Geocoris ochropterus* Fieber, 1844*:* RW- 26

Hymenoptera

Hymenoptera of clinical relevance include winged insects such as bees, wasps, hornets, and yellowjackets, as well as wingless insects such as imported fire ants. They exhibit facultative arrhenotoky, in which males are produced parthenogenetically, enabling these insects to control the sex of their offspring. Males are haploid and develop from unfertilized eggs, whereas the diploid females develop from fertilized eggs. Colonies of most social hymenopterans consist of sterile female workers with a single queen. The Hymenoptera constitute one of the largest and oldest orders of holometabolous insects. More than 120,000 species have been described, but the actual number of species is considerably higher. The present document reports the presence of 256 hymenopterans known to occur in Ramsar wetlands of India (Table 31). These insects become pest and damage the plants, when they aggregate in large numbers, as in the case of Carpenter bee, Red ant and Sawfly. They are small to large sized (0.2mm to 50.0mm in length) insects with two pairs of veined or almost vein wings or may be wingless, as in some worker ants. They are soft to hard bodied insects, with mobile head, long-jointed antennae; antennae may be short, clubbed and elbowed as in Chalcids. They possess, a constriction between thorax and abdomen. They are be solitary or colonial and feeds on leaves, flowers, pollen, nectar etc.

Table 31. Diversity of Hymenopterans from Ramsar Wetlands of India.

Class INSECTA
Order HYMENOPTERA
Family FORMICIDAE

1. *Anoplolepis gracilipes* (Smith, F., 1857)*:* RW- 26
2. *Aphaenogaster feae* Emery, 1889*:* RW- 26
3. *Bothroponera rufipes* Jerdon: RW- 5
4. *Bothroponera sulcata* (Mayr, 1867)*:* RW- 26
5. *Brachyponera jerdonii* (Forel, 1900)*:* RW- 26
6. *Brachyponera nigrita* (Emery, 1895)*:* RW- 26
7. *Camponotus (Tanaemyrmex) compressus* Fabricius, 1787: RW- 3, 5, 26, 27
8. *Camponotus dolendus* Forel, 1892*:* RW- 26
9. *Camponotus parius* Emery, 1889*:* RW- 26
10. *Camponotus sericeus* (Fabricius, 1798)*:* RW- 26
11. *Camponotus* sp.*:* RW- 15
12. *Cardiocondyla kagutsuchi* Terayama, 1999*:* RW- 26
13. *Cardiocondyla wroughtonii* (Forel, 1890)*:* RW- 26
14. *Carebara affinis* (Jerdon, 1851)*:* RW- 26
15. *Crematogaster aberrans* Forel, 1892*:* RW- 26
16. *Crematogaster buddhae* Forel, 1902*:* RW- 26
17. *Crematogaster hodgsoni* Forel, 1902*:* RW- 26
18. *Crematogaster rogenhoferi* Mayr, 1879*:* RW- 26
19. *Crematogaster subnuda* Mayr, 1879*:* RW- 26
20. *Diacamma rugosum* (Le Guillou, 1842)*:* RW- 26
21. *Dolichoderus thoracicus* (Smith, F., 1860)*:* RW- 26
22. *Hypoponera shattucki* Bharti, Akbar, Wachkoo & Singh, 2015*:* RW- 26
23. *Lepisiota frauenfeldi* (Mayr, 1855)*:* RW- 26
24. *Lepisiota opaca* (Forel, 1892)*:* RW- 26
25. *Meranoplus bicolor* (Guérin-Méneville, 1844)*:* RW- 26
26. *Meranoplus rothneyi* Forel, 1902*:* RW- 26
27. *Monomorium (Xeromyrmex) salomonics indicum* Forel : RW- 3
28. *Monomorium dichroum* Forel, 1902*:* RW- 26
29. *Monomorium floricola* (Jerdon, 1851)*:* RW- 26
30. *Monomorium indicum* Fabricius*:* RW- 27
31. *Monomorium monomorium* Bolton, 1987*:* RW- 26
32. *Monomorium orientale* Mayr, 1879*:* RW- 26
33. *Monomorium pharaonis* (Linnaeus, 1758)*:* RW- 26
34. *Nylanderia bourbonica* (Forel, 1886)*:* RW- 26
35. *Nylanderia indica* (Forel, 1894)*:* RW- 26
36. *Oecophylla smaragdina* Fabricius, 1775*:* RW- 15, 26, 32, 36
37. *Paratrechina longicornis* (Latreille, 1802)*:* RW- 26
38. *Pheidole indica* Mayr, 1879*:* RW- 26
39. *Pheidole megacephala* (Fabricius, 1793)*:* RW- 26
40. *Pheidole multidens* Forel, 1902*:* RW- 26
41. *Pheidole pronotalis* Forel, 1902*:* RW- 26
42. *Pheidole watsoni* Forel, 1902*:* RW- 26
43. *Plagiolepis jerdonii* Forel, 1894*:* RW- 26
44. *Polyrhachis dives* Smith, F., 1857*:* RW- 26
45. *Polyrhachis illaudata* Walker, 1859*:* RW- 26
46. *Polyrhachis lacteipennis* Smith, 1858*:* RW- 26
47. *Pseudoneoponera rufipes* (Jerdon, 1851)*:* RW- 26
48. *Sima rufonigra* Jerdon*:* RW- 27
49. *Solenopsis geminata* Fabricius, 1804*:* RW- 26, 27
50. *Tapinoma indicum*Forel, 1895*:* RW- 26

51. *Tetramorium guineense* (Bernard, 1953)*:* RW- 26
52. *Tetramorium obesum* André, 1887*:* RW- 26
53. *Tetraponera nigra* (Jerdon, 1851)*:* RW- 26
54. *Tetraponera rufonigra* (Jerdon, 1851)*:* RW- 26
55. *Trichomyrmex destructor* (Jerdon, 1851)*:* RW- 26

Family APIDAE

56. *Amegilla mucorea* (Klug, 1845)*:* RW- 27
57. *Apis (Micropis) florea* Fabricius*:* RW- 27
58. *Apis (Megapis) dorsata* Fabricius: RW- 5, 27, 29
59. *Apis indica* Fabricius, 1798: RW- 5, 15, 27, 32, 36
60. *Apis mellifera:* RW- 15
61. *Bombus tunicatus* Smith: RW- 5
62. *Braunsapis chandrai* Gupta & Sharma, 2016*:* RW-27
63. *Braunsapis puangensis* (Cockerell, 1929)*:* RW- 27
64. *Ceratina binghami* Cockerell, 1908*:* RW- 27
65. *Ceratina hieroglyphica* Smith, 1854*:* RW- 27
66. *Ceratina viridissima* Guer.: RW- 16
67. *Coelioxys capitatus* Smith: RW- 16
68. *Coelioxys fuscipennis* Smith: RW- 16
69. *MegachiIe lanata* Fabricius: RW- 5
70. *Megachile bicolor* Fabricius: RW- 5
71. *Megachile coelioxsides* Bing: RW- 5
72. *Megachile disjuncta* Fabricius: RW- 5
73. *Nomia oxybeloides* Smith: RW- 16
74. *Nomia westwoodi* Grib.: RW- 16
75. *Steganomus nodicornis* Smith: RW- 16
76. *Thyreus surniculus* Lieftinck, 1959*:* RW- 27
77. *Xylocopa aestuans* Linnaeus: RW- 16, 27
78. *Xylocopa bentoni* Cockerell, 1919*:* RW- 27
79. *Xylocopa fenestrata* Fabricius: RW- 16, 27
80. *Xylocopa nr. fenestrate* Fabricius: RW- 16
81. *Xylocopa rufescens* Smith: RW- 16
82. *Xylocopa* sp.: RW- 15
83. *Xylocopa tenuiscapa* Westw: RW- 16

Family VESPIDAE

84. *Allorhynchium argentatum* (Fabricius, 1804)*:* RW- 27
85. *Allorhynchium metallicum* (de Saussure, 1852)*:* RW-27
86. *Antepipona biguttata* (Fabricius, 1787)*:* RW- 26
87. *Antepiponaovalis* (de Saussure, 1853)*:* RW- 26
88. *Anterhynchium (Anterhynchium) abdominale abdominale* (Illiger, 1802)*:* RW- 27
89. *Antodynerus flavescens flavescens* (Fabricius, 1775)*:* RW- 26, 27
90. *Apodynerus troglodytes troglodytes* (Saussure, 1856)*:* RW- 27
91. *Delta conoideum* (Gmelin, 1790)*:* RW- 27
92. *Delta esuriens* (Fabricius, 1787)*:* RW- 27
93. *Delta pyriforme pyriforme* (Fabricius, 1775)*:* RW- 27
94. *Mega rothneyi:* RW- 15
95. *Oreumenoides edwardsii* (de Saussure, 1852)*:* RW-27
96. *Polistes (Megapolistes) olivaceous* De Geer, 1773: RW- 5, 15, 26, 27
97. *Polistes sagittarius* Sauss: RW- 15
98. *Polistes stigma* Fabricius: RW- 16
99. *Polistes stigma tamula* (Fabricius, 1798)*:* RW- 27
100. *Polistis hebraeus* Fabricius*:* RW- 27, 32, 36
101. *Polybia orientalis:* RW- 15, 29
102. *Polybia stigma* Smith*:* RW- 15
103. *Rhynchium brunneum brunneum* (Fabricius, 1793)*:* RW- 27
104. *Rhynchium carnaticum* (Fabricius, 1798)*:* RW- 27
105. *Rhynchium haemorrhoidale haemorrhoidale* (Fabicius, 1775)*:* RW- 27
106. *Ropalidia brevita* Das & Gupta, 1989*:* RW- 26
107. *Ropalidia cyathiformis* (Fabricius, 1804)*:* RW- 27
108. *Ropalidia jacobsoni* (du Saussure, 1855)*:* RW- 27
109. *Ropalidia marginata:* RW- 29
110. *Ropalidia variegata* (Smith,1852)*:* RW- 26
111. *Subanicistrocerus sichelii* (de Saussure, 1855)*:* RW-27
112. *Vespa affinis affinis* (Linnaeus, 1764)*:* RW- 27
113. *Vespa cincta* Fabricius, 1775*:* RW- 16, 27
114. *Vespa magnifica:* RW- 15
115. *Vespa orientalis* Linnaeus, 1771*:* RW- 26
116. *Vespa tropica haematodes* Bequaert, 1936*:* RW- 26
117. *Vespa tropica tropica* (Linnaeus, 1758)*:* RW- 26
118. *Xenorhynchium nitidulum* (Fabricius, 1798)*:* RW- 27

Family CHRYSIDIDAE

119. *Chrysis lusca* Fabricius: RW- 16
120. *Chrysis orientalis* Gues*:* RW- 15
121. *Stilbum cyanorum var. splendidum* Fabricius: RW- 16
122. *Stilbum cyanurum amethystinum* Fabricius: RW- 5

Family MUTILLIDAE

123. *MutilIa nr. pondicherensis* Rad. & Sich: RW- 16
124. *Mutilla indostana* Smith: RW- 16
125. *Mutilla nr. sexmaculata* Swed: RW- 16
126. *Mutilla ruficrus* Rad.: RW- 16
127. *Mutilla sexmaculata* Swed: RW- 16
128. *Mutilla* sp.: RW- 16

Family SCOLIIDAE

129. *EIis thoracica* Fabricius: RW- 16
130. *Scolia capitate* Guer: RW- 15

Family POMPILIDAE

131. *Macromeris violacea* Lepel: RW- 16
132. *Pompilus analis* Fabricius: RW- 16
133. *Pompilus rothneyi* Cam: RW- 16
134. *Salius averensericeus* Guer*:* RW- 15
135. *Salius madraspatanus* Smith: RW- 16
136. *Salius perplexus* Smith: RW- 16

Family SPHEGIDAE

137. *Ammophila atripes* Smith: RW- 16
138. *Ammophila laevigata* Smith: RW- 16
139. *Ampulex compressa* Fabricius: RW- 16
140. *Cerceris* sp.: RW- 16
141. *Cerceris vigilans* Smith: RW- 16

142. *Chlorion lobatum* (Fabricius, 1775)*:* RW- 27
143. *Sceliphron madraspatanum* Fabricius, 1781: RW- 16, 27
144. *Sceliphron violaceum* Fabricius: RW- 16
145. *Sphex aurulentus* Fabricius: RW- 16
146. *Sphex Iuteipennis* Moes.: RW- 16
147. *Stizus vespiformis* Fabricius: RW- 16
148. *Tachytes modesta* Smith: RW- 16

Family EUMENIDAE

149. *Eumenes atrophicus* (Fabricius, 1798)*:* RW- 26
150. *Eumenes brevirostrata* Sauss: RW- 16
151. *Eumenes conica* Fabricius: RW- 16
152. *Eumenes esuriens* Fabricius: RW- 16
153. *Eumenes macrops* de Sassure,1852*:* RW- 26
154. *Eumenes petiolata* Fabricius: RW- 16
155. *Odynerus punctum* Fabricius: RW- 16
156. *Rhynchium brunneum* Fabricius: RW- 15, 16

Family BRACONIDAE

157. *Diaeretus leucopterus* Haliday, 1834: RW- 15

Family MEGACHILIDAE

158. *Coelioxys capitatus* Smith, 1854*:* RW- 27
159. *Heriades parvulus* Bingham, 1897*:* RW- 27
160. *Lithurgus atratus* Smith, 1853: RW- 15
161. *Megachile relata* Smith, 1879*:* RW- 27

Family BRACONIDAE

162. *Lysiphlebia japonica* Ashmead, 1906: RW- 15

Family ICHNEUMONIDAE

163. *Enicospilus noctumus* Kohl, 1908: RW- 27
164. *Menoforia indica* Gupta & Saxena: RW- 27
165. *Xanthopimpla sikkimensis* Cameron: RW- 27

Family CHALCIDIDAE

166. *Antrocephalus fascicornis* (Walker, 1871)*:* RW- 26
167. *Antrocephalus phaeospilus* Waterston, 1922*:* RW- 26
168. *Antrocephalus validicornis* (Holmgren, 1869)*:* RW- 27
169. *Brachymeria lasus* (Walker, 1841)*:* RW- 27
170. *Brachymeria minuta* (Linnaeus, 1767)*:* RW- 26
171. *Brachymeria podagrica* (Fabricius, 1787)*:* RW- 26
172. *Dirhinus bakeri* (Crawford, 1915)*:* RW- 26
173. *Hockeria fronta* Narendran, 1989*:* RW- 27
174. *Hockeria gibsoni* Narendran, 1989*:* RW- 26
175. *Hockeria hayati* Narendran, 1989*:* RW- 26
176. *Hockeria manii* Narendran, 1989*:* RW- 26
177. *Hockeria opisinae* Narendran, 1989*:* RW- 26
178. *Kriechbaumerella pulvinata* (Masi, 1932)*:* RW- 26
179. *Kriechbaumerella rufimanus* (Walker, 1860)*:* RW- 26
180. *Tropimeris monodon* Boucek, 1958*:* RW- 27

Family EULOPHIDAE

181. *Aprostocetus bangaloricus* Narendran, 2003*:* RW- 27
182. *Aprostocetus benazeer* Narendran, 2007*:* RW- 27
183. *Aprostocetus dala* Narendran, 2007*:* RW- 27
184. *Aprostocetus kuriani* (Hussain & Khan, 1954)*:* RW- 27
185. *Aprostocetus vatiata* Narendran, 2007*:* RW- 27
186. *Chrysonotomyia postmarginaloides* (Saraswat, 1975)*:* RW- 27
187. *Elachertus nigrithorax* (Girault, 1913)*:* RW- 27
188. *Elasmus anticles* Walker, 1846*:* RW- 27
189. *Elasmus caligneus* Narendran, 2008*:* RW- 27
190. *Elasmus punensis* Mani & Saraswat, 1972*:* RW- 27
191. *Elasmus queenslandicus* Girault, 1913*:* RW- 27
192. *Elasmus rajasthanicus* Verma & Hayat, 2002*:* RW- 27
193. *Hemiptarsenus varicornis* (Girault, 1913)*:* RW- 27
194. *Leptocybe invasa* Fisher & LaSalle, 2004*:* RW- 27
195. *Neotrichoporoides galia* Narendran & Santhosh, 2006*:* RW- 27
196. *Neotrichoporoides idukkiensis* (Narendran, 2005)*:* RW- 27
197. *Neotrichoporoides viridimaculatus* (Fullaway, 1955)*:* RW- 27
198. *Pseudosecodes calicuticus* Narendran, 2006*:* RW- 27
199. *Sympiesis striatipes* (Ashmead, 1904)*:* RW- 27
200. *Tetrastichus dulciculus* Narendran, 2007*:* RW- 27
201. *Tetrastichus epilachnae* (Giard, 1896)*:* RW- 27

Family EURYTOMIDAE

202. *Eurytoma agalica* Narendran, 1994*:* RW- 27
203. *Eurytoma chaitra* Narendran, 1994*:* RW- 27
204. *Eurytoma tanjorensis* Narcndran, 1994*:* RW- 27
205. *Philolema albitarsis* (Motschulsky, 1863)*:* RW- 27

Family HALICTIDAE

206. *Curvinomia iridescens* (Smith, 1853)*:* RW- 27
207. *Hoplonomia elliotii* (Smith, 1875)*:* RW- 27
208. *Hoplonomia westwoodi* (Gribodo, 1894)*:* RW- 27
209. *Lasioglossum albescens* (Smith, 1853)*:* RW- 27
210. *Lasioglossum cire* (Cameron, 1897)*:* RW- 27
211. *Lasioglossum splendidulum* (Vachal, 1894)*:* RW- 27
212. *Lipotriches fulvinerva* (Cameron, 1907)*:* RW- 27
213. *Nomia curvipes* (Fabricius, 1793)*:* RW- 27
214. *Pseudapis oxybeloides* (Smith, 1875)*:* RW- 27

Family PTEROMALIDAE

215. *Acroclisoides maculatus* Sureshan & Narendran*:* RW- 41
216. *Agiommatus geethae* Sureshan & Narendran*:* RW- 41
217. *Callitula peethapada* Narendran & Mohana*:* RW- 41
218. *Dinarmus acutus* Thomson*:* RW- 41
219. *Dinarmus basalis* Rondani*:* RW- 41
220. *Dinarmus maculatus* Masi*:* RW- 41
221. *Metastenus indicus* Sureshan & Narendran, 2002*:* RW- 27
222. *Metastenus concinnus* Walker*:* RW- 41
223. *Notoglyptus scutellaris* (Dodd & Girault, 1915)*:* RW- 27
224. *Panstenon bengalense* Narendran & Girish Kumar,

2009*:* RW- 27

225. *Panstenon*sp.*:* RW- 41

226. *Pachyneuron aeneum* Masi*:* RW- 41

227. *Pachyneuron aphidis* Bouche*:* RW- 41

228. *Propicroscytus mirificus* (Girault, 1915b)*:* RW- 27

229. *Psilocera neoclavicornis* Narendran & Girish Kumar, 2009*:* RW- 27

230. *Pteromalus keralensis* Sureshan, 2001*:* RW- 27

231. *Pteromalus puparum* (Linnaeus, 1758)*:* RW- 27

232. *Pteromalus sundarbanicus* Narendran & Girish Kumar, 2009*:* RW- 27

233. *Soelnura ania* Walker*:* RW- 41

234. *Theocolax radhakirshnani* Sureshan & Narendran*:* RW- 41

235. *Spalangia nigroaenea* Curtis*:* RW- 41

236. *Sphegigaster brunneicornis* Ferriere*:* RW- 41

237. *Herbertia indica* Burks*:* RW- 41

238. *Kumarella angulus* Sureshan*:* RW- 41

239. *Uniclypea kumarani* Sureshan & Narendran*:* RW- 41

Family ENCYRTIDAE

240. *Acerophagus papayae* Noyes & Schauff*:* RW- 26

241. *Anagyrus aquilonaris* (Noyes & Hayat)*:* RW- 26

242. *Anagyrus dactylopii* (Howard)*:* RW- 26

243. *Anagyrus tricolor* (Girault)*:* RW- 26

244. *Anomalicornia tenuicornis* Mercet*:* RW- 26

245. *Cheiloneurus bengalorensis* (Subba Rao)*:* RW- 26

246. *Copidosoma floridanum* (Ashmead)*:* RW- 26

247. *Indaphycus planus* Hayat*:* RW- 26

248. *Metaphycus* Mercet*:* RW- 26

249. *Neodusmetia sangwani* (Subba Rao)*:* RW- 26

250. *Ooencyrtus utetheisae* (Risbec, 1951)*:* RW- 26

251. *Prochiloneurus albifuniculus* (Hayat, Alam & Agarwal)*:* RW- 26

252. *Prochiloneurus pulchellus* Silvestri*:* RW- 26

253. *Pseudleptomastix mexicana* Noyes & Schauff, 2003*:* RW- 26

254. *Rhopus* Foester, 1856*:* RW- 26

255. *Syrphophagus hofferi* (Hayat)*:* RW- 26

256. *Tassonia gloriae* (Girault)*:* RW- 26

Coleoptera

Members of the order Coleoptera are commonly known as beetles. The name Coleoptera was coined by Aristotle to signify the hardened,shield-like forewings (coleo = shield + ptera = wing). According to Grimaldi and Engel (2005) approximately 355,000 extant species and 600 fossil species of Coleoptera have been described. The lineage of Coleoptera is extremely diverse and abundant on all continents. The group is of interests to many taxonomists and ecologists due to their versatile habits, marvellous colouration and sculpture, as well as for their economic importance. Both adults and larvae are predominately aquatic in about half the families, with the remainder being aquatic primarily only in one life stage. Larvae are a challenge to identify even at the generic level for most groups. By contrast, adult beetles are relatively easy to identify at the generic and even species levels. BeetIes are of immense economic importance, some of them are beneficial, help in controlling many injurious insects. The importance of some Coccinellid species (Rodolia) in biological control is well known. On the other hand, damage caused by Coleoptera is immense, although no definite statistical data is available. The major ecological impact of beetles results from their effects on green plants, their contribution to the breakdown of plant and animal debris and the formation of soil, and their predatory activities. Many species have economic importance often becoming injurious and some others also beneficial. The document reports the presence of 331 species of Coleopterans from the Ramsar wetlands of India (Table 32).

Table 32. Diversity of Coleopterans from Ramsar Wetlands of India.

Phylum ARTHROPODA
Class INSECTA
Order COLEOPTERA
Family DYTISCIDAE

1. *Acilius sulcatus* Linnaeus, 1758*:* RW- 15
2. *Canthydrus angularis* Sharp, 1882*:* RW- 16, 27
3. *Canthydrus flavus* Motschulsky, 1855*:* RW- 15, 27
4. *Canthydrus laetabilis* Walker, 1858: RW- 14, 16, 26, 27, 39
5. *Canthydrus luctuosus* Aube, 1838: RW- 16
6. *Clypeodytes bufo* Sharp, 1890*:* RW- 16
7. *Cybister (Meganectes) posticus* Aube, 1832*:* RW- 2, 15
8. *Cybister (Meganectes) sugillatus* Erichson, 1934: RW- 2
9. *Cybister (Melanectes) tripunctatus* asiaticus Sharp, 1882: RW- 13, 14, 15, 21
10. *Cybister confusus* Sharp, 1882*:* RW- 15, 16, 27
11. *Cybister convexus* Sharp, 1882*:* RW- 13,14, 15, 38
12. *Cybister guerini* Aube, 1838*:* RW- 27
13. *Cybister javanus* Aube, 1838*:* RW- 26
14. *Cybister limbatus* Fabricius, 1775: RW- 16, 26, 27, 39
15. *Cybister tripunctatus lateralis* Fabricius, 1798*:* RW- 16, 26
16. *Cybister tripunctatus asiaticus* Sharp*:* RW- 38, 39
17. *Cybister posticus* Aube*:* RW- 39
18. *Cybister sugillatus* Erichson*:* RW- 38, 39
19. *Dytiscus marginalis* Linnaeus, 1758*:* RW- 15
20. *Dytiscus* sp.*:* RW- 15, 31
21. *Eretes griseus* Fabricius, 1781*:* RW- 16, 26, 27
22. *Eretes merione* Gram*:* RW- 15
23. *Eretes sticticus* Linnaeus, 1767*:* RW- 14, 15, 21
24. *Guignotus flammulatus* Sharp, 1854: RW- 14, 15, 21
25. *Guignotus penjabensis* Guignot, 1954*:* RW- 21
26. *Hydaticus (Guignotites) fabricii* Macleay, 1833: RW- 2, 5, 15, 38
27. *Hydaticus (Guignotites) vittatus* Fabricius, 1775: RW- 2, 14
28. *Hydaticus (Prodaticus) luczonicus* Aube, 1838*:* RW- 27
29. *Hydaticus (Prodaticus) ricinus* Wewalka,1979*:* RW- 5
30. *Hydaticus* sp.: RW- 13, 26, 39
31. *Hydaticus vittatus* Fabricius, 1775*:* RW- 15, 21, 38
32. *Hydroglyphus flammulatus* Sharp, 1882*:* RW- 5, 16, 26, 27
33. *Hydroglyphus inconstans* Régimbart, 1892*:* RW- 16, 26
34. *Hydroglyphus pradhani* Vazirani,1969*:* RW- 5
35. *Hydroglyphus punjabensis* Guignot, 1954*:* RW- 16, 27
36. *Hydroglyphus regimbarti* Gschwendtner, 1936: RW- 16
37. *Hydroglyphus signatellus* Klug, 1834*:* RW- 16
38. *Hydrovatus acuminatus* Motschulsky, 1859*:* RW- 16, 26
39. *Hydrovatus bonvouloiris* Sharp, 1882*:* RW- 16, 26, 27
40. *Hydrovatus confertus* Sharp, 1882: RW- 14, 16, 26
41. *Hydrovatus rufescens* Motschulsky, 1859*:* RW- 27
42. *Hydrovatus seminaries* Motschulsky, 1859*:* RW- 27
43. *Hydrovatus* sp.*:* RW- 5, 21
44. *Hyphoporus aper* Sharp, 1882*:* RW- 27
45. *Hyphoporus elevatus* Sharp, 1882: RW- 5
46. *Hyphoporus* sp.: RW- 5, 15, 39
47. *Hyphydrus lyratus flavicans* Régimbart, 1892*:* RW- 16
48. *Hyphydrus renardi* Severin, 1890*:* RW- 16
49. *Laccophilus anticatus* Sharp, 1890: RW- 15, 16, 26, 27, 39
50. *Laccophilus chinensis inefficiens* Walker, 1859*:* RW- 15, 27
51. *Laccophilus elegans* Sharp, 1882*:* RW- 14
52. *Laccophilus flexuosus* Aube, 1838: RW- 5, 16, 26
53. *Laccophilus inefficiens* (Walker, 1859)*:* RW- 5, 26, 27
54. *Laccophilus parvulus* Aube, 1938: RW- 5, 16, 26, 27
55. *Laccophilus ritsemae* Regimbart, 1880*:* RW- 15
56. *Laccophilus rufulus Regimbert:* RW- 39
57. *Laccophilus sharpi* Regimbert, 1889: RW- 5, 16, 21, 26, 27, 39
58. *Laccophilus uniformis* Motschulsky, 1859*:* RW- 16
59. *Leiodytes orissaensis* Vazirani, 1969*:* RW- 16
60. *Neohydrocoptus subvittulus* Motschulsky, 1859*:* RW- 16, 27
61. *Peschetius quadricostatus* Aube, 1838*:* RW- 27
62. *Rhantaticus congestus* Klug, 1832*:* RW- 5, 15, 16
63. *Rhantus taprobanicus* Sharp, 1890: RW- 2
64. *Sandracottus dejeani* Aube, 1838: RW- 5, 16
65. *Sandracottus festivus* Illiger, 1802: RW- 5
66. *Sandracottus manipurensis* Vazirani, 1969: RW- 15
67. *Uvarus livens* Régimbart, 1892*:* RW- 15

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68. *Georyssus* sp.: RW- 5

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69. *Amphiops mirabilis* Sharp, 1890*:* RW- 26
70. *Amphiops pedestris* Sharp, 1890: RW- 5, 13, 16, 26, 27
71. *Amphiops simplex* Sharp*:* RW- 15

72. *Berosus fairmairei* Zaitzev, 1908*:* RW- 21, 26
73. *Berosus indicus* Motschulsky, 1861: RW- 5, 14, 15, 16, 21, 26, 27, 39
74. *Berosus nigriceps* Fabricius, 1801*:* RW- 16, 21
75. *Berosus pulchellus* Macleay, 1825*:* RW- 5, 15, 16, 21, 27, 39
76. *Berosus* sp.*:* RW- 27
77. *Cercyon* sp.*:* RW- 16
78. *Coelostoma* sp.: RW- 5, 13
79. *Coelostoma subditum* D orchymont, 1936*:* RW- 15
80. *Dactylosternum abdominale* Fabricius, 1792*:* RW- 14
81. *Dineatus (Spinosodineatus) spinosus* Fabricius, 1781: RW- 2, 38
82. *Dineutus (Protodineutus) indicus* Aube, 1838*:* RW- 5, 13, 14, 26
83. *Dineutus unidentalus* Aube*:* RW- 39
84. *Dineutus* sp.*:* RW- 39
85. *Enochrus escuriens* Walker, 1858*:* RW- 14, 15, 16, 21, 26, 27
86. *Enochrus rubrocinctus* Regimbart, 1903*:* RW- 15
87. *Enochrus* sp.*:* RW- 27
88. *Regimbertia attenuata* (F.)*:* RW- 39

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89. *Gyrinus convexiusculus* MacLeay, 1871*:* RW- 14
90. *Gyrinus marinus* Gyllenhal, 1808*:* RW- 15
91. *Gyrinus natato* Linnaeus, 1758*:* RW- 15
92. *Gyrinus* sp.*:* RW- 15, 31
93. *Helochares anchoralis* Sharp, 1890: RW- 5, 13, 14,15, 16, 26
94. *Helochares crenatus* Regimbart: RW- 5, 14,15
95. *Helochares densus* Sharp, 1890*:* RW- 16
96. *Helochares lentus* Sharp, 1890*:* RW- 15, 16, 27
97. *Helochares pallens* Macleay, 1825*:* RW- 15, 16, 27
98. *Hydrochus annamita* Regimbart, 1903*:* RW- 15
99. *Hydrochus binodosus* Motschulsky, 1860*:* RW- 16
100. *Hydrochus locustris* Nietner, 1856*:* RW- 15
101. *Hydrochus* sp.: RW- 5
102. *Hydrophilus ceruboides* Linnaeus, 1758*:* RW- 15
103. *Hydrophilus indicum* Bedel*:* RW- 15
104. *Hydrophilus olivaceous* Fabricius, 1781: RW- 14, 15, 21, 38
105. *Hydrophilus rufocinctus* Bedel*:* RW- 39
106. *Hydrophilus* sp.*:* RW- 39
107. *Hydrous unguicularis* Regimbart, 1901: RW- 13
108. *Laccobius* sp.: RW- 5
109. *Orectochilus (Patrus) haemorrhous* Regimbart, 1891*:* RW- 27
110. *Orectochilus (Patrus) ribeiroi* Vazirani, 1958*:* RW- 27
111. *Orectochilus murinus* Regimbart, 1892: RW- 5
112. *Orectochilus neglectus* Ochs, 1925: RW- 5
113. *Orectochilus productus* Régimbart, 1884*:* RW- 26
114. *Orectochilus(Patrus) similis* Ochs, 1929*:* RW- 27
115. *Paracymus evanescens* Sharp,1890*:* RW- 16
116. *Regimbartia attenuata* Fabricius, 1801: RW- 5, 14,15, 16, 26, 27, 38
117. *Regimbertia* sp.*:* RW- 39
118. *Sphaeridium cameronid* Orchymont, 1926*:* RW- 27
119. *Sphaeridium severini* D orchymont, 1919*:* RW- 15
120. *Sternolophus rufipes* Fabricius, 1792: RW- 2, 5, 15,16, 26, 27, 38, 39

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121. *Odontolabis cuvera* Hope, 1842*:* RW- 27

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122. *Stenelmis* sp.: RW- 5

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123. *Byrrhus* sp.: RW- 5

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124. *Adoretus bicaudatus* Arrow, 1914*:* RW- 27
125. *Adoretus bimarginatus* Ohaus, 1914*:* RW- 27
126. *Adoretus duvauceli* Blanchard, 1850*:* RW- 27
127. *Adoretus flavus* Arrow, 1917*:* RW- 26, 27
128. *Adoretus lacustris* Arrow, 1917*:* RW- 26, 27
129. *Adoretus lasiopygus* Burmeister, 1855*:* RW- 26
130. *Adoretus* sp.*:* RW- 21, 27
131. *Adoretus versutus* Harold, 1869*:* RW- 26
132. *Anatona alboguttata* Burmeister, 1842*:* RW- 14
133. *Anatona stillata* (Newman, 1838)*:* RW- 14
134. *Anomala bengalensis* (Blanchard, 1851)*:* RW- 26
135. *Anomala biharensis* Arrow, 1917*:* RW- 26
136. *Anomala bilobata* Arrow, 1912*:* RW- 26
137. *Anomala dorsalis* Fabricius, 1775: RW- 21, 27
138. *Anomala polita* (Blanchard, 1851)*:* RW- 26
139. *Anomala ruficapilla* Burmeister, 1855: RW- 21, 27
140. *Anomala rugosa* Arrow, 1899*:* RW- 27
141. *Aphodius* sp.*:* RW- 21
142. *Apogonia cribricollis* Burmeister, 1855*:* RW- 21
143. *Apogonia ferruginea* Fabricius, 1894*:* RW- 21
144. *Astenus leptocerus* (Eppelsheim, 1895)*:* RW- 27
145. *Bledius (Hesperophilus) helferi* Fauvel, 1904*:* RW- 27
146. *Bledius (Pucerus) gracilicornis* Kraatz, 1859*:* RW- 21
147. *Bledius (s. str.) brunnipennis* (Fabricius, 1801)*:* RW- 27
148. *Bledius (s. str.) hoplites* Fauvel, 1904*:* RW- 27
149. *Bledius (s. str.) marusthanicus* Biswas & Sengupta, 1989*:* RW- 21
150. *Catharsius pithecius* (Fabricius, 1775)*:* RW- 14
151. *Charichirus* sp.*:* RW- 27
152. *Chiloloba acuta* (Wiedemann, 1823)*:* RW- 14
153. *Chiron cylindrus* Fabricius, 1798*:* RW- 21
154. *Clinteria klugi klugi* (Hope, 1831)*:* RW- 14
155. *Copris andrewesi* Waterhouse, 1891: RW- 21
156. *Copris punjabensis* Gillet, 1921*:* RW- 21
157. *Copris* sp.*:* RW- 21
158. *Cryptobium elephas* Fauvel, 1904*:* RW- 27
159. *Digitonthophagus gazella* (Fabricius, 1787)*:* RW- 27

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160. *Heliocopris gigas* Linnaeus, 1758*:* RW- 27
161. *Heteronychus lioderes* Redtenbacher, 1867*:* RW- 14, 26, 27
162. *Holotrichia consanguinea* Blanchard, 1851*:* RW- 21
163. *Hybosorus orientalis* Westwood, 1845: RW- 21
164. *Hybosorus* sp.*:* RW- 21
165. *Lathrobium cafrum* Boh, 1848*:* RW- 27
166. *Lathrobium unicolor* Kraate, 1859*:* RW- 15, 27
167. *Neobisnius* sp.*:* RW- 21
168. *Oniticellus cinctus* (Fabricius, 1775)*:* RW- 14
169. *Onitis philemon* Fabricius, 1801*:* RW- 26
170. *Onitis virens* Lansberge, 1875*:* RW- 14
171. *Onthopbagus (Colobonthophagus) ramosellus* Bates, 1891*:* RW- 27
172. *Onthopbagus quadridentalus* Fabricius, 1798*:* RW- 14, 27
173. *Onthophagus (Colobonthophagus) dama* (Fabricius, 1798)*:* RW- 26
174. *Onthophagus (Colobonthophagus) hindu* Arrow, 1931*:* RW- 14
175. *Onthophagus (Colobonthophagus) ramosus* (Wiedemann, 1823)*:* RW- 14
176. *Onthophagus bonasus* Fabricius, 1775: RW- 21
177. *Onthophagus catta* Fabricius, 1787: RW- 21
178. *Onthophagus negligens* Walker, 1858*:* RW- 14
179. *Oryctes rhinoceros* (Linnaeus, 1785)*:* RW- 26, 27
180. *Paederus fuscipes* Curtis, 1926*:* RW- 10, 15, 27
181. *Paederus himalayicus* Bernhauer, 1914*:* RW- 15
182. *Paracopris imitans* (Felsche, 1910)*:* RW- 14
183. *Paracopris surdus* (Arrow, 1931)*:* RW- 14
184. *Pentodon bispinifrons* Reitter, 1894*:* RW- 21
185. *Philonthus castaneus* Gem.et.Har, 1868*:* RW- 27
186. *Philonthus fimetarius* (Gravenhorst, 1802)*:* RW- 27
187. *Philonthus leucopus* Kraatz, 1859*:* RW- 27
188. *Philonthus poephagus* Cameron, 1928*:* RW- 21
189. *Philonthus quaediiformis* Cameron, 1932*:* RW- 27
190. *Philonthus quisquillarius* (Gyllenhal, 1810)*:* RW- 27
191. *Philonthus quisquillarius var. inquinatus* Stephens*:* RW- 27
192. *Philonthus rotundicollis* Menet, 1832*:* RW- 27
193. *Serica* sp.*:* RW- 21
194. *Stanus carinatus* Cameron, 1913*:* RW- 27
195. *Xylotrupes gideon* (Linnaeus, 1767)*:* RW- 26

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196. *Bembidion niloticum* Dejean, 1831*:* RW- 27
197. *Bembidion sobrinum* Boheman, 1848*:* RW- 27
198. *Chlaenius bimaculatus* Dejean, 1826*:* RW- 21
199. *Ciliaenius (Callytron) limosa* Saunders, 1834*:* RW- 26, 27
200. *Ciliaenius (Calochroa) sexpunctata* Fabricius, 1775*:* RW- 26, 27
201. *Ciliaenius (Chlaenites) circumdatus* Brulle, 1825*:* RW- 27
202. *Ciliaenius (Eugrapha) erudite* (Wiedemann, 1823)*:* RW- 27
203. *Ciliaenius (Hypaetha) biramosa* Fabricius, 1781*:* RW- 27
204. *Ciliaenius (Hypaetha) quadrilineata* Fabricius, 1781*:* RW- 27
205. *Ciliaenius (Myriochile) atelesta* Chaudoir, 1854*:* RW- 27
206. *Ciliaenius (Spilodia) multiguttata* Dejean, 1825*:* RW- 27
207. *Clivina helferi* Putzeys, 1863*:* RW- 27
208. *Clivina lobata* Bonelli, 1813*:* RW- 27
209. *Cylindera (Eugrapha)minuta* (Olivier, 1790)*:* RW- 26
210. *Eucolliuris fuscipennis* (Chaudoir, 1850)*:* RW- 27
211. *Harpalus* sp.*:* RW- 27
212. *Neocollyris bonelli* (Guerin, 1834)*:* RW- 26
213. *Neocollyris crassicornis* (Dejean, 1825)*:* RW- 26
214. *Ophionea (Ophionea) indica* (Thunberg, 1784)*:* RW- 27
215. *Pheropsophus catoirei* Dejean, 1825*:* RW- 27
216. *Pogonus (Pogonus) biroi* Csiki, 1907*:* RW- 26
217. *Scarites* sp. : RW- 21
218. *Slenolophus* sp.*:* RW- 27
219. *Zuphium* sp.*:* RW- 27

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220. *Cicindela aurovittata*Brulle, 1838*:* RW- 26
221. *Cicindela biromasa* Fabricius*:* RW- 27
222. *Cicindela catena* Fabricius, 1775*:* RW- 21
223. *Cicindela erudata* Wiedmann*:* RW- 27
224. *Cicindela fuliginosa* Dejean, 1826*:* RW- 21
225. *Cicindela limosa* Saunders, 1834*:* RW- 27
226. *Cicindela quodrilineata* Fabricius, 1781*:* RW- 27

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227. *Agrypnus holontelius* Vats & Kahsyap, 1992*:* RW- 21
228. *Agrypnus* sp.*:* RW- 26
229. *Dicronychus* sp.*:* RW- 21
230. *Lanelatex fuscipes* Fabricius: RW- 21

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231. *Anthrenus* sp.*:* RW- 26
232. *Attagenus alfierii* Fabricius, 1787*:* RW- 26

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233. *Dinoderus brevis* Horn, 1878*:* RW- 27
234. *Dinoderus* sp.*:* RW- 27
235. *Heterobostrichus aequalis* Waterhouse, 1979*:* RW- 27
236. *Rhizopertha dominica* Fabricius*:* RW- 27

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237. *Cheilomenes sexmaculata* (Fabricius, 1798)*:* RW- 14
238. *Chilocorus nigritus* Fabricius 1798*:* RW- 15
239. *Coccinella septempunctata* Linnaeus, 1758*:* RW- 14,15, 26

240. *Coccinella transversalis* Fabricius, 1781: RW- 14,15, 26
241. *Coelophora bisellata* Mulsant, 1850*:* RW- 15
242. *Coelophora saucia* Mulsant, 1850*:* RW- 15
243. *Coelophora unicolor* Fabricius, 1792*:* RW- 26
244. *Epilachna dodecastigma* Weidemann*:* RW- 15
245. *Epilachna manipurensis* Kapur, 1952*:* RW- 15
246. *Halyzia sanscrita* Mulsant, 1853*:* RW- 26
247. *Harmonia arcuata* Fabricius, 1787: RW- 15
248. *Harmonia octomaculata* Fabricius, 1781*:* RW- 15
249. *Henosepilachna indica* (Mulsant 1850)*:* RW- 26
250. *Henosepilachna vigintioctopunctata* (Fabricius, 1775)*:* RW- 26
251. *Leis dimidiata* Fabricius, 1781*:* RW- 15
252. *Menochilus sexmaculatus* Fabricius, 1781: RW- 15, 26, 27
253. *Micraspis discolor* Fabricius 1798*:* RW- 26, 27
254. *Oenopia impustulata* Linnaeus, 1767*:* RW- 15
255. *Oenopia kirbyi* Mulsant, 1850*:* RW- 15
256. *Scymnus japonicus* Weise, 1879*:* RW- 15
257. *Scymnus kawumunri* Onta*:* RW- 15
258. *Synonycha grandis* Thunber, 1781*:* RW- 15

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259. *Apomycena saltator* Fabricius, 1781*:* RW- 27
260. *Batocera rufomaculata* (De Geer, 1775)*:* RW- 27
261. *Ceresium zeylanicum* White, 1855*:* RW- 27
262. *Chlorophorus annularis* (Fabricius, 1787)*:* RW- 27
263. *Demonax sonneratiae* Gardner, 1940*:* RW- 27
264. *Derolus discicollis* Gahan, 1906*:* RW- 27
265. *Nepiodes sulcipennis* (White, 1853)*:* RW- 27
266. *Ropica pseudosignata* Breuning, 1938*:* RW- 27
267. *Stromatium barbatum* (Fabricius, 1775)*:* RW- 27
268. *Xystrocera globosa* Oliver, 1795: RW- 27

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269. *Myllocerus subfasciatus* Guérin-Méneville, 1843*:* RW- 21
270. *Myllocerus transmarinus* Herbst, 1795*:* RW- 21
271. *Neochtina eichhorinae* Warner, 1970*:* RW- 32, 36
272. *Sitophilus* sp.*:* RW- 27
273. *Tanymecus albomarginatus* Gyllenhal, 1834*:* RW- 27
274. *Tanymecus indicus* Faust, 1894*:* RW- 27
275. *Tanymecus marginalis* Gyllenhal, 1834*:* RW- 27

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276. *Haliplus (Liaphlus) pruthii* Vazirani, 1966: RW- 27
277. *Haliplus (Liaphlus) pulchellus indicus* Regimbart, 1899*:* RW- 14
278. *Haliplus angustifrons* Régimbart, 1892*:* RW- 26
279. *Haliplus* sp.: RW- 27

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280. *Heterocerus* sp.: RW- 27

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281. *Monanus concinnulus* Walker, 1858: RW- 27
282. *Oryzaephilus mercator* Fauvel, 1889: RW- 27

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283. *Spercheus gibbus* Champion, 1919*:* RW- 26, 27

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284. *Alphitobius diaperinus* Panzer, 1797: RW- 27
285. *Ceropria* sp.: RW- 27
286. *Gonocephalum depressum* (Fabricius, 1801)*:* RW- 26
287. *Gonocephalum hoffmannseggi* (Steven, 1829)*:* RW- 26
288. *Gonocephalum stoeckleini* Kaszab, 1952*:* RW- 26
289. *Gonocephalum vagum* (Steven, 1829)*:* RW- 26
290. *Scleron reitteri* Gebien 1906*:* RW- 26
291. *Scleropatrum strigatum* Fabricius, 1798*:* RW- 26
292. *Tribolium castaneum* (Herbst 1797)*:* RW- 26

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293. *Hycleus phaleratus*(Pallas, 1781)*:* RW- 26

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294. *Inopeplus* sp.: RW- 27

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295. *Aspidomorpha miliaris* Fabricius: RW- 14, 27
296. *Aspidomorpha sanctaecrucis* (Fabricius, 1792)*:* RW- 14
297. *Aulacophora almora* Maulik, 1936*:* RW- 26
298. *Aulacophora foveicollis* Lucas: RW- 26, 27
299. *Aulacophora lewisii* Baly, 1886*:* RW- 26
300. *Cassida circumdata* Herbst, 1799: RW- 26, 27
301. *Cassida enervis* Boheman, 1862*:* RW- 26
302. *Cryptocephalus sehestedti* Fabricius, 1798: RW- 27
303. *Dactylispa armigera* Fabricius: RW- 27
304. *Dicladispa armigera* (Olivier, 1808): RW- 27
305. *Erystus quadripunctatus* Ogloblin: RW- 27
306. *Hoplasoma unicolor* llliger: RW- 27
307. *Lema (Lema) lacertosa* Lacordaire, 1845*:* RW- 26
308. *Lema (Lema)coromandeliana* (Fabricius, 1798)*:* RW- 26
309. *Medythia nigrobilineata* (Motschulsky, 1860): RW- 27
310. *Monolepta signata* (Olivier,1808)*:* RW- 26
311. *Pachnephorus lewisii* Baly, 1878: RW- 27
312. *Platycorynus peregrinus* (Herbst, 1783)*:* RW- 14
313. *Trichobalya bowringi* (Baly, 1890)*:* RW- 26
314. *Zygogramma bicolorata* Pallister, 1953*:* RW- 14

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315. *Callosobruchus* sp.: RW- 27

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316. *Amasa schlichi* (Stebbing, 1907): RW- 27
317. *Coccotrypes opaciforns* Beeson: RW- 27
318. *Cryphalus neglectus* Schedl, 1941: RW- 27
319. *Hypothenemus areccae* (Hornung, 1842): RW- 27
320. *Microperus alpha* (Sampson, 1923)*:* RW- 27
321. *Xyleborinus artestriatus* (Eichhoff, 1878)*:* RW- 27
322. *Xyleborus bicolor* Blandford *var. alpha* Sampson, 1923*:* RW- 27
323. *Xyleborus bicolor* Blandford, 1894*:* RW- 27

324. *Xyleborus bidentatus* (Motschulsky, 1863)*:* RW- 27
325. *Xyleborus chrysophylli* Eggers, 1930*:* RW- 27
326. *Xyleborus cognatus* (Blandford, 1896)*:* RW- 27
327. *Xyleborus laticollis* Blandford, 1896*:* RW- 27
328. *Xyleborus quadridens* Eggers, 1930*:* RW- 27
329. *Xyleborus rameus* Schedl, 1940*:* RW- 27
330. *Xyleborus riehli* Eichhoff, 1878*:* RW- 27
331. *Xyleborus uniseriatus* Eggers, 1936*:* RW- 27

Lepidoptera

The Order Lepidoptera (*lepidos* = scale, *ptera* = wings) includes scale-winged insects and exhibits unity in diversity and diversity in multitude. They are holometabolous insects, which means that preadults (larvae) and adults differ greatly in form, function, and ecology. Larvae are specialized for feeding, and adults are specialized for dispersal and reproduction. The origin of this Order from ancestral prototype is known from Upper Permian. Therefore, the studies on phylogeny and evolution of the group are largely based on evidences from other disciplinary tools like biology, ecology, zoogeography, etc., of the extant forms. The butterflies and moths constituting Lepidoptera, are very familiar to mankind on account of their beautiful colouration, size, and plant relationship. A large number of species are known to be herbivores on aquatic and riparian vegetation, and are occasionally collected in aquatic sampling. They are cosmopolitan in distribution, occurring in every conceivable environs: from coastal areas and plains to deserts, forests, and valleys of hills and mountains. Linnaeus (1758, 1767) described all species of butterflies under genus *Papilio* and moths under *Phalaena* and *Noctua*. The Lepidoptera is one of the two or three largest orders of insects, with an estimated 160,000 named species worldwide. From the Ramsar wetlands of India, a total of 671 species of lepidopterans have been reported thus far (Table 33).

Table 33. Diversity of Lepidopterans from Ramsar Wetlands of India.

Class INSECTA
Order LEPIDOPTERA
Family PIERIDAE

1. *Anapbaeis mesentina* Cramer: RW- 16
2. *Anaphaeis aurota aurota* Fabricius, 1775: RW- 4, 22, 26
3. *Appias albina confusa* Fruh.: RW- 16, 27
4. *Appias albino* (Boisduval, 1836)*:* RW- 26, 27
5. *Appias Iibythea* (Fabricius, 1775): RW- 16, 26, 27
6. *Belenoisaurota* Fabricius, 1793*:* RW- 14, 32, 36, 41
7. *Catopsilia crocale* Cramer, 1775: RW- 4, 5, 27 , 41
8. *Catopsilia pomona* Fabricius, 1775: RW- 14, 16, 26, 28, 32, 36, 40, 41
9. *Catopsilia pyranthe* (Linnaeus, 1758): RW- 4, 5, 14, 16, 26, 27, 28, 29, 40, 41
10. *Cepora nerissa* (Fabricius, 1775): RW- 4, 22, 26, 27, 32, 36, 41
11. *Cepora nerissa phryne* (Fabricius, 1775)*:* RW- 14, 40
12. *Colias electo fieldii* Menetries: RW- 4
13. *Colias erate* Esper, 1805: RW- 4
14. *Colotis etrida etrida* Boisduval*:* RW- 40, 41
15. *Colotis amata* (Cramer, 1775)*:* RW- 22, 27, 41
16. *Colotis calais amatus* Fabricius: RW- 16, 40
17. *Colotis danae* Fabricius*:* RW- 41
18. *Colotis eucharis* Fabricius, 1775: RW- 22, 41
19. *Colotis fausta* (Oliver)*:* RW- 41
20. *Colo tis fausta faustina* C. & R. Felder*:* RW- 40
21. *Colotis fieldi* Menetries, 1855*:* RW- 6
22. *Colotis stoliczkana* Moore, 1878*:* RW- 6
23. *Colotis vestalis vestalis* Butler*:* RW- 40
24. *Delias belladonna horsfieldi* Gray: RW- 5
25. *Delias eucharis* (Drury, 1773): RW- 4, 14, 26, 27, 28, 32, 36
26. *Eurema andersoni* Moore, 1886*:* RW- 14, 28
27. *Eurema blanda* (Boisduval, 1836)*:* RW- 26, 27, 28
28. *Eurema blanda silhetana* (Wallace, 1867)*:* RW- 14
29. *Eurema brigitta:* RW- 32, 36
30. *Eurema brigitta rubella* Wallace: RW- 14, 27
31. *Eurema hecabe (*Linnaeus, 1758): RW- 22, 26, 27, 28, 29, 32, 36
32. *Eurema hecabe fimbriata* Wallace: RW- 5, 40
33. *Eurema hecabe simulata* (Moore, 1881)*:* RW- 14
34. *Eurema latea* Boisduval, 1836: RW- 5, 14
35. *Gandaca harina* (Horsfield, 1829)*:* RW- 32, 36
36. *Hebomoia glaucippe australis* Bert.: RW- 16, 41
37. *Huphina nerissa evagete* Cramer: RW- 16
38. *Ixias marianne (*Cramer, [1779]) : RW- 14, 22, 27, 41
39. *Ixias pyrene* (Linnaeus, 1764): RW- 27, 41
40. *Ixias pyrene kausala* Moore, 1877: RW- 4, 40
41. *Ixias pyrene pirenassa* Wall: RW- 16

42. *Leptosia nina* (Fabricius, 1793): RW- 4, 26, 27, 41
43. *Pareronia valeria* (Cramer, [1776]): RW- 14, 26, 27, 41
44. *Pareronia valeria hippia* Fabricius: RW- 16
45. *Pieris brassicae* Linnaeus 1758: RW- 15, 29
46. *Pieris brassicae nepalensis* Doubleday: RW- 4
47. *Pieris canidia indica* Evans: RW- 4, 5, 6
48. *Pieris rapae* Linnaeus: RW- 15
49. *Pieris* sp.: RW- 15
50. *Pontia callidice:* RW- 6
51. *Pontia daplidice moorei* Linnaeus: RW- 4
52. *Prioneris sita* C. Felder, 1865: RW- 32, 36
53. *Terias blanda* Boisduval: RW- 41
54. *Terias brigitta* Stoll: RW- 41
55. *Terias hecabe fimbriata* Wallace: RW- 4
56. *Terias hecabe* Linnaeus: RW- 16, 41
57. *Terias Iibythea* Fabricius: RW- 16
58. *Terias laeta laeta* Boisduval: RW- 4, 41
59. *Terias silhetana* Wall: RW- 16

Family PSYCHIDAE

60. *Eumeta crameri* (Westwood, 1854): RW- 27

Family HYBLAEIDAE

61. *Hyblaea puera* (Cramer, 1777): RW- 14, 27

Family PAPILLIONIDAE

62. *Atrophaneura hector* Linnaeus: RW- 27, 28
63. *Graphium agamemnon* (Linnaeus, 1758): RW- 14, 26, 27,41
64. *Graphium doson* (C. & R. Felder, 1864): RW- 26, 27, 32, 36
65. *Graphium euryplus:* RW- 32, 36
66. *Graphium nomius swinhoei* (Moore): RW- 27
67. *Graphium sarpedon* (Linnaeus, 1758): RW- 27, 28
68. *Graphium sarpedon luctatius* Fruhstorfer: RW- 5, 27, 28
69. *Pachliopta aristolochiae* (Fabricius, 1775): RW- 26, 27, 28
70. *Pachliopta hector* (Linnaeus, 1758): RW- 27
71. *Papilio aristolochiae* Fabricius, 1775: RW- 14, 16, 32, 36, 41
72. *Papilio castor:* RW- 32, 36
73. *Papilio clytia* Linnaeus, 1758: RW- 26, 27
74. *Papilio demoleus* Linnaeus, 1758 : RW- 4, 5, 14,16, 26, 27, 28, 32, 36, 41
75. *Papilio doson eleius* Fruh: RW- 16
76. *Papilio hector* Linnaeus: RW- 14, 16, 26, 41
77. *Papilio nomius* Esp: RW- 16
78. *Papilio polyctor polyctor* Boisdual: RW- 5
79. *Papilio polymnestor* Cramer, 1777: RW- 16, 26, 27
80. *Papilio polytes* Linnaeus, 1758: RW- 26, 27, 28, 29, 32, 36, 41
81. *Papilio polytes romulus* Cramer, 1775: RW- 4, 5, 14, 16
82. *Papilio protenor protenor* Cramer: RW- 5
83. *Parnassius jacquemonti :* RW- 6

Family NYMPHALIDAE

84. *Acraea violae* (Fabricius, 1793): RW- 14, 26, 27, 28
85. *Acraea terpsicore* Linnaeus: RW- 41
86. *Ariadne ariadne* (Linnaeus, 1763): RW- 26, 27
87. *Ariadne merione* (Cramer, [1777]): RW- 14, 15, 26, 32, 36, 41
88. *Ariadne merione tapestrina* Moore: RW- 4, 5, 27
89. *Atella phalanta* Drury: RW- 16
90. *Callerebia kalinda* Moore, 1865: RW- 6
91. *Catochrysops cnejus* Fabricius, 1798: RW- 14
92. *Catochrysops strabo* (Fabricius): RW- 28
93. *Charaxes solon* (Fabricius, 1793): RW- 26, 27
94. *Charaxes polyxena:* RW- 41
95. *Charaxes fabius:* RW- 41
96. *Cirrochroa tyche :* RW- 27
97. *Cirrochroa tyche mithila* Moore, 1872: RW- 27
98. *Cynthia cardui* Linnaeus: RW- 4
99. *Cyrestis thyodamas ganescha* Kollar: RW- 5
100. *Danais chrysippus* Linnaeus, 1758: RW- 16, 26, 41
101. *Danais limniace* Cramer : RW- 16
102. *Danais plexippus* Linnaeus: RW- 16
103. *Danaus chrysippus* (Linnaeus, 1758): RW- 4, 5, 22, 28, 14, 15, 27, 32, 36, 40, 41
104. *Danaus genutia* (Cramer, [1779]): RW- 4, 22, 14, 26, 27, 32, 36, 40, 41
105. *Danaus limniace* Cramer, 1775: RW- 15
106. *Danaus melanippus* (Cramer, [1777]): RW- 27
107. *Danaus melanippus indicus* (Fruhstorfer): RW- 27
108. *Elymnias hypermnestra* (Linnaeus, 1758): RW- 26
109. *Eulepis athamas* Drury: RW- 16
110. *Euploea core* (Cramer, [1780]): RW- 14, 16, 26, 27, 28, 32, 40, 41
111. *Euploea crameri* Lucas, 1853: RW- 27
112. *Euploea klugii* Moore, [1858]: RW- 26, 27
113. *Euthalia aconthea* (Cramer, [1777]): RW- 26, 27
114. *Euthalia nais* (Forster): RW- 28, 41
115. *Everes lacturnus* (Godart, 1824): RW- 14
116. *Hypolimnas bolina* (Linnaeus, 1758): RW- 4, 5, 14, 16, 26, 27, 28, 29, 32, 36
117. *Hypolimnas missipus* (Linnaeus, 1764): RW- 4, 14, 16, 26, 27, 28, 32, 36, 40
118. *Hypolimnas* sp.: RW- 15
119. *Idea agamarschana* (C. & R. Felder, 1865): RW- 27
120. *Junonia almana* (Linnaeus, 1758): RW- 4, 14, 15, 16, 22, 26, 27, 28, 29, 32, 36, 40
121. *Junonia atilites* (Linnaeus, 1763): RW- 4, 14, 22, 26, 27, 29, 32, 36, 41
122. *Junonia hierta* (Fabricius, 1798): RW- 4, 14, 27, 29, 41
123. *Junonia iphita* Cramer: RW- 4, 14, 29

124. *Junonia lemonias* (Linnaeus, 1758): RW- 4, 5, 16, 26, 27, 28, 32
125. *Junonia lemonias vaisya* (Fruhstorfer)Lemon Pansy: RW- 14, 22, 27
126. *Junonia lemonias persicaria* Fruhstorfer*:* RW- 40
127. *Junonia orithya* (Linnaeus, 1758): RW- 4, 16, 22, 27, 28, 29, 32, 36, 41
128. *Junonia orithya swinhoei* Butler, 1885*:* RW- 14, 40
129. *Junonia tesmonias* Linnaeus*:* RW- 15
130. *Kallima inachus huegeli* Kollar: RW- 5
131. *Karanasa hubneri* C. & R. Felder. 1867*:* RW- 6
132. *Lethe europa* (Fabricius, 1775)*:* RW- 27
133. *Maniola pulchra :* RW- 6
134. *Melanitis ismena* Gram*:* RW- 15
135. *Melanitis leda* (Linnaeus, 1758)*:* RW- 26, 27, 28, 32, 36, 41
136. *Melanitis leda ismene* (Cramer, 1775)*:* RW- 4, 14, 16, 28
137. *Melanitis phedima:* RW- 27
138. *Moduza procris* (Cramer, [1777]): RW- 26, 27
139. *Mycalesis mineus* (Linnaeus, 1758)*:* RW- 26
140. *Mycalesis perseus* (Fabricius, 1775): RW- 26, 27, 41
141. *Mycalesis visala* Moore, [1858]: RW- 16, 27
142. *Neptis erynome* Westwood*:* RW- 15
143. *Neptis hylas* (Linnaeus, 1758): RW- 4, 15, 26, 27, 29, 41
144. *Neptis hylas astola* Moore: RW- 5, 16
145. *Neptis jumbah* Moore, [1858]*:* RW- 26, 27
146. *Neptis mahendra* Moore: RW- 4
147. *Neptis yerburyi yerhuryi* Butler: RW- 5
148. *Pantoporia hordonia* (Stoll, 1790)*:* RW- 32, 36
149. *Phaedyma columella* (Cramer, [1780])*:* RW- 27
150. *Phalanta phalantha* (Drury, [1773]): RW- 4, 5, 14, 26, 27, 29, 32, 41
151. *Polyura athamas* (Drury, [1773]): RW- 5, 27, 41
152. *Precis atlites* Linnaeus*:* RW- 15, 41
153. *Precis hierta* Fabricius: RW- 5, 41
154. *Precis iphita siccata* Stichel: RW- 5
155. *Precis iphita* Fruhstorfer*:* RW- 41
156. *Precis lemonias persicaria* Fruhstorfer: RW- 5
157. *Precis polytes:* RW- 15
158. *Symbrenthia hippoclus* deNiceville: RW- 4
159. *Symphaedra nais* Forster, 1771*:* RW- 14, 41
160. *Telchinia violae* Fabricius: RW- 16
161. *Tirumala baldus:* RW- 27
162. *Tirumala limniace* (Cramer, [1775]): RW- 26, 27, 28, 32, 36, 41
163. *Tirumala limniace leopardus* Butler*:* RW- 40
164. *Tirulnala septentrionis* Butler*:* RW- 41
165. *Vanessa cardui* Linnaeus, 1758: RW- 6, 14, 16
166. *Vanessa cashmiriensis* kollar, 1844*:* RW- 6

Family LYMANTRIIDAE

167. *Euproctis* sp.*:* RW- 27

Family URANIIDAE

168. *Micronia aculeata* Guenee, 1857: RW- 14, 27
169. *Phazaca* sp.*:* RW- 26

Family SCYTHRIDIDAE

170. *Eretmocera* sp.*:* RW- 26

Family STATHMOPODIDAE: RW-

171. *Atkinsonia* sp.*:* RW- 26

Family LIMACODIDAE

172. *Altha nivea* Walker, 1862*:* RW- 27
173. *Thosea cana* Walker, 1865*:* RW- 27
174. *Thosea tripartite* Moore, 1884*:* RW- 27

Family SATURNIIDAE

175. *Actias selene* (Hubner, 1806): RW- 14, 26, 27
176. *Antheraea paphia* Linnaeus, 1758: RW- 14, 26, 27
177. *Cricula trifenestrata* Helfer, 1837*:* RW- 26

Family ERYCINIDAE

178. *Libythea myrrha sanguinalis* Fruh.: RW- 5

Family EREBIDAE

179. *Acanthodelta fulvida* Guen'ee, 1852*:* RW- 14
180. *Acanthodelta janata* (Linnaeus, 1758)*:* RW- 14
181. *Achaea janata* (Linnaeus, 1758)*:* RW- 27
182. *Achaea serva* (Fabricius, 1775)*:* RW- 27
183. *Agylla remelana* (Moore, 1865)*:* RW- 27
184. *Amata bicincta* (Kollar, 1844)*:* RW- 26
185. *Amata cyssea* (Stoll, 1782)*:* RW- 14, 26, 27
186. *Amata fortunei* d'Orza, 1869*:* RW- 26
187. *Amata georgina* (Butler, 1876)*:* RW- 14
188. *Amata hydatina* (Butler, 1876)*:* RW- 26
189. *Amata insueta* (Swinhoe, 1892)*:* RW- 26
190. *Amata lucina* (Butler, 1876)*:* RW- 14, 26
191. *Amata passalis* (Fabricius, 1781)*:* RW- 26, 27
192. *Amerila eugenia* (Fabricius, 1794)*:* RW- 27
193. *Amsacta emittens* Walker, 1855*:* RW- 27
194. *Amsacta lineola* (Fabricius, 1793)*:* RW- 27
195. *Amsacta moorei* Butler*:* RW- 15
196. *Anomis flava* (Fabricius, 1775)*:* RW- 14
197. *Anua coronate* (Fabricius, 1775)*:* RW- 14, 27
198. *Anua triphaenoides* (Walker, 1858)*:* RW- 14
199. *Arctornis submarginata* (Walker, 1855)*:* RW- 27
200. *Argina astrea* Drury, 1773: RW- 14, 27
201. *Aroa plana* Moore, 1879*:* RW- 26
202. *Aroa socrus* Geyer, 1837*:* RW- 26
203. *Artaxa digramma* Boisduval, 1844*:* RW- 26
204. *Artena dotata* Fabricius, 1794*:* RW- 14, 26, 27
205. *Asota caricae* Fabricius, 1775*:* RW- 5, 14, 26
206. *Asota ficus* (Fabricius, 1775)*:* RW- 26, 27
207. *Asota product* (Butler, 1875)*:* RW- 27
208. *Asura undulosa* (Walker, 1854)*:* RW- 27
209. *Azazia rubricans* (Boisduval, 1833)*:* RW- 14
210. *Barsine radians* Moore, 1878*:* RW- 26
211. *Brunia antica* (Walker, 1854)*:* RW- 27
212. *Caeneressa diaphana* (Kollar, 1844)*:* RW- 26, 27
213. *Ceryx godartii* (Boisduval, 1829)*:* RW- 27
214. *Chrysorabdia viridata* (Walker, 1865)*:* RW- 26
215. *Creatonotos gangis* Linnaeus, 1763: RW- 14, 15, 26,

27

216. *Creatonotos lactineus* Cramer, 1777*:* RW- 14

217. *Creatonotos transiens* Walker, 1855: RW- 27

218. *Diacrisia obliqua* Walker, 1855*:* RW- 15

219. *Eilema vicaria* (Walker, 1854)*:* RW- 26

220. *Eressa confinis* (Walker, 1854)*:* RW- 26

221. *Eressa discinota* Moroe*:* RW- 27

222. *Ericeia inangulata:* RW- 27

223. *Eudocima hypermnestra:* RW- 27

224. *Eudocima maternal* (Linnaeus, 1767)*:* RW- 27

225. *Eudocima* sp.*:* RW- 26

226. *Euproctis ampala* Walker, 1855*:* RW- 26

227. *Euproctis annulata* Hampson, 1900*:* RW- 26

228. *Euproctis asoetria* Huebner, 1818*:* RW- 26

229. *Euproctis lunata* Walker, 1855*:* RW- 26

230. *Euproctis plana* Fawcett, 1915*:* RW- 26

231. *Euproctis rhoda* (Moore, 1879)*:* RW- 26

232. *Euproctis similis* Moore, 1879*:* RW- 26

233. *Euproctis subfasciata* Walker, 1865*:* RW- 26

234. *Eupterote hibisci:* RW- 27

235. *Grammodes geometrica* Fabricius, 1775: RW- 14, 27

236. *Hamodes aurantiaca* Guen'ee, 1852*:* RW- 14

237. *Hamodes propitia* (Guerin, 1830)*:* RW- 27

238. *Homaea clathrum* Guenee, 1852*:* RW- 14

239. *Homodes crocea* Guenee, 1852*:* RW- 27

240. *Hulodes caranea* (Cramer, 1780)*:* RW- 27

241. *Ischyja marapok* Holloway, 2005*:* RW- 27

242. *Lymantriades varians* Walker, 1855*:* RW- 26

243. *Miltochrista congerens* (Felder, 1874)*:* RW- 26

244. *Miltochrista obsoleta* (Moore, 1878)*:* RW- 26

245. *Mocis frugalis* (Fabricius, 1775)*:* RW- 26, 27

246. *Narosodes punctata* Walker, 1863*:* RW- 26

247. *Nishada flabifera* Moore, 1878*:* RW- 26

248. *Olepa ricini* (Fabricius, 1794)*:* RW- 26

249. *Orgyia australis* Walker, 1855*:* RW- 26

250. *Orgyia postica* (Walker, 1855)*:* RW- 27

251. *Othreis* sp.*:* RW- 26

252. *Pantana visum* Huebner, 1825*:* RW- 26

253. *Perina nuda* Fabricius, 1787*:* RW- 26

254. *Psichotoe duvauceli* Boisduval, 1829*:* RW- 26, 27

255. *Ranghana punctata* Moore, 1878*:* RW- 26

256. *Remigia frugalis* (Fabricius, 1775)*:* RW- 14

257. *Remigia undata* (Fabricius,1775)*:* RW- 14

258. *Somena scintillans* Walker, 1856*:* RW- 26

259. *Spilosoma obliqua* Walker, 1855*:* RW- 27

260. *Spirama retorta* (Clerck, 1764)*:* RW- 27

261. *Syntomis sperbius:* RW- 15

262. *Syntomoides imaon* (Cramer,1782)*:* RW- 14, 26

263. *Thyas coronata* Fabricius, 1775*:* RW- 26

264. *Thyas honesta* (Hubner, 1806)*:* RW- 26, 27

265. *Tigrioides fulveola* Hampson, 1900*:* RW- 26

266. *Trigonodes hyppasia* (Cramer, [1779])*:* RW- 14, 27

267. *Trisula variegata* Moore, 1857*:* RW- 14

268. *Utetheisa lotrix* (Cramer, 1779)*:* RW- 27

269. *Utetheisa pulchella* (Linnaeus, 1758)*:* RW- 27

270. *Utetheisa pulchelloides* Hampson, 1907*:* RW- 14

271. *Vamuna ramelana* (Moore, 1900)*:* RW- 26

Family HESPERIIDAE

272. *Ampittia dioscorides* (Fabricius, 1793)*:* RW- 26, 27

273. *Badamia cinnara* (Wallace, 1866)*:* RW- 14

274. *Badamia exclamationis* Fabricius, 1775: RW- 14, 16, 27

275. *Baoris farri* (Moore, 1878)*:* RW- 27

276. *Baoris kumara:* RW- 22

277. *Borbo bevani* (Moore, 1878)*:* RW- 27

278. *Borbo cinnara* (Wallace, 1866): RW- 14, 26, 27

279. *Celaenorrhinus ambareesa* (Moore, [1866])*:* RW- 27

280. *Caltoris cahira* Moore*:* RW- 40

281. *Gangara thyrsis* Fabricius, 1775: RW- 15, 27

282. *Halpe porus* (Mabille, 1877)*:* RW- 27

283. *Hasora badra* (Moore, 1858): RW- 27

284. *Hasora butleri* Aurivill: RW- 16

285. *Hasora chromus* (Cramer): RW- 28

286. *Hasora vitta* (Butler, 1870): RW- 27

287. *Hesperia comma :* RW- 6

288. *Hyarotis adrastus* (Stoll, 1780): RW- 27

289. *Lambrix salsala* Moore, 1865: RW- 26, 27

290. *Matapa aria* Moore, 1866: RW- 14, 26, 27

291. *Notocrypta curvifascia* Felder: RW- 5

292. *Notocrypta paralysos* (Wood-Mason & de Niceville, 1881)*:* RW- 27

293. *Oriens gola* (Moore, 1877)*:* RW- 26

294. *Oriens goloides* Moore, 1881: RW- 26, 27

295. *Parnara bada* Moore, 1878: RW- 16, 27

296. *Parnara colaca* Moore: RW- 16

297. *Parnara guttatus* Bremer & Grey: RW- 5

298. *Parnara mathias* Fabricius: RW- 5, 16

299. *Pelopidas agna* (Moore, 1866)*:* RW- 26

300. *Pelopidas mathias* (Fabricius, 1798): RW- 4, 5,14, 26, 27, 28

301. *Polanthus pallida* Evans: RW- 5

302. *Polytremis eltola* Hewitson, 1869: RW- 5

303. *Pseudocoladenia dan* Fabricius, 1787: RW- 27

304. *Pyrgus cashmirensis* Moore, 1874*:* RW- 6

305. *Sarangesa dasahara* Moore, 1866: RW- 27, 28

306. *Spialia galba* Fabricius: RW- 4, 28

307. *Suastus gremius* (Fabricius, 1798): RW- 4, 5, 26, 27, 28, 41

308. *Tagiades japetus* (Stoll, [1781]): RW- 26, 27

309. *Taractrocera maevius* (Fabricius)*:* RW- 28

310. *Telicota ancilla* (Herrich-Schaffer, 1869)*:* RW- 26

311. *Telicota bambusae* (Moore, 1878): RW- 16, 27

312. *Telicota colon* (Fabricius, 1775): RW- 27

313. *Udaspes folus* (Cramer, [1775]): RW- 26, 27

Family DANAIDAE

314. *Euploea core core* Cramer: RW- 4, 5, 28, 29

315. *Parantica aglea melanoides* Moore: RW- 5
316. *Tirumala limniace leopardus* Butler: RW- 5
317. *Trimula hamata septentrionis* Butler: RW- 5

Family ZYGAENIDAE

318. *Balataea postvitta* Moore, 1879*:* RW- 26
319. *Gynautocera papilionaria* Guérin-Méneville, 1831*:* RW- 26
320. *Inope fuliginosa* Moore, 1879*:* RW- 26
321. *Thyrassia subcordata* Walker, 1854*:* RW- 26, 27
322. *Trypanophora semihyalina* Kollar, 1844*:* RW- 26

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323. *Acytolepis puspa* (Horsfield)*:* RW- 28
324. *Albulina metallica:* RW- 6
325. *Albulina omphisa:* RW- 6
326. *Anthene emolus* (Godart, 1824)*:* RW- 26, 27
327. *Anthene lycaenina lycambes* (Hewitson, 1878)*:* RW- 27
328. *Aphnaeus vulcanus* Fabricius: RW- 16
329. *Arhopala centaurus* (Fabricius, 1775)*:* RW- 27
330. Az*anus ubaldus* Cramer: RW- 16, 22, 28, 41
331. *Castalius rosimon* (Fabricius, 1775): RW- 4, 16, 26, 27, 28, 41
332. *Catachrysops cnejus* Fabricius: RW- 16
333. *Catachrysops strabo* (Fabricius, 1793): RW- 4, 16, 26, 27, 28
334. *Chilades lajus* (Stoll, [1780])*:* RW- 14, 16, 26, 27
335. *Chilades pandava* Horsfield*:* RW- 41
336. *Curetis bulis* Db. & Hew. : RW- 16
337. *Curetis phaedrus* Fabricius: RW- 16
338. *Curetis thetis* (Drury,[1773])*:* RW- 26, 27
339. *Euchrysops cnejus* (Fabricius, 1798): RW- 4, 22, 26, 27, 28
340. *Euchrysops pandava* Horsfield: RW- 4, 26
341. *Freyeria putli* Kollar: RW- 4
342. *Freyeria trochilus* Freyer*:* RW- 41
343. *Horaga onyx onyx* (Moore, 1858)*:* RW- 27
344. *Ionolyce helicon* (C. Felder, 1860)*:* RW- 27
345. *Iraota timoleon* Stoll.: RW- 16
346. *Jamides bochus* (Stoll)*:* RW- 28
347. *Jamides celeno* (Cramer, 1779]): RW- 26, 27, 28, 41
348. *Jamides celeno aelianus* (Fabricius, 1793)*:* RW- 14
349. *Lampides bochus* Cramer: RW- 16
350. *Lampides boeticus* (Linnaeus, 1767)*:* RW- 14, 27
351. *Lampides celeno* Cramer: RW- 16
352. *Leptotes plinius* (Fabricius, 1793)*:* RW- 27, 41
353. *Loxura atymnus* (Stoll, 1780): RW- 16, 26, 27
354. *Luthrodes pandava* (Horsefield, [1829])*:* RW- 27
355. *Mahathala ameria* (Hewitson, 1862)*:* RW- 27
356. *Megisba malaya* (Horsefield, [1828])*:* RW- 27
357. *Narathura atrax* Hewitson: RW- 4
358. *Neopithecops zalmora* (Butler, [1870]): RW- 16, 26, 27
359. *Polyommatus boeticus* Linnaeus: RW- 16
360. *Polyommatus florenciae:* RW- 6
361. *Prosotas dubiosa indica:* RW- 32, 36
362. *Prosotas nora* (C. Felder, 1860): RW- 4, 26, 27
363. *Pseudozizeeria maha* (Kollar, [1844]): RW- 4, 14, 26, 27, 28, 41
364. *Rapala amor:* RW- 27
365. *Rapala iarbus* Fabricius, 1787*:* RW- 14
366. *Rapala manea* (Hewitson, 1863): RW- 26, 27
367. *Rapala nissa* (Kollar, [1844]): RW- 27
368. *Rapala schistacea* Moore: RW- 4
369. *Rapala varuna (*Horsfleld, [1829]): RW- 27
370. *Rathinda amor* (Fabricius, 1775)*:* RW- 26, 27
371. *Spalgis epius* (Westwood, 1852)*:* RW- 27
372. *Spindasis elima* (Moore, 1877)*:* RW- 27
373. *Spindasis ictis* (Hewitson, 1865)*:* RW- 27, 41
374. *Spindasis vulcanus* (Fabricius, 1775): RW- 4, 14, 26, 27
375. *Surendra quercetorum:* RW- 41
376. *Tajuria cippus* (Fabricius, 1798)*:* RW- 27
377. *Tajuria jehana* Moore, 1883*:* RW- 27
378. *Talicada nyseus* (Guerin-Meneville,1843): RW- 27, 28
379. *Tarucus nara* Kollar, 1848*:* RW- 14, 26
380. *Tarucus callinara* Butler*:* RW- 40
381. *Virachola isocrates* Fabricius*:* RW- 15
382. *Zizeeria karsandra* (Moore, 1865): RW- 26, 27, 28, 32, 36
383. *Zizeeria otis* (Fabricius, 1787)*:* RW- 27, 28
384. *Zizera lysimon karsandra* Moore: RW- 16
385. *Zizula hylax* (Fabricius, 1775)*:* RW- 4, 26, 27, 41

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386. *Dendrolimus lattipenis* Walker, 1855*:* RW- 26
387. *Kunugia latipennis* (Walker, 1855)*:* RW- 27
388. *Metanastria hyrtaca* Cramer, 1782*:* RW- 26
389. *Streblote dorsalis* Walker, 1866*:* RW- 26
390. *Streblote siva* Lefebvre, 1827*:* RW- 26, 27
391. *Taragama siva* (Lefebvre, 1827)*:* RW- 14
392. *Trabala vishnou* (Lefebvre, 1827)*:* RW- 14, 26

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393. *Lethe rohria dytra* Felder: RW- 5
394. *Lethe rohria rohria* Fabricius: RW- 4
395. *Mycalesis mineus mineus* Linnaeus: RW- 4, 5, 41
396. *Mycalesis perseus:* RW- 41
397. *Mycalesis perseus blasius* Fabricius: RW- 4
398. *Ypthima ceylonica hubneri* Kirby: RW- 4
399. *Ypthima nareda nareda* Kollar: RW- 5
400. *Ypthima baldus* (Fabricius, 1775): RW- 26, 27, 28
401. *Ypthima huebneri* Kirby, 1871: RW- 26, 27, 28, 41
402. *Ypthima inica* Hewitson*:* RW- 40

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403. *Acherontia lachesis* (Fabricius, 1798): RW- 15, 26, 27
404. *Acherontia styx styx* (Westwood, 1848)*:* RW- 14, 26
405. *Acosmeryx naga* Moore 1857*:* RW- 26

406. *Agrius convolvuli convolvuli* (Linnaeus, 1758)*:* RW- 14, 26
407. *Callambulyx rubricosa* Walker 1856*:* RW- 26
408. *Cephonodes shylas* Linnaeus 1771*:* RW- 26
409. *Daphnis hypothous* Cramer 1780*:* RW- 26
410. *Daphnis nerii* Linnaeus 1758*:* RW- 26
411. *Eupana cramydon* Walker, 1856*:* RW- 26
412. *Hippotion boerhaviae* (Fabricius, 1775)*:* RW- 14
413. *Hippotion celerio* (Linnaeus, 1758): RW- 5, 27
414. *Leucophlebia lineata* Westwood 1847*:* RW-
415. *Macroglossum assimilis* Swainson 1821*:* RW- 26
416. *Macroglossum glaucoptera* Butler, 1875*:* RW- 26
417. *Marumba dyras dyras* (Walker,1856)*:* RW- 14
418. *Meganoton analis* C. Felder & R. Felder 1874: RW- 5, 26
419. *Meganoton rufescens rufescens* (Butler, 1875)*:* RW- 14
420. *Neogurelca hylas* Walker, 1856*:* RW- 26
421. *Nephele didyma* Fabricius, 1775: RW- 5, 14
422. *Nephele hespera* Fabricius, 1775*:* RW- 26
423. *Pergesa acteus* Cramer, 1779*:* RW- 26
424. *Polyptychus trilineatus* Moore: RW- 5
425. *Psilogramma menephron* Cramer, 1780: RW- 5, 14, 26
426. *Sataspes infernalis* Westwood 1848*:* RW- 26
427. *Theretra alecto* Linnaeus, 1758: RW- 5, 14, 26
428. *Theretra clotho clotho* Drury 1773*:* RW- 26
429. *Theretra latreillii* (MacLeay, [1826])*:* RW- 27
430. *Theretra nessus* Drury, 1773: RW- 5, 26
431. *Theretra oldenIandie* Fabricius, 1775: RW- 5, 14
432. *Theretra pinastrina* Martyn, 1797*:* RW- 26
433. *Theretra silhetensis* (Walker, 1856)*:* RW- 27

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434. *Aethaloessa floridalis* Zeller, 1852*:* RW- 26
435. *Agathodes ostentalis* Geyer, 1837*:* RW- 26
436. *Agrotera basinotata* Hampson, 1891*:* RW- 26
437. *Analyta melanopalis* Guenee, 1854*:* RW- 26
438. *Analyta sigulalis* Guenee, 1854*:* RW- 26
439. *Ancylolomia chrysographella* (Kollar, 1844)*:* RW- 26
440. *Antigastra catalaunalis* Duponchel, 1833*:* RW- 26
441. *Archernis tropicalis* Walker, 1859*:* RW- 26
442. *Arthroschista hilaralis* Walker, 1859*:* RW- 26
443. *Autocharis fessalis* Swinhoe, 1887*:* RW- 26
444. *Bocchoris acamasalis* Walker, 1859*:* RW- 26
445. *Botyodes asialis* Guenee, 1854*:* RW- 26, 27
446. *Botyodes flavibasalis* Moore, 1867*:* RW- 26
447. *Bradina admixtalis* Walker, 1859*:* RW- 26
448. *Ceratarcha umbrosa* Swinhoe, 1894*:* RW- 26
449. *Chilo* sp.*:* RW- 26
450. *Cirrhochrista brizoalis* (Walker, 1859)*:* RW- 14, 26
451. *Cnaphalocrocis medinalis* (Guenee, 1854)*:* RW- 14, 26, 27
452. *Cnaphalocrocis pauperalis* Strand, 1918*:* RW- 26
453. *Cnaphalocrocis trapezalis* Guenee, 1854*:* RW- 26, 27
454. *Cnaphalocrocis trebiusalis* Walker, 1859*:* RW- 26
455. *Cnaphalocrocis venilialis* Walker, 1859*:* RW- 26
456. *Crocidolomia binotalis* Zeller,1852*:* RW- 26
457. *Cryptographis indica* (Saunders, 1851)*:* RW- 26,,27
458. *Cydalima conchylalis* Guenee, 1854*:* RW- 14
459. *Cydalima laticostalis* Guenee, 1854*:* RW- 26
460. *Diaphania indica* (Saunders, 1851)*:* RW- 14
461. *Dichocrocis evaxalis* Walker, 1859*:* RW- 26
462. *Dolicharthrina punctalis* (Denis & Schiffermuller, 1775)*:* RW- 27
463. *Dysallacta negatalis* Walker, 1859*:* RW- 26
464. *Ercta elutalis* Walker, 1859*:* RW- 26
465. *Euclasta defamatalis* Walker, 1859*:* RW- 26
466. *Eurrhyparodes bracteolalis* Zeller, 1852*:* RW- 26
467. *Eurrhyparodes tricoloralis* Zeller, 1852*:* RW- 26
468. *Glyphodes bicolar* Swainson, 1821*:* RW- 26
469. *Glyphodes bivitralis* Guenee, 1854*:* RW- 26
470. *Glyphodes caesalis* Walker, 1859*:* RW- 26
471. *Glyphodes canthusalis* Walker, 1859*:* RW- 26
472. *Glyphodes pyloalis* Walker, 1859*:* RW- 26
473. *Glyphodes* sp.*:* RW- 26
474. *Glyphodes stolalis* Guenee, 1854*:* RW- 26
475. *Herpetogramma licarsisalis* Walker, 1859*:* RW- 26
476. *Herpetogramma* sp.*:* RW- 26
477. *Hyalobathra filalis* Guenee, 1854*:* RW- 26
478. *Hydriris ornatalis* Duponchel, 1832*:* RW- 26
479. *Hydrorybina bicolor* Moore, 1888*:* RW- 26
480. *Hymenoptychis sordida* (Zeller, 1852)*:* RW- 26, 27
481. *Lepyrodes geometralis* (Guenee, 1854)*:* RW- 26
482. *Leucinodes apicalis* Hampson, 1896*:* RW- 26
483. *Leucinodes orbonalis* Guenee, 1854*:* RW- 26, 27
484. *Loxoneptera albicostalis* Swinhoe, 1906*:* RW- 26
485. *Maruca testulalis* Geyer, 1832*:* RW- 26
486. *Maruca vitrata* Fabricius, 1787*:* RW- 26
487. *Mimudea leucanalis* Swinhoe, 1890*:* RW- 26
488. *Nausinoe perspectata* (Fabricius, 1775)*:* RW- 26
489. *Noorda blitealis* Walker, 1859*:* RW- 26
490. *Notarcha quaternalis* Zeller, 1852*:* RW- 26
491. *Nymphula depunctalis* Guenee, 1854*:* RW- 15
492. *Nymphula fluctuosalis* Zeller, 1852*:* RW- 14
493. *Nymphula responsalis* Walker, 1865*:* RW- 27
494. *Palpita vitrealis* (Rossi, 1794)*:* RW- 26
495. *Paraponyx crisonalis* Walker, 1859*:* RW- 26
496. *Paraponyx depunctalis* Guenee, 1854*:* RW- 26
497. *Parapoynx diminutalis* (Snellen, 1880)*:* RW- 27
498. *Parapoynx fluctuosalis* (Zeller, 1852)*:* RW- 14, 26, 27
499. *Parotis marginata* Hampson, 1893*:* RW- 26
500. *Parotis marinata* (Fabricius 1794)*:* RW- 26
501. *Parotis vertumnalis* Guenee, 1854*:* RW- 26
502. *Pleuroptya balteata* (Fabricius 1798)*:* RW- 26
503. *Polygrammodes sabelialis* Guenee, 1854*:* RW- 26
504. *Pycnarmon abraxalis* Walker, 1866*:* RW- 27

505. *Pycnarmon caberalis* Guenee, 1854*:* RW- 26
506. *Pycnarmon meritalis* Walker, 1859*:* RW- 26
507. *Pycnarmon virgatalis* Moore 1867*:* RW- 26
508. *Pygospila tyres* Cramer, 1780*:* RW- 14, 26
509. *Pyrausta diniasalis* (Walker, 1859)*:* RW- 14
510. *Pyrousta incoloralis* Guenee, 1854*:* RW- 26
511. *Ramila marginella* Moore 1868*:* RW- 26
512. *Ramila sundarbanensis* Biswas, Shah, Modak & Mitra, 2017*:* RW- 27
513. *Sameodes cancellalis* (Zeller, 1852)*:* RW- 14, 26, 27
514. *Schoenobius adjurellus* Walker, 1863*:* RW- 26
515. *Schoenobius bipunctifer* Walker, 1863*:* RW- 26
516. *Schoenobius immeritalis* Walker, 1859*:* RW- 26
517. *Schoenobius incertellus* Walker, 1863*:* RW- 26
518. *Scirpophaga bisignatus* Swinhoe, 1885*:* RW- 27
519. *Scirpophaga incertulas* (Walker, 1863)*:* RW- 27
520. *Scirpophaga nivella* (Fabricius, 1794)*:* RW- 27
521. *Spoladea recurvalis* Fabricius, 1775*:* RW- 14, 27
522. *Syllepte derogata* Fabricius, 1775*:* RW- 26
523. *Syllepte lunalis* Guenee, 1854*:* RW- 26
524. *Synclera trauducalis* Zeller, 1852*:* RW- 26
525. *Syngamia abruptalis* (Walker, 1859)*:* RW- 27
526. *Talanga sexpunctalis* Moore, 1877*:* RW- 26
527. *Tatobotys varanesalis* Walker, 1858*:* RW- 26
528. *Terastia meticulosalis* Guenee, 1854*:* RW- 26
529. *Tetridia caletoralis* (Walker, 1859)*:* RW- 26, 27
530. *Tryporyzo incertulus* Walker*:* RW- 15
531. *Tryporyzo innotata* Walker*:* RW- 15
532. *Tyspanodes linealis* (Moore, 1867)*:* RW- 14

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533. *Ausaris argenteola* (Moore, 1858)*:* RW- 27

Family ELASCHITIDAE

534. *Thudaca obliquella* Walker, 1856*:* RW- 26

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535. *Argina argus* Kollar: RW- 5
536. *Creatonotus transiens* Walker: RW- 5
537. *Cyana gelida* Walker: RW- 5
538. *Cyana puella* Drury, 1773: RW- 5, 14
539. *Estigmene biguttata (*Walker, 1855)*:* RW- 14
540. *Estigmene nigricans* (Moore, 1872)*:* RW- 14
541. *Hypsa ficus* Fabricius: RW- 5
542. *Olepa ricini* (Fabricius, 1775)*:* RW- 14
543. *Strysopha torticoides* Walker: RW- 5
544. *Zadadra distorta* Moore: RW- 5

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545. *Anua tirhaca* Cramer: RW- 5
546. *Aucha velans* (Walker, 1857)*:* RW- 27
547. *Chasmina candida* (Walker, 1865)*:* RW- 27
548. *Chrysodeixis eriosoma* Doubleday, 1843: RW- 5, 14, 26
549. *Fodina pallula* Guenee: RW- 5
550. *Helicoverpa armigera* (Hubner, 1827)*:* RW- 14
551. *Helicoverpa assulta* Guen'ee, 1852*:* RW- 14
552. *Hyblaea puera* Cramer: RW- 27
553. *Ischyia manlia* Cramer: RW- 5
554. *Leucania compta* (Moore, 1881)*:* RW- 27
555. *Lophoptera costata* (Moore, 1885)*:* RW- 27
556. *Ophiusa coronata* Fabricius: RW- 27
557. *Ophiusa tirrhaca* Hampson, 1780*:* RW- 14
558. *Paectes subapicalis* (Walker,[1858])*:* RW- 27
559. *Polydesma inangulata* (Guenee)*:* RW- 27
560. *Prospalta dolorosa* (Walker, 1865)*:* RW- 27
561. *Pseudaletia unipuncta* Haworth, 1809*:* RW- 26
562. *Psimada quadripennis* Walker: RW- 5
563. *Spirama retorta* (Clerck, 1764): RW- 5, 14
564. *Spodoptera litura* (Fabricius, 1775): RW- 14, 26, 27
565. *Thysanoplusia orichalcea* (Fabricius, 1775)*:* RW- 14

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566. *Carea angulata* Fabricus, 1793*:* RW- 14
567. *Gardirtha pulchra* (Butler, 1886)*:* RW- 27

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568. *Agathia lycaenaria* (Kollar, 1844)*:* RW- 26, 27
569. *Ascotis selenaria* (Schiffermuller, 1775)*:* RW- 14
570. *Ascotis* sp.*:* RW- 26
571. *Boarmia boarmiaria* Guenee: RW- 5
572. *Buzura suppressaria* (Guen'ee, 1858)*:* RW- 14
573. *Cleora determinata* Walker, 1860*:* RW- 27
574. *Cleora injectaria:* RW- 27
575. *Comibaenacassidara* Guenee, 1857*:* RW- 14
576. *Epipristis minimaria* Guenee, 1857*:* RW- 26
577. *Gelasma goniaria* Felder, 1875*:* RW- 26
578. *Gonodontis clelia* (Cramer, [1780])*:* RW- 27
579. *Hyposidra talaca* (Walker, 1860): RW- 14, 27
580. *Macaria fasciata* (Fabricius, 1775)*:* RW- 14
581. *Maxates* sp.: RW- 5
582. *Metoeca foedalis:* RW- 26
583. *Micronissa costata* Butler: RW- 5
584. *Pelagodes* sp.*:* RW- 26
585. *Problepsis vulgaris* Butler, 1889*:* RW- 26
586. *Scopula actuaria* Walker, 1861*:* RW- 26
587. *Scopula aspilataria* Walker, 1861*:* RW- 26
588. *Scopula emissaria* (Walker, 1861)*:* RW- 26
589. *Scopula pulchellata* Fabricius, 1794*:* RW- 14, 26
590. *Scopula remotata* Guenee, 1858*:* RW- 26
591. *Scopula* sp.*:* RW- 26
592. *Semiothisa pluviata* Fabricius, 1795*:* RW- 26
593. *Somatina anthophilata* Guen'ee, 1857*:* RW- 14
594. *Thalassodes quadraria* (Guenee, 1857)*:* RW- 26
595. *Timandra convectaria* Walker, 1861*:* RW- 26
596. *Timandra correspondens* Hampson, 1895*:* RW- 27
597. *Timandra mundissima* Walker, 1861*:* RW- 14
598. *Traminda* sp.*:* RW- 26

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599. *Botyodes asialis* Guenee: RW- 5, 27
600. *Canthelea oegnusalis* (Walker, 1859)*:* RW- 27
601. *Cnaphalocrocis medinalis* Guen'ee, 1854: RW- 14, 27

602. *Cnaphalocrocis trapezalis:* RW- 27
603. *Euzophera particella* Ragonot, 1888*:* RW- 26
604. *Galleria mellonella* Linnaeus, 1758*:* RW- 26
605. *Herculia marthalis* (Walker, 1859)*:* RW- 27
606. *Herculia nigrivitta* Walker, 1863*:* RW- 26
607. *Herculia suffusalis* [Walker, 1866]*:* RW- 26
608. *Hypsipyla robusta* (Moore, 1886)*:* RW- 27
609. *Maruca testulalis* Geyer: RW- 5, 14
610. *Nausinoe pueritia* Cramer: RW- 5
611. *Oligochroa leucophaeella* Zeller, 1863*:* RW- 26
612. *Orthopygia igniflualis* Walker, 1859*:* RW- 26
613. *Phycita hemixanthella* Hampson, 1856*:* RW- 26
614. *Pyralis manihotalis* Guenee, 1854*:* RW- 26
615. *Pyralis pictalis* Curtis, 1834*:* RW- 26
616. *Tamaraca torridalis* Lederer, 1834*:* RW- 26
617. *Terastia egialealis* Walker: RW- 5
618. *Thylacoptila paurosema* Meyrick, 1885*:* RW- 26

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619. *Abisara echerius* (Stoll, 1790)*:* RW- 26, 27

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620. *Abacetus antiquus* Dej.: RW- 16
621. *Abacetus* H.E. Andrewes: RW- 16
622. *Abacetus reflexus* Chaud.: RW- 16
623. *Amblystomus punctatus* Bates: RW- 16
624. *Amblystomus* sp.*:* RW- 26
625. *Barysomus semivittatus* Fabricius: RW- 16
626. *Callistomimus* H.E. Andrewes*:* RW- 16
627. *Chlaenius henryi* Andrewes*:* RW- 16
628. *Clivina attenuate* Herbst*:* RW- 16
629. *Clivina lobata* Bon.: RW- 16
630. *Clivina mordax* Putz.: RW- 16
631. *Clivina* sp.: RW- 16
632. *Cnaphalocrocis medinalis* Guenée, 1854*:* RW- 15
633. *Coleolissus* H.E. Andrewes: RW- 16
634. *Coptodera transversa* Schm. Goeb.: RW- 16
635. *Cosmodiscus picturatus* Andrewes: RW- 16
636. *Craspedophorus bifasciatus* Cast: RW- 16
637. *Dioryche chinnada* H.E. Andrewes: RW- 16
638. *Dioryche colombensis* Nietn: RW- 16
639. *Dioryche nagpurensis* Bates: RW- 16
640. *Dyschirius* sp.: RW- 16
641. *Harpalus advolans* Nietn: RW- 16
642. *Morio orientalis* Dej: RW- 16
643. *Omphra atrata* Klug.: RW- 16
644. *Omphra complanata* Reiche: RW- 16
645. *Ophionea indica* Thunb.: RW- 16
646. *Orthogonius* sp.: RW- 16
647. *Oxylobus costatus* Chaud.: RW- 16
648. *Pheropsophus tripustulatus* Fabricius: RW- 16
649. *Platymetopus flavilabrist* Fabricius: RW- 16
650. *Platymetopus rugosus* Nietn: RW- 16
651. *Pogonus biroi* Cziki: RW- 16
652. *Scarites indus* Oliv: RW- 16
653. *Scarites terricola* Bon.: RW- 16
654. *Tachys emarginatus* Nietn: RW- 16
655. *Tachys ornatus* Apetz: RW- 16
656. *Tetragonoderus quadrinotatus* Fabricius: RW- 16
657. *Velinda* H.E. Andrewes: RW- 16
658. *Velinda lirata* H.E. Andrewes: RW- 16

Family NOTODONTIDAE

659. *Antheua servula* (Drury, 1773)*:* RW- 14
660. *Lymantria mathura* Moore, 1865*:* RW- 14
661. *Norraca longipennis* Moore, 1881*:* RW- 27
662. *Perina nuda* (Fabricius, 1787)*:* RW- 14
663. *Phalera raya* Moore, 1859*:* RW- 14

Family COSSIDAE

664. *Azygophleps scalaris* (Fabricius, 1775)*:* RW- 27
665. *Zeuzera coffeae* Neitner, 1861*:* RW- 15, 27
666. *Zeuzera conferta* Walker, 1856*:* RW- 27

Family PTEROPHORIDAE

667. *Antarches milliararia* Linnaeus: RW- 15
668. *Exelastis atomosa* (Walsingham, 1885): RW- 15
669. *Hellinsia homodactyla:* RW- 26

Family EUPTEROTIDAE

670. *Eupterote hibisci* (Fabricius, 1775): RW- 27

Diptera

The Diptera, commonly called true flies or two-winged flies, are a group of familiar insects that includes mosquitoes, black flies, midges, fruit flies, and house flies. They are among the most highly specialized members of the Class Insecta. The group is ubiquitous and cosmopolitan, having successfully colonized nearly every habitat and all continents, including Antarctica. Dipterans are holometabolous, and readily recognized by the development of hind (metathoracic) wings as balancers, or halteres (halters), and in the larval stages by lack of true legs and the often maggot-like appearance. Venation of the fore (mesothoracic) flying wings ranges from complex to extremely simple. Mouthparts range from biting-and-sucking (e.g., biting midges and mosquitoes) to "lapping"-type with pseudotracheate labella functioning as a sponge (e.g., house flies). It is the Permian period that gave birth to modem orders of insects and it is thought that the Diptera evolved from the Mecopterous ancestors. The order Diptera is classified into three suborders: Nematocera (primitive forms), Brachycera (intermediate forms) and Cyclorrhapha (advanced forms). An earlier classification into two suborders: Orthorrhapha (Nematocera and Brachycera together) and Cyclorrhapha, is rarely adopted now-a-days. The Diptera are among the most diverse insect orders, with over 130 families and approximately 150,000 described species worldwide. From the Indian Ramsar sites, 298 species of dipterans have been reported so far (Table 34).

Table 34. Diversity of Dipterans from Ramsar Wetlands of India.

Class INSECTA
Order DIPTERA
Family PSYCHODIDAE

1. *Clogmia albipunctata* Williston: RW- 3
2. *Phlebotomus argentipes* Annadale & Brunetti, 1908*:* RW- 27
3. *Phlebotomus* sp.: RW- 3
4. *Psychoda alternata* Say, 1824: RW- 3, 14, 27
5. *Psychoda bengalensis* Brunetti*:* RW- 27
6. *Psychoda nigripennis* Brunetti, 1908*:* RW- 27
7. *Sergentomyia (Parrotomyia) babu* (Annadale, 1910)*:* RW- 27
8. *Sergentomyia Montana* (Sinton, 1924)*:* RW- 27

Family RHINIIDAE

9. *Idiella mandarina* (Wiedemann, 1830)*:* RW- 27
10. *Isomyia viridaurea* (Wiedemann, 1819)*:* RW- 26
11. *Stomorhina discolour* (Fabricius, 1794)*:* RW- 26, 27

Family STRATIOMYIDAE

12. *Adoxomyia heminopla* Wiedemann: RW- 3, 5
13. *Hermetiaillucens* (Linnaeus, 1758)*:* RW- 26
14. *Microchrysa flaviventris* (Wiedemann, 1824)*:* RW- 26
15. *Odontomyia dorsoangulata* Burnetti*:* RW- 27
16. *Odontomyia kashmirensis* Brunetti, 1920*:* RW- 27
17. *Odontomyia minuta* Fabricius: RW- 16, 27
18. *Odontomyia ochropa* Thomson, 1869*:* RW- 27
19. *Odontomyia rubrithorax* Macquart*:* RW- 27
20. *Odontomyia viridana* (Wiedemann, 1824)*:* RW- 27
21. *Oplodontha rubrithorax* Macquart: RW- 3, 5
22. *Prosopochrysa vitripennis* (Doleschall, 1856)*:* RW- 27
23. *Ptecticus australis* Schiner: RW- 3
24. *Sargus metallinus* Fabricius, 1805: RW- 3, 27
25. *Tinda indica* (Walker, 1851)*:* RW- 27

Family TABANIDAE

26. *Afidena mimetica* Dickle*:* RW- 15
27. *Atylotus agrestis* Fabricius*:* RW- 27
28. *Atylotus virgo* (Wiedemann, 1824)*:* RW- 27
29. *Chrysops designatus* Ricardo, 1911*:* RW- 27
30. *Chrysops dispar* Fabricius, 1798*:* RW- 14, 26, 27
31. *Haematopota assamensis* Ricardo, 1911*:* RW- 14
32. *Haematopota javana* Wiedemann, 1821: RW- 14, 27
33. *Haematopota marginata* Ricardo, 1911*:* RW- 14
34. *Haematopota roralis* Fabricius, 1805*:* RW- 14
35. *Haentatopota* sp.: RW- 16
36. *Philoliche taprobanes* (Walker, 1854)*:* RW- 14
37. *Tabanus (Tabanus) abscondens* Walker, 1860*:* RW- 14
38. *Tabanus (Tabanus) brunnipennis* Ricardo, 1911*:* RW- 26, 27
39. *Tabanus (Tabanus) diversifrons* Ricardo, 1911*:* RW- 27
40. *Tabanus (Tabanus) indianus* Ricardo: RW- 3, 14
41. *Tabanus (Tabanus) jucundus* Walker, 1848*:* RW- 14
42. *Tabanus (Tabanus) leucohirtus* Ricardo: RW- 3
43. *Tabanus (Tabanus) macer* (Bigot, 1892)*:* RW- 27
44. *Tabanus (Tabanus) melanognathus* Bigot*:* RW- 15
45. *Tabanus (Tabanus) monotaeniatus* (Bigot, 1892)*:* RW-

14

46. *Tabanus (Tabanus) rubidus* Wiedemann, 1821*:* RW- 26, 27

47. *Tabanus (Tabanus) striatus* Fabricius, 1787: RW- 3, 5, 14, 16, 26, 27

48. *Tabanus (Tabanus) tenens* Walker, 1850*:* RW- 27

49. *Tabanus dorsiger* Wiedemann, 1821*:* RW- 27

50. *Tabanus rufiventris* Fabricius, 1805*:* RW- 27

Family ASILIDAE

51. *Allocotasia aurata* Fabricius: RW- 16

52. *Astochia guptai* Joseph & Parui, 1981*:* RW- 26

53. *Philodicus ceylanicus* Schiner, 1868*:* RW- 26

54. *Philodicus femoralis* Ricardo, 1921*:* RW- 26, 27

55. *Philodicus javanus* (Wiedemann, 1819)*:* RW- 27

56. *Stichopogon indicus* Joseph & Parui: RW- 3

57. *Stichopogon meridionalis* Oldroyd: RW- 3

Family BOMBYLIIDAE

58. *Anastoechus barbatus* Osten Sacken, 1877*:* RW- 32, 36

59. *Anthrax afra* Fabricius: RW- 16

60. *Anthrax bipunctatus* Fabricius: RW- 3

61. *Anthrax distigma* Weidemann: RW- 3, 27

62. *Bombylius* sp.: RW- 16

63. *Bombylius wulpii* Brunetti: RW- 16

64. *Exoprosopa (Exoprosopa) insulata* Walker: RW- 3

65. *Exoprosopa flammea* Brunetti: RW- 16

66. *Exoprosopa pennipes* Weidemann : RW- 16

67. *Hyperalonia suffusipennis* Brunetti: RW- 16

68. *Micomitra vitrea* (Bigot, 1892)*:* RW- 27

Family CHIRONOMIDAE

69. *Calyptopogon albitarsis* Kieff: RW- 16

70. *Chironomus barbatitarsis* Keiffer, 1911*:* RW- 27

71. *Chironomus bharati* Singh & Kulshrestha, 1976: RW- 21

72. *Chironomus* sp.: RW- 3, 21,31, 27

73. *Chironomus tendipediformis:* RW- 19

74. *Chironomus tentans:* RW- 19

75. *Chironomus uttarpradeshensis* Singh & Kulshrestha, 1976*:* RW- 21

76. *Cladotanytarsus aduncus* Mazumdar & Chaudhuri, 2000*:* RW- 27

77. *Cladotanytarsus atridorsum* (Kieffer, 1924)*:* RW- 27

78. *Cladotanytarsus nigrovittatus* (Goetghebuer, 1922)*:* RW- 27

79. *Cladotanytarsus ovatus* Mazumdar & Chaudhuri, 2000*:* RW- 27

80. *Cladotanytarsus tasmanicus* Glover, 1973*:* RW- 27

81. *Cladotanytarsus verbosus* Mazumdar & Chaudhuri, 2000*:* RW- 27

82. *Clinotanypus vomerus* (Chaudhuri & Debnath), 1984*:* RW-

83. *Cricotopus pentazonus* Kieffer: RW- 3

84. *Cricotopus sylvestris* Fabricius, 1794: RW- 13

85. *Diamesa* sp.: RW- 13

86. *Dicrotendipes* sp.: RW- 3

87. *Krenosmittia lamminansis:* RW- 8

88. *Krenosmittia longulusi:* RW- 8

89. *Micropsepectraspatulata* Maheshwari & Maheshwari: RW- 8

90. *Micropspectrachanderi* Mahehwari & Maheshwari: RW- 8

91. *Micropspectrachandrarolensis* Mahehwari & Maheshwari: RW- 8

92. *Micropspectrahimachali* Maheshwari & Maheshwari: RW- 8

93. *Micropspectralahulensis* Maheshwari & Maheshwari: RW- 8

94. *Polypedilum angustiforceps* Kieffer, 1913: RW- 3, 21

95. *Smittia spicai:* RW- 8

96. *Smittia spiculumiensis:* RW- 8

97. *Tanypus khandariensis* Singh & Kulshrestha, 1975*:* RW- 21

98. *Tanypus riparius* Kiffer, 1911*:* RW- 21

99. *Tanypus* sp.*:* RW- 19

100. *Tanytarsus fasciculus* Chaudhuri & Mazumdar, 1998*:* RW- 27

101. *Tanytarsus insulus* Mazumdar, 1998*:* RW- 27

102. *Tanytarsus khandariensis* Singh & Kulshrestha, 1975*:* RW- 21

103. *Tanytarsus manleyensis* Glover, 1973*:* RW- 27

104. *Tanytarsus piratus* Chaudhuri & Mazumdar, 1998*:* RW- 27

105. *Tanytarsus rieki* Glover, 1973*:* RW- 27

106. *Tanytarsus ungulituberculatr* Singh & Kulshrestha, 1975*:* RW- 21

107. *Tanytarsus uvus* Chaudhuri & Mazumdar, 1998*:* RW- 27

Family CHLOROPIDAE

108. *Cadrema pallida var. bilineata* (de Meijere, 1904)*:* RW- 27

Family CULICIDAE

109. *Aedeomyia catastica* Knab: RW- 27

110. *Aedes (Stegomyia) aegypti* (Linnaeus, 1762)*:* RW- 26

111. *Aedes (Stegomyia) albopictus* (Skuse, 1894)*:* RW- 26

112. *Aedes culicifacies* Giles, 1901: RW- 16, 26

113. *Aedes fumidus* Edwards, 1928*:* RW- 27

114. *Aedes niveus* Ludlow, 1903*:* RW- 27

115. *Aedes* sp.*:* RW- 32, 36

116. *Anopheles (Cellia) stephensi* Liston, 1901*:* RW- 26

117. *Anopheles ahomi* Chowdhury*:* RW- 15

118. *Anopheles larvae:* RW- 13

119. *Anopheles peditaeniatus* (Leicester, 1904)*:* RW- 27

120. *Anopheles pseudojamesi* Strickland & Chowdhury, 1927*:* RW- 27

121. *Anopheles ramsayi* Covell, 1927*:* RW- 27

122. *Anopheles subpictus* Grassi, 1899: RW- 16, 27

123. *Anopheles sundaicus* Roden Waldt*:* RW- 27

124. *Anopheles vagus* Donitz, 1902*:* RW- 27

125. *Armigeres kuchingensis* Edwards, 1915*:* RW- 27
126. *Armigeres subalbatus* (Coquillett, 1898)*:* RW- 27
127. *Culex concolor* R. D.: RW- 16
128. *Culex edwarsi* Barraud*:* RW- 15
129. *Culex fuscanus* Wiedemann, 1820*:* RW- 27, 29
130. *Culex malayi* (Leicester, 1908)*:* RW- 27
131. *Culex pseudovishnui* Colless, 1957*:* RW- 27
132. *Culex quinquefasciatus* Say, 1823*:* RW- 14, 26, 27
133. *Culex sinensis* Theobald*:* RW- 15
134. *Culex sitiens* Wiedemann, 1828*:* RW- 16, 27
135. *Culex* sp.*:* RW- 31
136. *Culex tritaeniorhynchus* Giles, 1901*:* RW- 27
137. *Culex vishnui* Theobald, 1901*:* RW- 27
138. *Heizmannia complex:* RW- 15
139. *Lutzia fuscans* Wiedemann: RW- 27
140. *Mansonia annulifera* Theobald, 1901*:* RW- 27
141. *Mansonia indiana* Edwards, 1930*:* RW- 27
142. *Stegomyia albopicta* Skuse, 1894: RW- 16, 27
143. *Stegomyia walba* Theobald: RW- 16
144. *Taeniorhynchus annuliferus* Theobald: RW- 27
145. *Taeniorhynchus uniformis* Theobald: RW- 27
146. *Toxorhynchites (Toxorhynchites) splendens* (Wiedemann, 1819)*:* RW- 26
147. *Tripteriodes triperoides indicus* Barraud: RW- 15

Family SYRPHIDAE

148. *Allobaccha (Allobaccha) amphithoe* (Walker, 1849)*:* RW- 27
149. *Allobaccha (Allobaccha) apicalis* (Loew, 1858)*:* RW- 27
150. *Asarkina (Asarkina) ericetorum* (Fabricius, 1781)*:* RW- 27
151. *Dideopsis aegrota* (Fabricius, 1805)*:* RW- 27
152. *Episyrphus balteatus* De Geer, 1776: RW- 3, 5, 15, 26, 27
153. *Eristalinus (Eristalinus) arvorum* Fabricius, 1787: RW- 3, 26, 27
154. *Eristalinus (Eristalinus) megacephalus* (Meijere, 1908)*:* RW- 27
155. *Eristalinus (Eristalinus) polychromata* (Brunetti, 1923)*:* RW- 26
156. *Eristalinus (Eristalinus) quadristriatus* (Macquart, 1846)*:* RW- 27
157. *Eristalinus (Eristalinus) quinquestriatus* (Fabricius, 1794)*:* RW- 26
158. *Eristalis (Eristalis) tenax* Linnaeus, 1758*:* RW- 15, 26, 27
159. *Eristalis obscuritarsis* Mey.*:* RW- 27
160. *Helophilus quadrivittatus* Wiedemann*:* RW- 27
161. *Ischiodon scutellaris* (Fabricius, 1805)*:* RW- 27
162. *Mesembrius (Mesembrius) quadrivittatus* (Wiedemann, 1819)*:* RW- 26, 27
163. *Mesembrius bengalensis* (Wiedemann, 1819)*:* RW- 26
164. *Paragus serratus* Fabricius, 1805: RW- 16, 26, 27
165. *Phytomia (Dolichomerus) crassa* Fabricius: RW- 5, 27
166. *Sphaerophoria indiana* Bigot, 1884*:* RW- 26
167. *Syritta indica* (Wiedemann, 1824)*:* RW- 26, 27
168. *Syritta orientalis* Macquart, 1842*:* RW- 27
169. *Syritta rufifacies* Big*:* RW- 27

Family SCIOMYZIDAE

170. *Sepedon plumbella* Wiedemann, 1830: RW- 5, 26

Family PIPUNCULIDAE

171. *Pipunculus biroi* Kertesz, 1903: RW- 27

Family HIPPOBOSCADAE

172. *Hippobosca variegate* Megerle, 1803: RW- 3, 26

Family DROSOPHILIDAE

173. *Drosophila ananassae* Doleschall, 1858*:* RW- 26
174. *Drosophila (Sophophora) melanogaster* (Meigen 1830)*:* RW- 26

Family MUSCIDAE

175. *Gymnodia tonitrui* Wiedemann: RW- 5
176. *Musca (Byomya) conducens* Walker, 1859*:* RW- 27
177. *Musca (Byomya) confiscate* Speiser, 1924*:* RW- 27
178. *Musca (Byomya) emdeni* Nandi & Sinha, 2004*:* RW- 27
179. *Musca (Byomya) pattoni* Austen, 1910*:* RW- 27
180. *Musca (Byomya) sorbens* Wiedemann, 1830*:* RW- 27
181. *Musca (Byomya) ventrosa* Wiedemann, 1830*:* RW- 27
182. *Musca (Eumusca) hervei* Villeneuve, 1922*:* RW- 27
183. *Musca (Eumusca) seniorwhitei* Patton, 1922*:* RW- 27
184. *Musca (Musca) domestica* Linnaeus, 1758 : RW- 3, 5, 27, 29
185. *Musca (Philaematomyia) crassirostris* Stein, 1903*:* RW- 27
186. *Muscina stabulans* (Fallen, 1817) *:* RW- 27
187. *Neomyia indica* (Robineau-Desvoidy, 1830)*:* RW- 27
188. *Neomyia lauta* (Wiedemann, 1830)*:* RW- 27
189. *Neomyia timorensis* (Robineau-Desvoidy, 1830)*:* RW- 5, 27
190. *Stomoxys calcitrans* (Linnaeus, 1758)*:* RW- 5, 27
191. *Stomoxys indicus* Picard, 1908*:* RW- 27
192. *Synthesiomyia nudiseta* (Van der Wulp, 1883)*:* RW- 27

Family CALLIPHORIDAE

193. *Bengalia bezzi* Senior-White, 1923*:* RW- 27
194. *Bengalia torosa* (Wiedemann, 1819)*:* RW- 26, 27
195. *Calliphora (Calliphora) vicina* Robineau-Desvoidy, 1830*:* RW- 27
196. *Chrysomya bezziana* Villeneuve, 1914*:* RW- 27
197. *Chrysomya indica* Sinha & Nandi, 2004*:* RW- 27
198. *Chrysomya megacephala* Fabricius, 1794: RW- 3, 5, 26, 27
199. *Chrysomya rufifacies* (Macquart, 1843)*:* RW- 27
200. *Hemipyrellia ligurriens* (Wiedemann, 1830)*:* RW- 26, 27
201. *Hemipyrellia pulchra* (Wiedemann, 1830)*:* RW- 27

202. *Lucilia (s. str.) cuprina* (Wiedemann, 1830)*:* RW- 27
203. *Lucilia (s. str.) papuensis* Macquart, 1843*:* RW- 27
204. *Lucilia (s. str.) porphyrina* (Walker, 1856)*:* RW- 26, 27
205. *Lucilia (s. str.) sericata* (Meigen, 1826)*:* RW- 27
206. *Parasarcophaga (Parasarcophaga) albiceps* Meigen: RW- 5

Family CECIDOMYIIDAE

207. *Stefaniola bengalensis* Mani, 1934*:* RW- 27

Family TIPULIDAE

208. *Conosia irrorata* Wiedemann: RW- 5, 16
209. *Geranomyia cercipuractata* Brunetti*:* RW- 27
210. *Geranomyia flavicosta* Brunetti*:* RW- 27
211. *Geranomyia tridens* Brunetti*:* RW- 27
212. *Mongamioides trentepohlii* Wiedemann*:* RW- 27

Family BIBIONIDAE

213. *Plecia dispersa* Hardy: RW- 5
214. *Plecia tergorata* Rond: RW- 16

Family CHAOBORIDAE

215. *Chaoborus flavicans* Meigen: RW- 10

Family CERATOPOGONIDAE

216. *Alluaudomyia formosana* Okada, 1942*:* RW- 27
217. *Alluaudomyia maculosipensis* Tokunga*:* RW- 27
218. *Bezzia albicornis* (Meigen, 1818)*:* RW- 27
219. *Bezzia* sp.: RW- 13
220. *Cululoides* sp.: RW- 27
221. *Culicoides (Avaritia) actoni* Smith, 1929*:* RW- 26
222. *Culicoides (Avaritia) orientalis* Macfie,1932*:* RW- 26
223. *Culicoides (Hoffmania) innoxius* Sen & Das Gupta, 1959*:* RW- 26
224. *Culicoides (Hoffmania) peregrinus* Kieffer, 1910*:* RW- 16, 26
225. *Culicoides (Trithecoides) anophelis* Edwards, 1922*:* RW- 26
226. *Culicoides oxystoma* Keiffer: RW- 27
227. *Culicoides peliliouensis* Tokunaga, 1936*:* RW- 27
228. *Culicoides schultzei* (Enderlein, 1908)*:* RW- 26, 27
229. *Culicoides similis* Carter, Ingram & Macfie, 1920*:* RW- 27
230. *Forcipomyia borbonica* Clastrier, 1959*:* RW- 27
231. *Forcipomyia murina* (Winnertz, 1952)*:* RW- 27

Family SIMULDAE

232. *Simulium* sp.: RW- 13

Family EMPIDIDAE

233. *Elaphropeza ferruginea* Brunetti*:* RW- 27

Family DOLICHOPODIDAE

234. *Psilopus* sp.: RW- 16
235. *Medeterus grisescens* Meijere, 1916*:* RW- 27
236. *Chrysosoma leucopogon* (Wiedemann, 1824)*:* RW- 26

Family EPHYDRIDAE

237. *Brachydeutera longipes* Hendel, 1913*:* RW- 27

Family HYBOTIDAE

238. *Drapetis fascifemorata* Brunetti, 1913*:* RW- 27

Family LIMONIIDAE

239. *Antocha* sp.*:* RW- 31
240. *Dicranomyia circipunctata:* RW- 27
241. *Limonia (Limnobia) irrorata* (Wiedemann, 1828)*:* RW- 26
242. *Limonia flavicosta* (Brunetti, 1912)*:* RW- 26, 27
243. *Limonia tridens* (Brunetti, 1912)*:* RW- 27
244. *Trentepohlia trentepohlii* (Wiedemann, 1828)*:* RW- 27

Family MICROPEZIDAE

245. *Mimegralla albimana* (Doleschall, 1856)*:* RW- 27

Family SEPSIDAE

246. *Sepsis coprophila* de Meij.: RW- 16
247. *Sepsis indica* Wiedemann, 1824*:* RW- 26, 27

Family TRYPETIDAE

248. *Callistomyia pavonina* Bezzi: RW- 16

Family ANTHOMYIIDAE

249. *Lispa assimilis* Wiedemann: RW- 16
250. *Lispa glabra* Wiedemann: RW- 16

Family MUSCIDAE

251. *Atherigona (Atherigona) simplex* (Thomas, 1869)*:* RW- 26
252. *Atherigona orientalis* Schiner, 1868: RW- 27
253. *Curicea pumila* Wiedemann*:* RW- 27
254. *Cyrtoneura stobulans* Fli..*:* RW- 27
255. *Lipse pumila* Wiedemann, 1824*:* RW- 27
256. *Lyperosia minuta* Bezzi: RW- 16
257. *Musca (Byomya) ventrosa* Wiedemann, 1830*:* RW- 26
258. *Musca (Musca) domestica* Linnaeus, 1758*:* RW- 26
259. *Musca crassirostris* Stein..*:* RW- 27
260. *Musca pattoni* Aust..*:* RW- 27
261. *Musca seniorwhile* Patton*:* RW- 27
262. *Musca vicina* Macq..*:* RW- 27
263. *Neomyia timorensis* (Robineau-Desvoidy, 1830)*:* RW- 26
264. *Neomyia indica* (Robineau-Desvoidy, 1830)*:* RW- 26
265. *Neomyia lauta* (Wiedemann,1830)*:* RW- 26
266. *Orthellia indica* Robineau-Desvoidy: RW- 27
267. *Stomoxys calcitrans* Linnaeus: RW- 27
268. *Stomoxys indica* Pic..*:* RW- 27

Family TEPHRITIDAE

269. *Bactrocera (Bactrocera) dorsalis* (Hendel, 1912)*:* RW- 26
270. *Bactrocera (Zeugodacus) cucurbitae* (Coquillett, 1899)*:* RW- 26, 27
271. *Campiglossa cribellata* Bezzi, 1913*:* RW- 26
272. *Platensina acrostacta* (Wiedemann, 1824)*:* RW- 27

Family ULIDIDAE

273. *Physiphora aenea* (Fabricius)*:* RW- 27

Family HIPPOBOSCIDAE

274. *Lipoptena cervi* Linnaeus: RW- 16

Family PHLEBOTOMIDAE

275. *Phlebotomus bengalensis* Brun..*:* RW- 27

276. *Phlebotomus montana* Sinton, 1924*:* RW- 26
277. *Phlebotumus argentipes* Ann. & Brun.*:* RW- 26, 27
278. *Phleobotomus minutus* Rond.*:* RW- 27
279. *Psychodatavittata* (Brunetti, 1908)*:* RW- 26

Family SARCOPHAGIDAE

280. *Sarcophaaga (Iranihindia) martellata* (Senior-White, 1924)*:* RW- 14
281. *Sarcophaga (Iranihindia) futilis* (Senior-White, 1924)*:* RW- 26, 27
282. *Sarcophaga (Iranihindia) indica* Nandi, 1979*:* RW- 27
283. *Sarcophaga (Leucomyia) alba* (Fabricius, 1794)*:* RW- 27
284. *Sarcophaga (Liopygia) ruficornis* (Fabicius, 1794)*:* RW- 26, 27
285. *Sarcophaga (Liosarcophaga) brevicoenis* (Ho, 1934)*:* RW- 27
286. *Sarcophaga (Liosarcophaga) choudhuryi* Sinha & Nandi*:* RW- 27
287. *Sarcophaga (Liosarcophaga) scopariiformis* (Nandi, 1990)*:* RW- 27
288. *Sarcophaga (Liosarcophaga)dux* (Thomson, 1869)*:* RW- 26, 27
289. *Sarcophaga (Pandelleisca) bainbriggei* (Senior-White, 1925)*:* RW- 27
290. *Sarcophaga (Parasarcophaga) albiceps* Meigen, 1826*:* RW- 14, 26, 27
291. *Sarcophaga (Parasarcophaga) hirtipes* Wiedemann, 1830*:* RW- 27
292. *Sarcophaga (Parasarcophaga) misera* (Walker, 1849)*:* RW- 27
293. *Sarcophaga (Parasarcophaga) taenionota* (Walker, 1853)*:* RW- 27
294. *Sarcophaga (Prionophalla) peregrine* (Robineau-Desvoidy, 1830)*:* RW- 27
295. *Sarcophaga (Seniorwhitea) princeps* (Walker, 1856)*:* RW- 27
296. *Sarcophaga (Sinonipponia) bengalensis* (Nandi, 1977)*:* RW- 27
297. *Sarcophaga dux* Thomson, 1869.*:* RW- 27
298. *Sarcophaga ruficornis* Macquart, 1851*:* RW- 27

MOLLUSCA

Molluscs are a structurally heterogeneous group and are mainly soft-bodied animals covered by hard calcareous shell. The majority of the molluscs are known by the presence of shells though it is absent in several forms. The molluscs are popularly known by different names such as snails, slugs, mussels, oysters, clams, cuttle fishes, squids, octopuses, etc. The identification of mollusc is based on the combination of characters, the relative importance of each such character are variable and depends on the weightage given to that particular one. The majority of the contribution for the molluscs diversity has came from the study of marine forms that is also understudied. In India, majority of the work performed on malacofauna have mainly been done for the common and easily available forms, thus the actual diversity could be much higher then known till date.

Mollusca is the second largest group in the animal kingdom. They have been recorded from both aquatic (Marine and freshwater) and terrestrial in habitat. Freshwater molluscs diversity is less when compared to land and marine molluscs. The two large classes, namely, Gastropoda (consisting of organisms like snails and slugs) and Bivalvia have extended into freshwater and the former even on to land. These two classes together constitute 98% of the known living molluscan species with Gastropoda being the far most numerous molluscs in terms of classified and identified species accounting for 80 percent of the total species. The gastropods mainly depend on algal material and detritus as food that providing them rich carbon sources and thereby play an important role in nutrient cycling (litter decomposition in terrestrial ecosystem and formation of organic detritus in estuaries). Molluscs draw a small quantity of calcium for the formation of shell from their environment and release it back to the environment. They are bioindicator of ecosystem health, important component in the production of biomass. Further they have been employed as poultry feed additives, raw materials for various industries, source of biomedical compounds, manufacturing of ornaments and household items. Molluscs are one of the successfully group that has adopted to different ecological conditions.

The Indian coastline is rich in molluscan diversity. Some literature is available on this diversity, notable among which are the works of Crichton (1941), Gravely (1941, 1942), Subrahmanyam *et al.* (1952), Kundu (1965a, b), Subba Rao (1971, 1977, 1980, 1989), Rajgopal and Mukherjee (1978, 1982), Mookherjee (1985), Mandol and Nandi (1989), Subba Rao *et al*. (1984, 1986, 1993), SubbaRao *et al.* (1995), Surya Rao and Mitra (2000), Apte (1993, 2004), Mitra *et al*. (2004), Dey (2006, 2008), Raghunathan (2007), Nandi (2009), Sharma and Sharma (2013), Yousuf *et al*. (2013), Nayak *et al*. (2014), Ampili and Shiny Sreedhar (2015). A total of 514 species of molluscs have been reported thus far from the Ramsar wetlands of India (Table 35).

Table 35. List of species of Molluscs from the Ramsar Wetlands of India.

PHYLUM MOLLUSCA
CLASS GASTROPODA
ORDER ARCHITAENIOGLOSSA
FAMILY VIVIPARIDAE

1. *Angulyagra oxytropis* (Benson): RW- 15
2. *Bellamya bengalensis f. annandalei* (Kobelt, 1908): RW- 2, 16, 26, 27, 39, 41
3. *Bellamya bengalensis f. balteata* (Benson): RW- 24
4. *Bellamya bengalensis f. doliaris* (Annandale & Sewell, 1921): RW- 26,27, 39
5. *Bellamya bengalensis f. eburnean* (Annandale & Sewell, 1921): RW- 26, 27
6. *Bellamya bengalensis f. gigantea* (Reeve): RW- 26, 27
7. *Bellamya bengalensis f. typica* (Lamarck, 1822): RW- 1, 3, 5, 13, 18, 19, 26, 27, 28, 38, 39, 41
8. *Bellamya bengalensis mandiensis* Kobelt, 1909: RW- 18, 26, 27
9. *Bellamya crassa* (Benson, 1836): RW- 2, 26
10. *Bellamya dissimilis* (Muller, 1774): RW- 2, 13, 16, 18, 26, 27, 28, 39, 41
11. *Bellamya* sp.: RW- 13
12. *Cipangopaludina lecythis* (Benson, 1836): RW- 15
13. *Vivipara bengalensis mandiensis* Kobelt: RW- 19

FAMILY AMPULLARIIDAE

14. *Pila dolioides* (Reeve): RW- 23
15. *Pila globosa* (Swainson, 1822): RW- 2, 15, 16, 26, 27, 32, 36, 39

16. *Pila* sp.: RW- 13
17. *Pila theobaldi* (Hanley, 1875): RW- 2
18. *Pila var. minor* (Nevill): RW- 26
19. *Pila virens* (Lamarck): RW- 13

FAMILY CYCLOPHORIDAE

20. *Cyclophorus (Cyclophorus) polynema* Pfeiffer: RW- 16

FAMILY BULLIDAE

21. *Bulla ampulla* Linnaeus: RW- 23

FAMILY HYDATINIDAE

22. *Hydatina velum* (Gmelin): RW- 23

FAMILY ARCHITECTONICIDAE

23. *Architectonica laevigata* (Lamarck): RW- 23
24. *Architectonica perspectiva* (Linnaeus, 1755): RW- 26, 27
25. *Heliacus (Heliacus) stramineus* (Gmelin,1791): RW- 26
26. *Torinia dorsuosa* (Hinds): RW- 23

FAMILY RINGICULIDAE

27. *Ringicula propinquans* Hinds, 1844: RW- 26

ORDER CEPHALASPIDEA

FAMILY AGLAJIDAE

28. *Melanochlamys* sp.: RW- 26

FAMILY HAMINOEIDAE

29. *Haminea elegans* Leach, 1852: RW- 13
30. *Haminoea crocata* (Pease, 1860): RW- 16, 26, 27

FAMILY TORNATINIDAE

31. *Tornatina estriata* Preston, 1914: RW- 16

ORDER CYCLONERITIDA

FAMILY NERITIDAE

32. *Clithon oualaniensis* (Lesson) : RW- 16
33. *Clithon reticularis* (Sowerby): RW- 26, 27
34. *Nerita (Amphinerita) articulata* Gould, 1847: RW- 26, 27
35. *Nerita (Theliostyla) albicella* Linnaeus, 1758: RW- 13, 23
36. *Nerita dissimilis* O. F. Müller, 1774: RW- 27
37. *Neritina (Dostia) violacea* (Gmelin, 1791): RW- 13, 26, 27
38. *Neritina (Pseudonerita) obtusa* (Benson): RW- 27
39. *Neritina (Vittina) smithi* Wood, 1828: RW- 26, 27
40. *Pseudonerita sulculosa* (Von Martens): RW- 26, 27
41. *Septaria caerulescens* (Sowerby): RW- 26, 27
42. *Septaria lineata* Lamarck: RW- 26, 27
43. *Smaragdia (Smaragdella) mamilla* Annandale: RW- 16

FAMILY ACMAEIDAE

44. *Potamacmea fluviatilis* (Blanford): RW- 26, 27

FAMILY LIMAPONTIIDAE

45. *Stiliger pica* Annandale & Prashad, 1922: RW- 16

FAMILY PLAKOBRANCHIDAE

46. *Elysia chilkaensis* Eliot, 1916: RW- 16

ORDER NUDIBRANCHIA

FAMILY CUTHONIDAE

47. *Cuthona annandalei* Eliot: RW- 27
48. *Cuthona henrici* Elliot: RW- 16

ORDER ELLOBIIDA

FAMILY ELLOBIIDAE

49. *Cassidula bensoni* Pfeiffer: RW- 27
50. *Cassidula nucleus* (Gmelin, 1791): RW- 27
51. *Ellobium (Auricula) gangeticum* (Benson): RW- 27
52. *Ellobium (Auricula) translucens* Annandale & Prasad: RW- 27
53. *Ellobium aurisjudae* (Linnaeus, 1758: RW- 26, 27
54. *Ellobium gangeticum* (Pfeiffer, 1855): RW- 11, 26
55. *Melampus ceylonicus* Petit, 1843: RW- 16
56. *Melampus pulchella* Petit: RW- 26, 27
57. *Melampus singaporensis* Petit: RW- 27
58. *Melampus* sp.: RW- 13
59. *Pythia plicata* (Ferussac) Gray, 1825: RW- 26, 27

ORDER SYSTELLOMMATOPHORA

FAMILY ONCHIDIIDAE

60. *Onchidium tenerum* Stoliczka, 1869: RW- 26, 27
61. *Onchidium tigrinum* Stoliczka: RW- 26, 27
62. *Onchidium typhae* Buchanan, 1800: RW- 26, 27
63. *Onchidium verruculatum* Cuvier: RW- 27

ORDER TROCHIDA

FAMILY TROCHIDAE

64. *Clanculus clanguloides* (Wood, 1856): RW- 13
65. *Trochus niloticus:* RW- 11
66. *Trochus radiatus* Gmelin: RW- 23
67. *Trochus stellatus* Gmelin: RW- 23
68. *Umbonium vestiarium* (Linnaeus, 1758): RW- 16, 23, 27

FAMILY LIOTIIDAE

69. *Liotia cidaris* (Reeve): RW- 23

FAMILY TURBINIDAE

70. *Astraea semicostata* (Kiener): RW- 23
71. *Turbo intercostalis* Menke: RW- 23
72. *Turbo murmoratus:* RW- 11

Family PHASIANELLIDAE

73. *Phasianella nivosa* Reeve: RW- 23

Family SOLARIELLIDAE

74. *Solariella satparaensis* Preston: RW- 16, 26, 27

Family SKENEIDAE

75. *Leucorhynchia variegata* (Preston): RW- 16, 2

Order BASOMMATOPHORA

Family LYMNAEIDAE

76. *Lymnaea (Pseudosuccinea) acuminata f. chlamys* Benson: RW- 15
77. *Lymnaea (Pseudosuccinea) luteola f. australis* Annandale & Rao: RW- 26
78. *Lymnaea (Radix) auricularia* Linnaeus: RW- 5, 9
79. *Lymnaea (Radix) persica* IsseI*:* RW- 38
80. *Lymnaea columella:* RW- 9
81. *Lymnaea ovalior* Anndale & Prashad: RW- 15

82. *Lymnaea stagnalis* (Linnaeus): RW- 9, 27, 32, 36
83. *Lymnea (Pseudosuccinea) acuminata f. typica* Lamarck, 1822: RW- 2, 5, 15, 16, 27, 28, 38, 39, 41
84. *Lymnea (Pseudosuccinea) acuminata f. gracilior* Martens, 1881: RW- 2, 26, 39
85. *Lymnea (Pseudosuccinea) acuminata f. rufenscens* Gray, 1822: RW- 2, 5, 15, 26, 39
86. *Lymnea (Pseudosuccinea) luteola f. impura* Troschel: RW- 25
87. *Lymnea (Pseudosuccinea) luteola f. ovalis* Gray: RW- 16, 26
88. *Lymnea (Pseudosuccinea) luteola* Lamarck, 1822: RW- 2, 13, 19, 26, 27, 38

Family PLANORBIDAE

89. *Ferrissia viola* Annandale & Prashad, 1921: RW- 15
90. *Gyraulus barrackporensis* (Clessin, 1886): RW- 26
91. *Gyraulus convexiusculus* (Hutton, 1849): RW- 2, 15, 26, 27, 38,39, 41
92. *Gyraulus euphraticus* (Mousson, 1874): RW- 15, 26, 39
93. *Gyraulus labiatus* (Benson): RW- 5, 24, 27, 38
94. *Hippeutis (Helicorbis) umbilicalis umbilicalis* (Benson): RW- 15
95. *Planorbis planorbis* Linnaeus, 1758*:* RW- 32, 36
96. *Polypylis calathus* (Benson, 1850)*:* RW- 26
97. *Trochorbis trochoideus* (Benson, 1836)*:* RW- 26

Family BULLINIDAE

98. *Indoplanorbis exustus* (Deshayes, 1834): RW- 2, 13, 15, 16, 19, 26, 27, 28, 38, 39, 41

Family PHYSIDAE

99. *Physella acuta* (Draparnaud, 1805)*:* RW- 26, 28

Family THIARIDAE

100. *Larina burmana* (Blanford)*:* RW- 34
101. *Melanoides tuberculata* (Mueller, 1774)*:* RW- 28, 41
102. *Melanoides* sp.*:* RW- 19
103. *Tarebia granifera* (Lamarck, 1816): RW- 16, 26, 27, 28
104. *Tarebia lineata* (Gray, 1828): RW- 26, 27, 41
105. *Thiara (Mainwaringia) paludomidea* (Nevill): RW- 26, 27
106. *Thiara (MeIalloides) tuberculata* (Muller, 1774): RW- 5, 13, 16, 19, 24, 26, 27, 38, 39
107. *Thiara (Stenomelania) torulosa* (Bruguiere): RW- 16
108. *Thiara (Tarebia) lineata* (Gray): RW- 16, 28, 39
109. *Thiara (Thiara) scabra* Muller, 1774: RW- 13, 16, 18, 26, 27, 28, 38
110. *Thiara* sp.: RW- 18

Family CERITHIDAE

111. *Bittium* sp.: RW- 13

Family PACHYCHILIDAE

112. *Brotia costula* (Rafinesque, 1833): RW- 26, 27

FAMILY AMPHIBOLIDAE

113. *Amphibola burmana* Blanford: RW- 27
114. *Salinator burmana* (Blanford): RW- 27
115. *Salinator fragilis:* RW- 27

Order STYLOMMATOPHORA

Family ACHATINIDAE

116. *Achatina fulica* Bowdich**:** RW- 15, 26, 27, 28
117. *Glessula gemma* (Reeve): RW- 27
118. *Lamellaxis (Allopeas) gracile* Hutton, 1834: RW- 16, 26, 27

Family CERASTIDAE

119. *Rachis bengalensis* (Lamarck): RW- 26, 27

Family ARIOPHANTIDAE

120. *Ariophanta interrupta* (Benson): RW- 26, 27
121. *Ariophanta laevipes* Mueller*:* RW- 41
122. *Ariophanta bajadera* Pfeiffer*:* RW- 41
123. *Cryptaustenia bensoni* (Pfeiffer): RW- 27
124. *Euplecta infausta* (Blanford): RW- 16
125. *Macrochlamys indica* Godwin-Austen: RW- 26, 27
126. *Macrochlamys petrosa* (Hullon): RW- 26

Family ENIDAE

127. *Rachistia praetermissus* (Blanford): RW- 16

Family SUCCINEIDAE

128. *Succinea crassinuclea* Pfeiffer: RW- 26, 27
129. *Succinea daucina f. hrawasikhara* Rao: RW- 26, 27
130. *Succinea daucina* Pfeiffer : RW- 16, 26
131. *Succinea godivariana f. vangiya* Rao: RW- 26, 27
132. *Succinea snigdha* Rao: RW- 26, 27

Family STREPTAXIDAE

133. *Huttonella bicolor* (Hutton): RW- 16
134. *Huttonella rambhaensis* Ray: RW- 16

Family PUPILLIDAE

135. *Pupilla barrackporensis* Gude: RW- 26, 27

Family VALLONIDAE

136. *Pupisoma orcula* (Benson): RW- 26, 27

Family TROCHOMORPHIDAE

137. *Sivella castra* (Benson, 1852): RW- 26

Order SYSTELLOMMATOPHORA

Family VERONICELLIDAE

138. *Laevicaulis alte* (Ferussac, 1822): RW- 26
139. *Filicaulis (Eleutherocaulis) alte* (Ferussac): RW- 27

Order PTEROPODA

Family CAVOLINIIDAE

140. *Cavolinia* sp.: RW- 13

Order LITTORINIMORPHA

Family HYDROBIIDAE

141. *Hydrobia* sp.: RW- 13

Family NACELLIDAE

142. *Cellana radiata radiata* (Born, 1778): RW- 13

Family PACHYCHILIDAE

143. *Brotia (Antimelania) costula* (Rafinesque, 1833): RW- 2, 24

Family PALUDOMIDAE

144. *Paludomus (Paludomus) blanfordiana* Nevill, 1877: RW- 2

145. *Paludomus (Paludomus) conica* (Gray, 1834): RW- 2

146. *Paludomus (Paludomus) reticulata* Blanford, 1856: RW- 2

Family VANIKORIDAE

147. *Cyclostrema (Tubiola) innocens* Preston: RW- 27

148. *Tubiola microscopica* (Nevill) : RW- 16, 26, 27

Family STENOTHYRIDAE

149. *Gangetia miliacea* (Nevill): RW- 16, 26, 27

150. *Stenothyra blanfordiana* Nevill, 1880: RW- 16, 26, 27

151. *Stenothyra deltae* (Benson, 1836): RW- 26, 27

152. *Stenothyra gangetica milicea* (Nevill): RW- 27

153. *Stenothyra minima* (Sowerby, 1837): RW- 16

154. *Stenothyra soluta* Annandale & Prashad: RW- 26, 27

155. *Stenothyra woodmasoniana* Nevill: RW- 26, 27

Family ASSIMINEIDAE

156. *Assiminea francesiae* (Gray): RW- 26

157. *Assiminea francessi* (Wood): RW- 26, 27

158. *Assiminea hungerfordiana* Nevill: RW- 26

159. *Assiminea microsculpta* Nevill: RW- 26, 27

160. *Assiminea theobaldiana* Nevill: RW- 26, 27

161. *Assiminea woodmasoniana* Nevill: RW- 26, 27

162. *Assiminia beddomeana* Nevill, 1880: RW- 26, 27

163. *Assiminia brevicula* (Pfeiffer, 1854): RW- 26, 27

Family TURRITELLIDAE

164. *Turritella acutangula* (Linnaeus): RW- 16

165. *Turritella attenuata* Reeve, 1869: RW- 13, 26

166. *Turritella columnaris* Kiener: RW- 16

167. *Turritella duplicata* (Linnaeus, 1758): RW- 13

Family LITIOPIDAE

168. *Alaba blanfordi* A. Adams: RW- 16

Family SCALIOLIDAE

169. *Finella virgata* (Philippi): RW- 16

Family PLANAXIDAE

170. *Chilkaia imitatrix* Preston: RW- 16

Family TONNIDAE

171. *Tonna dolium* (Linnaeus, 1758): RW- 26, 27

172. *Tonna sulcosa* (Born, 1778): RW- 26, 27

Family BURSIDAE

173. *Bursa crumena* (Lamarck, 1816): RW- 13

174. *Bursa granularis* Roding: RW- 23

175. *Bursa margaritula* (Deshayes): RW- 23

176. *Bursa rana* (Linnaeus,1758): RW- 13

177. *Bursa spinosa* (Lamarck,1843): RW- 23, 27

Family CASSIDAE

178. *Phalium (Phalium) areola* (Linnaeus): RW- 16, 23

179. *Phalium (Semicassis) canaliculatum* (Bruguiere): RW- 16, 23

180. *Phalium bisulcatum* (Schubert & Wagner): RW- 26, 27

181. *Phalium glaucum* (Linnaeus): RW- 23

Family RANELLIDAE

182. *Gyrineum natator* (Roding, 1798): RW- 26, 27

Family XENOPHORIDAE

183. *Xenophora solaris* (Linnaeus, 1764): RW- 26, 27

Family AMNICOLIDAE

184. *Amnicola limosus* (Say, 1817): RW- 9

Order LITTORINIMORPHA

Family LITTORINIDAE

185. *Littorina (Littorina) undulata* Gray, 1839: RW- 13, 26, 27

186. *Littorina (Littorinopsis) melanostoma* Gray,1839: RW- 13, 26, 27

187. *Littorina (Littorinopsis) scabra scabra* (Linnaeus, 1758): RW- 13, 26, 27

188. *Littorina carinifera* Menke: RW- 27

189. *Littorina littorea* (Linnaeus, 1758): RW- 13

190. *Mainwaringia paludomidea* (Nevill): RW- 27

Family IRAVADIIDAE

191. *Iravadia june rea* Preston, 1916: RW- 13

192. *Iravadia ornata* Blanford: RW- 26, 27

193. *lravadia annandalei* Preston, 1916: RW- 13

Family CALYPTRAEIDAE

194. *Calyptraea extinctorium* Lamarck: RW- 23

195. *Crepidula walshi* Herrmannsen: RW- 23

Family OVULIDAE

196. *Volva sowerbyana* Weinkauff: RW- 23

Family STROMBIDAE

197. *Laevistrombus canarium* Linnaeus, 1758*:* RW- 11

198. *Lambis lambis* (Linnaeus, 1758): RW- 23

Family TONNIDAE

199. *Tonna dolium* Linnaeus, 1758: RW- 23

200. *Tonna fasciata* (Martini, 1777): RW- 23

Family FICIDAE

201. *Ficus ficoides* (Lamarck, 1822): RW- 23

202. *Ficus gracilis* (Sowerby): RW- 26, 27

203. *Ficus variegata* Röding, 1798: RW- 23, 26, 27

Family RANELLIDAE

204. *Cymatium cingulatum* (Lamarck, 1822): RW- 23

205. *Cymatium rhinoceros* (Lamarck): RW- 23

Family NATICIDAE

206. *Eunaticina coarctata* (Reeve): RW- 16

207. *Eunaticina papilla* (Gmelin): RW- 23

208. *Natica didyma* (Roding, 1798: RW- 23

209. *Natica lineata* Lamarck: RW- 23, 26, 27

210. *Natica maculosa* Lamarck, 1822: RW- 23

211. *Natica qualteriana* Recluz, 1844: RW- 13, 26, 27

212. *Natica rufa* (Born): RW- 23

213. *Natica tigrina* (Roeding, 1798): RW- 13, 16, 26, 27

214. *Natica traillii* Reeve: RW- 23

215. *Natica vitellus* (Linnaeus, 1758): RW- 13, 16, 26, 27

216. *Polinices (Glossaulax) didyma* (Roeding, 1798): RW- 26, 27

217. *Polinices tumidus* (Swainson): RW- 26, 27

218. *Polynices mamilla* (Linnaeus, 1758): RW- 19

219. *Sinum cuvierianum* (Recluz): RW- 23

220. *Sinum delessertii* (Recluz): RW- 23

221. *Sinum neritoideum* Linnaeus: RW- 23, 26, 27

Family PYRAMIDELLIDAE

222. *Odostomia babylonica* Winckworth: RW- 23

223. *Odostomia chilkaensis* Preston: RW- 16

224. *Pyramidella terebellum* (Muller): RW- 23

225. *Pyrgulina ecclesia* (Preston): RW- 16

226. *Pyrgulina humilis* (Preston): RW- 16

227. *Pyrgulina nadiensis* (Preston): RW- 16

228. *Pyrgulina rambhaensis* (Preston): RW- 13

229. *Turbonilla crichtoni* Winckworth: RW- 23

230. *Turbonilla rambhaensis* (Preston): RW- 16

Family EULIMIDAE

231. *Eulima bivittata* (Hinds &A. Adams): RW- 23

Family POTAMIDIDAE

232. *Cerithidea (Cerithidea) obtusa* (Lamarck, 1822): RW- 26, 27

233. *Cerithidea (Cerithideopsilla) cingulata* (Gmelin, 1791): RW- 16, 26, 27

234. *Cerithidea alata* (Philippi, 1849): RW- 27

235. *Cerithidea fluviatilis* (Potiez & Michaud): RW- 23

236. *Telescopium telescopium* (Linnaeus, 1758): RW- 16, 26, 27

Family CERITHIIDAE

237. *Cerithium morus* Lamarck: RW- 23

238. *Cerithium obeliscus* Bruguiere: RW- 23

239. *Cerithium splendens* Sowerby: RW- 23

Family TRIPHORIDAE

240. *Triphora concinna* Hinds: RW- 23

241. *Triphora violacea* (Quoy & Gaimard): RW- 23

Family JANTHINIDAE

242. *Janthina roseola* Reeve: RW- 23

Family RISSOIDAE

243. *Rissoina clathrata* A. Adams: RW- 23

Family MITRIDAE

244. *Mitra circula* Kiener: RW- 23

Family TURRITELLIDAE

245. *Turritella acutangula* Linnaeus: RW- 23

246. *Turritella attenuata* Reeve: RW- 13, 23

247. *Turritella duplicata* (Linnaeus, 1758): RW- 13

Family EPITONIIDAE

248. *Acrilla gracilis* (Sowerby): RW- 26

249. *Amaea (Acrilla) acuminata* (Sowerby, 1844): RW- 26, 27

250. *Eglisia tricarinata* Adam & Reeve: RW- 23

251. *Epitonium hamatulae* Preston: RW- 16

252. *Epitonium scalaris* (Linnaeus): RW- 23

Family MURICIDAE

253. *Chicorius ramosus* Linnaeus: RW- 23

254. *Cronia (Ergalatax) contracta* (Reeve, 1846): RW- 16

255. *Drupa heptagonalis* (Reeve): RW- 23

256. *Drupa margariticola* (Broderip): RW- 23

257. *Drupa tuberculata* (Blainville): RW- 23

258. *Jopas sertum* (Bruguiere): RW- 23

259. *Maculotriton serrialis* (Laborde): RW- 23

260. *Murex adustus* Lamarck: RW- 23

261. *Murex badius* Reeve: RW- 23

262. *Murex carbonnieri* (Jousseaume, 1881): RW- 13

263. *Murex haustellum* Linnaeus: RW- 23

264. *Murex* sp.: RW- 13

265. *Murex trapa* Roding: RW- 23

266. *Murex virgineus* (Roding): RW- 23

267. *Rapana bulbosa* (Dillwyn): RW- 23

268. *Thais blanfordi* (Melvill): RW- 27

269. *Thais bufo* (Lamarck): RW- 11, 23

270. *Thais intermedia* (Kiener): RW- 23

271. *Thais lacera* (Born, 1778): RW- 16, 27

272. *Thais rudolphi* (Lamarck): RW- 23

273. *Thais rugosa* (Born): RW- 23

274. *Thais* sp.: RW- 13

275. *Thais tissoti* (Petit): RW- 23

Family CONIDAE

276. *Conus amadis* Gmelin: RW- 23

277. *Conus araneosus* Hwass: RW- 23

278. *Conus ebraeus* Linnaeus: RW- 23

279. *Conus milne-edwardsi* Jousseaume: RW- 23

280. *Conus nussatella* Linnaeus: RW- 23

281. *Conus piperatus* Dillwyn: RW- 23

282. *Conus* sp.: RW- 13

Family BITHYNIIDAE

283. *Bithynia (Digoniostoma) cerameopoma* (Benson): RW- 27

284. *Bithynia (Digoniostoma) pulchella* Benson, 1836: RW- 26, 27, 39, 41

285. *Digoniostoma cerameoporna* (Benson): RW- 26

286. *Digoniostoma pulchella* (Benson): RW- 26, 38

287. *Gabbia orcula* (Frauenfeld, 1862): RW- 15, 16, 26, 38, 39

288. *Gabbia orcula Frauenfeld var. producta* (Nevill)*:* RW- 27

289. *Gabbia orcula var. producta* (Nevill): RW- 26, 27

Order NEOGASTROPODA

Family COLUMBELLIDAE

290. *Columbella duclosiana* Sowerby, 1844: RW- 26

291. *Pseudanachis duclosiana* (Sowerby): RW- 27

Family TEREBRIDAE

292. *Duplicaria duplicata* (Linnaeus): RW- 23

Family TURRIDAE

293. *Surcula amicta* Smith: RW- 23

294. *Surcula javana* Linnaeus, 1767 : RW- 23

Family BABYLONIIDAE

295. *Babylonia spirata* (Linnaeus): RW- 23

296. *Babylonia zeylonica* (Bruguiere, 1789): RW- 13

Family PISANIIDAE

297. *Cantharus undosus* (Linnaeus): RW- 23

Family FASCIOLARIIDAE

298. *Fasciolaria trapezium* (Linnaeus): RW- 23

299. *Fusinus longicauda* (Bory): RW- 23
300. *Fusinus toreuma* (Lamarck): RW- 23

Family VOLUTIDAE

301. *Cymbium melo* (Solander): RW- 23
302. *Harpulina lapponica* Linnaeus: RW- 23

Family OLIVIDAE

303. *Oliva (Oliva) oliva* (Linnaeus): RW- 16
304. *Oliva gibbosa* (Born): RW- 11, 16, 23, 26
305. *Oliva nebulosa* Lamarck: RW- 23
306. *Olivancillaria gibbosa* (Born, 1778): RW- 27

Family ANCILLARIIDAE

307. *Ancilla acuminata* (Sowerby): RW- 23
308. *Ancilla ampla* (Gmelin, 1791): RW- 23, 26, 27
309. *Ancilla cinnamomea* (Lamarck): RW- 23
310. *Ancilla scaphella* (Sowerby): RW- 23

Family NASSARIIDAE

311. *Bullia (Dorsanunl) vittata* (Linnaeus): RW- 16
312. *Bullia melanoides* (Deshayes): RW- 23
313. *Nassarius (Hima) stolatus* (Gmelin, 1791): RW- 16, 26, 27
314. *Nassarius (Niotha) livescens* (Philippi, 1840): RW- 13, 16
315. *Nassarius (Pygnzaeonassa) orissaensis* (Preston): RW- 16, 27
316. *Nassarius costata* Adams: RW- 23
317. *Nassarius ennurensis* (Preston): RW- 27
318. *Nassarius foveolata:* RW- 27
319. *Nassarius foveolatus* (Dunker, 1847): RW- 16, 26
320. *Nassarius hepatica* (Montagu): RW- 23
321. *Nassarius jacksoniana* (Quoy & Gaimard): RW- 16, 23
322. *Nassarius pallidula* Adams: RW- 23
323. *Nassarius subconstrictus* (Sowerby, 1899): RW- 13, 16, 27
324. *Nassarius suturalis* (Lamarck): RW- 23
325. *Nassarius thersites* (Bruguiere): RW- 23
326. *Nassarius vittatus* A. Adams: RW- 16

Family TURBINELLIDAE

327. *Tudicla spirillus* Linnaeus, 1767: RW- 23
328. *Turbinella rambhaensis* (Preston): RW- 13

Family MELONGENIDAE

329. *Hemifusus cochlidium* (Linnaeus): RW- 16, 23, 26, 27
330. *Hemifusus pugilinus* (Born): RW- 23

Family HARPIDAE

331. *Harpa conoidalis* Lamarck: RW- 23

Family MARGINELLIDAE

332. *Marginella angustata* Sowerby: RW- 23
333. *Marginella elegans* (Gmelin): RW- 16

Family BORSONIIDAE

334. *Asthenotoma vertebrata* (Smith): RW- 26, 27

Family CLAVATULIDAE

335. *Turricula javana* (Linnaeus,1767): RW- 26, 27

Family CANCELLARIIDAE

336. *Cancellaria elegans* Sowerby: RW- 16

Class BIVALVIA

Order UNIONIDA

Family UNIONIDAE

337. *Indonaia careulea*Lea*:* RW- 19, 38
338. *Lamellidens corrianus* (Lea, 1834): RW- 26, 27, 39, 41
339. *Lamellidens generosus* Gould: RW- 15
340. *Lamellidens marginalis* (Lamarck, 1819): RW- 13, 16, 19, 24, 26, 27, 28, 32, 36, 39
341. *Parreysia (Parreysia) burmana* (Blanford): RW- 15
342. *Parreysia (Parreysia) favidens* (Benson): RW- 26, 27, 41
343. *Parreysia (Parreysia) favidens f deltae* (Benson) : RW- 27
344. *Parreysia corrugata* (Muller, 1774): RW- 19, 26, 27
345. *Parreysia var. delte* (Benson): RW- 26

Order VENERIDA

Family VENERIDAE

346. *Clementia vatheleti* Mebille: RW- 16
347. *Dosinia (Asa) fibula* (Reeve): RW- 16
348. *Dosinia (Asa) tumida* Gray: RW- 16
349. *Dosinia (Sinodia) trigona* (Schroter): RW- 27
350. *Dosinia insularum* Fischer-Piette & Deloma, 1967: RW- 13
351. *Gafrarium pectinatum* (Linnaeus): RW- 26
352. *Gafrarium tunidium:* RW- 11
353. *Marcia pinguis* (Schroeter): RW- 16
354. *Meretrix casta* (Gmelin, 1791): RW- 11, 13, 16
355. *Meretrix meretrix* (Linnaeus, 1758): RW- 13, 16, 26, 27
356. *Paphia ala-papilionis* Roeding, 1798: RW- 13
357. *Paphia malabarica* (Dillwyn, 1817): RW- 11, 26, 27
358. *Paphia marmarata:* RW- 11
359. *Paphia textilis* (Gmelin, 1791): RW- 26, 27
360. *Paphia undulata* (Born): RW- 16, 27
361. *Pelecyora trigona* (Reeve, 1850): RW- 26, 27
362. *Pitar alabastrum* (Reeve): RW- 26, 27
363. *Sunetta (Sunetta) donacina* (Gmelin): RW- 16
364. *Sunetta (Sunetta) meroe* (Linnaeus): RW- 16
365. *Sunetta (Sunetta) scripta* (Linnaeus): RW- 16
366. *Sunetta solanderii* Gray, 1825: RW- 13
367. *Tapes bruguieri* (Hanley): RW- 26, 27
368. *Timoclea (Glycodonta) imbricata* (Sowerby, 1853): RW- 13, 16, 27
369. *Timoclea scabra* (Hanley): RW- 16
370. *Tivela dillwyni* (Deshayes): RW- 16

Family GLAUCONOMIDAE

371. *Glauconome cerea* Reeve: RW- 27
372. *Glauconome sculpta* Sowerby, 1894: RW- 27

Order PHOLADOMYOIDA

Family LATERNULIDAE

373. *Laternula truncata* (Lamarck, 1818): RW- 26, 27
374. *Laternula navicula* (Reeve): RW- 16

Family CYRENIDAE

375. *Batissa* sp.: RW- 13

376. *Corbicula abbreviate:* RW- 35

377. *Corbicula calcarea:* RW- 27

378. *Corbicula gracilis:* RW- 27

379. *Corbicula striatella* Deshayes, 1854: RW- 15, 16, 19, 26, 27, 38, 41

380. *Corbicula peninsularias* Prashad, 1928*:* RW- 28

381. *Polymesoda (Geloina) bengalensis* (Lamarck): RW- 26, 27

382. *Villorita cornucopia* Prashad, 1921: RW- 13

383. *Villorita cyprinoides:* RW- 11, 13

384. *Villorita cyprinoides var. cochinensis* Preston: RW- 13

Family TRAPEZIIDAE

385. *Trapezium (Neotrapezium) sublaevigatum* (Lamarck): RW- 16, 26, 27

Family PANDORIDAE

386. *Pandora flexosa* Sowerby, 1820: RW- 13

Order LIMIDA

Family LIMIDAE

387. *Ctenoides annulata* (Lamarck): RW- 16

Order MYIDA

Family PHOLADIDAE

388. *Barnea candida* (Linnaeus, 1758): RW- 26, 27

389. *Lignopholas fuminalis* (Blanford): RW- 26

390. *Martesia fragilis* (Sowerby, 1873): RW- 13, 26, 27

391. *Martesia striata* (Linnaeus, 1758): RW- 13, 16, 27

Family TEREDINIDAE

392. *Bactronophorus thoracites* (Gould, 1856): RW- 26, 27

393. *Bankia campanellata* Moll & Roch, 1831: RW- 13, 26, 27

394. *Bankia carinata* (Gray, 1827): RW- 13, 16

395. *Bankia nordi* Moll: RW- 27

396. *Bankia rochi* Moll: RW- 26, 27

397. *Dicyathifer manni* (Wright, 1866): RW- 13, 26, 27

398. *Lyrodus pedicillatus* (Quatrefages, 1849): RW- 13

399. *Nausitora dunlopei* Wright: RW- 26, 27

400. *Nausitora hedleyi* Schepman, 1919: RW- 13

401. *Teredo clappi* Bartsch, 1923: RW- 13

402. *Teredo furcifera* von Martens, 1894: RW- 13

403. *Teredora princisae* (Sivickis, 1928): RW- 13

404. *Teredothyra smithi* (Bartsch, 1927): RW- 13

Family MYIDAE

405. *Sphenia perversa* Blanford: RW- 26, 27

406. *Sphenia pedata* (Linnaeus): RW- 27

Family CORBULIDAE

407. *Corbula abbreviata* Preston, 1907: RW- 26, 27

408. *Corbula alcocki* Preston: RW- 26

409. *Corbula calcarea* Preston: RW- 26, 27

410. *Corbula feiferi* Preston: RW- 26

411. *Corbula gracilis* Preston: RW- 26, 27

Order POROMYOIDA

Family CUSPADARIIDAE

412. *Cuspidaria chilkaensis* Preston: RW- 16, 26, 27

413. *Cuspidaria* sp.: RW- 13

Order NUCULIDA

Family NUCULIDAE

414. *Nucula (Leionucula) convexa* Hinds: RW- 26, 27

415. *Nucula (Nucula) mitralis* Hinds: RW- 26, 27

416. *Nuculana (Secella) fragilis* Chemnitz: RW- 26, 27

417. *Nueulana mauritiana* (Sowerby, 1825): RW- 13

418. *Yoldia nicobarica* (Bruguiere): RW- 26, 27

Order ARCIDA

Family ARCIDAE

419. *Anadara granosa* (Linnaeus, 1758: RW- 13, 16, 26, 27

420. *Anadara inequivalvis* (Bruguicre): RW- 13, 26, 27

421. *Anadara rhombea* (Born): RW- 16

422. *Arca* sp.: RW- 13

423. *Scapharca deyrollei* Joussaeume, 1893: RW- 16

424. *Scaphula celox* Benson: RW- 26

425. *Scaphula delta* Blanford: RW- 26, 27

426. *Trisidos tortuosa* (Linnaeus, 1758): RW- 13

Family GLYCYMERIDIDAE

427. *GIycymeris tenuicostatus* (Reeve): RW- 16

Family NOETIIDAE

428. *Striarca lactea* (Linnaeus): RW- 16, 26, 27

Order MYTILOIDA

Family MYTILIDAE

429. *Modiolus philippinarum* Hanley: RW- 16

430. *Modiolus striatulus* (Hanley): RW- 13, 16, 26, 27

431. *Modiolus tulipa* (Lamrack, 1836): RW- 13

432. *Modiolus undulatus* (Dunker): RW- 13, 16, 26, 27

433. *Musculista senhousia* Benson: RW- 13

434. *Perna viridis* (Linnaeus, 1758): RW- 13, 16

Order OSTREIDA

Family PINNIDAE

435. *Atrina pectinata* Linnaeus, 1767: RW- 26, 27

Family OSTREIDAE

436. *Crassostrea cuttackensis* (Newton & Smith): RW- 13, 16, 26, 27

437. *Crassostrea gryphoides* (Schlotheim): RW- 26, 27

438. *Crassostrea madrasensis :* RW- 11

439. *Crassostrea palmepes* (Sowerby) : RW- 27

440. *Ostrea forskalli:* RW- 13

441. *Ostrea virginica:* RW- 27

442. *Saccostrea cucullata* (Born): RW- 13, 16, 26, 27

Family GRYPHAEIDAE

443. *Hyotissa hyotis* (Linnaeus): RW- 16

Order PECTINIDA

Family PLACUNIDAE

444. *Placuna placenta* Linnaeus, 1758: RW- 16, 26

Family ANOMIIDAE

445. *Anomia achaeus* Gray, 1839: RW- 16

446. *Enigmonia aenigmatica* Holten: RW- 26, 27

Order LUCINIDA

Family LUCINIDAE

447. *Eamesiella philippinarum* Reeve, 1850: RW- 26, 27

Order CARDIIDA

Family CARDIIDAE

448. *Acanthocardia coronata* (Schroeter): RW- 13, 16

449. *Acanthocardia lata* (Born): RW- 16

450. *Laevicardium (Fulvia) apertum* (Bruguiere): RW- 16

451. *Trachycardium asiaticum* (Bruguiere): RW- 26, 27

Family MACTRIDAE

452. *Mactra (Coelomactra) turgida* Gmelin: RW- 16, 26, 27

453. *Mactra (Coelomactra) violacea* Gmelin: RW- 26, 27

454. *Mactra (Mactra) grandis* Gmelin: RW- 16

455. *Mactra (Mactra) luzonica* Deshayes : RW- 16, 26, 27

456. *Mactra (Mactra) mera* Deshayes: RW- 16, 26, 27

457. *Mactra (Mactrinula) plicataria* Linnaeus: RW- 26, 27

458. *Meropesta pellucida* (Gmelin, 1782): RW- 13

459. *Spisula (Standella) annandalei* Preston: RW- 16

460. *Tanysiphon rivalis* Benson: RW- 26, 27

Order ADAPEDONTA

Family SOLENIDAE

461. *Solen annandalei* Preston: RW- 16

462. *Solen brevis* Gray: RW- 26, 27

463. *Solen kempi* Preston: RW- 16, 27

464. *Solen lamarckii* Desbayes, 1839: RW- 13

Family PHARIDAE

465. *Cultellus subelliptica* Dunker: RW- 16, 26, 27

466. *Neosolen aquaedulcioris* Ghosh: RW- 13, 16, 27

467. *Novaculina gangetica* Benson: RW- 26, 27

468. *Pharella javanica* (Lamarck): RW- 26, 27

469. *Siliqua albida* Dunker: RW- 26, 27

470. *Siliqua radiata* (Linnaeus,1758): RW- 16

Order CARDIIDA

Family TELLINIDAE

471. *Apolymetis edentula* Spengler: RW- 26

472. *Macoma birmanica* (Philippi): RW- 16, 26, 27

473. *Macoma qubemaculum* Hanley: RW- 27

474. *Macoma truncata* (Janas): RW- 16

475. *Strigilla splendida* (Anton): RW- 26, 27

476. *Tellina (Angulus) rhodon* Hanley, 1844: RW- 13

477. *Tellina (Omala) texturata* Sowwerby: RW- 16

478. *Tellina (Pharaonella) irridescens* (Benson): RW- 16, 26, 27

479. *Tellina (Tellinides) sinuata* Spengler: RW- 26, 27

480. *Tellina barhampurensis* Preston: RW- 16

481. *Tellina corbuloides* Hanley: RW- 26

482. *Tellina tenuis* da Costa: RW- 13

Family DONACIDAE

483. *Donax (Donax) pulchella* Hanley: RW- 16

484. *Donax (Hecuba) scortum* (Linnaens, 1758): RW- 16

485. *Donax (Latona) incarnatus* Gmelin: RW- 26, 27

486. *Donax cuneatus:* RW- 11

Family SEMELIDAE

487. *Cumingia hinduorum* Preston: RW- 16

488. *Theora opalina* (Hinds, 1843): RW- 13, 16, 26, 27

489. *Theora* sp.: RW- 13

Family PSAMMOBIIDAE

490. *Gari (Psammobia) mahosaensis* Preston: RW- 16

491. *Sanguinolaria (Solelellina) acuminata* Reeve, 1857: RW- 26, 27

Family SPHAERIIDAE

492. *Pisidium clarckeanum* G. & H. Nevill: RW- 26, 27

493. *Sphaerium (S.) indicum* Deshayes: RW- 5, 38

494. *Sphaerium* sp.: RW- 9

Family UNGULINIDAE

495. *Diplodonta barhampurensis* Preston: RW- 16

496. *Diplodonta satparaensis* Preston: RW- 16

497. *Felania annandalei* Preston: RW- 16

498. *Felania chilkaensis* Preston: RW- 16

499. *Felania ovalis* Preston: RW- 16

Family LASAEIDAE

500. *Kellia chilkaellsis* Preston: RW- 16

501. *Kellia mahosaensis* Preston: RW- 16

Family GALEOMMATIDAE

502. *Scintilla chilkaensis* Preston: RW- 16

Order CARDITIDA

Family CARDITIDAE

503. *Cardites antiquata* (Linnaeus): RW- 16

Class CEPHALOPODA

Order SEPIIDA

Family SEPIIDAE

504. *Sepia aculeata* d'Orbigny: RW- 11, 26, 27

505. *Sepia brevimana:* RW- 11

506. *Sepiella inermis* (Ferussac d'Orbigny): RW- 16, 26, 27

Order MYOPSIDA

Family LOLIGINIDAE

507. *Doryteuthis singhalensis* Ortmann: RW- 26, 27

508. *Loligo duvauceli* d'Orbigny: RW- 11, 26, 27

509. *Loligo indica* Pfeiffer: RW- 27

510. *Loliolus investigatoris* Goodrich: RW- 26, 27

ORDER OCTOPODA

FAMILY OCTOPODIDAE

511. *Octopus macropus* Risso: RW- 27

512. *Octopus rugosus* (Bose): RW- 27

ORDER SCAPHOPODA

FAMILY DENTALIIDAE

513. *Dentalium octangulatum* Donovan: RW- 26, 27

514. *Dentalium* sp.: RW- 13

PISCES

Fishes are aquatic cold-blooded vertebrates that possess gills for resperation throughout life and are primarily dependent on water as a medium for survival. Fish fauna of India exhibits enormous diversity in their morphology, habitats they occupy, as well as biology. Apart from this fishes occupy almost every conceivable aquatic habitats, i.e., they are found along the coasts of the Indian subcontinent, whether rocky, sandy or muddy, and amongst coral reefs, in deep sluggish rivers or in fast torrential streams, in lakes, ponds and wells, in river estuaries, -coastal lagoons and backwaters; or total darkness in caves. Fishes are of immense value to mankind, since they form an important element in the economy of India and many countries while giving incalculable recreational and psychological value to the naturalist, sports enthusiast and home aquarist. Many Government institutions are dedicated to perform research on their biology and propagation. They are used as general bio-indicators of pollution and thus it is desirable to maintain the diversity and perform research on the systematist studies.

Wetland ecosystems are fragile but vital ecosystems that are recognized for their role in conservation of fish biodiversity. Wetlands ecosystem supports the conservation of fish diversity as they provide a refuge for breeding, feeding and nesting purpose at one or more stages in their life cycle (Wetzel, 2001). Further, the wetlands have been designated as Ramsar sites (Internationally recognized wetlands) on the basis of the number of threatened fish species they support (Kottelat and Whitten, 1996). However, in recent years there has been a significant decline in the diversity of fishes due to various natural and anthropogenic activity, e.g., destruction of habitats (Dudgeon et al., 2006). A large variety of fishes inhabit the estuarine environment, especially the migratory marine species that use this habitat as a necessity in their early life cycle. The two main modes of the migration used by the fishes, i.e., anadromous and catadromous, utilizes estuaries as a transitory abode during their migration from their spawning and main feeding areas (Haedrich, 1983; Dando, 1984). The estuarine ecosystem also provides home to the permanent residing fish species in estuarine ecosystem.The distribution of marine fishes is quite wide having common species to the Indo-Pacific and the Atlantic regions.

The diversity of fishes have been studied by various authors from different ecosystem of India with descriptions of several new/endemic species as well as new records to Indian fauna. Some of the studies on fishes of Indian Ramsar wetlands were performed by Kurup and Samuel (1983), Mandal and Nandi (1989), Kaza (1995), Mehata (2000), Chandra and Sagar (2003), Barman (2004), Narayan et al. (2005), Prusty et al. (2007), Raghunathan, (2007), Sarkar et al. (2007), Dua and Prakash (2009), Nandi (2009), Kumar (2009), Sharma and Mehta (2009), Goswami and Kalita (2012), Mandal et al. (2012), Sharma and Sharma (2013), Jindal et al. (2014), Qureshi et al. (2014), Sebastian et al. (2014), Vimal et al. (2014), Maiban et al. (2015), Sharma (2015), Krishna et al. (2016), Chandra et al. (2017), Kaur et al. (2017), Subadani et al. (2017), Das (2018), Kumar et al. (2018). The present document reports the occurance of 689 species of fishes from the Ramsar wetlands of India (Table 36).

Table 36. List of species of fish from the Ramsar Wetlands of India.

SI. No.	Species	Distribution
	CLASS ACTINOPTERYGII	
	ORDER ANGUILLIFORMES	
	FAMILY ANGUILLIDAE	
1.	*Anguilla bengalensis* Gray , 1831	1, 13, 16, 27, 28, 33
2.	*Anguilla bicolor* McClelland, 1844	1, 12, 16, 27
3.	*Anguilla nebulosa* McClelland, 1844	1, 27
	FAMILY MORINGUIDAE	
4.	*Moringua guthriana* McClelland, 1844	27
5.	*Moringua raitaborua* Hamilton, 1822	1, 26, 27
	FAMILY MURAENIDAE	
6.	*Lycodontis sathete* Hamilton-Buchanan, 1822	27
7.	*Lycodontis tile* Hamilton-Buchanan, 1822	27
8.	*Thyrsoidea macrura* Bleeker, 1854	16
	FAMILY OPHICHTHIDAE	
9.	*Lamnostoma orientalis* McClelland, 1844	27
10.	*Ophichthus apicalis* Anonymous (Bennett), 1830	27
11.	*Ophichthus microcephalus* Day, 1878	11
12.	*Pisodonophis boro* Hamilton-Buchanan, 1822	16, 26, 27
13.	*Pisodonophis cancrivorus* Richardson, 1848	16
14.	*Pisodonophis hijala* Hamilton, 1822	27
15.	*Uroconger lepturus* Richardson, 1845	27
	FAMILY MURAENESOCIDAE	
16.	*Congresox talabon* Cuvier, 1829	27
17.	*Congresox talabonoides* Bleeker, 1853	16, 27
18.	*Muraenesox bagio* Hamilton-duchanan, 1822	27
19.	*Muraenesox cinereus* Forsskal, 1775	13, 16, 27
	ORDER ELIOPIFORMES	
	FAMILY ELIOPIDAE	
20.	*Elops machnata* Forsskal, 1775	11, 13, 16, 27
21.	*Elopssaurus* Linnaeus, 1766	1
	FAMILY MEGALOPIDAE	
22.	*Megalops cyprinoides* Broussonet, 1782	1, 11, 12, 13, 16, 27
	ORDER CLUPEIFORMES	
	FAMILY CLUPEIDAE	
23.	*Anodonstoma thailandia* Wongratana, 1983	27
24.	*Anodontosoma chacunda* Hamilton-Buchanan, 1822	11, 13, 16, 27
25.	*Corcia sobornaa* Hamilton, 1822	16, 27
26.	*Dayella malabarica* Day, 1873	12, 13
27.	*Dussumieria acuta* Valenciennes, 1847	11
28.	*Ehirava fluviatilis* Deraniyagala, 1929	11
29.	*Escualosa thoracata* Valenciennes, 1847	16, 27
30.	*Gonialosa manmina* Hamilton, 1822	16, 27
31.	*Gudusia chapra* Hamilton, 1822	1, 2, 14,18, 16, 22, 24, 25, 27, 30
32.	*Hilsa (Hilsa) kelee* Cuvier, 1829	16, 27
33.	*Hilsa (Tenualosa) ilisha* Hamilton Buchanan, 1822	2, 16, 17, 18, 27
34.	*Hilsa toli* Valenciennes, 1847	27
35.	*Nematalosa galatheae* Nelson & Rothman, 1973	27
36.	*Nematalosa nasus* Bloch, 1795	11, 13, 16, 27
37.	*Sardinella fimbriata* Valenciennes, 1847	11

38.	*Sardinella gibbosa* Bleeker, 1849	13
39.	*Sardinella longiceps* Valenciennes, 1847	11, 13
40.	*Sardinella melanura* Cuvier, 1829	16
41.	*Sardinella sirm* Walbaum, 1792	16
	FAMILY PRISTIGASTERIDAE	
42.	*Ilisha elongata* Bennett, 1830	16, 27
43.	*Ilisha kampeni* Weber & de Beaufort, 1913	27
44.	*Ilisha megaloptera* Swainson, 1839	27
45.	*Ilisha melastoma* Bloch & Schneider, 1801	16, 27
46.	*Ilisha sirishai* Seshagiri Rao, 1975	27
47.	*Opisthopterus tardoore* Cuvier, 1829	27
48.	*Pellona ditchela* Valenciennes, 1847	27
49.	*Raconda russeliana* Gray, 1831	27
	FAMILY ENGRAULIDAE	
50.	*Coilia dussumieri* Valenciennes, 1848	27
51.	*Coilia neglecta* Whitehead, 1967	27
52.	*Coilia ramcarati* Hamilton-Buchanan, 1822	27
53.	*Coilia reynaldi* Valenciennes, 1848	27
54.	*Setipinna brevifilis* Valenciennes, 1848	27
55.	*Setipinna phasa* Hamilton-Buchanan, 1822	27
56.	*Setipinna taty* Valenciennes, 1848	27
57.	*Setipinna tenuifilis* Valenciennes, 1848	27
58.	*Stolephorus bagenensis* Hardenberg, 1933	16, 27
59.	*Stolephorus commersonnii* Lacepede, 1803	11, 13, 27
60.	*Stolephorus dubiosus* Wongratana, 1983	16
61.	*Stolephorus indicus* Van Hasselt, 1823	11, 13, 16, 27
62.	*Thryssa dussumieri* Valenciennes, 1848	13, 27
63.	*Thryssa gautamiensis* Babu Rao, 1971	27
64.	*Thryssa hamiltonii* Gray, 1835	11, 16, 27
65.	*Thryssa kammalensis* Bleeker, 1849	16
66.	*Thryssa malabarica* Bloch, 1795	11, 13, 16, 27
67.	*Thryssa mystax* Bloch & Schneider, 1801	11, 16
68.	*Thryssa purava* Hamilton-Buchanan, 1822	11, 16, 27
69.	*Thryssa setirostris* Broussonet, 1782	11
70.	*Thryssa stenosoma* Wongratana, 1983	27
	FAMILY CHIROCENTRIDAE	
71.	*Chirocentrus dorab* Forsskål, 1775	27
	ORDER GONORHYNCHIFORMES	
	FAMILY CHANIDAE	
72.	*Chanos chanos* Forsskål, 1775	1, 11, 13, 16, 27
	ORDER OSTEOGLOSSIFORMES	
	FAMILY NOTOPTERIDAE	
73.	*Chitala chitala* Hamilton, 1822	2, 15, 18, 19, 22, 24, 25, 26, 28, 30, 35
74.	*Notopterus kapirat* 2	
75.	*Notopterus notopterus* Pallas, 1769	1, 2, 4, 14, 15, 16,18, 19, 22, 24, 25, 26, 27, 28, 29, 39
	ORDER CYPRINIFORMES	
	FAMILY CYPRINIDAE	
76.	*Amblypharyngodon melettinus* Valenciennes, 1844	12,13, 25
77.	*Amblypharyngodon microlepis* Bleeker, 1853	13
78.	*Amblypharyngodon mola* Hamilton, 1822	1, 2, 13, 15, 18, 22,25,26, 27, 28, 29, 39
79.	*Aspidoparia morar* Hamilton, 1822	2, 38
80.	*Bangana dero* Hamilton, 1822	4, 5,15, 18, 20, 38
81.	*Bangana lippus* Fowler, 1936	18

82.	*Barbonymus gonionotus* (Bleeker 1849)	26
83.	*Barilius barila* Hamilton, 1822	2, 4, 5, 25
84.	*Barilius barna* Hamilton, 1822	4, 15, 38
85.	*Barilius bendelisis* Hamilton, 1822	4, 5, 15, 38
86.	*Barilius bola*	2, 13, 14, 25
87.	*Barilius gatensis* Valenciennes, 1844	15
88.	*Barilius guttatus* Day, 1870	15
89.	*Barilius modestus* Day, 1872	25
90.	*Barilius vagra* Hamilton, 1822	4, 5, 18, 25, 38
91.	*Carassius auratus auratus* Linneaus, 1758	4, 26
92.	*Carassius carassius* Linnaeus, 1758	4, 7, 18
93.	*Catla catla* Hamilton, 1822	1, 2, 3, 4, 13, 14, 16, 18, 19, 20, 22, 25,26, 28, 29, 32, 36, 37, 39, 40
94.	*Chagunius chagunio* Hamilton-Buchanan, 1822	22, 38
95.	*Chela (Chela) cachius* Hamilton, 1822	22, 36
96.	*Chela laubuca* Hamilton, 1822	1, 14, 16, 25, 26, 27, 39
97.	*Cirrhinus cirhosus* Bloch, 1795	3, 32
98.	*Cirrhinus mrigala* Hamilton, 1822	1,2, 3, 4, 13, 14, 15, 18,20, 22, 25,26, 29, 30,32, 33, 36, 37, 39, 40
99.	*Cirrhinus reba* Hamilton, 1822	1, 2, 4, 14, 15, 16,18, 22, 24,25,26, 28, 29, 30
100.	*Crossocheilus latius diplocheilus* Heckel, 1838	4, 7, 18
101.	*Crossocheilus latius latius* Hamilton-Buchanan, 1822	4, 15, 16,22, 25, 38
102.	*Ctenopharyngodon idella* Valenciennes, 1844	1, 2, 4, 15, 18, 19, 20, 26, 30
103.	*Cyprinus carpio communis* Linnaeus, 1758	2, 7, 20, 29
104.	*Cyprinus carpio* Linnaeus, 1758	1, 2, 3, 4, 7, 13, 14, 15, 18, 19, 22, 26, 29, 40
105.	*Cyprinus carpio specularis* Lacepède, 1803	7, 20
106.	*Danio aequipinnatus* McClelland, 1839	11
107.	*Danio albolineatus* Blyth, 1860	22
108.	*Danio dangila* Hamilton, 1822	22, 25
109.	*Danio devario* Hamilton, 1822	1, 4, 25, 38
110.	*Danio malabaricus* Jerdon, 1849	13, 28
111.	*Danio rerio* Hamilton, 1822	4, 5, 10, 16, 25,26, 27, 38
112.	*Esomus altus* Blyth, 1860	15
113.	*Esomus barbatus* Jerdon, 1849	1
114.	*Esomus danricus* Hamilton, 1822	1, 4, 5, 14,15, 16, 18, 22,24,26, 27, 38, 39
115.	*Esomus danricus jabalpurensis* Rao & Sharma, 1972	15
116.	*Esomus thermoicos* Valenciennes, 1842	1
117.	*Garra gotyla gotyla* Gray, 1830	4, 14, 18, 25, 38
118.	*Garra gravelyi* Annandale, 1919	15
119.	*Garra lamta* Hamilton-Buchanan, 1822	4
120.	*Garra mullya* Sykes, 1839	3, 28
121.	*Hypophthalmichthys molitrix* Valenciennes, 1844	2, 15, 18, 26, 29, 30, 32, 36, 40
122.	*Hypophthalmichthys nobilis* Richardson, 1845	26
123.	*Hypselobarbus dobsoni* Day, 1876	1
124.	*Hypselobarbus jerdoni* Day, 1870	3
125.	*Hypselobarbus kolus* (Sykes)	28
126.	*Labeo angra* Hamilton, 1822	15, 18
127.	*Labeo bata* Hamilton, 1822	1, 2, 3, 4, 5, 14, 15, 18, 19, 22, 24,26, 39
128.	*Labeo boga* Hamilton, 1822	1, 25, 26
129.	*Labeo boggut* (Sykes)	28
130.	*Labeo caeruleus* Day, 1877	2, 18
131.	*Labeo calbasu* Hamilton, 1822	1, 2, 3, 4, 14, 15,

		18, 19, 20, 22, 25,26, 28, 29, 32, 36, 39
132.	*Labeo dero* Hamilton-Buchanan	38
133.	*Labeo diagonelis*	2
134.	*Labeo dussumieri* Valenciennes, 1842	13, 14
135.	*Labeo dyocheilus* McClelland, 1839	4, 18, 20, 29, 38
136.	*Labeo fimbriatus* Bloch, 1795	1, 3, 13, 22
137.	*Labeo gonius* Hamilton, 1822	2, 14, 15, 18, 20, 22, 25
138.	*Labeo nandina* Hamilton, 1822	2
139.	*Labeo pangusia* Hamilton, 1822	1, 25
140.	*Labeo rohita* Hamilton, 1822	1, 2, 3,4, 5,10, 13, 14, 16, 18, 19, 20, 22,25, 26, 28, 29, 30, 32, 33, 36, 39, 40
141.	*Osteobrama belangeri* Valenciennes, 1844	15
142.	*Osteobrama cotio cotio* Hamilton, 1822	1, 14,15, 18, 22, 25, 39
143.	*Osteobrama cotio cunma* Day, 1888	15, 30
144.	*Osteobrama vigorsii* Sykes, 1839	16
145.	*Parapsilorhynchus prateri*	28
146.	*Pethia conchonius* Hamilton, 1822	1, 2, 4, 5, 7, 15, 26, 27, 38
147.	*Pethia gelius* Hamilton, 1822	1
148.	*Pethia guganio* Hamilton, 1822	1
149.	*Pethia phutunio* Hamilton, 1822	4, 15, 26, 28
150.	*Pethia punctata* Day, 1865	12
151.	*Pethia shalynius* 28	
152.	*Pethia ticto* Hamilton, 1822	2, 26, 27, 28, 38
153.	*Puntius amphibius* Valenciennes, 1842	11, 13, 28
154.	*Puntius carletoni* Fowler	38
155.	*Puntius chola* Hamilton, 1822	1, 4, 5,15, 18, 25,26, 27, 28, 38
156.	*Puntius conchonius*Hamilton-Buchanan	2, 10, 38
157.	*Puntius chrysopterus* McClelland	39
158.	*Puntius dorsalis* Jerdon, 1849	1, 12
159.	*Puntius filamentosus* Valenciennes, 1844	11,12,13
160.	*Puntius javanicus* Bleeker, 1855	26
161.	*Puntius jerdoni* Day, 1870	18
162.	*Puntius mahecola* Valenciennes, 1844	11, 12
163.	*Puntius melanostigma* Day, 1878	13
164.	*Puntius sarana* Hamilton, 1822	1,2,5,14,20,25, 28
165.	*Puntius sarana subnasutus* (Valenciennes, 1842)	12
166.	*Puntius sophore* Hamilton, 1822	1, 2, 3, 4, 13, 14,16, 18, 19, 22, 24, 25,26, 27, 28, 38, 39
167.	*Puntius* sp.	3, 25
168.	*Puntius terio* Hamilton, 1822	1, 18, 26, 27
169.	*Puntius ticto* Hamilton, 1822	1, 2, 3, 4, 5,12,14, 15, 18, 20, 22, 25,26, 28, 29, 38
170.	*Puntius vittatus* Day, 1865	1, 11, 12, 13, 16
171.	*Raiamas bola* Hamilton, 1822	4, 15, 26, 38
172.	*Rasbora bacalia*	2
173.	*Rasbora caverii*	5
174.	*Rasbora daniconius* Hamilton, 1822	1, 2, 3, 4, 5, 11, 14,16, 18,22, 25, 26, 27, 28, 38, 39
175.	*Rasbora labiosa*	28
176.	*Rasbora rasbora* Hamilton, 1822	10, 16
177.	*Rohtee ogilbii* Sykes, 1839	1
178.	*Salmophasia boopis*	25
179.	*Salmostoma bacaila* Hamilton, 1822	2, 3, 14,16, 18, 22, 25,26, 27, 28, 30

180.	*Salmostoma clupeoides* Bloch, 1795	1, 3, 28
181.	*Salmostoma horai* Silas, 1951	18
182.	*Salmostoma novacula*	28
183.	*Salmostoma phulo phulo* Hamilton, 1822	1, 18, 26
184.	*Schizopyge niger* Heckel, 1838	7
185.	*Schizothorax curvifrons* Heckel, 1838	7
186.	*Schizothorax esocinus* Heckel, 1838	7
187.	*Schizothorax richardsonii* Gray, 1832	4,7, 18, 38
188.	*Systomas rubripinnis* Valenciennes, 1842	15
189.	*Systomus orphoides* Valenciennes, 1842	15
190.	*Systomus sarana* Hamilton, 1822	1, 2, 3, 4, 11, 12,13, 14,15, 16, 18, 20,25, 26, 27, 38
191.	*Systomus subnasutus* Valenciennes, 1842	13
192.	*Thynnichthys sandkhol* Sykes, 1839	1
193.	*Tor chelynoides* McClelland	38
194.	*Tor putitora* Hamilton, 1822	4, 5, 25, 30, 38
195.	*Tor tor* Hamilton, 1822	4, 5, 25, 38
	FAMILY DUSSUMIERIIDAE	
196.	*Dussumieria acuta* Valenciennes, 1847	11
	FAMILY COBITIDAE	
197.	*Aorichtyhs seenghala*	2, 20
198.	*Botia birdi* Chaudhuri, 1909	4, 18
199.	*Botia dario* Hamilton, 1822	2, 15, 25
200.	*Botia histrionica* Blyth, 1860	2
201.	*Botia lohachata* Chaudhuri, 1912	22
202.	*Botia rostrata*Günther 1868	24
203.	*Lepidocephalichthys guntea* Hamilton, 1822	1, 2, 3,4, 15, 16,18, 22, 25,26, 27, 30, 38, 39
204.	*Lepidocephalichthys irrorata* Hora, 1921	15
205.	*Lepidocephalichthys furcatus* de Beaufort 1933	38
206.	*Lepidocephalus coudofurcatus* Tilak & Husain	38
207.	*Lepidocephalus guntea* Hamilton-Buchanan	38
208.	*Pangia pangia* Hamilton, 1822	15
209.	*Syncrossus hymenophysa* Bleeker, 1852	15
	FAMILY NEMACHEILIDAE	
210.	*Acanthocobitis botia* Hamilton, 1822	4, 5, 14,22, 25, 38
211.	*Nemacheilus sikmaiensis*	5
212.	*Nemacheilus* sp.	7
213.	*Nemacheilus beavani* Gunther	38
214.	*Nemachelius bevasni*	25
215.	*Nemachelius botia*	38
216.	*Nemachelius corica* Hamilton, 1822	22, 25, 38
217.	*Nemacheilus denisoni* (Day)	28
218.	*Nemacheilusdoonensis* Tilak & Husain	38
219.	*Nemachelius kangrae*	4
220.	*Nemachelius multifasciatus*	25
221.	*Nemachelius savena*	25, 38
222.	*Nemachelius scaturingina*	25
223.	*Nemachelius zonatus*	25
224.	*Paraschistura montana* McClelland, 1838	4, 25, 38
225.	*Schistura devdevi* Hora, 1935	4,5, 25
226.	*Schistura himachalensis* Menon, 1987	4
227.	*Schistura horai* Menon, 1952	4
228.	*Schistura rupecula* McClelland, 1838	5, 38
229.	*Schistura sikmaiensis* Hora, 1921	15

230.	*Triplophysa* sp.	7
	ORDER SILURIFORMES	
	FAMILY BAGRIDAE	
231.	*Bagarius bagarius* Hamilton, 1822	4, 25, 30
232.	*Bagarius yarrellii* Sykes, 1839	4, 18, 38
233.	*Batasio affinis* Blyth, 1860	26
234.	*Horabagarus brachysoma* Günther, 1864	12,13
235.	*Mystus armatus* Day, 1865	1, 26
236.	*Mystus bleekeri* Day, 1877	1, 4, 12, 14, 15, 18, 25, 26, 27, 28, 30, 38, 39
237.	*Mystus cavasius* Hamilton, 1822	1, 3, 14,15, 16, 18, 22, 24, 25,26, 27, 28, 29, 39
238.	*Mystus gulio* Hamilton, 1822	1, 3, 12,16, 24,26, 27
239.	*Mystus horai* Jayaram, 1954	18
240.	*Mystus malabaricus* (Jerdon)	28
241.	*Mystus montanus* Jerdon, 1849	3
242.	*Mystus mysticetus*	30
243.	*Mystus oculatus* Valenciennes, 1840	12, 13
244.	*Mystus* sp.	13
245.	*Mystus tengara* Hamilton, 1822	2, 18, 19, 22, 25,26, 27, 39
246.	*Mystus vittatus* Bloch, 1794	1, 2, 13, 16, 18, 22, 25,26, 27, 29, 35, 38
247.	*Rita rita* Hamilton, 1822	18, 25,26, 27, 29, 30
248.	*Sperata aor* Hamilton, 1822	2, 4, 14, 18, 22, 24,25,26, 27
249.	*Sperata seenghala* Sykes, 1839	2, 3, 4, 14,15, 16, 18, 19, 20, 22, 25,27, 29, 30, 32, 36, 37
250.	*Tachysurus* sp.	13
	FAMILY SILURIDAE	
251.	*Kryptopterus bicirrhis* Valenciennes, 1840	2
252.	*Ompok bimaculatus* Bloch, 1794	1, 2, 12, 13, 14, 15,16,18, 22, 24,25,27, 28, 39
253.	*Ompok malabaricus* Valenciennes, 1840	12, 13, 28
254.	*Ompok pabda* Hamilton, 1822	1, 2, 3, 15, 18, 24, 25,26, 27, 35
255.	*Ompok pabo* Hamilton, 1822	1, 2, 15, 24, 35
256.	*Ompok* sp.	11
257.	*Wallago attu* Bloch & Schneider, 1801	1, 2, 3, 4, 13, 15, 16, 19, 20, 22, 24,25,26, 27, 28, 29, 39, 40
	FAMILY AMBLYCIPITIDAE	
258.	*Amblyceps mangois* Hamilton, 1822	4, 38
	FAMILY SISORIDAE	
259.	*Bagarius bagarius* Hamilton, 1822	4, 15, 16, 18, 27
260.	*Gagata cenia* Hamilton, 1822	15
261.	*Glyptothorax conirostrae* Steindachner, 1867	4
262.	*Glyptothorax garhwali* Tilak, 1969	4
263.	*Glyptothorax pectinopterus* McClelland, 1842	4, 38
264.	*Glyptothorax stoliczkea* Steindachner, 1867	4
265.	*Glyptothorax trilineatus* Blyth, 1860	15
266.	*Gogangra viridescens* Hamilton, 1822	22, 25
267.	*Nangra nangra*	25
	FAMILY SCHILBEIDAE	
268.	*Ailia coila* Hamilton, 1822	2, 16, 22,25,26, 27, 35, 40
269.	*Clupisoma garua* Hamilton, 1822	2, 18, 22, 25, 29
270.	*Euptropiichthys vacha* Hamilton, 1822	15, 16, 18, 22, 25, 29, 35
271.	*Eutropiichthys murius* Hamilton, 1822	18
272.	*Pachypterus atherinoides* Bloch, 1794	1, 22, 26, 27

273.	*Silonia silondia* Hamilton, 1822	16, 26, 27
	FAMILY PANGASIIDAE	
274.	*Pangasianodon hypophthalmus* Sauvage, 1878	26
275.	*Pangasius pangasius* Hamilton, 1822	1, 25,26, 27
	FAMILY CLARIIDAE	
276.	*Clarias batrachus* Linnaeus, 1758	1, 2, 13, 14,15, 16,18, 19, 22, 25,26, 32, 35, 36, 38, 39, 40
277.	*Clarias gariepinus* Burchell, 1822	1, 22, 26, 28, 40
278.	*Clarias magur* Hamilton, 1822	25, 26, 27
279.	*Clarias* sp.	3
	FAMILY CHACIDAE	
280.	*Chaca chaca* Hamilton, 1822	13, 25,26
	FAMILY HETEROPNEUSTIDAE	
281.	*Heteropneustes fossilis* Bloch, 1794	1, 2,3,12, 13,14, 15, 16, 18,22, 24, 25, 26, 27, 28, 29,32, 36, 37, 38, 39
282.	*Heteropneustes* sp.	3
	FAMILYEXOCOETIDAE	
283.	*Hyporhamphus gaimardi*	1
	FAMILY LORICARIIDAE	
284.	*Hypostomus punctatus* Valenciennes 1840	1
285.	*Pterygoplichthys anisitsi* Eigenmann & Kennedy, 1903	26
286.	*Pterygoplichthys disjunctivus* Weber, 1991	26
287.	*Pterygoplichthys multiradiatus* Hancock, 1828	26
288.	*Pterygoplichthys pardalis* (Castelnau, 1855)	26
	FAMILY ARIIDAE	
289.	*Arius arius* Hamilton, 1822	16, 27
290.	*Arius gagora* Hamilton, 1822	27
291.	*Arius jella* Day, 1877 27	
292.	*Arius maculatus* Thunberg, 1792	11, 13, 16
293.	*Arius subrostratus* Valenciennes, 1840	11, 13
294.	*Batrachocephalus mino* Hamilton, 1822	27
295.	*Cephalocassis jatia* Hamilton, 1822	27
296.	*Hemiarius sona* Hamilton, 1822	27
297.	*Hexanematichthys sagor* Hamilton, 1822	27
298.	*Nemapteryx caelata* Valenciennes, 1840	16, 27
299.	*Nemapteryx nenga* Hamilton, 1822	27
300.	*Netuma thalassina* Rüppell, 1837	11, 27
301.	*Osteogeniosus militaris* Linnaeus, 1758	16, 27
302.	*Plicofollis dussumieri* Valenciennes, 1840	11, 27
303.	*Plicofollis layardi* Günther, 1866	16
304.	*Plicofollis platystomus* Day, 1877	13, 27
305.	*Sciades sona* Hamilton, 1822	27
	FAMILY PLOTOSIDAE	
306.	*Plotosus canius* Hamilton, 1822	16, 27
307.	*Plotosus lineatus* Thunberg, 1787	16, 27
	ORDER AULOPIFORMES	
	FAMILY SYNODONTIDAE	
308.	*Harpadon nehereus* Hamilton, 1822	27
	ORDER GADIFORMES	
	FAMILY BREGMACEROTIDAE	
309.	*Bregmaceros macclellandii* Thompson, 1840	27
	ORDER BATRACHOIDIFORMES	
	FAMILY BATRACHOIDAE	
310.	*Allenbatrachus grunniens* Linnaeus, 1758	27

	ORDER BELONIFORMES	
	FAMILY BELONIDAE	
311.	*Strongylura leiura* Bleeker, 1850	27
312.	*Strongylura strongylura* Van Haseelt, 1823	11, 27, 28
313.	*Tylosurus crocodilus* Péron & Lesueur, 1821	11, 27
314.	*Xenentodon cancila* Hamilton, 1822	1, 2, 3, 4, 11, 12,13, 14,16, 18,22, 25,26, 27, 28, 30, 38, 39
	ORDER CYPRINODONTIFORMES	
	FAMILY POECILIIDAE	
315.	*Gambusia affinis* Baird & Girard, 1853	18
316.	*Poecilia reticulata* Peters, 1859	13
	FAMILY APLOCHEILIDAE	
317.	*Aplocheilus blockii* Arnold, 1911	13
318.	*Aplocheilus lineatus* Valenciennes, 1846	11, 12,13
319.	*Aplocheilus panchax* Hamilton, 1822	1, 12, 13, 16, 26, 27
	ORDER BELONIFORMES	
	FAMILY ADRIANICHTHYIDAE	
320.	*Oryzias dancena* Hamilton, 1822	1, 27
321.	*Oryzias melanostigma* McClelland, 1839	16, 27
	FAMILY HEMIRAMPHIDAE	
322.	*Hemiramphus far* Forsskal, 1775	27
323.	*Hyporamphus limbatus* Valenciennes, 1847	1, 11, 12, 16, 27
324.	*Hyporamphus* sp. 13	
325.	*Hyporamphus xanthopterus* Valenciennes, 1847	11, 13
326.	*Rhynchorhamphus georgii* Valenciennes, 1847	27
327.	*Zenarchopterus brachynotopterus* Bleeker, 1853	27
328.	*Zenarchopterus buffonis* Valenciennes, 1847	11, 27
329.	*Zenarchopterus dispar* Valenciennes, 1847	11, 27
330.	*Zenarchopterus ectunio* Hamilton, 1822	27
331.	*Zenarchopterus striga* Blyth, 1858	27
	ORDER PERCIFORMES	
	FAMILY CHANNIDAE	
332.	*Channa amphibius*	5
333.	*Channa barca* Hamilton, 1822	2
334.	*Channa cephalus* 4	
335.	*Channa diplogramma* F. Day, 1865	12
336.	*Channa gachua* Hamilton, 1822	1, 2, 14, 22,25, 26, 27, 28, 29, 38
337.	*Channa leucopunctatus* 14	
338.	*Channa marulius* Hamilton, 1822	1, 2,3, 4, 5, 12, 13, 14, 18, 19, 22, 24, 25,26, 27, 28, 29, 30, 36, 39
339.	*Channa orientalis* Bloch & Schneider, 1801	1,2, 3, 5,13, 15
340	*Channa punctata* Bloch, 1793	1, 2, 3,4, 5, 10, 11, 14, 15,16,18, 19, 20, 22, 24, 25,26, 27, 28, 29, 32, 36, 38, 39
341.	*Channa* sp. 1	3, 13
342.	*Channa stewartii*	25
343.	*Channa striata* Bloch, 1793	1, 2, 3, 4, 11,12, 14, 15,16,18, 19, 20, 22, 25,26, 27,29, 32, 36, 39
344.	*Colisa fasciata*	1,2,14,20,24,25, 39
	FAMILY BLENNIIDAE	
345.	*Omobranchus zebra* Bleeker, 1868	16
	FAMILY AMBASSIDAE	
346.	*Ambassis ambassis* Lacepede, 1802	11, 13, 16
347.	*Ambassis gymnocephalus* Lacepede, 1802	11, 16
348.	*Ambassis kopsii* Bleeker, 1858	27

349.	*Ambassis nalua* Hamilton, 1822	27
350.	*Ambassis* sp.	13
351.	*Chanda commersoni* 1	
352.	*Chanda nama* Hamilton, 1822	1,2,3,14,15,16,18,20, 22,25,26,27, 28, 32, 39
353.	*Parambassis baculis* Hamilton, 1822	19, 27
354.	*Parambassis dayi* Bleeker, 1874	12
355.	*Parambassis lala* (Hamilton, 1822)	26, 28
356.	*Parambassis ranga* Hamilton, 1822	1,2, 3,13,14, 15,16,18,20, 22,24,25,26,27, 28, 39
357.	*Parambassis thomassi* Day, 1870	12, 13
	FAMILY GERREIDAE	
358.	*Gerres erythrourus* Bloch, 1791	11
359.	*Gerres filamentosus* Cuvier, 1829	1, 11, 13, 16, 27
360.	*Gerres limbatus* Cuvier, 1830	16
361.	*Gerres longirostris* Lacepède, 1801	16
362.	*Gerres oblongus* Cuvier, 1830	11
363.	*Gerres oyena* Forsskal, 1775	16, 27
364.	*Gerres phaiya* Iwatsuki & Heemstra, 2001	27
365.	*Gerres punctatus*	1
366.	*Gerres setifer* Hamilton, 1822	11, 13, 16, 27
	FAMILY LETHRINIDAE	
367.	*Lethrinus nebulosus* Forsskål, 1775	11
	FAMILY POMACANTHIDAE	
368.	*Pomacanthus annularis* Bloch, 1787	11
	FAMILY LATIDAE	
369.	*Lates calcarifer* Bloch, 1790	1, 13, 16, 26, 27
	FAMILY MENIDAE	
370.	*Mene maculata* Bloch & Schneider, 1801	27
	FAMILY POLYNEMIDAE	
371.	*Eleutheronema tetradactylus* Shaw, 1804	13, 16, 27
372.	*Leptomelanosoma indicum* Shaw, 1804	16, 27
373.	*Polydactylus plebeius* Broussonet, 1782	27
374.	*Polydactylus sextarius* Bloch & Schneider, 1801	16, 27
375.	*Polynemus paradiseus* Linnaeus, 1758	27
	FAMILY NANDIDAE	
376.	*Nandus nandus* Hamilton, 1822	1, 2, 13, 14,18, 24, 25,26, 27, 39
	FAMILY BADIDAE	
377.	*Badis badis* Hamilton, 1822	1, 25,26, 27, 38, 39
	FAMILY PRISTOLEPIDIDAE	
378.	*Pristolepis fasciata* Bleeker, 1851	13
379.	*Pristolepis marginata* Jerdon, 1849	13
	FAMILY KURTIDAE	
380.	*Kurtus indicus* Bloch, 1786	27
	FAMILY DREPANIDAE	
381.	*Drepane longimana* Bloch & Schneider, 1801	27
382.	*Drepane punctata* Linnaeus, 1758	16,27
	FAMILY CORYPHAENIDAE	
383.	*Coryphaena hippurus* Linnaeus, 1758	27
	FAMILY SERRANIDAE	
384.	*Centropristis cephalus*	5
385.	*Centropristis marulius*	5
386.	*Centropristis striata*	5
387.	*Cephalopholis boenak* Bloch, 1790	11
388.	*Epinephelus coioides* Hamilton, 1822	27
389.	*Epinephelus diacanthus* Valenciennes, 1828	11

390.	*Epinephelus lanceolatus* Bloch, 1790	16, 27
391.	*Epinephelus malabaricus* Bloch & Schneider, 1801	11, 27
392.	*Epinephelus tauvina* Forsskal, 1775	11, 16
	FAMILY TRICHIURIDAE	
393.	*Eupleurogrammus muticus* Gray, 1831	27
394.	*Lepturacanthus pantulai* Gupta, 1966	27
395.	*Lepturacanthus savala* Cuvier, 1829	27
396.	*Trichiurus gangeticus* Gupta, 1966	27
397.	*Trichiurus lepturus* Linnaeus, 1758	27
	FAMILY STROMATEIDAE	
398.	*Pampus argenteus* Euphrasen, 1788	27
399.	*Pampus chinensis* Euphrasen, 1788	27
400.	*Scomberomorus guttatus* Bloch & Schneider, 1801	27
401.	*Stromateus sinensis* 27	
	FAMILY ACANTHURIDAE	
402.	*Acanthurus mata* Cuvier, 1829	11
403.	*Ctenochaetus strigosus* Bennett, 1828	11
	FAMILY CICHLIDAE	
404.	*Etroplus canarensis* Day, 1877	1
405.	*Etroplus maculatus* Bloch, 1795	1, 11, 12,13, 27
406.	*Etroplus suratensis* Bloch, 1790	1, 11,12, 13 16, 27
407.	*Oreochromis mossambica* Peters, 1852	1, 3, 13,15, 26, 28
408.	*Oreochromis niloticus* Linnaeus, 1758	26
409.	*Oreochromis karongae*	40
	FAMILY GOBIIDAE	
410.	*Acenntrogobius madraspatensis* Day, 1868	16
411.	*Acentrogobius caninus* Valenciennes, 1837	11, 27
412.	*Acentrogobius chlorostigmatoides* Bleeker, 1849	11
413.	*Acentrogobius cyanomos* Bleeker, 1849	11, 16
414.	*Acentrogobius griseus* Day, 1876	16
415.	*Acentrogobius gymnocephala* Bleeker, 1853	27
416.	*Acentrogobius masoni* Day, 1873	16
417.	*Acentrogobius viridipunctatus* Valenciennes, 1837	16, 27
418.	*Amblyotrypauchen arctocephalus* Alcock, 1890	27
419.	*Apocryptes bato* Hamilton, 1822	27
420.	*Apocryptodon madurensis* Bleeker, 1849	27
421.	*Awaouichthys menoni* Chatterjee & Mishra, 2013	27
422.	*Bathygobius coalitus* Bennett, 1832	16
423.	*Bathygobius fuscus* Rüppell, 1830	11, 27
424.	*Bathygobius ostreicola* Chaudhuri, 1916	16
425.	*Boleophthalmus boddaerti* Pallas, 1770	27
426.	*Boleopthalmus dussumieri* Valenciennes, 1837	27
427.	*Brachygobius nunus* Hamilton-Buchanan, 1822	16, 27
428.	*Caragobius urolepis* Bleeker, 1852	11, 27
429.	*Drombus globiceps* Hora, 1923	16, 27
430.	*Favonigobius reichei* Bleeker, 1854	11
431.	*Glossogobius giuris* Hamilton, 1822	1, 2, 3, 4, 11,12,13, 14, 15, 16,18, 25,26, 27, 28, 39
432.	*Gnatholepis cauerensis* Bleeker, 1853	27
433.	*Gobiopsis macrostoma* Steindachner, 1861	1, 27
434.	*Gobiopterus chuno* Hamilton, 1822	16, 27
435.	*Hemigobius hoevenii* Bleeker, 1851	27
436.	*Istogobius ornatus* Rüppell, 1830	27
437.	*Odontamblyopus rubicundus* Hamilton, 1822	11, 27
438.	*Oligolepis acutipennis* Valenciennes, 1837	11, 16

439.	*Oligolepis cylindriceps* Hora, 1923	16
440.	*Oxuderces dentatus* Eydoux & Souleyet, 1850	27
441.	*Oxyurichthys formosanus* Nichols, 1958	11, 13
442.	*Oxyurichthys microlepis* Bleeker, 1849	11
443.	*Oxyurichthys tentacularis* Valenciennes, 1837	11, 13
444.	*Parachaeturichthys polynema* Bleeker, 1853	27
445.	*Parapocryptes rictuosus* Valenciennes, 1837	16
446.	*Parapocryptes serperaster* Bleeker, 1851	27
447.	*Paratrypauchen microcephalus* Bleeker, 1860	27
448.	*Periophthalmus barbarus* Linnaeus, 1766	16, 27
449.	*Periophthalmus kalolo* Lesson, 1831	27
450.	*Periophthalmus novemradiatus* Hamilton, 1822	27
451.	*Periophthalmus weberi* Eggert, 1935	27
452.	*Periopthalmodon schlosseri* Pallas, 1770	27
453.	*Periopthalmodon septemradiatus* Hamilton, 1822	27
454.	*Periopthalmus variabilis* Eggert, 1935	27
455.	*Psammogobius biocellatus* Valenciennes, 1837	11, 16
456.	*Pseudapocryptes elongatus* Cuvier, 1816	1, 16, 27
457.	*Pseudogobius javanicus* Bleeker, 1856	16, 27
458.	*Pseudotrypauchen multiradiatus* Hardenberg, 1931	27
459.	*Scartelaos histophorus* Valenciennes, 1837	1, 27
460.	*Stenogobius gymnopomus* Bleeker, 1853	13
461.	*Stigmatogobius minima* Hora, 1923	16
462.	*Stigmatogobius sadanundio* Hamilton, 1822	1, 27
463.	*Taenioides anguillaris* Linnaeus, 1758	27
464.	*Taenioides buchanani* Day, 1873	16, 27
465.	*Taenioides cirratus* Blyth, 1860	27
466.	*Trypauchen vagina* Bloch & Scheider, 1801	11, 16,27
467.	*Trypauchenichthys sumatrensis* Hardenberg, 1931	27
	FAMILY ANABANTIDAE	
468.	*Anabas cobojius* Hamilton, 1822	1, 15, 16, 26, 27
469.	*Anabas testudineus* Bloch, 1792	1, 2, 11, 12, 13, 15, 16, 24,25,26, 27, 39
470.	*Anabas oligolepia*	1
	FAMILY MONODACTYLIDAE	
471.	*Monodactylus argenteus* Linnaeus, 1758	11, 16, 27
	FAMILY LUTJANIDAE	
472.	*Lutjanus argentimaculatus* Forsskal, 1775	1, 11, 16, 27
473.	*Lutjanus fulviflamma* Forsskal, 1775	11
474.	*Lutjanus fulvus* Forster, 1801	27
475.	*Lutjanus indicus* Allen, White & Erdmann, 2013	27
476.	*Lutjanus jahngarah*	1
477.	*Lutjanus johnii* Bloch, 1792	1, 16, 27
478.	*Lutjanus kasmira* Forsskal, 1775	16
479.	*Lutjanus russelli* Bleeker, 1849	11, 16
	FAMILY SCATOPHAGIDAE	
480.	*Scatophagus argus* Linnaeus, 1766	1, 11, 13, 16, 27
	FAMILY SPHYRAENIDAE	
481.	*Eusphyra blochii* Cuvier, 1816	27
482.	*Sphyraena jello* Cuvier, 1829	11
483.	*Sphyraena obtusata* Cuvier, 1829	27
484.	*Sphyraena putnamae* Jordan & Seale, 1905	11, 16
485.	*Sphyrna zygaena* Linnaeus, 1758	27
	FAMILY OSPHRONEMIDAE	
486.	*Polyacanthus chuna* Hamilton, 1822	27

487.	*Pseudosphromenus cupanus* Cuvier, 1831	1, 12, 13
488.	*Trichogaster chuna* Hamilton, 1822	15
489.	*Trichogaster fasciatus* Bloch & Schneider, 1801	1, 2, 10, 14, 15, 18, 22, 23,25,26, 27, 38, 39
490.	*Trichogaster labiosa* Day, 1877	1
491.	*Trichogaster lalius* Hamilton, 1822	1, 16, 18, 25, 26, 27
	FAMILY SPARIDAE	
492.	*Acanthopagrus berda* Forsskål, 1775	11, 27
493.	*Acanthopagrus latus* Houttuyn, 1782	16, 27
494.	*Acanthopagrus longispinnis* Valenciennes, 1830	27
495.	*Crenidens crenidens* Forsskal, 1775	16
496.	*Rhabdosargus sarba* Forsskal, 1775	16, 27
497.	*Sparidentex datnia*	27
	FAMILY HAEMULIDAE	
498.	*Plectorhinchus gibbosus* Lacepède, 1802	16, 27
499.	*Pomadasys argenteus* Forsskal, 1775	11, 16, 27
500.	*Pomadasys kaakan* Cuvier, 1830	27
501.	*Pomadasys maculatus* Bloch, 1793	27
	FAMILY TERAPONIDAE	
502.	*Pelates quadrilineatus* Bloch, 1790	11, 16
503.	*Terapon jarbua* Forsskål, 1775	1, 11, 16, 27
504.	*Terapon puta* Cuvier, 1829	11, 16, 27
505.	*Terapon theraps* Cuvier, 1829	27
	FAMILY CALLIONYMIDAE	
506.	*Callionymus fluviatilis* Day, 1876	27
507.	*Callionymus megastomus* Fricke, 1982	27
508.	*Callionymus sagitta* Pallas, 1770	27
509.	*Eleutherochir opercularis* Valenciennes, 1837	27
	FAMILY SIGANIDAE	
510.	*Siganus canaliculatus* Park, 1797	11, 16, 27
511.	*Siganus javus* Linnaeus, 1766	11, 13, 27
	FAMILY SILLAGINIDAE	
512.	*Sillaginopsis domina* Cuvier, 1829	27
513.	*Sillaginopsis panijus* Hamilton-Buchanan, 1822	16, 27
514.	*Sillago sihama* Forsskal, 1775	11, 16, 27
	FAMILY RACHYCENTRIDAE	
515.	*Rachycentron canadum* Linnaeus, 1766	16
	FAMILY TOXOTIDAE	
516.	*Toxotes chatareus* Hamilton- Buchanan, 1822	27
517.	*Toxotes jaculatrix* Pallas, 1767	27
	FAMILY APOGONIDAE	
518.	*Fibramia thermalis* Cuvier, 1829	11
	FAMILY ECHENEIDAE	
519.	*Echeneis naucratus* Linnaeus, 1758	16
	FAMILY POMACENTRIDAE	
520.	*Neopomacentrus cyanomos* Bleeker, 1856	11
	FAMILY ELEOTRIDIDAE	
521.	*Butis butis* Hamilton-Buchanan, 1822	11, 16, 27
522.	*Butis humeralis* Valenciennes, 1837	27
523.	*Eleotris fusca*Bloch & Schneider, 1801	11, 13, 16,27
524.	*Eleotris melanosoma* Bleeker, 1853	27
525.	*Giuris margaritacea* Valenciennes, 1837	27
526.	*Odonteleotris macrodon* Bleeker, 1853	27
527.	*Ophiocara ophicephalus* Valenciennes, 1837	27
	FAMILY CARANRGIDAE	

528.	*Alectis indica* Ruppell, 1830	16, 27
529.	*Alepes djedaba* Forsskal, 1775	16, 27
530.	*Alepes kleinii* Bloch, 1793	11
531.	*Atropus atropus* Bloch & Schneider, 1801	27
532.	*Atule mate* Cuvier, 183316, 27	
533.	*Carangoides malabaricus* Bloch & Schneider, 1801	27
534.	*Carangoides praeustus* Bennett, 1830	16, 11
535.	*Caranx hippos* Linnaeus, 1766	11, 16, 27
536.	*Caranx ignobilis* Forsskal, 1775	11, 16, 27
537.	*Caranx melampygus* Cuvier, 1833	16
538.	*Caranx sexfasciatus* Quoy & Gaimard, 1825	1, 11, 16
539.	*Megalaspis cordyla* Linnaeus, 1758	13, 16, 27
540.	*Parastromateus niger* Bloch, 1795	27
541.	*Scomberoides commersonnianus* Lacepede, 1801	27
542.	*Scomberoides lysan* Forsskal, 1775	16, 27
543.	*Scomberoides* sp.	11
544.	*Scomberoides tala* Cuvier, 1832	16, 27
545.	*Trachinotus blochii* Laccpede, 1801	16, 27
	FAMILY LEIOGNATHIDAE	
546.	*Aurigequula fasciata* Lacepède, 1803	27
547.	*Equulites lineolatus* Valenciennes, 1835	11
548.	*Eubleekeria splendens* Cuvier, 1829	11, 13, 27
549.	*Gazza minuta* Bloch, 1795	16, 13, 11, 27
550.	*Karalla daura* Cuvier, 1829	13, 16
551.	*Karalla dussumieri* Valenciennes, 1835	13, 16, 27
552.	*Leiognathus berbis* Valenciennes, 1835	13
553.	*Leiognathus brevirostris* Valenciennes, 1835	13
554.	*Leiognathus equulus* Forsskal, 1775	1, 11, 13, 16, 27
555.	*Nuchequula blochii* Valenciennes, 1835	11, 16, 27
556.	*Nuchequula gerreoides* Bleeker, 1851	27
557.	*Photopectoralis bindus* Valenciennes, 1835	11, 13, 27
558.	*Secutor insidiator* Bloch, 1787	11, 13, 16, 27
559.	*Secutor ruconius* Hamilton-Buchanan, 1822	11, 13, 27
	FAMILY DATNIODIDAE	
560.	*Datnioides polota* Hamilton, 1822	16, 27
	FAMILY SCOMBRIDAE	
561.	*Scomberomorus lineolatus* Cuvier, 1829	16
	FAMILY SCIAENIDAE	
562.	*Bahaba chaptis* Hamilton, 1822	27
563.	*Chrysochir aurens* Richardson, 1846	27
564.	*Daysciaena albida* Cuvier, 1830	11, 13, 16,27
565.	*Dendrophysa russelii* Cuvier, 1829	16, 27
566.	*Johnius belangerii* Cuvier, 1830	16, 27
567.	*Johnius borneensis* Bleeker, 1851	27
568.	*Johnius carutta* Bloch, 1793	27
569.	*Johnius coitor* Hamilton, 1822	13, 27
570.	*Johnius dussumieri* Cuvier, 1830	27
571.	*Johnius gangeticus* Talwar, 1991	27
572.	*Johnius macropterus* Bleeker, 1853	16
573.	*Macrospinosa cuja* Hamilton-Buchanan, 1822	27
574.	*Nibea coibor* Hamilton, 1822	27
575.	*Nibea soldado* Lacepede, 1802	27
576.	*Otolithoides biauritus* Cantor, 1849	16, 27
577.	*Otolithoides pama* Hamilton, 1822	16, 27

578.	*Panna microdon* Bleeker, 1849	27
579.	*Paranibea semiluctuosa* Cuvier, 1830	16
580.	*Protonibea diacanthus* Lacepede, 1802	16, 27
581.	*Pterotolithus maculatus* Cuvier, 1830	27
	ORDER SYNBRANCHIFORMES	
	FAMILY SYNBRANCHIDAE	
582.	*Monopterus armantus* Lacepede	15
583.	*Monopterus cuchia* Hamilton, 1822	2, 18, 26, 27, 33, 35, 39
584.	*Ophisternon bengalense* McClelland, 1845	1, 12, 26, 27
	FAMILY MASTACEMBELIDAE	
585.	*Macrognathus aculeatus* Bloch, 1787	1, 2, 3, 14, 22, 25, 39
586.	*Macrognathus aral* Bloch & Schneider, 1801	1, 16, 18, 26, 27, 28
587.	*Macrognathus guentheri* Day, 1865	12, 13
588.	*Macrognathus pancalus* Hamilton, 1822	1, 3, 14,16, 18, 22, 24,25,26, 27, 28, 38, 39
589.	*Macrognathus siamensis*24	
590.	*Mastacembelus armatus* Lacepede, 18001, 2, 4, 5, 10,	13,14, 15, 16, 18, 20, 22, 25,26, 27, 28, 38, 39
	ORDER BELONIFORMES	
	FAMILY BELONIDAE	
591.	*Strongylura leiura* Bleeker, 1850	27
592.	*Strongylura strongylura* Van Hasselt, 1823	3, 16, 27
	FAMILY OSPHRONEMIDAE	
593.	*Osphronemus gorami*Lacepède 1801	1
594.	*Trichogaster fasciata* Bloch & Schneider	15, 25
595.	*Trichogaster lalious* Hamilton, 1822	15, 25
	CLASS ELSMOBRANCHII	
	ORDER CARCHARHINIFORMES	
	FAMILY SPHYRNIDAE	
596.	*Eusphyra blochii* Cuvier, 1816	27
	CLASS ACTINOPTERYGII	
	ORDER MUGILIFORMES	
	FAMILY MUGILIDAE	
597.	*Chelon parsia* Hamilton-Buchanan, 1822	1, 11, 13, 16, 26, 27
598.	*Chelon planiceps* Valenciennes, 1836	16, 27
599.	*Crenimugil buchanani* Bleeker, 1853	11, 27
600.	*Crenimugil seheli* Forsskal, 1775	11,16, 27
601.	*Ellochelon vaigiensis* Quoy & Gaimard, 1825	16, 27
602.	*Liza tade* Forsskål, 1775 27	
603.	*Mugil cephalus* Linnaeus, 1758	1, 11, 16, 27
604.	*Mugil parsia*	13
605.	*Osteomugil cunnesius* Valenciennes, 1836	11,16, 27
606.	*Planiliza macrolepis* Smith, 1846	11, 13, 16, 27
607.	*Planiliza melinopterus* Valenciennes, 1836	16, 27
608.	*Planiliza subviridis* Valenciennes, 1836	16, 27
609.	*Rhinomugil corsula* Hamilton, 1822	1, 16, 26, 27
610.	*Valamugil speigleri* Bleeker, 1858	16, 27
	ORDER CHARACIFORMES	
	FAMILY SERRASALMIDAE	
611.	*Piaractus brachypomus* Cuvier, 1818	26
612.	*Pygocentrus nattereri* Kner, 1858	1, 13
	CLASS ACTINOPTERYGII	
	ORDER PLEURONECTIFORMES	
	FAMILY SOLEIDAE	
613.	*Brachirus orientalis* Bloch & Schneider, 1801	1, 11, 13, 16

614.	*Brachirus pan* Hamilton, 1822	27
615.	*Solea ovata* Richardson, 1846	16
616.	*Synaptura albomaculata* Kaup, 1858	27
617.	*Synaptura commersonnii* Lacepede, 1802	11, 27
	FAMILY CYNOGLOSSIDAE	
618.	*Cynoglossus arel* Bloch & Schneider, 1801	27
619.	*Cynoglossus bilineatus* Lacepède, 1802	11, 13
620.	*Cynoglossus cynoglossus* Hamilton, 1822	13, 26, 27
621.	*Cynoglossus lida* Bleeker, 1851	11
622.	*Cynoglossus lingua* Hamilton, 1822	11, 16, 27
623.	*Cynoglossus macrostomus* Norman, 1928	11, 27
624.	*Cynoglossus microlepis* Bleeker, 1851	13
625.	*Cynoglossus puncticeps* Richardson, 1846	1, 11, 16, 27
626.	*Paraplagusia bilineata* Bloch, 1787	11, 27
	FAMILY PARALICHTHYIDAE	
627.	*Pseudorhombus arius* Hamilton, 1822	16, 27
628.	*Pseudorhombus elevatus* Ogilby, 1912	27
629.	*Pseudorhombus javanicus* Bleeker, 1853	27
630.	*Pseudorhombus triocellatus* Bloch & Schneider,1801	11
	ORDER TETRAODONIFORMES	
	FAMILY TETRAODONTIDAE	
631.	*Arothron hispidus* Linnaeus, 1758	11
632.	*Arothron immaculatus* Bloch & Schneider, 1801	11
633.	*Arothron reticularis* Bloch & Schneider, 1801	16
634.	*Chelonodon patoca* Hamilton, 1822	11, 16, 27
635.	*Dichotomyctere fluviatilis* Hamilton, 1822	16,27
636.	*Lagocephalus lunaris* Bloch & Schneider, 1801	16, 27
637.	*Leiodon cutcutia* Hamilton, 1822	26, 27
638.	*Takifugu oblongus* Bloch, 1786	16, 27
639.	*Tetraodon cutcutia* Hamilton, 1822	1, 2, 16, 26, 27, 39
	FAMILY TRICANTHIDAE	
640.	*Pseudotricanthus strigilifer* Cantor, 1849	27
641.	*Triacanthus biaculeatus* Bloch, 1786	11, 13, 16, 27
	FAMILY OSTRACIIDAE	
642.	*Ostracion meleagris* Shaw, 1796	11
	ORDER SYNGNATHIFORMES	
	FAMILY SYNGNATHIDAE	
643.	*Hippichthys spicifer* Rüppell, 1838	27
644.	*Hippocampus fuscus* Rüppell, 1838	16
645.	*Ichthyocampus carce* Hamilton, 1822	16, 27
646.	*Microphis cuncalus* Hamilton, 1822	11, 27
	ORDER SCORPAENIFORMES	
	FAMILY SCORPAENIDAE	
647.	*Pteropterus radiata* Cuvier, 1829	16
	FAMILY PLATYCEPHALIDAE	
648.	*Grammoolites scaber* Linnaeus, 1758	27
649.	*Platycephalus indicus* Linnaeus, 1758	11, 13, 16, 27
650.	*Sunagocia carbunculus* Valenciennes, 1833	11
	ORDER ATHERINIFORMES	
	FAMILY ATHERINIDAE	
651.	*Atherinomorus duodecimalis* Valenciennes, 1835	11
	CLASS ELASMOBRANCHII	
	ORDER CARCHARHINIFORMES	

	FAMILY CARCHARHINIDAE	
652.	*Carcharhinus hemiodon* Müller & Henle, 1839	27
653.	*Carcharhinus leucas* Valenciennes, 1839	27
654.	*Carcharhinus limbatus* Müller & Henle, 1839	16, 27
655.	*Carcharhinus melanopterus* Quoy & Gaimard, 1824	16, 27
656.	*Carcharhinus sorrah* Müller & Henle, 1839	27
657.	*Galeocerdo curvier* Péron and Lesueur in Lesueur, 1822	27
658.	*Glyphis gangeticus* Muller & Henle, 1839	16, 27
659.	*Lamiopsis temminckii* Müller & Henle, 1839	27
660.	*Rhizoprionodon acutus* Rüppell, 1837	13, 27
661.	*Scoliodon laticaudus* Muller & Henle, 1838	16, 27
	ORDER ORECTOLOBIFORMES	
	FAMILY HEMISCYLLIIDAE	
662.	*Chiloscyllium griseum* Muller & Henle, 1838	27
	FAMILY STEGOSTOMATIDAE	
663.	*Stegostoma fasciatum* Herman, 1783	27
	ORDER RHINOPRISTIFORMES	
	FAMILY PRISTIDAE	
664.	*Anoxypristis cuspidate* Latham, 1794	27
665.	*Pristis clavata* Garman, 1906	27
666.	*Pristis microdon* Latham, 1794	27
667.	*Pristis pectinata* Latham, 1794	16
668.	*Pristis pristis* Linnaeus, 1758	27
	FAMILY RHINOBATIDAE	
669.	*Glaucostegus granulatus* Cuvier, 1829	27
670.	*Glaucostegus obtusus* Muller & Henle, 1841	27
671.	*Glaucostegus typus* (Anonymous [Bennett], 1830)	27
672.	*Rhinobatos annandalei* Norman, 1926	27
673.	*Rhinobatos lionotus* Norman, 1926	27
674.	*Rhynchobatus laevis* Bloch & Schneider, 1801	27
	ORDER MYLIOBATIFORMES	
	FAMILY DASYATIDAE	
675.	*Brevitrygon imbricata* Bloch & Schneider, 1801	16, 27
676.	*Himantura fava* Annandale, 1909	27
678.	*Himantura gerrardi* Gray, 1851	27
679.	*Himantura marginata* Blyth, 1860	27
680.	*Himantura uarnacoides* Bleeker, 1852	27
681.	*Himantura uarnak* Gmelin, 1789	13, 16, 27
682.	*Himantura walga* Muller & Henle, 1841	27
683.	*Pastinachus sephen* Forsskal, 1775	16, 27
683.	*Pateobatis bleekeri* Blyth, 1860	27
684.	*Telatrygon zugei* Muller & Heole, 1841	27
	FAMILY MYLIOBATIDAE	
685.	*Aetobatus flagellum* Bloch & Schneider, 1801	16
686.	*Aetobatus narinari* Eupbrasen, 1790	16, 27
687.	*Aetobatus ocellatus* Kuhl, 1823	27
688.	*Aetomylaeus nichofii* Bloch & Schneider, 1801	16
	FAMILY GYMNURINAE	
689.	*Gymnura japonica* Temminck & Schlegel, 1850	27
690.	*Gymnura poecilura* Shaw, 1804	27
	ORDER TORPEDINIFORMES	
	FAMILY TORPEDINIDAE	
691.	*Narcine brunnea* Annandale, 1909	27

AMPHIBIA

Amphibian are poikilothermic (cold blooded) and the first evolved tetrapod vertebrates which possess characteristics of both fishes and reptiles, i.e., life in water as well as land. They are rich in diversity and play an important role in the food chain in terrestrial and aquatic ecosystems by serving as primary and secondary carnivores on several insects, including crop pests and disease vectors (Behangana 2004). They hold vital positions in forest and aquatic food webs as the nutrient portion of the vertebrate biomass (Hutchens and De Perno 2009). They play a key role in trophic dynamics of tropical forests by acting both as predator and prey (Toft 1980; Blaustein *et al.,* 1994). Mostly, amphibians are restricted to moist habitats and many species are associated with freshwater and damp areas, while some have been reported from tree holes and deserts. Amphibians are widely considered to be useful as indicator species (Welsh and Ollivier 1998; Sheridan and Olson 2003). There are about 7700 species of amphibian known worldwide inhabiting all continents except for Antarctica. From India, about 386 species are known of which 345 are anurans (Anil *et al*., 2011; Biju *et al.,* 2011; Dinesh *et al*., 2012; and Chandra *et al.,* 2017). Amphibian diversity has been reported limited to freshwater species and comparatively low in mangroves and no record of marine (Alfred and Ramakrishna 2004). Amphibians are distributed among three orders namely, Apoda (or Gymnophiona), Caudata (or Urodela) and Anura. In general, amphibians include salamanders, caecilians, toads, and frog. A rather familiar group of amphibian are frogs and toads that have short, tailless bodies, long and powerful hind legs used for jumping and swimming. The thin sheet of skin called 'web', found between the fingers and the toes facilitates them to swim. Toads have rougher and warty skins and are mostly land dwellers whereas frogs live in or near the moist places and have a slimy or smooth skin. Further, toads are stout bodied and less streamlined than frogs. Interestingly, frogs and toads are the only amphibians that have a true voice and make characteristic sounds, especially males possesses vocal sacs-swellings on each side of the throat that inflates during croaking. Tree frogs are strictly arboreal possess the discs on the tips of the toes and the fingers, with web between the toes. They descends to the ground to lay eggs in an unusual foam nests.

The life history of most amphibians is divided into egg, larval and adult stages. Eggs are deposited inside or near water or carried by the parents, which later hatches into larvae or tadpole. However, in certain species eggs hatch and grow within the body of a parent or directly develop in froglets.

The first effort to prepare a catalogue of amphibian and reptiles were made in 1866, though the list comprised only of the Indian Museum collection holdings. T. N. Annandale initiated work on the amphibians of the Chilika lagoon, Himalayan salamander, Abor hills of Arunachal Pradesh and Tibet with description of several new species. Subsequently, several authors worked on the amphibian diversity with record of several new and recorded species. However, the first list of Indian amphibians were reported by Inger and Dutta in 1986. Further, significant discovery of a Pig-nosed frog was made by Biju and Bossuyt (2003). Biju worked on the caecilians of North-eastern India and described 4 new species. Not much attention has been given on the inventorization of amphibians from the Ramsar sites of India. Some scattered reports exists which have been considered in the present document, these includes, Sarkar (1984), Murthy (1990), Sarkar *et al.* (1992), Sarkar (1993), Nandi *et al.* (1999), Sarkar *et al.* (2005), Ningombam and Bordoloi (2007), Varadaraju (2009), Sengupta *et al.* (2010), Bashir *et al.* (2012), Jena *et al.* (2013), Radhakrishnan and Dinesh (2013), and Litvinchuk *et al.* (2018). The document reports the presence of 47 amphibians from the Ramsar wetlands of India (Table 37).

Table 37. Diversity of Amphibians from Ramsar Wetlands of India.

SI. No.	Species	Distribution
	Class AMPHIBIAOrder ANURA	
	Family BUFONIDAE	
1.	*Bufo andersonii* Boulenger, 1883	5
2.	*Bufo latastii* Boulenger,1882	9
3.	*Bufo melanostictus* Schneider, 1799	2, 3, 4, 5, 13, 14,15, 16, 17, 20, 23, 26, 27, 28, 29, 32, 36, 38, 39, 41
4.	*Bufo stomaticus* Lutken, 1864	3, 4, 5, 14,17, 26
	Family MICROHYLIDAE	
5.	*Kaloula pulchra* Gray, 1831	17, 26, 27
6.	*Microhyla ornata* Dumeril & Bibron, 1841	2, 3, 4, 5, 14, 15,16, 17, 26, 27, 38, 39, 41
7.	*Uperodon globulosum* Gunther, 1864	26
8.	*Uperodon systoma* Schneider, 1799	4
9.	*Uperodon taprobanicus* Parker, 1934	2, 14, 26
	Family RANIDAE	
10.	*Amolops formosus* Günther, 1876	15
11.	*Amolops gerbillus* Annandale, 1912	15
12.	*Amolops mamoratus* Blyth, 1855	15
13.	*Humerana humeralis* Boulenger, 1887	15
14.	*Hylarana aurantiaca* Boulenger, 1904	13
15.	*Hylarana erythraea* Schlegal, 1837	15, 26, 39
16.	*Hylarana malabarica* Tschudi, 1838	13
17.	*Hylarana tytleri* Theobald, 1868	15, 17, 26, 27
18.	*Odorrana livida* Blyth, 1856	15
	Family DICROGLOSSIDAE	
19.	*Euphlyctis cyanophlyctis* Schneider, 1799	2, 3, 4, 5, 13, 14, 15, 16, 17, 26, 27, 28, 32, 38, 39, 41
20.	*Euphlyctis hexadactylus* Lesson, 1834	3, 13, 15, 17, 26, 27
21.	*Fejervarya cancrivora* Gravenhorst, 1829	17
22.	*Fejervarya limnocharis* Gravenhorst, 1829	3, 5, 13, 14, 15, 16, 20, 26, 27, 38, 39, 41
23.	*Fejervarya nepalensis* Dubois, 1975	2, 15
24.	*Fejervarya orissaensis* Dutta, 1997	17
25.	*Fejervarya pierrei* Dubois, 1975	2
26.	*Fejervarya syhadrensis* Annandale, 1919	2, 4, 15, 17, 27
27.	*Fejervarya teraiensis* Dubois, 1984	2, 15
28.	*Hoplobatrachus crassus* Jerdon, 1853	15, 17, 26, 27
29.	*Hoplobatrachus tigerinus* Daudin, 1803	3, 4, 5, 13, 14,15, 17, 20, 25, 26, 27, 28, 29, 32, 36, 39, 41
30.	*Minervarya agricola* (Jerdon, 1853)	26
31.	*Nanorana minica* Dubois, 1975	5
32.	*Sphaerotheca breviceps* Schneider, 1799	4, 5, 14, 16, 20, 26, 41
33.	*Sphaerotheca rolandae* Dubois, 1983	17
	Family HYLIDAE	
34.	*Hyla annectans* Jerdon, 1870	15
35.	*Hyla arborea* Linnaeus, 1758	15
	Family RHACOPHORIDAE	
36.	*Chiromantis vittatus* Boulenger, 1887	15

37.	*Philautus* sp.	13
38.	*Polypedates leucomystax* Gravenhorst, 1829	15
39.	*Polypedates maculatus* Gray, 1830	13, 14, 16, 17, 26, 27, 39, 41
40.	*Polypedates megacephalus* Hallowell, 1861	15
41.	*Polypedates teraiensis* Dubois, 1987	15
42.	*Rhacophorus bipunctatus* Ahl, 1927	2, 15
43.	*Rhacophorus malabaricus* Jerdon, 1870	13
44.	*Rhacophorus maximus* Günther, 1858	2, 15
	Family MEGOPHRYIDAE	
45.	*Xenophrys major* Boulenger, 1908	15
46.	*Xenophrys parva* Boulenger, 1893	15
47.	*Xenophrys wuliangshanensis* Ye & Fei, 1995	15

The present report compiles a total of 47 species belonging to 19 genera and 7 families of amphibian known thus far from the Ramsar Wetlands of India. The report compiled lists amphibians from 12 Ramsar wetlands reflect a rather meagre diversity and a huge gap area, i.e., no report of amphibians from Kolleru lake, Chandratal Lake, Wular Lake, Tso-Morari Lake, Mansar-Surinsar, Ashtamudi Lake, Sasthamkotta Lake, Bhoj, Harike, Kanjli, Sambhar, Keoldeo NP, Point Calimere, Rudra Sagar, and Upper Ganga, that must be inventories as there is strong threat to the group due to various anthropogenic activities. Some species have already been listed under the threaten categories (IUCN red list of threatened species: about 5% falls under critically endangered; 9.0 % Endangered; 6.5% vulnerable; 2.0% near threatened). The major cause of the threat includes, deforestation and habitat destruction, dams, over-fishing and pollution, pesticides and fungicides, trade and capture of frogs, climate change and global warming, acidification, UV radiation, and human significance. There is strong need to gain expertise in morpho- and molecular taxonomy to understand the systematics, ecology and phylogeny, bio-acoustical analyses, larval studies.

REPTILIA

Reptiles are considered as one of the major classes of the phylum Vertebrata that includes three major groups, i.e., turtles (Order Testudines), crocodilians (Order Crocodylia), and snakes and lizards (Order Squamata) and another group represented by only one species (*Sphenodonpunctatus*) of the Order Rhynchocephaliafound in New Zealand. Though the recent classification based on molecular sequence analyses place crocodiles more tbatao birds and turtles in a distinctive group with a different evolutionary past. They are cold blooded and use their lungs for respiration throughout their existence. The body is covered with scales and the skull articulates with the vertebral column by a single median occipital condyle. These combination of characteristics distinguish reptiles from other vertebrates. The reptilian fauna of India is very rich in its composition and constitutes a major component of the Indian vertebrate fauna. They are the most important group of predators, which helps in maintaining the natural balance. They have been reported in India from environment ranging from deserts to the rain forests, brackish water and beaches fringing the coasts of plains, hills and dense jungles. Reptile species associated with freshwater habitats have developed a diverse suite of morphological and physiological adaptations.

The main characteristics of freshwater reptiles are flattened tails and webbing between toes (assists while swimming), nostril placement and morphology (allowing them to breathe while remaining mostly submerged), mouth and cloacal tissues rich in blood vessels (for oxygen exchange under water); and eggs (that can be laid under water). Reptiles of inland waters could be permanently aquatic (rarely leave water except for females, to lay eggs on land), semiaquatic (frequently leave water to bask or travel between wetlands), and marginally aquatic (spend most of their time on land and use wetlands occasionally to search for prey or to escape predators).

Turtles are characterised by the presence of dome-shaped shell that acts as a protective armour and is composed of carapace (upper part) and plastron (lower part) joined by bony bridge.Their size vary from 300 mm to 1.8 m. They are omnivorous with the ability to survive without food for months similar to that seen in other reptiles. Turtles are toothless though they possess a beak with horny sheaths that helps to chew their food before swallowing. The term tortoise refers to the strictly land dwelling species with elephant-like stubby feet and turtles to mainly the aquatic forms inhabiting sea, rivers, other water bodies and possessing flippers or webbed toes.

Crocodiles are large, semiaquatic reptiles that occupy large lakes, swamps, marches and river. The body is heavily armoured with long and strong muscular tailthat along with streamlined body enables them to swim fast and swiftly. They can see, smell and hear while lying low in water hidden, from their prey due to placement of their eyes, nostrils and ears on the top of the head. They possess a good night vision providing them advantage for nocturnal hunting. Since they feed by grabbing and holding onto their prey, their assists in piercing and holding onto the flesh along with powerful muscles to close the jaw and hold them shut. They are carnivorous animals that rely on meat or flesh for survival. They lay eggs in shallow excavations (holes or mound nest depending on the species) near the water edge. The nesting period ranges from a few weeks up to six months.

Snakes are elongated, legless, carnivorous reptiles of the suborder Serpentes. Their body is covered with overlapping scales (smooth or keeled). The flicking forked tongue acts as sensory organs. Many species of snakes have skulls with several more joints that enables them to swallow prey much larger than their heads with their highly mobile jaws. They possess needle like teeth which points backward and enables them to grab the slippery prey. Poisonous snakes possess hypodermic needle-like fangs for injecting the venom while striking. To support narrow body the paired organs (such as kidneys) appear one in front of the other instead of side by side, and most have only one

functional lung. Some species have retained a pelvic girdle with a pair of vestigial claws on either side of the cloaca. Lizards on the other hand belongs to the order Squamata that are characterised by four well developed limb, a short ,flat tongue, and an external ear opening. Most lizards are quadrupedal, i.e., running with a strong side-to-side motion while some are legless and have long snake-like bodies though can be identified from snakes by their distinctive ear opening and movable eyelids. They use their tongue for lapping up their prey and also as sensory organ. Lizards are mainly carnivorous, often being sit-and-wait predators mainly insects. Lizards make use of a variety of anti-predator adaptations, including camouflage, venom, reflex bleeding, and the ability to sacrifice and regrow their tails.

Global reptilian diversity contains 10,544 species belonging to 1,194 genera under 85 families of 4 orders (Uetz *et al.,* 2017). Indian diversity of reptiles is represented by 603 species under 30 families and 3 orders (Das, 2012; Uetz *et al.,* 2017; Giri *et al.,* 2018 and Chandra *et al*., 2018).

Information concerning the study on reptiles initiated way back in 1790 (Russell 1796, 1801). Followed by the remarkable work on Indian reptiles by Gunther (1864), in *Fauna of British India* by Boulenger (1890) and Smith (1931, 1935, and 1943). Subsequently, studies were performed by Murthy (1985), Sharma (1969, 1977, 1978, 1998), Tikader and Sharma (1992), Tiwari and Biswas (1973), Biswas and Sanyal (1977, 1978). Das (2003) compiled the checklist of Indian reptiles along with a compiled standard reference (Das 2002; Daniel 2002; Whitaker and Captain 2004; Sharma 2002, 2007; Venugopal 2010a, b). Many species of reptiles new to science and new record to Indian fauna were added by several authors [Acharji and Mukherjee (1964), Saha (1983) and Talukdar (1982); Das and Bauer 2000; Das and Sengupta 2000; Bauer 2003; Gower and Winkler 2007; Manamendra-Arachchi *et al*., 2007; Mukerjee and Bhupathy, 2007; Thorpe *et al.,* 2007; Giri and Bauer, 2008; Das and Vijayakumar, 2009; Mahony 2009ab, Van Rooijen and Vogel 2009; Giri *et al.,* 2009 ab; Pook *et al*., 2009; Zambre *et al*., 2009; Giri, 2008; Haralu 2010; Mahony 2010, 2011; Vogel and van Rooijen 2011ab, 2012; Agarwal *et al*., 2011; Vogel and David 2012; Harikrishnan *et al*., 2012ab; Smith *et al*., 2012; Aengals and Ganesh 2013; Datta-Roy *et al*., 2013; Vogel and Ganesh 2013; Pyron *et al*., 2013; Vogel and Harikrishnan 2013; Mirza and Sanap 2014; Mirza *et al*., 2014ab; Cyriac and Umesh 2014; Ganesh *et al*., 2014; Guo *et al*., 2014; Pyron *et al*., 2014a,b; Vogel *et al*., 2014; Deepak *et al*., 2015; Guptha *et al*., 2015; Murthy *et al*., 2015; Dandge and Tiple 2015; Srinivasulu *et al*., 2015; Lajmi *et al*., 2016; Mirza *et al*., 2016; Srinivasulu *et al*., 2016; Pyron *et al*., 2016; Agarwal *et al*., 2016; Agarwal 2016; Deepak *et al*., 2016a,b; Gower *et al*., 2016; Mohapatra *et al*., 2016; Sayyed *et al*., 2016; Mirza and Patel 2017; Mohapatra *et al*., 2017; Giri *et al*., 2017a,b; Mirza and Raju 2017; Mirza *et al*., 2017; Vogel *et al*., 2017; Agarwal *et al*., 2018b,c; Chaitanya *et al*., 2018; Jins *et al*., 2018; Raha *et al*., 2018; Sadasivan *et al*., 2018; Agarwal *et al*., 2018a; Ganesh and Vogel 2018; Lalremsanga *et al*., 2018]. Recently, an updated checklist was published by Aengals *et al*., (2018) with a record of 572 species of reptiles from India (including 3 species of crocodiles, 34 turtles and tortoise, 231 lizards, and 304 species of snakes. The present compilation includes the data retrieved from the following reports, (Murthy 1990, Murthy 1995, Mandaland Nandi 1989, Mehta 2000, Kumar 2009, Saikia and Mehta 2009, Nandi 2009, Mukherjee 2015 and Chandra *et al*., 2017b). A total of 143 reptiles were identified and presented in this report that are known from the Ramsar wetlands of India. The systematic list of the reptiles recorded from Indian Ramsar wetlands is provided in Table 38. The reptiles have been identified mainly from eightRamsar wetlands of India, Nalsarovar, Pongdam, Renuka wetland, Vembanad Kol, Loktak, Chilika, Upper Ganga, Sunderbans, with maximum diversity reported from the Sunderbans with 75 species, followed by Chilika. Though, in some wetlands reptiles diversity is meagre and demands reinvestigation, i.e., Renuka wetland (13 species), Pong dam and Upper ganga (29 and 20 species). In the current scenario, it is clear that the studies on the diversity of reptiles are missing from many Ramsar wetlands e.g.,Kolleru Lake, Deepor Beel, Chandertal lake, Wullar lake, Tso-Moriri, Hokera, Surinsar-Mansar, Ashtamudi, Sasthamkotta, Bhoj wetland, Bhitarkanika, Harike, Kanjli, Ropar, Sambhar, Keoldeo, Point calimere,Rudrasagar,and East Kolkata Wetland.The group need to be explored in this country and knowledge of theirinadequate identity requires prioritization since the population of these reptiles has become considerably reduced due to the commercial value of their skin. Many of these reptiles are at present protected under the Indian Wildlife (Protection) Act, 1972 (Mandal and Nandi, 1989).

Table 38. Diversity of Reptiles from Ramsar Wetlands of India.

SI. No.	Species Distribution	
	Phylum CHORDATA Class REPTILIA Order SQUAMATA Family COLUBRIDAE	
1.	*Ahaetulla anomala* Annandale, 1906	26
2.	*Ahaetulla myeterizans* Linnaeus	27
3.	*Ahaetulla nasuta* Bonnaterre, 1790	4, 13,14, 15, 27, 41
4.	*Boigatrigonata* Schneider, 1802	14,16, 27, 41
5.	*Chrysopelea ornata* Shaw, 1802	15, 17, 26, 27
6.	*Coelognathushelena* Daudin, 1803	4, 14,15, 16, 27, 29, 41
7.	*Coelognathus radiatus* Boie, 1827	15, 27
8.	*Lycodon aulicus* Linnaeus, 1758	4, 13, 15, 26, 27, 41
9.	*Lycodon capucinus*	3
10.	*Lycodon flavomaculatus*	4
11.	*Lycodon jara* Shaw, 1802	15, 27
12.	*Lycodon striatus* Shaw	4, 20, 29, 41
13.	*Oligodon albocinctus* Cantor, 1839	15
14.	*Oligodon arnensis* Shaw, 1802	4, 14, 15, 16, 26, 27, 29, 41
15.	*Oligodon cyclurus* Cantor, 1839	15
16.	*Oligodon taeniolatus* Jerdon, 1853	13, 14, 41
17.	*Oligodon venustus* Jerdon, 1853	15
18.	*Opheodrys dorine* Boulenger, 1888	15
19.	*Ptyas mucosa* Linnaeus, 1758	3, 4, 5,13, 14,15, 16, 20,25, 26, 27, 29, 33, 41
20.	*Ptyas korraos* Schlegel, 1837 15	
21.	*Sibynophis subpunctatus* Dum. & Bibr	27, 41
22.	*Spalerosophis atriceps* Fischer, 1885	22
	Family HOMALOPSIDAE	
23.	*Cerberus rynchops* Schneider	13, 16, 26, 27
24.	*Cerberus schneiderii* Schlegel, 1837	16
25.	*Enhydris enhydris* Schneider, 1799	16, 26, 27, 32, 36, 39
26.	*Ferania sieboldii* Schlegel, 1837	13, 27
27.	*Fordonia leucobalia*	27
28.	*Gerardia prevostianus*	27
	Family NACTRICIDAE	
29.	*Amphiesma stolatum* Linnaeus, 1758	3, 4, 13,14, 15,16, 26, 27, 41
30.	*Argyrogena fasciolata* (Shaw, 1802)	14, 41
31.	*Atretium schistosum* Daudin, 1803	14, 26, 27
32.	*Dendrelaphis ahaetulla* Linnaeus	27
33.	*Dendrelaphis pictus* Gmelin, 1789	26, 27, 41
34.	*Dendrelaphis tristis* Daudin, 1803	13, 15, 16, 26, 27, 41
35.	*Xenochrophis cerasogaster* Cantor, 1839	26, 27, 39
36.	*Xenochrophis piscator* Schneider, 1799	3, 4, 13, 15, 16, 27, 29, 38, 39, 41
37.	*Xenochrophis schrurrenbergi* 27	
	Family ELAPIDAE	
38.	*Bungarus caeruleus* Schenider 1801	3,4, 13, 14, 15, 16, 17, 20, 26, 27, 29, 32, 33, 36, 41
39.	*Bungarus fasciatus* Schenider, 1801	15, 17, 26, 27
40.	*Callophis melanurus* Shaw	41
41.	*Gongylophis colubrinus*	3
42.	*Hydrophis caerulescens*	27
43.	*Hydrophis cantoris* Günther, 1864	27

44.	*Hydrophis cyanocinctus*	27
45.	*Hydrophis gracilis* Shaw, 1802	27
46.	*Hydrophis nigrocinctus* Daudin, 1803	27
47.	*Hydrophis obscurus* Daudin, 1803	16, 27
48.	*Hydrophis schistose* Daudin, 1803	16, 27
49.	*Laticauda colubrina* Schneider, 1799	27
50.	*Laticauda laticaudata* Linnaeus, 1758	27
51.	*Naja kaouthia* Lesson, 1831	3, 26, 27
52.	*Naja naja* Linnaeus, 1758	3, 4, 13, 14,15, 16, 20,25, 27, 29, 32, 33, 36, 41
53.	*Naja oxiana*	4, 14
54.	*Ophiophagus hannah* Cantor, 1836	17, 27
55.	*Rhabdophis subminiatus* Schlegel, 1837	15
56.	*Rhabdophis plumbicolor*(Cantor, 1839)	14, 41
	Family AGAMIDAE	
57.	*Calotes calotes* Linnaeus,1758	13
58.	*Calotes versicolor* Daudin, 1802	3, 4, 5, 13, 14,15, 16, 20,23, 25, 26, 27, 29, 32, 36, 39, 41
59.	*Laudakia tuberculata* Gray, 1827	4, 5
60.	*Psammophilus blanfordanus* Stoliczka, 1871	14, 16
61.	*Phrynocephalus theobaldi* Blyth, 1863	42
62.	*Sitanaponticeriana* Cuvier, 1829	16, 41
63.	*Sitanaspinaecephalus* Deepak, Vyas&Giri, 2016	14
64.	*Uromastix hardwickii* Gray, 1827	20
	Family CHAMAELEONIDAE	
65.	*Chamaeleozeylanicus* Laurenti, 1768	14, 27, 29, 41
	Family GEKKONIDAE	
66.	*Cnemaspis* sp.	13
67.	*Gekko gecko*	27
68.	*Hemidactylus brooki* Gray 1845	3, 4, 5, 16, 27, 41
69.	*Hemidactylus chipkali* Mirza & Raju, 2017	14
70.	*Hemidactylus flaviviridis* Rüppell, 1835	3, 4, 5, 14,26, 27, 32, 36, 41
71.	*Hemidactylus flow*	27
72.	*Hemidactylus frenatus* Dumeril & Bibron, 1836	13, 14, 16, 26, 27, 41
73.	*Hemidactylus gleadowi* Murray, 1884	14
74.	*Helnidactylus gracilis* Blanford	41
75.	*Hemidactylus leschenaultii* Dumeril & Bibron, 1836	3, 16, 27, 41
76.	*Hemidactylus parvimaculatus* (Deraniyagala, 1953)	26
77.	*Hemidactylus reticulatus* Beddome	41
78.	*Hemidactylus triedrus* Daudin41	
	Family LACERTIDAE	
79.	*Ophisopsjerdoni* Blyth 1853	3, 14, 41
80.	*Ophisopsmicrolepis* Blanford 1870	3
	Family VARANIDAE	
81.	*Varanus bengalensis* Daudin, 1802	3, 4, 5, 13, 14, 16, 17, 20, 25, 27, 29, 32, 33, 36, 41
82.	*Varanus flavescens* Hardwicke & Gray, 1827	5, 17, 26, 27, 29
83.	*Varanus salvator* Laurenti 1768	3, 15, 17, 26, 27
	Family BOIDAE	
84.	*Eryxconicus* Schneider, 1801	4, 14, 16, 27, 29, 32, 36, 41
85.	*Eryxjohnii* Russell, 1801	3, 14, 20,25, 32, 36, 41
	Family NATRICIDAE	
86.	*Fowleapiscator* (Schneider, 1799)	14, 26, 41

87.	*Fowlea schnurrenbergeri* (Kramer, 1977)	26
88.	*Macropisthodon plumbicolor*	41
	Family ACROCHORDIDAE	
89.	*Acrochordusgranulatus* Schneider, 1820	16, 27
90.	*Ramphotyphlopsbraminus* Daudin, 1803	4, 27, 32, 41
	Family VIPERIDAE	
91.	*Daboiarusselii* Shaw & Nodder, 1797	4, 5, 13, 14, 15, 16, 20,25, 27, 29, 32, 36, 41
92.	*Echiscarinatus* Schneider 1801	3, 4, 5, 14, 20, 29, 41
93.	*Gloydius himalayanus* Günther, 1864	5
94.	*Ovophis convictus* Stoliczka, 1870	15
95.	*Trimeresurusalbolabris* Gray, 1842	15
96.	*Trimeresuruserythurus* Cantor, 1839	15, 27
97.	*Trimeresurusgramineus* Shaw, 1802	15, 41
	Family SCINCIDAE	
98.	*Asymblepharus ladacensis* Günther, 1864	42
99.	*Barkudia insularis* Annandale, 1917	16
100.	*Eurylepis taeniolatus* Blyth, 1854	4
101.	*Eutropis bibronii* Gray, 1838 16	
102.	*Eutropis carinata* Schneider, 1801	5, 13, 14,16, 26, 27, 32, 36, 41
103.	*Eutropis macularia* Blyth, 1853	14, 16, 20, 26, 27, 41
104.	*Lygosoma albopunctata* Gray, 1846	14, 16, 26, 27
105.	*Lygosoma punctata* Gmelin, 1799	4, 5, 14,16, 27, 32, 36
106.	*Ophiomorus tridactylus*B lyth, 1853	20
107.	*Mabuya trivittata* Hardwicke & Gray	41
108.	*Riopa lineata* (Gray, 1839)	14
	Family TYPHLOPIDAE	
109.	*Grypotyphlopsacutus* Duméril & Bibron, 1844	16, 41
110.	*Indotyphlopsbraminus* Daudin, 1803	4, 13, 14,15, 16, 26, 27, 41
111.	*Indotyphlopsporrectus* Stoliczka, 1871	5, 16, 20,27, 41
	Family PYTHONIDAE	
112.	*Python molurus* Linnaeus, 1758	3, 4, 13, 14,15, 20,27, 29, 31, 33, 40
113.	*Python molurus bivittatus*	17
114.	*Python reticulated*	32, 36
	Family LEPTOTYPHLOPIDAE	
115.	*Myriopholis blanfordi* Boulenger, 1890	20
	FamilyLAMPROPHIIDAE	
116.	*Psammophis leithii* Günther, 1869	20, 41
117.	*Psammophis longifrons* Boulenger	41
118.	*Psammophis condanarus* Merrem	41
	Order TESTUDINES	
	Family TRIONYCHIDAE	
119.	*Lissemys punctata andersoni* Webb, 1980	3, 4, 13,14
120.	*Lissemys punctatapunctata* Bonnaterre, 1789	3, 4, 16, 25, 26, 27, 29, 32, 36, 39
121.	*Pelochelys bibroni* Owen, 1853	27
	Family TESTUDINIDAE	
122.	*Chitra chitra*	30
123.	*Chitra indica* Gray, 1831	20,25, 27,32, 36
124.	*Geochelone elegans* Schoepff, 1795	14, 15, 41
125.	*Nilssonia gangetica* Cuvier, 1825	4, 14, 25, 27, 30, 40
126.	*Nilssonia hurum* Gray, 1831	14, 25, 27
	Family GEOEMYDIDAE	
127.	*Batagur dhongoka* Gray, 1832	25
128.	*Batagur kachuga* Gray, 1831	5, 25, 27
129.	*Batagur baska* Gray, 1830	27

130.	*Geoclemys hamiltonii* Gray, 1831	4, 20,25, 27, 29, 30
131.	*Hardella thurjii* Gray, 1831 25, 30	
132.	*Melanochelys tricarinata* Blyth, 1856	27
133.	*Melanochelys trijuga* Schweigger, 1812	4, 13, 25, 41
134.	*Morenia ocellata* Dumeril & Bibron, 1835	27
135.	*Pangshura smithii* Gray, 1863	25
136.	*Pangshura tecta* Gray, 1831	25,27
137.	*Pangshura tentoria* Gray, 1834	4, 14, 25, 29, 32, 36
	Family CHELONIIDAE	
138.	*Chelonia mydas* Linnaeus, 1758	27
139.	*Eretmochelys imbricate* Linnaeus, 1766	27
140.	*Lepidochelys olivacea* Eschscholtz, 1829	27
	Order CROCODYLIA	
	Family CROCODYLIDAE	
141.	*Crocodylus palustris* Lesson, 1831	14, 25
142.	*Crocodylus porosus* Schneider, 1801	17, 27
	Family GAVIALIDAE	
143.	*Gavialis gangeticus* Gmelin, 1789	14, 25, 29, 30

AVES

The class Aves includes the fascinating warm bloodedvertebrate creatures known as birdsthat are characterized bythe presence of feathers which serve many purposes like insulating the bodyand contributing to the flying apparatus of wing and tail. They have dispersed over every corner of the planet by the ability of flying. They have colonized in the vast varity of habitats such as the artic tundra, hottest deserts, dense forests, remote oceanic islands and even the houses of the human dwellings. Many species are gregarious, i.e., they team in flocks of thousands while others are solitary or move in pairs or in small groups of 5-50. In most terrestrial environments,seasonal changes in habitat structure and food abundance potentially influence their species richness (Wiens, 1989), especially the water birds community that experience these on a local (DuBowy, 1988; Bethke, 1991) as well as on a regional scale (Bethke andNudds, 1995). Variations in species composition may also differ in different seasons due to arrival of migratory species, together with the presence of species dwelling in the area. Further, variations in abundance result from population processes (i.e., birth and death rates), as well as migration among habitats (Poulin *et al.,* 1993). Wiens(1989) mentioned that the bird abundance at a local depends on habitat characteristics (i.e., water body size and depth, and water physical and chemical conditions), the availability, distribution and density of food, and the availability of suitable sites for reproduction or resting.Moreover, variations in habitat conditions may also produce changes in community species composition (Garcia *et al*., 1997; Caziani and Derlindati, 2000).Any natural and anthropogenic disturbance altering the habitat and distribution of plant community may seriously affect the bird diversity and this modification also affects the relative abundance of the species.

Birds have been used extensively as both indicators and predictors of environmental consequences as a result of using agro chemicals (Hardy *et al*., 1987) thereby playing an important role in the maintenance of natural ecosystem. The Government of India has created several Protected Areas (PAs) such as national parks and sanctuaries where the wildlife including birds receives protection against poaching and destruction of habitat.

Global biodiversity is getting degraded at an alarming rate due to anthropogenic activities.Very few studies have been so far carried out on the birds of Indian wetlands that are known to provide a habitat for birds. Wetlands are important bird habitats and birds use them for breeding, nesting, and rearing young ones. Birds also use wetlands as a source of drinking water and for feeding, resting, shelter, and social interactions (Stewart, 2007).Past studies have documented the birds communities of different wetland habitats in India e.g., Mukerjee (1969),Zargar and Naqash (1993), Bibby *et al.* (1998), Imran and Mithas (2009), Kumar and Gupta (2009), Tak *et al*.(2010), Acharya *et al*. (2010), Bacha (2002), Islam and Rahmani (2004), Khan *et al.* (2004). The major threats to Indian wetlands includes increased siltation, eutrophication due to run-off from catchments, agricultural conversion, receding open water areas as a result of expanding reed beds, construction of canals, weirs, levees, over-grazing etc.

An international treaty was signed, i.e., Ramsar Convention,keeping in mind the urgent need toconserve the wetlands especially as waterfowl habitats. The official name of the treaty, reflects the original emphasis upon the conservation and wise use of wetlands primarily as habitat for water birds. Over the years, however, the Convention has broadened its scope of implementation to cover all aspects of wetland conservation and wise use, recognizing wetlands asecosystems that are extremely important for biodiversity conservation and for the well-being of human communities, thus fulfilling the full scope of the Convention text. However, still many wetlands and even the Ramsar wetlands have been poorly explored for the presence of aves fauna. The present document reports the presence of 840 species of birds from the Ramsar wetlands of India (Table 39).

Table 39. Diversity of Aves from Ramsar Wetlands of India.

	Class AVES	
	Order PODICIPEDIFORMES	
	Family PODICIPEDIDAE	
1.	*Podiceps auritus* Linnaeus, 1758	4, 18
2.	*Podiceps cristatus* Linnaeus, 1758	1, 2, 3, 4, 8, 9,10,16, 18, 21, 22, 25, 26, 35, 36, 38, 39, 42
3.	*Podiceps griseigena* Boddaert, 17834, 38	
4.	*Podiceps nigricollis* C.L. Brehm, 1831	2, 3, 4, 10,16, 18, 21, 22, 38, 42
5.	*Tachybaptus ruficollis capensis* Salvadori, 1884	13, 25
6.	*Tachybaptus ruficollis* Pallas, 1764	1, 2, 3, 4, 7, 9, 13,14,16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41, 42
	OrderPELECANIFORMES	
	FamilyPELECANIDAE	
7.	*Pelecanus crispus* Bruch, 1832	3, 4, 19, 22
8.	*Pelecanus onocrotalus* Linnaeus, 1758	1, 3, 15, 21, 22, 27, 28, 34, 38
9.	*Pelecanus philippensis crispus*	22, 25
10.	*Pelecanus philippensis* Gmelin, 1789	1, 2, 3, 11, 13, 16, 17, 22, 23, 25, 26, 27, 40
	Family SULIDAE	
11.	*Sula dactylatra melanops* Hartlaub, 1859	13
	FamilyARDEIDAE	
12.	*Ardea alba* Linnaeus, 1758	1, 2, 3, 4, 9, 10,13, 15, 16, 17, 20, 21, 22, 25, 26, 27, 28, 32, 35, 36, 38, 40, 41
13.	*Ardea alba modesta* J.E. Gray, 1831	11, 13,16, 38, 39
14.	*Ardea cinerata rectirostris* Gould	11, 13,16, 29, 38, 39
15.	*Ardea cinerea* Linnaeus, 1758	1, 2, 3, 4, 7, 9, 13, 14, 15, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 32, 35, 36, 38, 40, 41, 42
16.	*Ardea goliath* Cretzschmar, 1829	2, 27, 40
17.	*Ardea insignis* Hume 1878	39
18.	*Ardea intermedia* Wagler, 1827	1, 3,15, 25, 28, 32, 36, 41
19.	*Ardea purpurea* Linnaeus, 1766	1, 2, 3, 4, 11, 13, 14, 16, 17, 21, 22, 23, 26, 27, 28, 32, 35, 36, 38, 40
20.	*Ardea purpurea malinensis* Meyen13, 29, 38, 39	
21.	*Ardeola bacchus* Bonaparte, 18552, 15, 17	
22.	*Ardeola grayii* Sykes, 1832	1, 2, 3, 4, 5, 9, 10, 13, 14, 15, 16, 18, 20, 21,22,23, 25,26, 27, 28, 29, 32, 34, 35, 36, 38, 39, 40, 41
23.	*Botaurus stellaris* Linnaeus, 1758	3, 22, 38, 39
24.	*Bubulcus ibis coromandus*	13, 38, 39
25.	*Bubulcus ibis* Linnaeus, 1758	1, 2, 3, 4, 11, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 40, 41
26.	*Butorides striatus chloriceps* Bonaparte, 1855	13, 27
27.	*Butorides striatus* Linnaeus, 1758	1, 3, 15, 17, 18, 21, 23, 32, 35, 38, 39, 40
28.	*Dupetor flavicollis* Latham, 1790	2, 4, 11, 13, 16, 17, 18, 22, 23, 26, 27, 32, 36, 39
29.	*Egrella sarca* Gmelin	13
30.	*Egretta garzetta* Linnaeus, 1766	1, 2, 3, 4, 5, 7, 9, 10,11, 13, 14, 15, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 36, 38, 39, 40, 41
31.	*Egretta gularis* Bosc, 1792	1, 3, 11, 13, 14, 17, 23, 38, 39
32.	*Egretta intermedia* Wagler, 1829	1, 2, 3, 4, 5, 9, 11, 13, 14, 17, 21, 22, 23, 25, 26, 27, 29, 32, 35, 38, 39, 40
33.	*Ixobrychus cinnamomeus* Gmelin, 1789	1, 2, 4, 11, 13, 16, 17, 22, 23, 26, 27, 28, 32, 36, 38, 39
34.	*Ixobrychus minutus* Linnaeus, 1766	3, 9, 18, 27, 35, 36, 38, 39, 40
35.	*Ixobrychus sinensis* Gmelin, 1789	1, 2, 3, 4, 10, 11, 13, 17, 18, 26, 27, 32, 36, 39

36.	*Nycticorax nycticorax* Linnaeus, 1758	1, 2, 3, 4, 9, 11, 13, 15, 16, 17, 18, 21, 22, 23, 26, 27, 28, 29, 32, 34, 35, 36, 38, 39,40, 41
	FamilyTHRESKIORNITHIDAE	
37.	*Platalea leucorodia* Linnaeus, 1758	1, 3, 4, 13, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 34, 35, 36, 38, 39, 40, 41
38.	*Plegadis falcinellus* Linnaeus, 1766	1, 3, 13, 18, 21, 22, 23, 27, 28, 29, 32, 35, 36, 38, 39, 40
39.	*Pseudibis papillosa* Temminck, 1824	1, 3, 18, 22,23, 28, 29, 32, 35, 36, 38, 39, 40, 41
40.	*Threskiornis aethiopica* Latham, 1790	14
41.	*Threskiornis melanocephalus* Latham, 1790	1, 3, 13, 16, 17, 18, 22, 23, 26, 27, 28, 29, 32, 33, 35, 36, 40
	Order SULIFORMES	
	FamilyPHALACROCORACIDAE	
42.	*Microcarbo niger* Vieillot, 1817	1, 2, 3, 4, 9,11, 13, 14, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
43.	*Phalacrocorax carbo* Linnaeus, 1758	1, 2, 3, 4, 7, 9,13, 14,16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38
44.	*Phalacrocorax carbo sinensis* Linnaeus, 1758	13, 38, 39
45.	*Phalacrocorax fuscicollis* Stephens, 1826	1, 2, 3, 4, 13, 14, 16, 18, 22, 25, 26, 27, 32, 33, 35, 36, 38, 39, 40
	FamilyANHINGIDAE	
46.	*Anhinga melanogaster* Pennant, 1769	1, 2, 3, 4, 11, 13, 16, 17, 18, 21, 26, 27, 29, 32, 33, 35, 36, 38, 39, 40
47.	*Anhinga rufa* Daudin, 1802	14, 22, 23, 25, 26, 27, 40
	FamilyFREGATIDAE	
48.	*Fregata minor aldabrensis* Mathews, 1914	11, 27
	Order PROCELLARIIFORMES	
	Family PROCELLARIIDAE	
49.	*Ardenna tenuirostris* Temminck, 1836	27
50.	*Oceanites oceanicus* Kuhl, 1820	27
	Order PHOENICOPTERIFORMES	
	FamilyPHOENICOPTERIDAE	
51.	*Phoenicopterus minor* É. Geoffroy Saint-Hilaire, 1798	1, 3, 16, 21, 23, 28
52.	*Phoenicopterus roseus* Pallas, 1811	3, 16, 22, 23, 28
53.	*Phoenicopterus ruber* Linnaeus, 1758	1, 3, 21, 25
	Order CICONIIFORMES	
	FamilyCICONIIDAE	
54.	*Anastomus oscitans* Boddaert, 1783	1, 2, 3, 4, 13, 17, 18, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
55.	*Ciconia ciconia* Linnaeus, 1758	3, 13, 18, 22, 23, 28, 29, 33, 40
56.	*Ciconia episcopus* Boddaert, 1783	3, 4, 13, 18, 21, 22, 23, 25, 26, 27, 28, 32, 35, 36, 37, 38, 39, 41
57.	*Ciconia nigra* Linnaeus, 1758	3, 4, 18, 21, 25,32, 36, 38
58.	*Ephippiorhynchus asiaticus* Latham, 1790	2, 3, 15, 16, 17, 18, 22, 25, 27, 28, 32, 33, 34, 35, 36, 37, 38, 39, 40
59.	*Leptoptilos dubius* Gmelin, 1789	1, 2, 22,27, 39
60.	*Leptoptilos javanicus* Horsfield, 1821	2, 3, 17, 18, 22,27, 32, 35, 36
61.	*Mycteria leucocephala* Pennant, 1769	1, 3, 4, 14, 17, 18, 21, 22, 23, 25, 27, 28, 29, 31, 32, 33, 35, 36, 37, 38, 40
	OrderANSERIFORMES	
	FamilyANATIDAE	
62.	*Aix galericulata* Linnaeus, 1758	15
63.	*Anas acuta* Linnaeus, 1758	1, 2, 3, 4, 7, 9, 10, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42
64.	*Anas clypeata* Linnaeus, 1758	1, 2, 3, 4, 6, 7, 9, 10,14, 15, 16, 17, 18, 19, 20, 22, 23, 25, 26, 27, 28, 29, 32, 34, 35, 36, 38, 39, 40, 41, 42

65.	*Anas crecca* Linnaeus, 1758	1, 2, 3, 4, 6, 7, 9, 10,11, 13, 14, 15, 16, 17, 19, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 38, 39, 40, 41
66.	*Anas falcate* Georgi, 1775	1, 3, 18, 22, 26, 27, 38
67.	*Anas formosa* Georgi, 1775	3
68.	*Anas penelope* Linnaeus, 1758	1, 2, 3, 7, 9, 10,14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 37, 38, 39, 40, 41, 42
69.	*Anas platyrhynchos* Linnaeus, 1758	1, 2, 3, 4, 7, 8, 9, 10,14, 18, 19, 20, 21, 22, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
70.	*Anas poecilorhyncha* J. R. Forster, 1781	1, 2, 3, 4, 6,13, 14, 15, 16, 18, 20 ,21, 22, 23, 25, 26, 27, 28, 29, 32, 34, 35, 36, 38, 40, 41
71.	*Anas querquedula* Linnaeus, 1758	1, 2, 3, 4, 8, 9, 10,11, 13, 15, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 32, 36, 38, 39, 40, 41, 42
72.	*Anas strepera* Linnaeus, 1758	1, 2, 3, 4, 7, 9, 10,14, 15, 16, 17, 18, 19, 20 ,21, 22, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 38, 39, 40, 42
73.	*Anser albifrons* Scopoli, 1769	4, 22, 38
74.	*Anser anser* Linnaeus, 1758	1, 3, 4, 7, 9, 15, 18, 22, 26, 27, 32, 34, 35, 36, 37, 38, 40
75.	*Anser anser rubirostris* Swinhoe, 1871	15, 25, 29, 38, 39
76.	*Anser erythropus* Linnaeus, 1758	22, 38
77.	*Anser indicus* Latham, 1790	1, 2, 8, 15, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 34, 35, 36, 37, 38, 39, 40, 42
78.	*Aythya baeri* Radde, 1863	2, 17, 24, 26, 27
79.	*Anas falcata*	38
80.	*Aythya ferina* Linnaeus, 1758	1, 2, 3, 4, 10,14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 38, 39, 40, 41, 42
81.	*Aythya fuligula* Linnaeus, 1758	1, 2, 3, 6, 8, 9, 10, 16, 18, 19, 21, 25, 26, 27, 28, 29, 32, 33, 35, 36, 38, 39, 40, 41, 42
82.	*Aythya marila* Linnaeus, 1761	1, 3, 4, 17, 27, 38, 39
83.	*Aythya nyroca* Güldenstädt, 1770	1, 2, 3, 4, 8, 9,11, 13, 14, 15, 16, 18, 19, 21, 22, 24, 26, 27, 28, 29, 32, 33, 35, 36, 38, 39, 40
84.	*Dendrocygna bicolor* Vieillot, 1816	1, 2, 3, 17, 27, 40
85.	*Dendrocygna javanica* Horsfield, 1821	1, 2, 3, 4, 11, 12, 13, 15, 16, 17, 18, 22, 23, 26, 27, 28, 29, 32, 34, 35, 36, 38, 39, 40, 41
86.	*Marmaronetta angustirostris* Ménétriés, 1832	3, 22, 38
87.	*Mergus merganser*Linnaeus, 1758	4, 8, 29, 38, 40
88.	*Mergus serrator* Linnaeus, 1758	26, 27
89.	*Netta rufina*Pallas, 1773	1, 2, 3, 4, 7, 8,14, 15, 16, 18, 20, 21, 22,25, 26, 27,28, 29, 32, 34, 35, 36, 38, 39, 40, 41, 42
90.	*Nettapus coromandelianus* Gmelin, 1789	1, 2, 3, 13, 15, 16, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
91.	*Oxyura leucocephala* Scopoli, 1769	18
92.	*Sarkidiornis melanotos* Pennant, 1769	1, 3, 13,14, 16, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
93.	*Tadorna ferruginea* Pallas, 1764	1, 2, 3, 4, 6, 7, 8, 10,14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41, 42
94.	*Tadorna tadorna* Linnaeus, 1758	3, 4, 9,15, 21, 22, 26, 27, 38, 40
	OrderACCIPITRIFORMES	
	FamilyACCIPITRIDAE	
95.	*Accipiter badius dussumieri* Temminck, 1824	2, 27, 39
96.	*Accipiter badius* Gmelin, 1788	1, 4, 5, 6,13, 16, 17, 18, 20, 21, 22, 23, 25, 27, 28, 29, 32, 35, 36, 38, 41
97.	*Accipiter gentilis* Linnaeus, 1758	4, 22
98.	*Accipiter nisus* Linnaeus, 1758	1, 2, 4, 17, 18, 20, 21, 22, 23, 28, 35, 38
99.	*Accipiter trivirgatus* Temminck, 1824	27, 35, 36, 38

100.	*Accipiter virgatus* Temminck, 1822	4, 18, 21, 22
101.	*Aegypius calvus*	22
102.	*Aegypius monachus* Linnaeus, 1766	4, 21, 38
103.	*Aquila chrysaetos* Linnaeus, 1758	6, 18, 42
104.	*Aquila clanga* Pallas, 1811	3, 4, 17, 18, 22, 26, 27, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
105.	*Aquila fasciata* Vieillot, 1822	4, 21, 22, 27, 38
106.	*Aquila hastata* Lesson, 1831	27, 28, 38
107.	*Aquila heliaca* Savigny, 1809	3, 4, 18, 22, 28
108.	*Aquila nipalensis* Hodgson, 18334, 13, 18, 21, 22, 38	
109.	*Aquila pomarina* C.L. Brehm, 1831	1, 17, 18, 22
110.	*Aquila rapax* Temminck, 1828	4, 17, 18, 21, 22, 23, 28, 35, 36
111.	*Butastur teesa* Franklin, 1831	4, 18, 21, 22, 28, 38, 39, 41
112.	*Buteo buteo* Linnaeus, 1758	4, 15, 36
113.	*Buteo buteo vulpinus* (Gloger, 1833)	22
114.	*Buteo rufinus* Cretzschmar, 1829	2, 4, 18, 21, 22, 28
115.	*Buteo hemilasius* Temminck & Schlegel, 1844	42
116.	*Circaetus gallicus* Gmelin, 1788	1, 4, 6,17, 18, 21, 22, 27, 28, 35, 36, 38
117.	*Circus aeruginosus* Linnaeus, 1758	1, 3, 4, 7, 11,13,16,17, 18, 20, 21, 22, 23, 26, 27, 28, 29, 35, 36, 38, 39, 41
118.	*Circus cyaneus* Linnaeus, 1766	4, 18, 27
119.	*Circus macrourus* S.G. Gmelin, 1770	1, 2, 3, 4, 13,16, 17, 18, 21, 22, 27, 28, 35, 39
120.	*Circus melanoleucos* Pennant, 1769	1, 2, 4, 13,16, 17, 18, 26, 28
121.	*Circus pygargus* Linnaeus, 175818, 21, 28	
122.	*Elanus caeruleus* Desfontaines, 1789	1, 2, 4, 5, 13, 16, 17, 18, 20, 21, 22, 25, 27, 28, 29, 32, 35, 36, 38, 41
123.	*Elanus caerulens vociferus* Latham 1790	39
124.	*Gypaetus barbatus* Linnaeus, 17586, 42	
125.	*Gyps bengalensis* Gmelin, 1788	1, 2, 4, 5, 6, 16, 17, 18, 21, 22, 25, 27, 28, 33, 35, 36, 37, 38, 39
126.	*Gyps fulvus* Hablizl, 1783	4, 18, 21, 28, 38
127.	*Gyps himalayensis* Hume, 1869	4, 6, 38, 42
128.	*Gyps indicus* Scopoli, 1786	1, 16, 18, 21, 22, 28, 33, 35, 36, 39
129.	*Gyps tenuirostris* G.R. Gray, 1844	4, 27
130.	*Haliaeetus albicilla* Linnaeus, 1758	4, 22, 38
131.	*Haliaeetus leucogaster* Gmelin, 1788	1, 11, 16, 17, 23, 27
132.	*Haliaeetus leucoryphus* Pallas, 1771	2, 3, 4, 16, 17, 18, 21, 22, 25, 27, 31, 32, 35, 37, 38, 39
133.	*Haliastur indus* Boddaert, 1783	1, 3, 4, 13, 16, 17, 18, 20, 22, 23, 25, 27, 28, 35, 39
134.	*Haliastur indus indus* Boddaert, 1783	2, 11, 38
135.	*Hieraaetus pennatus* Gmelin, 1788	4, 17, 18, 21, 23, 27, 38
136.	*Hieraeetus fasciatus* Vieillot, 1822	22
137.	*Ichthyophaga ichthyaetus* Horsfield, 1821	2, 13, 27, 42
138.	*lctinaetus malaiensis* Temminck, 1824	4, 17, 28
139.	*Milvus migrans* Boddaert, 1783	1, 2, 4, 5, 9, 15, 16, 17, 18, 22, 25, 26, 27, 28, 32, 35, 36, 38, 39, 41
140.	*Milvus migrans govinda* Sykes, 1832	13, 21, 23, 27, 29
141.	*Neophron percnopterus* Linnaeus, 1758	1, 4, 5, 18, 21, 22, 25, 28, 31, 32, 33, 35, 36, 38
142.	*Nisaetus cirrhatus* Gmelin, 1788	17, 27
143.	*Pernis ptilorhynchus* Temminck, 1821	1, 2, 4, 16, 17, 18, 21, 22,27, 38, 41
144.	*Sarcogyps calvus* Scopoli, 1786	2, 4, 18, 21, 22, 38
145.	*Spilornis cheela* Latham, 1790	1, 2, 4, 15, 16, 17, 18, 22, 23, 26, 27, 28, 36,38, 39
	Order FALCONIFORMES	
	Family FALCONIDAE	

146.	*Falco biarmicus* Temminck, 1825	22, 23
147.	*Falco cherrug* J.E. Gray, 1834	4, 22, 42
148.	*Falco chicquera* Daudin, 1800	1, 2, 4, 17, 18, 21, 28, 38, 39
149.	*Falco jugger* J.E. Gray, 1834	15, 18, 21, 22, 28
150.	*Falco peregrinus* Tunstall, 1771	4, 11, 13, 17, 18, 21, 22, 23, 27, 28, 29, 38, 39
151.	*Falco severus*	22
152.	*Falco subbuteo* Linnaeus, 1758	4, 27, 38, 42
153.	*Falco tinnunculus* Linnaeus, 1758	1, 4, 5, 6,11, 13, 17, 18, 21, 22, 27, 28, 35, 36, 38, 41, 42
	Family PANDIONIDAE	
154.	*Pandion haliaetus* Linnaeus, 1758	2, 4, 11,13, 17, 18, 20, 22, 23, 26, 27, 28, 38
	Order GALLIFORMES	
	Family PHASIANIDAE	
155.	*Alectoris chukar* J. E. Gray, 1830	6, 42
156.	*Bambusicola fytchii hopkinsoni* Godwin-Austen, 1874	15
157.	*Coturnix coromandelica* Gmelin, 1789	4, 21, 23, 27, 28
158.	*Coturnix coturnix* Linnaeus, 1758	4, 15, 18, 21, 22, 27, 35, 36, 38
159.	*Coturnix japonica* Temminck & Schlegel, 1849	15
160.	*Francolinus francolinus* Linnaeus, 1766	4, 18, 20, 22, 29, 35, 36, 38, 39
161.	*Francolinus gularis* Temminck, 1815	27
162.	*Francolinus pondicerianus* Gmelin, 1789	1, 4, 5,16, 17, 18, 20, 22, 23, 28, 29, 35, 36, 38, 41
163.	*Galloperdix spadicea* Gmelin, 1789	23
164.	*Gallus gallus* Linnaeus, 1758	4, 17, 20,27, 29, 32, 36
165.	*Gallus sonneratii* Temminck	41
166.	*Lerwa lerwa* Hodgson, 1833	6
167.	*Lophura leucomelanos* Latham, 1790	4, 15
168.	*Pavo cristatus* Linnaeus, 1758	4, 18, 21, 22,23, 25, 28, 29, 32, 35, 36, 41
169.	*Perdicula asiatica* Latham, 1790	4, 5,16, 18, 20, 21, 22, 23, 28, 35, 36, 38, 41
170.	*Perdix hodgsoniae* Hodgson, 1857	42
171.	*Tetraogallus himalayensis* G. R. Gray, 1843	6, 42
172.	*Tetraogallus tibetanus* Gould, 1854	6, 42
	Order GRUIFORMES	
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173.	*Grus antigone antigone* Linnaeus, 1758	15, 38, 39
174.	*Grus antigone* Linnaeus, 1758	1, 3, 4, 14, 21, 22, 25, 29, 32, 33, 34, 35, 36, 37, 40
175.	*Grus grus* Linnaeus, 1758	1, 3, 18, 21,22, 25, 28, 29
176.	*Grus leucogeranus* Pallas, 1773	1, 22
177.	*Grus nigricollis* Prjevalsky, 1876	3, 8, 42
178.	*Grus virgo* Linnaeus, 1758	3, 4, 21, 22, 28, 35, 40
	Family HELIORNITHIDAE	
179.	*Heliopais personatus* G.R. Gray, 1849	27
	Family RALLIDAE	
180.	*Amaurornis akool* Sykes, 1832	1, 3, 4, 5, 18, 21, 22, 26, 28, 38, 40
181.	*Amaurornis fuscus zeylonicus* Baker	13, 22
182.	*Amaurornis phoenicurus* Pennant, 1769	1, 2, 3, 4, 5, 11, 13, 14, 15, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
183.	*Fulica atra* Linnaeus, 1758	1, 2, 3, 4, 5, 8, 9, 10 ,13, 14, 15, 16, 17, 18, 20, 21, 22,25, 26, 27, 28, 29, 32, 34, 35, 36, 38, 39, 40, 41, 42
184.	*Gallicrex cinerea* Gmelin, 1789	1, 2, 3, 13, 17, 18, 22, 26, 27, 35, 36, 39, 40
185.	*Gallinula chloropus* Linnaeus, 1758	1, 2, 3, 4, 7, 9, 10,13, 14, 15, 17, 18, 20, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
186.	*Gallirallus striatus* Linnaeus, 1766	1, 3, 13, 17, 26, 27, 35, 36, 40
187.	*Porphyrio martinica*	33
188.	*Porphyrio porphyria* Linnaeus, 1758	1, 2, 3, 4, 9, 10, 11, 13, 14, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 35, 36, 39, 40, 41

189.	*Porphyrio porphyrio poliocephalus* Latham	38
190.	*Porzana fusca* Linnaeus, 1766	1, 3, 4, 13, 17, 18, 22, 26, 27, 28, 38, 40
191.	*Porzana parva* Scopoli, 1769	1, 28, 40
192.	*Porzana porzana* Linnaeus, 1766	3, 18, 22, 26, 27, 39, 40
193.	*Porzana pusilla* Pallas, 1776	4, 13, 22, 26, 27, 28, 40
194.	*Rallina eurizonoides* Lafresnaye, 1845	3, 13, 26, 27
195.	*Rallina fasciata*	40
196.	*Rallus aquaticus* Linnaeus, 1758	1, 2, 3, 4, 9, 18, 22, 26, 27, 35, 36, 39, 40
	Order CHARADRIIFORMES	
	Family TURNICIDAE	
197.	*Turnix suscitator* Gmelin, 1789	4, 15, 16, 22, 23, 26, 28, 35, 38
198.	*Turnix sylvaticus* Desfontaines, 1789	15, 18
199.	*Turnix tanki* Blyth, 1843	15, 18, 21, 23, 28
	Family JACANIDAE	
200.	*Hydrophasianus chirurgus* Scopoli, 1786	1, 2, 3, 4, 9, 13, 14, 16, 17, 18, 20, 21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40
201.	*Metopidius indicus* Latham, 1790	1, 2, 3, 13, 14, 15, 16, 17, 22, 23, 26, 27, 28, 32, 35, 36, 38, 40
	Family RECURVIROSTRIDAE	
202.	*Himantopus himantopus* Linnaeus, 1758	1, 2, 3, 4, 6,7, 8,13, 14, 16, 17, 18, 20, 21, 22, 23, 25, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41, 42
203.	*Himantopus mexicanus*	6
204.	*Recurvirostra avosetta* Linnaeus, 1758	1, 3, 4, 13, 17, 18, 21, 22, 23, 25, 27, 28, 35, 36, 38, 40, 42
	Family DROMADIDAE	
205.	*Dromas ardeola* Paykull, 1805	3, 17, 23
	Family BURHINIDAE	
206.	*Burhinus oedicnemus* Linnaeus, 1758	3, 4, 16, 17, 18, 21, 22, 23, 25, 27, 28, 35, 36
207.	*Esacus magnirostris* Vieillot, 1818	13, 16, 23, 25
208.	*Esacus recurvirostris* Cuvier, 1829	3, 4, 17, 18, 21, 25, 27, 38, 39
	Family CHARADRIIDAE	
209.	*Charadrius alexandrines* Linnaeus, 1758	1, 3, 4, 6, 11,13,16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 35, 36, 38, 41, 42
210.	*Charadrius asiaticus* Pallas, 1773	23
211.	*Charadrius dubius curonicus* Gmelin	13
212.	*Charadrius dubius* Scopoli, 1786	1, 2, 3, 4, 9, 11, 13, 14, 16, 17, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41, 42
213.	*Charadrius dubius jerdoni* Legge	38
214.	*Charadrius hiaticula* Linnaeus, 1758	3, 4,13,16, 17, 22, 26, 27, 32, 36
215.	*Charadrius leschenaultia* Lesson, 1826	1, 3, 4, 11, 13, 16, 17, 21, 23
216.	*Charadrius mongolus* Pallas, 1776	3, 4, 6, 8, 11, 13, 18, 26, 17, 21, 22, 23, 27, 28, 42
217.	*Charadrius placidus* Gray & Gray, 1863	2
218.	*Pluvialis apricaria* Linnaeus, 1758	3, 15, 18, 21, 28, 39
219.	*Pluvialis dominica* Statius Muller, 1776	2, 13, 22, 26
220.	*Pluvialis fulva* Gmelin, 1789	1, 2, 4, 13, 16, 17, 18, 21, 23, 26, 27, 42
221.	*Pluvialis squatarola* Linnaeus, 1758	3, 4, 16, 17, 18, 21, 22, 23, 26, 27
222.	*Vanellus cinereus* Blyth, 1842	1, 2, 15, 17, 22, 26, 27, 35, 36
223.	*Vanellus duvaucelii* Lesson, 1826	4, 21, 27, 38, 40
224.	*Vanellus gregarious* Pallas, 1771	3, 18, 21
225.	*Vanellus indicus* Boddaert, 1783	1, 2, 3, 4, 5, 6,13, 14, 15, 16, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41
226.	*Vanellus leucurus* Lichtenstein, 1823	3, 4, 17, 18, 21, 22, 27, 28, 29, 35, 36, 38
227.	*Vanellus malabaricus* Boddaert, 1783	1, 3, 4, 13, 16, 17, 18, 20, 21, 22, 23, 26, 28, 29, 32, 35, 36, 38, 39, 41

228.	*Vanellus spinosus* Linnaeus, 1758	22, 25, 26
229.	*Vanellus vanellus* Linnaeus, 1758	2, 4, 15, 18, 22, 38
	Family SCOLOPACIDAE	
230.	*Actitis hypoleucos* Linnaeus, 1758	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 16, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 36, 38, 41, 42
231.	*Arenaria interpres* Linnaeus, 1758	3, 4, 16, 17, 18, 21, 22, 23, 27, 42
232.	*Calidris alba* Pallas, 1764	3, 13, 21, 23, 27
233.	*Calidris alpina* Linnaeus, 1758	3, 16, 17, 18, 21, 22, 23, 27
234.	*Calidris canutus* Linnaeus, 1758	3, 17, 22, 27
235.	*Calidris ferruginea* Pontoppidan, 1763	3, 4, 18, 21, 27, 28, 42
236.	*Calidris minuta* Leisler, 1812	1, 2, 3, 4, 6, 11, 13, 16, 17, 18, 20, 21, 22, 23, 26, 27, 28, 38, 41, 42
237.	*Calidris ruficollis* Pallas, 1776	27
238.	*Calidris subminuta* Middendorff, 1853	16, 18, 3, 27
239.	*Calidris temminckii* Leisler, 1812	1, 3, 4, 8,13,16, 17, 18, 21, 22, 23, 27, 28, 38, 42
240.	*Calidris tenuirostris* Horsfield, 1821	1, 27
241.	*Calidris testaceus* Pallas, 1764	11, 13,16, 17, 22, 23, 27
242.	*Eurynorhynchus pygmeus* Linnaeus, 1758	1, 2, 23,27
243.	*Gallinago gallinago gallinago* Linnaeus, 1758	11, 27, 38
244.	*Gallinago gallinago* Linnaeus, 1758	1, 2, 3, 4, 7, 9, 13, 14, 15, 16, 17, 18, 21, 22, 23, 26, 27, 28, 35, 36, 39, 40, 42
245.	*Gallinago megala* Swinhoe, 1861	27
246.	*Gallinago minima*Brunnich 1764	22, 39
247.	*Gallinago nemoricola* Hodgson, 1836	1, 3, 27, 35, 36
248.	*Gallinago solitaria* Hodgson, 1831	2, 6, 15
249.	*Gallinago stenura* Bonaparte, 1831	1, 2, 3, 4, 11, 13, 16, 17, 21, 22, 26, 27, 28, 36, 39, 41
250.	*Limicola falcinellus falcinellus* Pontoppidan, 1763	11, 18, 21, 22, 23, 27
251.	*Limnodromus semipalmatus* Blyth, 1848	18, 23, 27
252.	*Limosa lapponica* Linnaeus, 1758	1, 3, 16,17, 27, 28
253.	*Limosa limosa* Linnaeus, 1758	1, 3, 4, 13, 17, 18, 21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 40, 42
254.	*Lymnocryptes minimus* Brunnich, 1764	1, 3, 4, 17, 18, 21, 23, 27, 28
255.	*Numenius arquata* Linnaeus, 1758	1, 3, 4, 11, 13, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 42
256.	*Numenius phaeopus* Linnaeus, 1758	1, 3, 11, 13, 16, 17, 21, 23, 27, 28, 42
257.	*Phalaropus fulicarius* Linnaeus, 1758	3, 27
258.	*Phalaropus lobatus* Linnaeus, 1758	4, 21, 22, 23, 42
259.	*Philomachus pugnax* Linnaeus, 1758	3, 4, 16, 17, 18, 21, 22, 23, 27, 28, 38, 42
260.	*Scolopax rusticola* Linnaeus, 1758	3, 15, 27
261.	*Trigna terek*	22
262.	*Tringa erythropus* Pallas, 1764	1, 2, 3, 4, 16,17, 18, 21, 22, 26, 27, 28, 35, 36, 38, 40, 42
263.	*Tringa glareola* Linnaeus, 1758	1, 2, 3, 4, 11, 13, 16, 17, 21, 22, 23, 26, 27, 28, 32, 35, 36, 38, 39, 41, 42
264.	*Tringa guttifer* Nordmann, 1835	3, 17
265.	*Tringa hypoleucos* Linnaeus, 1758	6, 13, 22, 25, 38, 39, 41
266.	*Tringa nebularia* Gunnerus, 1767	1, 2, 4, 5, 6, 8,11, 13, 14, 21, 22, 26, 27, 28, 29, 32, 36, 38, 39, 42
267.	*Tringa ochropus* Linnaeus, 1758	1, 2, 3, 4, 5, 8, 13, 16, 21, 22, 23, 26, 27, 28, 32, 35, 36, 38, 39, 42
268.	*Tringa stagnatilis* Bechstein, 1803	1, 2, 3,4, 11, 13, 16, 17, 18, 21, 22, 23, 26, 27, 28, 35, 38, 39, 40, 42
269.	*Tringa tetanus* Linnaeus, 1758	1, 3, 4, 8, 11, 13, 14, 15, 16, 17, 18, 21, 22, 25, 27, 28, 29, 32, 35, 36, 38, 39, 41, 42
270.	*Tringa totanus eurhinus* (Oberholson)	13

271.	*Xenus cinereus* Güldenstädt, 1775	1, 3, 16, 17, 18, 21, 23, 27, 28, 38
	Family ROSTRATULIDAE	
272.	*Rostratula benghalensis* Linnaeus, 1758	1, 2, 3, 4, 13, 14, 15, 17, 18, 21, 22, 23, 27, 28, 35, 36, 38, 39, 40
	Family HAEMATOPODIDAE	
273.	*Haematopus ostralegus* Linnaeus, 1758	3, 4, 11, 17, 18, 27
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274.	*Cursorius coromandelicus* Gmelin, 1789	21, 22, 28, 35, 36
275.	*Cursorius cursor* Latham, 1787	3, 13, 21
276.	*Glareola lactea* Temminck, 1820	1, 3, 4, 13, 17, 18, 21, 22, 23, 25, 26, 27, 28, 38, 39, 40
277.	*Glareola maldivarum* J.R. Forster, 1795	2, 4, 13,17, 18, 21, 27
278.	*Glareola pratincola* Linnaeus, 1766	1, 3, 16, 21, 22, 23, 28
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279.	*Chlidonias hybrida*Pallas, 1811	1, 2, 3, 4, 9, 11, 13, 16, 17, 18, 21, 22,23, 27, 28, 38, 42
280.	*Chlidonias hybrida indica* Stephens	38
281.	*Chlidonias leucopterus* Temminck, 1815	3, 13, 16, 18, 27
282.	*Chlidonias niger*	22
283.	*Chroicocephalus brunnicephalus* Jerdon, 1840	1, 3, 4, 11, 13, 16, 17, 21, 23, 27, 38, 42
284.	*Chroicocephalus genei* Breme, 1839	4, 18
285.	*Chroicocephalus ridibuandus* Linnaeus, 1766	1, 2, 3, 4, 11, 13, 16, 17, 21, 23, 25, 27, 28, 29, 35, 36, 38
286.	*Gelochelidon nilotica* Gmelin, 1789	1, 3, 4, 11, 13, 16, 17, 18, 21, 22, 27, 28, 29, 38, 39
287.	*Hydrocoloeus minutus* Pallas, 1776	3, 4, 18, 27, 29
288.	*Hydroprogne caspia* Pallas, 1770	1, 3, 11, 13, 16, 17, 27, 28
289.	*Larus argentatus heuglini* Bree	13
290.	*Larus argentatus* Pontoppidan, 1763	1, 22, 23, 27
291.	*Larus brunnicephalus* Jerdon, 1840	8, 13, 18, 22, 25, 29, 35, 36, 38, 39
292.	*Larus cachinnans* Pallas, 1811	4, 18, 21, 29
293.	*Larus canus* Linnaeus, 1758	4, 18
294.	*Larus fuscus heuglini* Bree, 1876	4, 13, 17, 27
295.	*Larus fuscus* Linnaeus, 1758	13, 23
296.	*Larus ichthyaetus* Pallas, 1773	1, 4, 8,11, 16, 17, 18, 21, 22, 27, 29, 40
297.	*Larus ridibundus*Linnaeus	2, 13, 38
298.	*Onychoprion anaethetus* Scopoli, 1786	23
299.	*Onychoprion fuscatus* Linnaeus, 1766	13, 27
300.	*Rynchops albicollis* Swainson, 1838	3, 4, 17, 18, 25, 27, 29
301.	*Sterna acuticauda* J.E. Gray, 1831	1, 2, 3, 4, 13,17, 18, 22, 23, 25, 27, 29, 31, 38
302.	*Sterna albifrons* Pallas, 1764	1, 3, 4, 11, 13, 18, 21, 22, 23, 25, 27, 38, 39
303.	*Sterna aurantia* J.E. Gray, 1831	1, 2, 3, 4, 14, 16, 17, 18, 20, 21, 22, 23, 25, 27, 28, 29, 32, 33, 35, 36, 38, 39, 41
304.	*Sterna bergii* Lichtenstein, 1823	13, 27
305.	*Sterna hirundo* Linnaeus, 1758	3, 8, 11, 16, 18, 23, 27, 39, 42
306.	*Sterna melanogaster*	4, 13
307.	*Sterna repressa* Hartert, 1916	13
308.	*Sterna sumatrana* Raffles, 1822	13
309.	*Sternula saundersi* Hume, 1877	13, 27
310.	*Thalasseus bengalensis* Lesson, 1831	11, 13, 16, 17, 23, 27
311.	*Thalasseus bergii velox* Cretzschmar, 1827	11, 13, 17, 23, 27
312.	*Thalasseus sandvicensis* Latham, 1787	13, 23
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313.	*Ardeotis nigriceps* Vigors, 1831	21
314.	*Chlamydotis undulate* Jacquin, 1784	21
315.	*Sypheotides indicus* J.F. Miller, 1782	3, 21

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316.	*Chalcophaps indica* Linnaeus, 1758	2, 13, 17, 27, 38, 41
317.	*Columba eversmanni*	22
318.	*Columba leuconota* Vigors, 1831	6, 42
319.	*Columba livia* Gmelin, 1789	1, 4, 5, 6, 9, 13, 17, 18, 21, 22, 23, 25, 26, 27, 28, 32, 35, 36, 38, 39, 41, 42
320.	*Columba punicea* Blyth, 1842	15, 17
321.	*Columba rupestris* Pallas, 1811	6, 42
322.	*Ducula aenea* Linnaeus, 1766	13
323.	*Streptopelia chinensis* Scopoli, 1786	1, 2, 4, 5, 13, 18, 20, 21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 41
324.	*Streptopelia chinensis tigrina* Temnick 1820	39
325.	*Streptopelia decaocto* Frivaldszky, 1838	1, 2, 4, 5, 9, 17, 18, 20, 21, 22, 23, 25,27, 28, 29, 32, 35, 36, 38, 39, 41
326.	*Streptopelia orientalis* Latham, 1790	2, 4, 17, 18, 21, 22, 27, 28, 29, 38, 41
327.	*Streptopelia orientalis meena*	35, 36
328.	*Streptopelia senegalensis cambayensis* Gmelin, 1789	16
329.	*Streptopelia senegalensis* Linnaeus, 1766	1, 4, 5, 6, 18, 21, 22, 28, 35, 36, 38, 41
330.	*Streptopelia tranquebarica* Hermann, 1804	2, 4, 18, 21, 22, 25, 27, 28, 32, 35, 36, 38
331.	*Treron bicinctus bicinctus* Jerdon, 1840	15, 17, 27, 36
332.	*Treron phoenicoptera* Latham, 1790	2, 4, 18, 20, 21, 22, 23, 27, 28, 29, 32, 35, 36, 38, 41
333.	*Treron pompadora* Gmelin	41
	Order PTEROCLIDIFORMES	
	Family PTEROCLIDIDAE	
334.	*Pterocles exustus* Temminck, 1825	4, 18, 21, 22, 35
335.	*Pterocles indicus* Gmelin, 1789 18, 21	
336.	*Pterocles orientalis* Linnaeus, 1758 21	
	Family PTEROCLIDAE	
337.	*Syrrhaptes tibetanus* Gould, 1850 42	
	Order PSITTACIFORMES	
	Family PSITTACIDAE	
338.	*Loriculus vernalis* Sparrman, 1787	11, 13, 28
339.	*Psittacula cyanocephala* Linnaeus, 1766	4, 5, 11, 13, 18, 21, 23, 29, 35, 36, 38, 41
340.	*Psittacula eupatria* Linnaeus, 1766	2, 4, 15, 17, 18, 20, 29, 32, 35, 36, 38, 39, 41
341.	*Psittacula himalayana* Lesson, 1831	4, 5, 15, 18, 38
342.	*Psittacula krameri* Scopoli, 1769	1, 2, 4, 9, 11, 13, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 39, 41
343.	*Psittacula roseate* Biswas, 1951	2, 15, 17
344.	*Surniculus lugubris dicruroides* Hodgson, 1839	11
	Order CUCULIFORMES	
	Family CUCULIDAE	
345.	*Cacomantis merulinus* Scopoli, 1786	2, 27, 28
346.	*Cacomantis passerines* Vahl, 1797	4, 26, 27, 35, 36, 38, 39
347.	*Centropus bengalensis* Gmelin, 1788	1, 27, 35, 36
348.	*Centropus sinensis* Stephens, 1815	1, 2, 4, 5, 13, 15, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41
349.	*Clamator coromandus* Linnaeus, 1766	2, 27
350.	*Clamator jacobinus* Boddaert, 1783	1, 3, 4, 5, 13, 16, 17, 18, 20, 21, 22, 23, 27, 28, 35, 36, 38, 41
351.	*Cuculus canorus* Linnaeus, 1758	1, 4, 9, 17, 21, 27, 32, 36, 38
352.	*Cuculus macroryhynchos*	20
353.	*Cuculus micropterus* Gould, 1838	1,2, 4, 13, 17, 27, 32, 36
354.	*Cuculus poliocephalus* Latham, 1790	4

355.	*Cuculus saturates* Blyth, 1843	27
356.	*Cuculus sparveriodes*	2
357.	*Cuculus varius* Vahl, 1797	1, 2, 4, 5, 13, 16, 17, 18, 20, 21, 22, 26, 27, 28, 35, 36, 38, 39, 41
358.	*Eudynamys scolopacea* Linnaeus, 1758	1, 2, 4, 5, 9, 13, 17, 18, 20, 21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41
359.	*Rhopodytes tristis* Lesson, 1830	27
360.	*Rhopodytes viridirostris* Jerdon, 1840	17, 23
361.	*Surniculus lugubris* Horsfield, 1821	4, 28
362.	*Taccocua leschenaultia* Lesson, 1830	4, 5, 18, 21, 22, 32, 36
	Order STRIGIFORMES	
	Family STRIGIDAE	
363.	*Asio flammeus* Pontoppidan, 1763	4, 18, 21, 22, 27, 28, 39
364.	*Athene brama indica*	18, 20
365.	*Athene brama* Temminck, 1821	1, 2, 4, 5, 13, 16, 17, 21, 22, 23, 27, 28, 29, 32, 35, 36, 38, 39, 41
366.	*Athene noctua* Scopoli, 1769	42
367.	*Bubo bubo bengalensis*	20, 38
368.	*Bubo bubo* Linnaeus, 1758	1, 2, 4, 5, 18, 22, 27, 32, 35, 36, 41
369.	*Bubo coromandus* Latham, 1790	2, 16, 18, 21, 22
370.	*Bubo nipalensis* Hodgson, 1836	15
371.	*Glaucidium cuculoides* Vigors, 1831	2, 4, 32, 36
372.	*Glaucidium radiatum* Tickell, 1833	4, 23, 32, 35, 36, 38
373.	*Ketupa flavipes* Hodgson, 1836	15
374.	*Ketupa ketupu* Horsfield, 1821	27
375.	*Ketupa zeylonensis* Gmelin, 1788	1, 4, 13, 17, 18, 22, 25,27, 28, 29, 39
376.	*Ninox scutulata* Raffles, 1822	1, 13, 36, 38
377.	*Otus bakkamoena* Pennant, 1769	13, 16, 17, 18, 22, 23, 27
378.	*Otus scops* Linnaeus, 1758	2, 16, 17, 22, 27
379.	*Otus sunia* Hodgson, 1836	2, 4, 27
380.	*Strix leptogrammica* Temminck, 1831	2
381.	*Strix ocellata ocellata* Lesson, 1839	11, 13, 21, 28
	Family TYTONIDAE	
382.	*Tyto alba* Scopoli, 1769	1, 2, 13, 15, 17, 18, 20, 21, 23, 27, 28, 29, 35, 36, 39, 41
	Order CAPRIMULGIFORMES	
	Family CAPRIMULGIDAE	
383.	*Caprimulgus affinis* Horsfield, 1821	4, 18, 21, 22, 38
384.	*Caprimulgus asiaticus* Latham, 1790	1, 2, 4, 16, 18, 21, 22, 23, 27, 28, 32, 36, 41
385.	*Caprimulgus climacurus*Vieillot, 1824	27
386.	*Caprimulgus indicus* Latham, 1790	1, 4, 16, 17, 18, 20, 22, 23, 27, 29, 35
387.	*Caprimulgus macrurus* Horsfield, 1821	1, 4, 16, 17, 18, 27
388.	*Caprimulgus mahrattensis*Sykes, 1832	18, 22
	Family PODARGIDAE	
389.	*Batrachostomus hodgsoni* G.R. Gray, 1859	15
	OrderAPODIFORMES	
	FamilyAPODIDAE	
390.	*Aerodramus brevirostris* Horsfield, 1840	4, 38
391.	*Apus affinis* J.E. Gray, 1830	1, 2, 4, 5, 13, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 35, 36, 39, 41, 42
392.	*Apus melba* Linnaeus, 1758	1, 2, 4, 13, 18, 22, 38
393.	*Apus pacificus* Latham, 1801	2, 18, 27
394.	*Cypsiurus balasiensis* J.E. Gray, 1829	1, 13, 26, 27, 28, 35, 36
395.	*Cypsiurus parvus* Lichtenstein, 1823	16, 17, 20, 22, 23, 27
396.	*Cypsiurus parvus infumatus* Scatter	39
397.	*Zoonavena sylvatica* Tickell, 1846	23
	OrderCORACIFORMES	

	FamilyALCEDINIDAE	
398.	*Alcedo atthis* Linnaeus, 1758	1, 2, 3, 4, 5, 7, 9, 11, 13, 14, 16, 17, 18, 20 ,21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41, 42
399.	*Alcedo atthis bengalensis* Gmelin	38
400.	*Alcedo hercules* Laubmann, 1917	3
401.	*Alcedo meninting* Horsfield, 1821	2, 27
402.	*Ceryle rudis leucomelanurus* Reichenbach, 1851	15, 29
403.	*Ceryle rudis* Linnaeus, 1758	1, 2, 3, 4, 5, 7, 11, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 32, 35,36, 38, 39, 41
404.	*Ceryle rudis travancorensis* Whistler	13
405.	*Ceryle lugubris continentalis* Hartert	38
406.	*Halcyon amauroptera* Pearson, 1841	17, 27
407.	*Halcyon coromanda* Latham, 1790	17, 27
408.	*Halcyon pileata* Boddaert, 17831, 11, 13, 17, 22, 27	
409.	*Halcyon smyrnensis* Linnaeus, 1758	1, 2, 3, 4, 5, 7, 9, 13, 14,15, 16 , 17, 18, 20, 21,22, 23, 25, 26, 27, 28, 29, 32, 35,36, 38, 39, 41
410.	*Halcyon smyrnensis fusca* Boddaert	38
411.	*Megaceryle lugubris* Temminck, 1834	4, 9, 38
412.	*Pelargopsis amauroptera* Pearson, 1841	27
413.	*Pelargopsis capensis* Linnaeus, 1766	2, 11, 13, 16, 17, 22, 23, 26, 27, 35, 36, 38
414.	*Todiramphus chloris* Boddaert, 1783	11, 17, 27
	Family MEROPIDAE	
415.	*Merops leschenaultia* Vieillot, 1817	1, 2, 4, 13, 17, 23, 27, 28 , 38, 41
416.	*Merops orientalis* Latham, 1802	1, 2, 4, 11, 13, 16, 17, 18, 21, 22, 23, 25, 27, 28, 29, 32, 35, 36, 38, 39, 41
417.	*Merops persicus* Pallas, 1773	4, 18, 21, 28
418.	*Merops philippinus* Linnaeus, 1766	1, 2, 4, 11, 13, 17, 18, 22, 23, 25, 27,28, 29, 35, 36, 38, 39
419.	*Merops superciliosus*	22, 29
	Family CORACIIDAE	
420.	*Coracias benghalensis* Linnaeus, 1758	1, 2, 4, 5, 13, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41
421.	*Coracias garrulous* Linnaeus, 1758	4, 18, 21, 22, 28, 38
422.	*Eurystomus orientalis* Linnaeus, 1766	23, 27
	Order BUCEROTIFORMES	
	Family UPUPIDAE	
423.	*Upupa epops* Linnaeus, 1758	1, 2, 4, 5, 6, 9, 13, 15, 16, 17, 20, 21, 22, 23, 25, 27, 28, 29, 32, 35,36, 38, 39, 41
	Family BUCEROTIDAE	
424.	*Ocyceros birostris* Scopoli, 1786	1, 4, 5, 17, 18, 20, 21, 22, 28, 29, 32, 35, 36, 38, 41
	Order PICIFORMES	
	Family RAMPHASTIDAE	
425.	*Megalaima asiatica* Latham, 17902, 5, 16, 20, 26, 27, 38	
426.	*Megalaima haemacephala* Statius Muller, 1776	1, 2, 4, 5, 13, 16, 18, 20 ,21, 22, 23, 26, 27, 29, 32, 35, 36, 38, 41
427.	*Megalaima lineata* Vieillot, 1816	2, 26, 27, 38
428.	*Megalaima rubricapilla* Gmelin	41
429.	*Megalaima virens* Boddaert, 1783	4, 13, 38
430.	*Megalaima zeylanica* Gmelin, 1788	4, 5, 16, 18, 20 ,23, 27, 32, 35, 36, 38, 41
	Family PICIDAE	
431.	*Celeus brachyurus brachyurus* Vieillot, 1818	17, 27, 38
432.	*Chrysocolaptes festivus* Boddaert, 1783	21, 27
433.	*Chrysocolaptes lucidus* Scopoli, 1786	1, 17, 23, 27, 38
434.	*Dendrocopos auriceps* Vigors, 1831	4, 38

435.	*Dendrocopos canicapillus*	36, 38
436.	*Dendrocopos cathpharius* Blyth, 1845	15
437.	*Dendrocopos macei* Vieillot, 18182, 4, 38	
438.	*Dendrocopos mahrattensis* Latham, 1802	4, 18, 21, 27, 35, 36, 38, 39, 41
439.	*Dendrocopos nanus*	38
440.	*Dinopium benghalense* Linnaeus, 1758	1, 2, 4, 11, 13, 16, 17, 18, 20, 22, 23, 27, 29, 32, 36, 38, 39, 41
441.	*Dinopium javanense* Ljungh, 1797	21, 27
442.	*Dryocopus javensis* Horsfield	41
443.	*Jynx torquilla* Linnaeus, 1758	4, 17, 18, 21, 22,27, 38
444.	*Picumnus innominatus* Burton, 1836	2, 4, 17, 27, 38
445.	*Picus canus* Gmelin, 1788	4, 22, 27, 38
446.	*Picus chlorolophus* Vieillot, 1818	2, 5, 27
447.	*Picus mahrattensis* Latham, 18015, 22, 28, 41	
448.	*Picus squamatus*Vigors, 1831	4, 9
449.	*Picus xanthopygaeus* J.E. Gray & G.R. Gray, 1847	4
450.	*Yungipicus canicapillus* Blyth, 1845	4, 5, 35
451.	*Yungipicus nanus* Vigors, 1832	13, 17, 18, 22, 27, 32, 35, 36, 41
	Order PASSERIFORMES	
	Family ARTAMIDAE	
452.	*Artamus fuscus* Vieillot, 1817	1, 11, 13, 23, 27, 28, 38
	Family PITTIDAE	
453.	*Pitta brachyuran* Linnaeus, 1766	4, 13, 17, 18, 20, 22,23, 27, 28, 35, 36, 38
454.	*Pitta megarhyncha* Schlegel, 1863	17, 27
	Family ALAUDIDAE	
455.	*Alauda arvensis* Linnaeus, 1758	4
456.	*Alauda gulgula* Franklin, 1831	1, 2, 4, 9, 11, 13, 15, 16, 17, 18, 20, 21, 22, 23, 27, 28, 39 , 41
457.	*Ammomanes phoenicura* Franklin, 1831	1, 18, 20, 21, 22, 25, 28, 39, 41
458.	*Calandrella acutirostris*	18, 42
459.	*Calandrella brachydactyla* Leisler, 1814	4, 17, 18, 21, 28, 41
460.	*Calandrella cinerea* Gmelin, 1789	1, 11, 22
461.	*Calandrella raytal* Blyth, 1845	4, 18, 38
462.	*Eremophila alpestris* Linnaeus, 1758	6, 42
463.	*Eremopterix griseus* Scopoli, 1786	1, 4, 13, 17, 18, 22, 23, 28, 38, 41
464.	*Eremopterix nigriceps* Gould, 1839	27
465.	*Galerida cristata chendola*	22, 29
466.	*Galerida cristata* Linnaeus, 1758	1, 4, 5, 17, 18, 20, 21, 38, 41
467.	*Galerida cristata magna*	22
468.	*Galerida deva*	22, 28, 41
469.	*Galerida malabarica* Scopoli, 1786	13, 23, 28
470.	*Melanocorypha bimaculata* Ménétriés, 1832	4, 18, 21
471.	*Melanocorypha maxima*	42
472.	*Mirafra assamica* Horsfield, 1840	2, 4, 16, 17, 18, 23, 27, 35, 38, 39
473.	*Mirafra cantilans* Blyth, 1845	4, 21
474.	*Mirafra erythroptera* Blyth, 1845	1, 4, 16, 17, 18, 20, 21, 22,23, 25, 35, 36, 39
475.	*Mirafra javanica*	18
	Family STENOSTIRIDAE	
476.	*Chelidorhynx hypoxantha* Blyth, 1843	4, 38
	Family STURNIDAE	
477.	*Acridotheres fuscus mahratensis* Sykes	13, 18
478.	*Acridotheres fuscus* Wagler, 1827	1, 2, 4, 5, 13, 16, 17, 27, 28, 32, 36, 38
479.	*Acridotheres ginginianus* Latham, 1790	1, 2, 4, 5, 18, 20, 21, 22, 25, 27, 29, 35, 38, 39
480.	*Acridotheres tristis* Linnaeus, 1766	1, 2, 4, 5, 9, 13, 15, 16, 17, 18, 20, 21, 22, 23,25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41

481.	*Agropsar sturninus* Pallas, 1776	15
482.	*Gracula religiosa* Linnaeus, 1758	2, 15
483.	*Gracupica contra* Linnaeus, 1758	1, 2, 4, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 29, 32, 35, 36, 38, 39, 41
484.	*Pastor roseus* Linnaeus, 1758	1, 4, 13, 18, 21, 22,23, 28, 32, 35, 36, 41
485.	*Sturnia malabarica* Gmelin, 1789	2, 4, 13, 15, 17, 23, 26, 27, 32, 35, 36, 38, 39
486.	*Sturnia pagodarum* Gmelin, 1789	1, 4, 5, 13, 15, 17, 18, 22, 23, 25, 27, 28, 32, 35, 36, 38, 39, 41
487.	*Sturnus vulgaris* Linnaeus, 1758	1, 4, 9, 13, 18, 21, 22, 27, 35, 38
	Family CORVIDAE	
488.	*Corvus corax* Linnaeus, 1758	4, 6, 18, 21, 29, 42
489.	*Corvus levaillantii* Lesson,1831 2	
490.	*Corvus macrorhynchos culminatus* Sykes	13, 35, 36
491.	*Corvus macrorhynchos intermedius* 35	
492.	*Corvus macrorhynchos* Wagler, 1827	1, 4, 5, 6, 9, 13, 15, 16, 17, 18, 22, 23, 25, 26, 27, 28, 32, 36, 39, 41
493.	*Coloeus monedula* Linnaeus, 1758	9
494.	*Corvus splendens* Vieillot, 1817	1, 2, 4, 5, 9, 11, 13, 16, 17, 18, 21, 22,23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41
495.	*Corvus splendensprotegatus* Madarasz	13
496.	*Dendrocitta formosae* Swinhoe, 1863	4, 5
497.	*Dendrocitta vagabunda* Latham, 1790	1, 2, 4, 5, 13, 17, 18, 20, 21, 22,23, 25,27, 28, 29, 32, 35, 36, 38, 39, 41
498.	*Pica pica* Linnaeus, 1758	42
499.	*Pyrrhocorax graculus* Linnaeus, 1766	6, 42
500.	*Pyrrhocorax pyrrhocorax* Linnaeus, 1758	6, 42
501.	*Urocissa erythrorhyncha* Boddaert, 1783	4
502.	*Urocissa flavirostris* Blyth, 1846	4, 9
	Family CAMPEPHAGIDAE	
503.	*Coracina macei* Lesson, 1831	2, 4, 13, 17, 27, 32, 36, 38, 41
504.	*Coracina melanoptera sykesi* Strickland, 1844	11, 13, 18, 21, 22, 23
505.	*Coracina melaschistos* Hodgson, 1836	4, 5, 17, 27
506.	*Coracina novaehollandiae* Gmelin, 1789	11,13, 23
507.	*Hemipus picatus* Sykes, 1832	27, 35, 36, 38
508.	*Pericrocotus brevirostris brevirostris* Vigors, 1831	2, 21, 22
509.	*Pericrocotus cinnamomeus* Linnaeus, 1766	1, 4, 11, 13, 17, 18, 20, 21, 22, 27, 28, 38
510.	*Pericrocotus cinnamomeus malabariclls* Gmelin	13
511.	*Pericrocotus divaricatus* Raffles, 1822	17
512.	*Pericrocotus erythropygius* Jerdon, 1840	18, 21, 22
513.	*Pericrocotus ethologus* Bangs & J.C. Phillips, 1914	4, 18, 38
514.	*Pericrocotus flammeus* J.R. Forster, 1781	2, 5, 13, 18, 22, 23, 27, 28
515.	*Pericrocotus roseus* Vieillot, 1818 4,	27
516.	*Pericrocotus speciosus*	38
	Family TEPHRODORNITHIDAE	
517.	*Tephrodornis gularis* Raffles, 1822 2	
518.	*Tephrodornis pondicerianus* Gmelin, 1789	1, 4, 5, 13, 18, 20, 21, 22, 23, 32, 36, 38, 41
	Family MUSCICAPIDAE	
519.	*Copsychus malabaricus* 36	
520.	*Copsychus saularis ceylonensis* P.L. Sclater, 1861	11, 13, 27
521.	*Copsychus saularis* Linnaeus, 1758	1, 2, 4, 5, 6, 13, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 41
522.	*Cyornis rubeculoides* Vigors, 1831	4, 17, 27
523.	*Cyornis tickelliae* Blyth, 1843	1, 22, 23, 27, 28, 32, 36, 38, 41
524.	*Cyornis unicolor* Blyth, 1843	27

525.	*Enicurus leschenaultia* Vieillot, 1818	15
526.	*Enicurus schistaceus* Hodgson, 1836	15
527.	*Eumyias thalassinus* Swainson, 1838	4, 17, 18, 27, 28, 38
528.	*Ficedula albicilla*	38
529.	*Ficedula parva* Bechstein, 1792	2, 4, 17, 18, 21, 22, 23, 27, 28, 38, 39
530.	*Ficedula strophiata* Hodgson, 1837	4
531.	*Ficedula subrubra*	12
532.	*Ficedula superciliaris* Jerdon, 1840	4, 18
533.	*Ficedula tricolor* Hodgson, 1845	4, 18, 38
534.	*Ficedula westermanni* Sharpe, 1888	27
535.	*Luscinia brunnea* Hodgson, 1837	4
536.	*Luscinia calliope* Pallas, 1776	22, 27
537.	*Luscinia pectoralis* Gould, 1837	4, 38
538.	*Luscinia svecica* Linnaeus, 1758	2, 4, 13, 18, 21, 22, 27, 28, 38, 42
539.	*Monticola cinclorhynchus* Vigors, 1832	4, 18, 21, 22, 38
540.	*Monticola rufiventris* Jardine & Selby, 1833	4
541.	*Monticola solitaries* Linnaeus, 1758	4, 6, 21,2 2, 27, 28, 38, 41, 42
542.	*Muscicapa dauurica* Pallas, 1811	2, 28, 41
543.	*Muscicapa latirostris* Raffles, 1822	4, 13
544.	*Muscicapa sibirica* Gmelin, 1789	5
545.	*Muscicapa striata* Pallas, 1764	21
546.	*Muscicapa sundara*	35, 36
547.	*Muscicapa thalassina* Swainson, 1838	20, 23, 39
548.	*Muscicappa ceylonensis* Swainson 1820	39
549.	*Myophonus caeruleus* Scopoli, 1786	2, 4, 5, 9, 38
550.	*Oenanthe deserti* Temminck, 1825	4, 18, 21, 22, 28, 42
551.	*Oenanthe finschii* (von Heuglin, 1869)	20
552.	*Oenanthe fusca* Blyth, 1851	4, 15, 18, 21, 22, 28, 32, 36, 41
553.	*Oenanthe isabellina* Temminck, 1829	4, 18, 21, 42
554.	*Oenanthe picata* Blyth, 1847	4, 18, 21, 42
555.	*Oenanthe pleschanka* Lepechin, 1770	4, 42
556.	*Pellorneum palustre* Gould, 1872	2
557.	*Pellorneum ruficeps* Swainson, 1832	1, 4, 18, 27, 28 , 38
558.	*Phoenicurus ochruros rujivenlris* Vieillot	13
559.	*Phoenicurus caeruleocephala* Vigors, 1831	4
560.	*Phoenicurus erythrogastrus* Güldenstädt, 1775	6, 42
561.	*Phoenicurus frontalis* Vigors, 1832	4
562.	*Phoenicurus fuliginosus* Vigors, 1831	2, 4, 18, 38
563.	*Phoenicurus hodgsoni*	6
564.	*Phoenicurus leucocephalus* Vigors, 1831	4, 18, 38, 42
565.	*Phoenicurus ochruros* S.G. Gmelin, 1774	4, 6, 17, 18, 20,21, 22, 26, 27, 28, 32, 36, 38, 39, 41, 42
566.	*Saxicola caprata* Linnaeus, 1766	1, 4, 5, 13, 18, 20, 22, 23, 27, 28, 29, 32, 36, 38, 41
567.	*Saxicola ferreus* J.E. Gray & G.R. Gray, 1847	1, 4, 5, 38
568.	*Saxicola leucura* Blyth, 1847	4, 18, 20, 27, 29
569.	*Saxicola maurus* Pallas, 1773	42
570.	*Saxicola torquatus* Linnaeus, 1766	1, 4, 5, 13, 18, 20, 21, 22, 27, 28, 32, 36, 38
571.	*Saxicoloides fulicatus* Linnaeus, 1766	1, 4, 5, 13, 18, 20, 21, 22, 23, 25, 27, 28, 32, 35, 36, 38, 41
	Family LEIOTHRICHIDAE	
572.	*Argya earlei* Blyth, 1844	4, 17, 18, 20, 27, 35, 36, 38
573.	*Trochalopteron erythrocephalum* Vigors, 1832	4
574.	*Trochalopteron lineatum* Vigors, 1831	4, 5
575.	*Turdoides affinis* Jerdon, 1845	13
576.	*Turdoides caudata* Dumont, 1823	1, 4, 17, 18, 20, 21, 22,2 3, 25, 28, 29, 32, 35, 36, 38, 39, 41

577.	*Turdoides malcolmi* Sykes, 183216, 18, 20, 21, 22, 25, 28, 29, 35, 36, 38, 41	
578.	*Turdoides striata* Dumont, 1823	1, 4, 5, 13, 16, 17, 18, 20, 21, 22, 23, 27, 28, 32, 35, 36, 39, 41
579.	*Turdoides striata orientalis*	36
	Family TIMALIIDAE	
580.	*Chrysomma sinense* Gmelin, 1789	4, 5, 16, 18, 21, 22, 23, 27, 28, 35, 32, 36, 38, 41
581.	*Chrysomma sinense hypoleucum* Franklin	38
582.	*Dumetia hyperythra* Franklin, 1831	1, 23, 38
583.	*Macronus gularis* Horsfield, 1821	17, 27
584.	*Pomatorhinus erythrogenys* Vigors, 1832	4, 5, 18
585.	*Pomatorhinus horsfieldii*	28, 41
586.	*Pomatorhinus schisticeps* Hodgson, 1836	4, 18, 23
587.	*Stachyridopsis pyrrhops* Blyth, 1844	4, 38
588.	*Timalia pileata* Horsfield, 1821	17, 27
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589.	*Hypothymis azurea*Boddaert, 1783	15, 16, 17, 23, 27, 28
590.	*Terpsiphone paradise* Linnaeus, 1758	1, 4, 5, 9, 11, 13, 17, 18, 21, 22, 23, 27, 28, 32, 36, 38, 41
591.	*Terpsiphone paradisi leucogasrer* Swainson	13
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592.	*Cettia brunnifrons* Hodgson, 1845	4
593.	*Cettia flavolivacea* Blyth, 1845	2, 38
594.	*Cettia major* Moore, 1854	1
595.	*Cettia cetti*	18, 22
596.	*Cettia pallidipes pallidipes* Blanford	38
597.	*Horornis fortipes* Hodgson, 1845	4
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598.	*Orthotomus sutorius guzuratus* Latham	13, 38
599.	*Orthotomus sutorius* Pennant, 1769	1, 2, 4, 5, 11, 13, 17, 18, 20, 21, 22, 23, 26, 27, 28, 32, 35, 36, 38, 41
600.	*Prinia buchanani* Blyth, 1844	4, 18, 21, 22, 38
601.	*Prinia burnesii*	18
602.	*Prinia crinigera* Hodgson, 1836	4
603.	*Prinia flaviventris* Delessert, 1840	4, 17, 18, 27
604.	*Prinia gracilis* Lichtenstein, 1823	18, 21
605.	*Prinia gracilis lepida* Blyth	38
606.	*Prinia hodgsonii* Blyth, 1844	5, 13, 18, 21, 23, 27, 28, 38
607.	*Prinia hodgsonni albogztlaris* Walden	13
608.	*Prinia hodgsonii rufula* Godwin-Austen	38
609.	*Prinia inornata* Sykes, 1832	4, 13, 16, 17, 18, 21, 26, 27, 28, 32, 36, 38, 41
610.	*Prinia socialis stewarti* Blyth, 1847	27, 38
611.	*Prinia socialis* Sykes, 1832	1, 2, 4, 5, 13, 17, 18, 20, 21, 22, 23, 28, 29, 32, 36, 38, 41
612.	*Prinia subflava franklinii* Blyth	13
613.	*Prinia subflava terricolor* Hume	38
614.	*Prinia subflava* Gmelin, 1789	20, 22, 23
615.	*Prinia sylvatica*Jerdon, 1840	4, 28, 36, 38
616.	*Prinia sylvatica gangetica* Blyth	38
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617.	*Phylloscopus affinis* Tickell, 1833	4, 22, 38
618.	*Phylloscopus chloronotus* J.E. Gray & G.R. Gray, 1847	4, 27, 38
619.	*Phylloscopus collybita* Vieillot, 1817	4, 5, 16, 17, 18, 21, 22, 27, 28, 38, 39
620.	*Phylloscopus fuligiventer* Hodgson, 1845	4
621.	*Phylloscopus fuscatus* Blyth, 1842	2, 16, 22, 27, 38
622.	*Phylloscopus griseolus* Blyth, 1847	4, 18, 21, 22
623.	*Phylloscopus humei* W.E. Brooks, 1878	4, 18, 27, 38

624.	*Phylloscopus inornatus* Blyth, 1842	4, 22
625.	*Phylloscopus magnirostris* Blyth, 1843	27
626.	*Phylloscopus neglectus* Hume, 1870	4, 5
627.	*Phylloscopus occipitalis* Blyth, 1845	4, 18, 22, 38, 41
628.	*Phylloscopus proregulus* Pallas, 1811	5
629.	*Phylloscopus reguloides* Blyth, 1842	1, 27
630.	*Phylloscopus* sp.	1
631.	*Phylloscopus subaffinis*	22
632.	*Phylloscopus subviridis* W.E. Brooks, 1872	4, 18, 22
633.	*Phylloscopus trochiloides*Sundevall, 1837	4, 13, 16, 18, 21, 22, 23, 27, 38, 41
634.	*Phylloscopus tytleri*Brooks, 1872	22
635.	*Phylloscopus xanthoschistos* E. Gray & G.R. Gray, 1847	4, 5 , 18, 38
636.	*Seicercus burkii* Burton, 1836	4, 27
637.	*Seicercus whistleri*	38
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638.	*Acrocephalus agricola* Jerdon, 1845	1, 4, 17, 18, 22, 27, 28, 29, 32, 35, 36, 38
639.	*Acrocephalus concinens*	22
640.	*Acrocephalus dumetorum* Blyth, 1849	4, 13,17, 18, 21, 22, 23, 26, 27, 28, 35, 36, 38, 41
641.	*Acrocephalus melanopogon* Temminck, 1823	4, 18, 22
642.	*Acrocephalus orinus* Oberholser, 1905	27
643.	*Acrocephalus stenroreus brunnescens* Jerdon	13
644.	*Acrocephalus stentoreus* Hemprich & Ehrenberg, 1833	1, 4, 9, 11, 13, 16, 17, 18, 20, 21, 22, 23, 26, 27, 28, 35, 36, 38, 41
645.	*Iduna aedon* Pallas, 1776	22,27, 39
646.	*Iduna caligata* Lichtenstein, 1823	4, 18, 21, 22,23
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647.	*Culicicapa ceylonensis* Swainson, 1820	4, 5, 18, 21, 22, 28, 38
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648.	*Sylvia althaea* Hume, 1878	4, 18, 21
649.	*Sylvia curruca althaea*	22
650.	*Sylvia curruca blythi*	22, 41
651.	*Sylvia curruca* Linnaeus, 1758	4, 18, 21, 23, 28, 38
652.	*Sylvia hortensis* Gmelin, 1789	18, 21, 22, 41
653.	*Sylvia nana* Hemprich & Ehrenberg, 1833	4, 18, 22
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654.	*Locustella certhiola* Pallas, 1811	27
655.	*Locustella lanceolata*	22
656.	*Locustella naevia* Boddaert, 1783	4
657.	*Megalurus palustris* Horsfield, 1821	1, 4, 18, 20, 26, 27, 35, 36
658.	*Megalurus palustris toklao* Blyth	38
659.	*Schoenicola striatus* Jerdon, 1841	18, 28
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660.	*Rhipidura albicollis* Vieillot, 1818	4, 5, 17, 18, 27, 38, 41
661.	*Rhipidura aureola* Lesson, 1831	2, 4, 5, 11, 13, 18, 21, 22, 28, 35, 36, 38, 39, 41
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662.	*Pnoepyga albiventer* Hodgson, 1837	4
663.	*Pnoepyga immaculata*	38
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664.	*Geokichla citrina* Latham, 1790	4, 13, 17, 21, 22,27, 28
665.	*Geokichla gurneyi* Hartlaub, 1864	27
666.	*Turdus atrogularis*	18, 38
667.	*Turdus boulboul* Latham, 1790	4, 18, 22
668.	*Turdus merula* Linnaeus, 1758	18, 20, 23
669.	*Turdusphilomelos*	18
670.	*Turdus ruficollis* Pallas, 1776	4, 18, 20, 22

671.	*Turdus unicolor* Tickell, 1833	4, 9, 17, 21, 22, 27
672.	*Zoothera dauma* Latham, 1790	18, 27
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673.	*Cisticola exilis* Vigors & Horsfield, 1827	2, 22
674.	*Cisticola juncidis* Rafinesque, 1810	4, 13, 16, 17, 18, 20, 21, 22, 26, 27, 28, 38, 41
675.	*Cisticola jauncidis cursitans* Franklin	38
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676.	*Pachycephala cinerea* Blyth, 1847	17, 27
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677.	*Aegithina nigrolutea* G.F.L. Marshall, 1876	21, 22
678.	*Aegithina tiphia* Linnaeus, 1758	1, 2, 4, 5, 13, 15, 17, 18, 21, 22, 27, 28, 32, 36, 38, 41
679.	*Aegithina tiphia multicolor* Gmelin	13
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680.	*Anthus campestris* Linnaeus, 1758	4, 17, 18, 21, 22, 27, 28, 38
681.	*Anthus cervinus* Pallas, 1811	4, 18
682.	*Anthus godlewskii* Taczanowski, 1876	22, 23
683.	*Anthus hodgsoni* Richmond, 1907	1, 4, 17, 18, 21, 22, 27, 28, 35, 36, 38, 39, 41
684.	*Anthus novaeseelandiae* Gmelin, 1789	5, 11, 16, 23, 27, 29, 39
685.	*Anthus novaeseelandiae richaardi*	22, 39
686.	*Anthus novaeseelandiae waitei*	22
687.	*Anthus richardi* Vieillot, 1818	2, 4, 13, 17, 18, 27, 41
688.	*Anthus roseatus* Blyth, 1847	4, 18, 22, 38, 42
689.	*Anthus rufulus* Vieillot, 1818	1, 2, 4, 9, 13, 18, 21, 26, 27, 28, 29, 32, 35, 36, 38, 41
690.	*Anthus similis* Jerdon, 1840	4, 18, 20, 38
691.	*Anthus similis travancorensis* Ripley	13
692.	*Anthus spinoletta* Linnaeus, 1758	4, 22, 38
693.	*Anthus sylvanus* Hodgson, 1845	4, 18
694.	*Anthus trivialis* Linnaeus, 1758	4, 17, 18, 20, 22, 27, 28, 32, 38, 41
695.	*Dendronanthus indicus* Gmelin, 1789	1, 2, 13, 16, 17, 23, 27, 28, 32, 36
696.	*Motacilla alba duckhunensis* Sykes	13, 20, 38, 39, 41
697.	*Motacilla alba* Linnaeus, 1758	2, 4, 6, 9, 13, 15, 18, 21, 22,2 3, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41, 42
698.	*Motacilla caspica* Gmelin	20, 22, 38
699.	*Motacilla cinerea* Tunstall, 1771	1,2, 4, 5, 6, 13, 14, 15, 17, 18, 21, 23, 25, 26, 27, 28, 35, 36, 38, 39, 41, 42
700.	*Motacilla citreola calcarata*Hodgson	22, 38
701.	*Motacilla citreola* Pallas, 1776	1, 2, 4, 5, 6, 9, 15, 16, 17, 18, 20, 21, 22, 26, 27, 28, 35, 36, 38, 41, 42
702.	*Motacilla citreola werae* Buturlin	13
703.	*Motacilla citrina*	6
704.	*Motacilla flava bema* Sykes, 1832	2, 6,11, 36
705.	*Motacilla flava* Linnaeus, 1758	1, 4, 9, 13, 17, 18, 20,21,23, 26, 27, 28, 32, 35, 38, 39
706.	*Motacilla flava melanogrisea*	22
707.	*Motacilla flava thunbergi* Billberg, 1828	11, 13, 22
708.	*Motacilla indica* Gmelin	13, 22
709.	*Motacilla maderaspatensis* Gmelin, 1789	1, 2, 4, 5, 11, 14, 13, 15, 16, 18, 21, 22, 23, 25, 26, 28, 32, 35, 36, 38, 41
710.	*Motacilla* sp.	1
711.	*Motacilla tschutschensis tschutschensis* Gmelin, 1789	11
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712.	*Dicaeum agile* Tickell, 1833	2, 4, 18, 20, 22, 27, 35, 36, 41
713.	*Dicaeum cruentatum* Linnaeus, 175827	
714.	*Dicaeum erythrorhynchos* Latham, 1790	1, 4, 5, 13, 22, 23, 27, 28, 35, 36

715.	*Dicaeum trigonostigma* Scopoli, 1786	27
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716.	*Aethopyga siparaja* Raffles, 1822	2, 4, 5, 27, 28, 35, 36, 38
717.	*Arachnothera longirostra* Latham, 1790	2, 27
718.	*Cinnyris asiaticus* Latham, 1790	1, 2, 4, 5, 13, 17, 18, 20, 21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 39, 41
719.	*Cinnyris jugularis* Linnaeus, 1766	17
720.	*Cinnyris lotenius* Linnaeus, 1766	13, 23, 28
721.	*Leptocoma minima*	28
722.	*Leptocoma zeylonica* Linnaeus, 1766	13, 17, 23, 27, 28, 41
723.	*Nectarina gouldiae* Image, 1867	2
724.	*Nectarinia lotenia hindustanica* Whistler	13
725.	*Nectarinia zeylonica flaviventris* Hennann	13
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726.	*Parus major* Linnaeus, 1758	2, 4, 5, 9, 13, 17, 18, 20, 21, 22, 27, 28, 32, 36, 38, 41
727.	*Parus melanolophus* Vigors, 1831	4
728.	*Parus monticolus* Vigors, 1831	4
729.	*Parus xanthogenys* Vigors, 1831	4
730.	*Pseudopodoces humilis* Hume, 1871	42
731.	*Sylviparus modestus* Burton, 1836	4
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732.	*Prunella atrogularis* Brandt, 1843	4
733.	*Prunella collaris* Scop.	6
734.	*Prunella rubeculoides*	42
735.	*Prunella strophiata* Blyth, 1843	4, 6
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736.	*Yuhina flavicollis* Hodgson, 1836 4	
737.	*Zosterops palpebrosus* Temminck, 1824	2, 4, 5, 17, 18, 21, 22, 28, 29, 32, 35, 36, 38, 41
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738.	*Tichodroma muraria* Linnaeus, 1766	4, 18, 20, 38, 42
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739.	*Sitta castanea* Lesson, 1830	2, 4, 18, 22, 27
740.	*Sitta cinnamoventris*	38
741.	*Sitta frontalis* Swainson, 1820	27, 38
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742.	*Emberiza bruniceps*von J.F. Brandt, 1841	4, 18, 21, 22, 28, 35, 36
743.	*Emberiza buchanani* Blyth, 1845	4, 21
744.	*Emberiza cia* Linnaeus, 1766	4, 6, 42
745.	*Emberiza fucata* Pallas, 1776	22, 27, 38
746.	*Emberiza lathami* J.E. Gray, 1831	4, 5, 18, 20, 21, 22, 38
747.	*Emberiza leucocephalos* S.G. Gmelin, 1771	4
748.	*Emberiza melanocephala*Scopoli 1769	18, 20, 22, 28, 39
749.	*Emberiza stewarti* Blyth, 1854	4, 18, 22, 38
750.	*Emberiza striolata* M.H.K. Lichtenstein, 1823	18, 21, 35, 36
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751.	*Certhia himalayana* Vigors, 1832	4, 5, 18, 20
752.	*Salpornis spilonota* Franklin, 183121, 22	
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753.	*Amandava amandava* Linnaeus, 1758	1, 4, 13, 18, 20, 22, 27, 28, 29, 35, 36, 38
754.	*Euodice malabarica* Linnaeus, 1758	1, 4, 17, 21, 22, 23, 27, 28, 35, 36, 38, 41
755.	*Gymnoris xanthocollis* Burton, 1838	4, 11, 13, 15, 18, 21, 22, 28, 35, 36, 38, 41
756.	*Lonchura malacca* Linnaeus, 1766	1, 2, 13, 17, 18, 22, 23, 27, 28, 36, 38, 39, 41
757.	*Lonchura punctulata* Linnaeus, 1758	1, 2, 4, 5, 13, 17, 18, 21, 22, 23, 27, 28, 32, 35, 36, 38, 39, 41

758.	*Lonchura striata* Linnaeus, 1766	1, 2, 13, 22, 23, 27
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759.	*Montifringilla adamsi* Adams, 1859	6, 42
760.	*Pyrgilauda blanfordi* Hume, 1876	42
761.	*Passer domesticus indicus*Jerdine & Selby 1886	22, 39
762.	*Passer domesticus* Linnaeus, 1758	1, 2, 4, 5, 6, 9, 13, 15, 16, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 41
763.	*Passer domesticus parkini*	22
764.	*Passer hispaniolensis* Temminck, 1820	18, 21, 22
765.	*Passer montanus* Linnaeus, 1758	2
766.	*Passer montanus malaccensis* Dubois 1912	39
767.	*Passer pyrrhonotus*	18, 20
768.	*Passer rutilans* Temminck, 1836	4
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769.	*Ploceus benghalensis* Linnaeus, 1758	4, 17, 18, 22, 27, 35, 36, 38
770.	*Ploceus manyar flaviceps* Lesson, 1831	11, 13, 22
771.	*Ploceus manyar* Horsfield, 1821	1, 4, 13, 18, 20, 22, 27, 35, 38
772.	*Ploceus megarhynchus* Hume, 186927, 35	
773.	*Ploceus philippinus* Linnaeus, 1766	1, 2, 4, 5, 11, 13, 16, 17, 18, 20, 21, 22,23, 27, 28, 29, 32, 35, 36, 38, 41
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774.	*Carduelis carduelis* Linnaeus, 1758	4
775.	*Carduelis spinoides*	38
776.	*Carpodacus erythrinus* Pallas, 1770	4, 5, 6, 18, 21, 22, 27, 28, 38, 42
777.	*Carpodacus rubicilloides*	42
778.	*Carpodacus rubicilla*	42
779.	*Chloris spinoides* Vigors, 1831	4
780.	*Leucosticte brandti* Bonaparte, 1851	6, 42
781.	*Leucosticte nemoricola* Hodgson, 1836	6, 42
782.	*Linaria cannabina* Linnaeus, 1758	4, 18, 42
783.	*Linaria flavirostris* Linnaeus, 1758	6, 42
784.	*Serinus pusillus* Pallas, 1811	4, 6, 42
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785.	*Alophoixus flaveolus* Gould, 1836	2
786.	*Hypsipetes leucocephalus* Gmelin, 1789	4, 38
787.	*Pycnonotus cafer* Linnaeus, 1766	1, 2, 4, 5, 13, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 35, 36, 38, 41
788.	*Pycnonotus cafer wetmorei* Deignan, 1960	16
789.	*Pycnonotus flaviventris*	38
790.	*Pycnonotus jocosus fuscicaudatus* Gould	13
791.	*Pycnonotus jocosus* Linnaeus, 1758	1, 2, 13, 17, 18, 22, 23, 27, 28, 32, 35, 36, 38
792.	*Pycnonotus leucogenys* J.E. Gray, 1835	4, 5, 9, 15, 18, 22, 29, 38
793.	*Pycnonotus leucotis* Gould, 1836	15, 18, 21
794.	*Pycnonotus luteolus* Lesson, 1841	16, 22, 23
795.	*Pycnonotus melanicterus* Gmelin, 1789	2
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796.	*Cecropis daurica* Laxmann, 1769	4, 5, 13, 16, 17, 18, 20, 21, 22, 23, 25, 27, 28, 29, 35, 36, 38, 41
797.	*Delichon dasypus* Bonaparte, 1850	4, 17
798.	*Delichon nipalense* Moore, 1854	2, 38
799.	*Delichon urbicum* Linnaeus, 1758	2, 5, 28, 35
800.	*Hirundo rustica gutturalis*	22
801.	*Hirundo rustica* Linnaeus, 1758	1, 2, 5, 9, 11, 13, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 32, 35, 36, 38, 39, 41, 42

802.	*Hirundo smithii* Leach & K.D. Koenig, 1818	1, 4, 13, 18, 20, 22, 28, 29, 32, 35, 36, 38, 41
803.	*Hirundo smithii filifera* Stephens	38
804.	*Hirundo tahitica* Gmelin, 1789	13
805.	*Petrochelidon fluvicola* Blyth, 1855	4, 13, 18, 21, 22, 27, 28, 38
806.	*Ptyonoprogne concolor* Sykes, 1832	1, 21, 22, 28, 38, 41
807.	*Ptyonoprogne rupestris* Scopoli, 1769	4, 28, 42
808.	*Riparia diluta* Sharpe & Wyatt, 1893	4, 18, 38
809.	*Riparia paludicola chinensis* (Grey J E)	13
810.	*Riparia paludicola* Vieillot, 1817	2, 4, 18, 21, 22, 32, 36, 38
811.	*Riparia riparia* Linnaeus, 1758	2, 4, 18, 22, 27, 28 , 38
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812.	*Irena puella* Latham, 1790	2, 23
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813.	*Cinclus cinclus* Linnaeus, 1758	8, 42
814.	*Cinclus pallasii* Temminck, 1820	4, 42
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815.	*Chloropsis aurifrons* Temminck, 1829	1, 2, 16, 18, 27, 38
816.	*Chloropsis cochinchinensis* Gmelin, 1789	2, 13, 16, 17, 35
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817.	*Lanius collurio* Linnaeus, 1758	22, 39
818.	*Lanius cristatus* Linnaeus, 1758	1, 2, 4, 13, 16, 17, 18, 20, 22, 23, 25, 26, 27, 35, 36
819.	*Lanius excubitor* Linnaeus, 1758	1, 20, 22, 25, 28, 35, 36, 41
820.	*Lanius isabellinus* Hemprich & Ehrenberg, 1833	4, 18, 21, 28
821.	*Lanius meridionalis* Temminck, 1820	4, 18, 21, 27, 38, 41
822.	*Lanius schach* Linnaeus, 1758	2, 4, 5, 9, 13, 17, 18, 20, 21, 22, 23, 25, 27, 28, 29, 32, 35, 36, 38, 41
823.	*Lanius schach tricolor* Hodgson, 1837	26, 27
824.	*Lanius tephronotus* Vigors, 1831	27
825.	*Lanius vittatus* Valenciennes, 1826	1, 4, 18, 21, 22, 23, 27, 28, 38, 41
826.	*Pteruthius rufiventer*	27
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827.	*Oriolus chinensis* Linnaeus, 1766	1, 2, 13, 18, 27
828.	*Oriolus kundoo* Sykes, 1832	15, 38
829.	*Oriolus larvatus*	27
830.	*Oriolus oriolus* Linnaeus, 1758	1, 4, 5, 9, 13, 16, 17, 18, 20, 21, 22, 23, 27, 28, 32, 35,36, 41
831.	*Oriolus traillii* Vigors, 1832	4, 38
832.	*Oriolus xanthornus* Linnaeus, 1758	1, 2, 4, 13, 15, 16, 17, 22, 23, 27, 28, 32, 35, 36, 38
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833.	*Dicrurus adsimilis* Bechstein, 1794	5, 11, 13,16, 20, 22,23, 25, 27, 39, 41
834.	*Dicrurus aeneus* Vieillot, 1817	2, 11, 13, 15, 27
835.	*Dicrurus annectens* Hodgson, 1836	2, 15
836.	*Dicrurus caerulescens* Linnaeus, 1758	1, 4, 16, 17, 22, 27, 28, 39, 41
837.	*Dicrurus hottentottus* Linnaeus, 1766	2, 4, 15, 23, 27, 38
838.	*Dicrurus leucophaeus* Vieillot, 1817	1, 2, 4, 13, 17, 18, 23, 26, 27, 28, 29, 41
839.	*Dicrurus macrocercus* Vieillot, 1817	1, 2, 4, 9, 13, 17, 18, 21, 27, 28, 29, 32, 35, 36, 38, 41
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841.	*Dicrurus remifer* Temminck, 1823	2, 35

MAMMALIA

Mammals belong to class Mammalia and have a worldwide distribution mainly due to their ability to regulate their body temperatures and internal environment in case of excess heat, aridity and in severe cold. They are present in both terrestrial as well as aquatic habitats, i.e., from snowy heights of the Himalayas to the thick rain forests to the arid region. Basically mammalian are referred to any member of the group of vertebrate animals that nourishes their young ones with milk through special mammary glands of the mother, e.g., whales, elephants, rhinoceroses, tigers, shrews, mice, bats. Another important feature of the group is the presence of hairs on the body at least during some period of their life cycle. Further, the mammalian lower jaw is hinged directly to the skull, instead of through a separate bone (quadrate) as in all other vertebrates. Three tiny bones transmits sound waves across the middle ear. The heart and the lungs are separated from the abdominal cavity by muscular diaphragm. Only the left aortic arch persists and the mature red blood cells (erythrocytes) lack a nucleus; all other vertebrates have nucleated red blood cells.

There is immense pressure on the diversity of mammals in India mainly due to destruction of habitat, and exploitation for other purposes that have resulted in shrinkage of about 50% of the species distributional range. This has severely affected the wildlife. The undue exploitation of several species of wild animals and their parts for trade, medicinal purposes and flesh have threatened many of them to nearly extinction. Competition for food and transmission of diseases by domestic livestock are other threats to herbivores, particularly to certain groups, i.e., cervids and bovids. As per Agrawal (1998) of the 390 species of mammals reported from India, 175 are threatened with extinction and based on their degree of threat many mammals have been listed in Schedule (I-IV) of the Wild Life (Protection) Act.

Some documents have been published around 1900 on Indian mammals, e.g., Mammals of India (Jerden. 1867), Check list of Palaearctic and Indian Mammals (Ellerman and Morrison Scott, 1951) and Fauna of British India, Rodentia, (Ellerman, 1961). The mammals of central India/Madhya Pradesh were reported in Prater (1971) (Harshey and Chandra 2001). Since 1977, The Small-clawed Otter has been listed on CITES Appendix II which indicates that the species is not necessarily threatened with extinction, but the trade on its pelt must be controlled in order to avoid utilization incompatible with their survival (Chandra *et al.,* 2017). One species of the mammal, *Herpestes palustris* also known as Marsh Mongoose was reported from West Bengal (Alfred and Nandi 2000). It has been also mentioned that socio-biology and endemicity of Marsh Mongoose and *H. auropunctatus* (Hodgson 1836) are less studied. Documents on vertebrate fauna have been published from the Upper Ganga by Behera (1995), Behera and Rao (1999), Behera (2002), Bashir *et al.* (2010a, b). A checklist of the Indian mammals was published by Sharma *et al.* (2013) reporting 423 species of mammals. Kamalakannan *et al.* (2017) reported the mammals from freshwater habitats of India. The mammals of Ramsar wetlands have been documented in Alagarrajan *et al.* (1987), Ayyadurai *et al*. (1987), Behara (1995), Bashir *et al*. (2012), Sharma and Sharma (2013), Mallick (2009, 2011), Singh *et al.* (2017), Chandra *et al.* (2017b), Mondal and Nandi (1989), Nandi (2009), Kumar (2005, 2009), Sinha (2000), Saha (1995).

Mammals include about 5500 species belonging 29 Orders, 154 families, of which, a total of 124 species of mammals belonging to 11 orders are freshwater forms. Out of 124 species of global freshwater mammals, only 6 species namely, Gangetic Dolphin *Platanista gangetica* (Roxburgh, 1801), Oriental small-clawed otter *Aonyx cinerea* (Illiger, 1815), European otter *Lutra lutra* (Linnaeus, 1758), Smooth-coated otter *Lutrogale*

perspicillata (I.Geoffroy Saint-Hilaire, 1826), Himalayan water shrew *Chimarrogale himalayica* (Gray, 1842) and Elegant water shrew *Nectogale elegans* Milne-Edwards, 1870 are considered as freshwater mammals in India (Chandra *et al.,* 2017). Few studies have focused on studying the diversity of mammals from the Indian wetlands, especially Ramsar sites. The present compilation shows that a total of 154 species have been reported from Ramsar wetlands of India (Table 40). From the Indian wetlands maximum mammal diversity reported from the Sundarbans (61 species), Keoldeo NP (42 species), East Kolkata Wetlands (12 species), Nalsarovar (26 species). Many Ramsar wetland still remains to be explored for the Presence of mammalian fauna, i.e., Kolleru Lake, Pong Dam, Chandratal lake, Wullar Lake, Tso-Morari, Hokersar, Mansar-Surinsar, Ashtamudi, Sasthamkotta, Bhoj, Loktak, Bhitarkanika, Harike, Kanjli, Ropar, Point Calimere, Rudhra Sagar. The diversity of mammals are under threat and facing catastrophic decline thus adequate knowledge on their diversity and ecology is required for their conservation or control.

Table 40. Diversity of mammals from Ramsar Wetlands of India.

SI. No.	Species	Distribution
	Class MAMMALIA	
	Order ERINACEOMORPHA	
	Family ERINACEIDAE	
1.	*Paraechinus micropus* Blyth, 1846	22, 25
2.	*Paraechinus nudiventris* Horsfield, 1851	13
	Order SORICOMORPHA	
	Family SORICIDAE	
3.	*Suncus etruscus* Savi, 1822	3, 14
4.	*Suncus murinus* Linnaeus, 1766	3, 5, 13, 14, 22, 26, 27, 41
	Order CARNIVORA	
	Family CANIDAE	
5.	*Canis aureus indicus* Hodgson, 1833	16, 32, 36
6.	*Canis aureus* Linnaeus, 1758	3, 4, 5, 13, 14, 22, 23, 25, 26, 27, 32, 34, 38, 39, 40
7.	*Canis lupus* Linnaeus, 1758	3, 5, 6, 28, 41
8.	*Canis lupus chanco* Gray, 1863 42	
9.	*Canis lupus pallipes* Sykes, 1831	25
10.	*Cuon alpinus* Pallas, 1811	6, 42
11.	*Vulpes bengalensis* Shaw, 1800	3, 16, 22, 27, 28, 32, 34, 39
12.	*Vulpes vulpes* Linnaeus, 1758	5, 6, 34, 40, 42
13.	*Vulpes ferrilata* Hodgson, 1842	42
14.	*Vulpes vulpes pusilla* Blyth, 1854	21
	Family URSIDAE	
15.	*Melursus ursinus* Shaw, 1791	14
16.	*Ursus thibetanus* G.[Baron] Cuvier, 1823	5
	Family FELIDAE	
17.	*Felis chaus kutas* Pearson, 1832	16
18.	*Felis chaus* Schreber, 1777	3, 4, 5, 13, 14, 22, 27, 29, 32, 34, 40 , 41
19.	*Felis lynx*	6, 42
20.	*Felis silvestris ornata* Gray, 1832	21
21.	*Panthera pardus* Linnaeus, 1758	4, 5, 14,22, 28, 31, 38
22.	*Panthera tigris* Linnaeus, 1758	22, 27

23.	*Panthera uncia*Schreber, 1775	6, 42
24.	*Prionailurus bengalensis* Kerr, 1792	14, 22, 27
25.	*Prionailurus rubiginosus*	22
26.	*Prionailurus viverrinus* Bennett, 1833	16, 17, 22, 25,27, 40
27.	*Otocolobus manul* Pallas, 1776	42
	Family HERPESTIDAE	
28.	*Herpestes edwardsii* E. Geoffrey Saint-Hilaire, 1818	3, 4, 13, 14, 22, 27, 28, 29, 32, 34, 36, 40, 41
29.	*Herpestes edwardsii ferrugineus* Blanford, 1874	21
30.	*Herpestes javanicus auropunctatus* Hodgson, 1836	5, 16, 25, 29
31.	*Herpestes javanicus* E. Geoffrey Saint-Hilaire, 1818	4, 27, 37, 38
32.	*Herpestes javanicus palustris* Ghose, 1965	26, 27
	Family VIVERRIDAE	
33.	*Paradoxurus hermaphroditus* Pallas, 1777	3, 4, 5, 13, 14, 16, 17, 22, 27, 28, 32, 36, 41
34.	*Viverra zibetha*	4
35.	*Viverra zibetha zibetha* Linnaeus, 1758	16, 27
36.	*Viverricula indica* E. Geoffrey Saint-Hilaire, 1803	3, 4, 5, 13, 14, 17, 25, 22, 23, 27, 29, 32, 36, 38
37.	*Viverricula indica indica* E. Geoffrey Saint-Hilaire, 1803	16
	Family HYAENIDAE	
38.	*Hyaena hyaena* Linnaeus, 1758	3, 14, 17, 22, 28, 41
	FAMILY MUSTELLIDAE	
39.	*Aonyx cinereus*	27
40.	*Lutra lutra* Linnaeus, 1758	25, 27
41.	*Lutra perspicillata* I. Geoffroy Saint-Hilaire, 1826	13, 17, 25, 22, 27
42.	*Mellivora capensis* Schreber, 1776	40
	Order PHOLIDOTA	
	Family MANIDAE	
43.	*Manis crassicaudata* É. Geoffroy Saint-Hilaire, 1803	4, 22, 25, 29, 31, 38, 40
44.	*Manis pentadactyla* Linnaeus, 1758	27
	Order ARTIODACTYLA	
	Family SUIDAE	
45.	*Sus scrofa* Linnaeus, 1758	3, 4, 14, 17, 25, 22, 23,27, 28, 29, 33, 38
	Family BOVIDAE	
46.	*Antilope cervicapra* Linnaeus, 1758	3, 14,25, 22, 23, 41
47.	*Bos frontalis gaurus* C.H. Smith, 1827	22
48.	*Bos frontalis* Lambert, 1804	5
49.	*Bos gaurus* C.H. Smith, 1827	14
50.	*Bos gruniens* Linnaeus	6
51.	*Bos indicus* Linnaeus, 1758	22
52.	*Boselaphus tragocamelus* Pallas, 1766	3, 4, 14, 21, 22, 25, 32, 33, 34, 36, 39, 40
53.	*Capra sibirica* Pallas, 1766	6
54.	*Hemitragus jemlahicus* Smith	6
55.	*Naemorhaedus goral* Hardwicke, 1825	5, 38
56.	*Ovis ammon* Blyth	6
57.	*Ovis ammon hogdsoni*	8, 42
58.	*Ovis vignei* Blyth, 1841	42
59.	*Procapra picticaudata*	8
60.	*Pseudois nayaur* Hadgson, 18336	
61.	*Tetracerus quadricornis* Blainville, 1816	14
	FamilyCERVIDAE	
62.	*Axis axis* Erxleben, 1777	5, 14, 17, 22, 23,27, 32, 33, 38, 40
63.	*Axis porcinus* Zimmermann, 1780	22, 27, 29, 30, 31, 40
64.	*Bubalus bubalis* Linnaeus, 1758	22, 27
65.	*Cervus eldi eldi*	15

66.	*Cervus unicolor*Kerr	5, 17, 38
67.	*Hyelaphus porcinus* Zimmermann, 1780	25
68.	*Muntiacus muntjak aureus* C.H. Smith, 1826	27
69.	*Muntiacus muntjak* Zimmermann, 1780	4, 5, 14, 29, 38, 41
70.	*Rucervus duvaucelii* G. Cuvier, 1823	25, 27
71.	*Rusa unicolor* Kerr, 1792	4, 5, 14, 22, 29
	Family MOSCHIDAE	
72.	*Moschus chrysogaster* Hadgson	6
	Order CETACEA	
	Family PLATANISTIDAE	
73.	*Platanista gangetica* Roxburgh, 1801	25, 27, 30
	Order RODENTIA	
	Family SCIURIDAE	
74.	*Callosciurus pygerythrus* I. Geoffroy Saint Hilaire, 1832	2
75.	*Funambulus palmarum* Linnaeus, 1766	13,14, 22, 23, 29, 32, 36, 41
76.	*Funambulus palmarum robertsoni* Wroughton	41
77.	*Funambulus pennantii* Wroughton, 1905	3, 4, 21, 25, 26, 27, 34, 38, 40, 41
78.	*Marmota bobak himalayana* Hodgson, 1840	6
79.	*Marmota himalayana* Hodgson, 1841	6, 8, 42
	Family MURIDAE	
80.	*Bandicota bengalensis* Gray, 1835	3, 13, 14, 22, 27, 29, 38
81.	*Bandicota indica* Bechstein, 1800	3, 13, 14, 22, 26, 27, 32, 36, 38
82.	*Golunda ellioti* Gray, 1837	14, 22
83.	*Lutrogale perspicillata*	30
84.	*Meriones hurrianae* Jordon, 1867	3
85.	*Millardia meltada* Gray, 1837	25
86.	*Mus booduga* Gray, 1837	13, 14, 16, 22, 27, 32, 34, 36, 40, 41
87.	*Mus musculus* Linnaeus, 1758	3, 5, 13, 14, 22, 26, 27
88.	*Pitymus leucurus* Blyth	6
89.	*Rattus norvegicus* Berkenhout, 1769	27
90.	*Rattus rattus* Linnaeus, 1758	3, 5, 13,14, 22, 26, 27, 29, 32, 36
91.	*Rattlls rattus rufescens* Gray	41
92.	*Rattus* sp.	6
93.	*Rattus tanezumi* Temminck, 1844	14
94.	*Tatera indica* Hardwicke, 1807	3, 14,16, 21, 22
	Family CRICETIDAE	
95.	*Alticola roylei*Gray, 1842	6, 8, 42
96.	*Alticola stoliczkanus*	42
	Family HYSTRICIDAE	
97.	*Hystrix indica* Kerr, 1792	4, 5, 14, 17, 25, 22, 27, 29, 32, 33, 34, 36, 38, 40
	Family MUSTELIDAE	
98.	*Mustela sibirica*	6
99.	*Mustela altaica* Pallas, 1811	42
	Order LAGOMORPHA	
	Family LEPORIDAE	
100.	*Lepus nigricollis* Cuvier, 1823	3, 4, 5, 14, 22, 25, 27, 28, 29, 32, 34, 36, 38, 39, 40, 41
101.	*Lepus oistolus*	8, 42
102.	*Lepus rigricollis ruficaudatus* Geoffroy, 1826	16, 22
	Family OCHOTONIDAE	
103.	*Ochotona curzoniae*	8, 42
104.	*Ochotona ladacensis* Günther, 1875	6, 8, 42
105.	*Ochotona macroti*	8
	Order CHIROPTERA	

	Family PTEROPODIDAE	
106.	*Cynopterus brachyotis* (Müller, 1838)	26
107.	*Cynopterus sphinx* Vahl, 17973, 13,14, 16, 22, 23, 26, 27, 41	
108.	*Pteropus giganteus* Brunnich, 1782	5, 13,14, 16, 23, 26, 27, 29, 38
109.	*Rousettus leschenaulti* Desmarest, 1820	5, 14,16, 25, 26, 27, 41
	Family VESPERTILIONIDAE	
110.	*Kerivoula papillosa* Temminck, 1840	27
111.	*Kerivoula picta* Pallas, 1767	13
112.	*Myotis hasseltii* Temminck, 1840	27
113.	*Pipistrellus ceylonicus* Kelaart, 1852	3, 14
114.	*Pipistrellus coromandra* Grey, 1838	5, 26, 27, 38
115.	*Pipistrellus pygmaeus*	27
116.	*Pipistrellus* sp.	13
117.	*Pipistrellus tenuis* (Temminek, 1840)	14
118.	*Pipistrellus tenuis mimus* Wroughton, 1899	16, 27
119.	*Scotophilus heathi* Horsfield, 1831	14,16, 22, 27
120.	*Scotophilus kuhlii* Leach, 1821	14, 22, 27
121.	*Scotozous dormeri* Dobson, 1875	14
	Family RHINOPOMATIDAE	
122.	*Rhinopoma hardwickii* Gray, 1831	14, 27
	FAMILY MEGADERMATIDAE	
123.	*Megaderma lyra* E. Geoffroy, 1810	13,14, 16, 27
124.	*Megaderma spasma* Linnaeus, 1758	13, 27
	FAMILY RHINOLOPHIDAE	
125.	*Rhinolophus lepidus* Blyth, 184414, 27	
126.	*Rhinolophus rouxii* Temminck, 1835	13
	FAMILY HIPPOSIDERIDAE	
127.	*Coelops frithi* Blyth, 1848	27
128.	*Hipposideros bicolor* Temminck, 1834	27
129.	*Hipposideros fulvus* Gray, 1838	14, 22
130.	*Hipposideros lankadiva* Kelaart, 1850	27
131.	*Hipposideros pomona*	27
	Family EMBALLONURIDAE	
132.	*Taphozous longimanus* Hardwicke, 1825	14, 16, 27, 41
133.	*Taphozous melanopogon* (Temminck, 1841)	14
134.	*Taphozous nudiventris* (Cretzschmar, 1830)	14
	Order PERISSODACTYLA	
	Family RHINOCEROTIDAE	
135.	*Rhinoceros sondaicus* Desmarest, 1822	27
136.	*Rhinoceros unicornis* Linnaeus, 1758	27
	Order PRIMATES	
	Family CERCOPITHECIDAE	
137.	*Macaca mulatta* Zimmermann, 1780	5, 14, 25, 22, 27, 32, 33, 34, 36, 38, 39
138.	*Presbytes entellus* Duffresne	5, 41
139.	*Rhesus macaque*	4, 33
140.	*Semnopithecus ajax*	33
141.	*Semnopithecus entellus* Dufresne, 1797	3, 4, 14, 22, 38, 41
	Family HYLOBATIDAE	
142.	*Hoolock gibbon* Harlan, 1834	2
	Order PERISSODACTYLA	
	Family EQUIDAE	
143.	*Equus onager* Boddaert, 1785	3
144.	*Equus hemionus*Khur	3

145.	*Equus kiang*Moorcroft, 1841	8, 42
	Order SIRENIAFamily DUGONGIDAE	
146.	*Dugong dugon* Müller, 1776	16
	Order CETACEA	
	Family DELPHINIDAE	
147.	*Delphinus delphis* Linnaeus, 1758	17, 23
148.	*Orcaella brevirostris* Owen in Gray, 1866	16, 17, 27
149.	*Sotalia plumbea*	27
150.	*Sousa chinensis* Osbeck, 1765	17, 27
151.	*Stenella attenuata* Gray, 1846	27
152.	*Stenella malayana*	27
	Family PHOCOENIDAE	
153.	*Neophocaena phocaenoides* Cuvier, 1829	17, 27
	Order PROBOSCIDEA	
	Family ELEPHANTIDAE	
154.	*Elephas maximus* Linnaeus, 1758	2, 38

List of Threatened species from Ramsar wetlands of India

	AVES	SITES
1.	*Aegypius monachus* Linnaeus, 1766	4, 21, 38
2.	*Alcedo hercules* Laubmann, 1917	3
3.	*Anhinga melanogaster* Pennant, 1769	1, 2, 3, 4, 11, 13, 16, 17, 18, 21, 26, 27, 29, 32, 33, 35, 36, 38, 39, 40
4.	*Anser erythropus* Linnaeus, 1758	22, 38
5.	*Grus antigone* Linnaeus, 1758	1, 3, 4, 14, 21, 22, 25, 29, 32, 33, 34, 35, 36, 37, 40
6.	*Aquila clanga* Pallas, 1811	3, 4, 17, 18, 22, 26, 27, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
7.	*Aquila heliaca* Savigny, 1809	3, 4, 18, 22, 28
8.	*Aquila hastata*Lesson, 1831	27, 28, 38
9.	*Aquila nipalensis* Hodgson, 1833	4, 13, 18, 21, 22, 38
10.	*Aquila rapax* Temminck, 1828	4, 17, 18, 21, 22, 23, 28, 35, 36
11.	*Ardeotis nigriceps* Vigors, 1831	21
12.	*Aythya baeri* Radde, 18632, 17, 24, 26, 27	
13.	*Aythya ferina* Linnaeus, 1758	1, 2, 3, 4, 10,14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28,29, 30, 31, 32, 33, 35, 36, 38, 39, 40, 41, 42
14.	*Aythya nyroca* Güldenstädt, 1770	1, 2, 3, 4, 8, 9,11, 13, 14, 15, 16, 18, 19, 21, 22, 24, 26, 27, 28, 29,32, 33, 35, 36, 38, 39, 40
15.	*Calidris canutus* Linnaeus, 1758	3, 17, 22, 27
16.	*Calidris ferruginea* Pontoppidan, 1763	3, 4, 18, 21, 27, 28, 42
17.	*Eurynorhynchus pygmeus* Linnaeus, 1758	1, 2, 23,27
18.	*Calidris minuta* Leisler, 1812	1, 2, 3, 4, 6, 11, 13, 16, 17, 18, 20, 21, 22, 23, 26, 27, 28, 38, 41, 42
19.	*Calidris ruficollis* Pallas, 1776	27
20.	*Calidris temminckii* Leisler, 1812	1, 3, 4, 8,13,16, 17, 18, 21, 22, 23, 27, 28, 38, 42
21.	*Calidris tenuirostris* Horsfield, 1821	1, 27
22.	*Schoenicola striatus* Jerdon, 1841	18, 28
23.	*Ciconia episcopus* Boddaert, 1783	3, 4, 13, 18, 21, 22, 23, 25, 26, 27, 28, 32, 35, 36, 37, 38, 39, 41
24.	*Circus macrourus* S.G. Gmelin, 1770	1, 2, 3,4, 13,16, 17, 18, 21, 22, 27, 28, 35, 39
25.	*Aquila clanga* Pallas, 18113, 4, 17, 18, 22, 26, 27, 29, 30,	31, 32, 33, 34, 35, 36, 37, 38, 39, 40
26.	*Aquila hastata* Lesson, 1831	27, 28, 38
27.	*Columba punicea* Blyth, 1842	15, 17
28.	*Coturnix japonica* Temminck & Schlegel, 1849	15
29.	*Ephippiorhynchus asiaticus* Latham, 1790	2, 3, 15, 16, 17, 18, 22, 25, 27, 28, 32, 33, 34, 35, 36,37, 38, 39, 40
30.	*Esacus magnirostris* Vieillot, 1818	13, 16, 23, 25
31.	*Esacus recurvirostris* Cuvier, 1829	3, 4, 17, 18, 21, 25, 27, 38, 39
32.	*Eurynorhynchus pygmeus* Linnaeus, 1758	1, 2, 23,27
33.	*Falco cherrug*J.E. Gray, 1834	4, 22, 42
34.	*Falco chicquera* Daudin, 1800	1, 2, 4, 17, 18, 21, 28, 38, 39
35.	*Falco jugger* J.E. Gray, 1834	15, 18, 21, 22, 28
36.	*Francolinus gularis* Temminck, 1815	27
37.	*Gallinago nemoricola* Hodgson, 1836	1, 3, 27, 35, 36
38.	*Grus antigone* Linnaeus, 1758	1, 3, 4, 14, 21, 22, 25, 29, 32, 33, 34, 35, 36, 37, 40
39.	*Grus leucogeranus* Pallas, 1773	1, 22
40.	*Grus nigricollis*Prjevalsky, 1876	3, 8, 42
41.	*Grus virgo* Linnaeus, 1758	3, 4, 21, 22, 28, 35, 40
42.	*Gypaetus barbatus* Linnaeus, 1758	6, 42
43.	*Gyps bengalensis* Gmelin, 1788	1, 2, 4, 5, 6, 16, 17, 18, 21, 22, 25, 27, 28, 33, 35, 36, 37, 38, 39
44.	*Gyps himalayensis* Hume, 1869	4, 6, 38, 42

45.	*Gyps indicus* Scopoli, 1786	1, 16, 18, 21, 22, 28, 33, 35, 36, 39
46.	*Gyps tenuirostris*G.R. Gray, 1844	4, 27
47.	*Haematopus ostralegus* Linnaeus, 1758	3, 4, 11, 17, 18, 27
48.	*Haliaeetus albicilla* Linnaeus, 1758	4, 22, 38
49.	*Haliaeetus leucogaster* Gmelin, 1788	1, 11, 16, 17, 23, 27
50.	*Haliaeetus leucoryphus* Pallas, 1771	2, 3, 4, 16, 17, 18, 21, 22, 25, 27, 31, 32, 35, 37, 38, 39
51.	*Heliopais personatus* G.R. Gray, 1849	27
52.	*Ichthyophaga ichthyaetus* Horsfield, 1821	2, 13, 27, 42
53.	*Leptoptilos dubius* Gmelin, 1789	1, 2, 22,27, 39
54.	*Leptoptilos javanicus* Horsfield, 1821	2, 3, 17, 18, 22,27, 32, 35, 36
55.	*Limnodromus semipalmatus* Blyth, 1848	18, 23, 27
56.	*Limosa lapponica* Linnaeus, 1758	1, 3, 16,17, 27, 28
57.	*Limosa limosa* Linnaeus, 1758	1, 3, 4, 13, 17, 18, 21, 22, 23, 26, 27, 28, 29, 32, 35, 36, 38, 40, 42
58.	*Marmaronetta angustirostris*Ménétriés, 1832	3, 22, 38
59.	*Mycteria leucocephala* Pennant, 1769	1, 3, 4, 14, 17, 18, 21, 22, 23, 25, 27, 28, 29, 31, 32, 33, 35, 36, 37, 38, 40
60.	*Neophron percnopterus* Linnaeus, 1758	1, 4, 5, 18, 21, 22, 25, 28, 31, 32, 33, 35, 36, 38
61.	*Numenius arquata* Linnaeus, 1758	1, 3, 4, 11, 13, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 42
62.	*Pelargopsis amauroptera* Pearson, 1841	27
63.	*Pelecanus crispus* Bruch, 1832	3, 4, 19, 22
64.	*Pelecanus philippensis* Gmelin, 1789	1, 2, 3, 11, 13, 16, 17, 22, 23, 25, 26, 27, 40
65.	*Phoenicopterus minor*É. Geoffroy Saint-Hilaire, 1798	1, 3, 16, 21, 23, 28
66.	*Phylloscopus tytleri* Brooks, 1872	22
67.	*Pitta megarhyncha* Schlegel, 1863	17, 27
68.	*Ploceus megarhynchus* Hume, 1869	27, 35
69.	*Podiceps cristatus* Linnaeus, 1758	1, 2, 3, 4, 8, 9,10,16, 18, 21, 22, 25, 26, 35, 36, 38, 39, 42
70.	*Podiceps auritus* Linnaeus, 1758	4, 18
71.	*Podiceps nigricollis* C.L. Brehm, 1831	2, 3, 4, 10,16, 18, 21, 22, 38, 42
72.	*Tachybaptus ruficollis* Pallas, 1764	1, 2, 3, 4, 7, 9, 13,14,16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 35, 36, 38, 39, 40, 41, 42
73.	*Tachybaptus ruficollis capensis* Salvadori, 1884	13, 25
74.	*Psittacula eupatria* Linnaeus, 1766	2, 4, 15, 17, 18, 20, 29, 32, 35, 36, 38, 39, 41
75.	*Psittacula roseate* Biswas, 1951	2, 15, 17
76.	*Rynchops albicollis* Swainson, 1838	3, 4, 17, 18, 25, 27, 29
77.	*Sarcogyps calvus* Scopoli, 1786	2, 4, 18, 21, 22, 38
78.	*Sterna acuticauda*J.E. Gray, 1831	1, 2, 3, 4, 13,17, 18, 22, 23, 25, 27, 29, 31, 38
79.	*Sterna aurantia* J.E. Gray, 1831	1, 2, 3, 4, 14, 16, 17, 18, 20, 21, 22, 23, 25, 27, 28, 29, 32, 33, 35, 36, 38, 39, 41
80.	*Sypheotides indicus* J.F. Miller, 1782	3, 21
81.	*Threskiornis melanocephalus* Latham, 1790	1, 3, 13, 16, 17, 18, 22, 23, 26, 27, 28, 29, 32, 33, 35, 36, 40
82.	*Tringa erythropus* Pallas, 1764	1, 2, 3, 4, 16,17, 18, 21, 22, 26, 27, 28, 35, 36, 38, 40, 42
83.	*Tringa guttifer* Nordmann, 1835	3, 17
84.	*Vanellus duvaucelii* Lesson, 1826	4, 21, 27, 38, 40
85.	*Vanellus gregarious* Pallas, 1771	3, 18, 21
86.	*Vanellus vanellus* Linnaeus, 1758	2, 4, 15, 18, 22, 38
87.	*Oxyura leucocephala* Scopoli, 1769	18

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88.	*Anoxypristis cuspidate* Latham, 1794	27
89.	*Ailia coila* Hamilton, 18222, 16, 22,25,26, 27, 35, 40	
90.	*Anguilla bengalensis* Gray , 1831	1, 13, 16, 27, 28, 33
91.	*Bagarius yarrellii* Sykes, 1839	4, 18, 38

92.	*Botia birdi* Chaudhuri, 1909	4, 18
93.	*Bagarius bagarius*Hamilton, 1822	4, 25, 30
94.	*Carcharhinus hemiodon* Müller & Henle, 1839	27
95.	*Cirrhinus cirhosus* Bloch, 1795	3, 32
96.	*Chitala chitala* Hamilton, 1822	2, 15, 18, 19, 22, 24, 25, 26, 28, 30, 35
97.	*Cyprinus carpio* Linnaeus, 1758	1, 2, 3, 4, 7, 13, 14, 15, 18, 19, 22, 26, 29, 40
98.	*Etroplus suratensis* Bloch, 1790	1, 11,12, 13 16, 27
99.	*Glyphis gangeticus*Muller& Henle, 1839	16, 27
100.	*Horabagarus brachysoma* Günther, 1864	12,13
101.	*Macrognathus guentheri* Day, 1865	12, 13
102.	*Parambassis thomassi* Day, 1870	12, 13
103.	*Pethia shalynius*	28
104.	*Pristis microdon* Latham, 1794	27
105.	*Puntius sarana* Hamilton, 1822	1,2,5,14,20,25, 28
106.	*Puntius ticto* Hamilton, 1822	1, 2, 3, 4, 5,12,14,15, 18, 20, 22, 25,26, 28, 29, 38
107.	*Parapsilorhynchus prateri*	28
108.	*Tor putitora* Hamilton, 1822	4, 5, 25, 30, 38
109.	*Eusphyra blochii*Cuvier, 1816	27
110.	*Sphyrna zygaena*Linnaeus, 1758	27

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111.	*Alticola roylei*Gray, 18426, 8, 42	
112.	*Antilope cervicapra* Linnaeus, 1758	3, 14,25, 22, 23, 41
113.	*Axis porcinus* Zimmermann, 1780	22, 27, 29, 30, 31, 40
114.	*Capra sibirica* Pallas, 17666	
115.	*Kerivoula picta* Pallas, 1767	13
116.	*Cervus eldi eldi*	15
117.	*Cuon alpinus* Pallas, 18116, 42	
118.	*Canis lupus chanco* Gray, 1863	42
119.	*Platanista gangetica* Roxburgh, 1801	25, 27, 30
120.	*Marmota bobakhimalayana* Hodgson, 1840	6
121.	*Manis crassicaudata* É. Geoffroy Saint-Hilaire, 1803	4, 22, 25, 29, 31, 38, 40
122.	*Pseudois nayaur*Hadgson, 1833	6
123.	*Neophocaena phocaenoides* Cuvier, 1829	17, 27
124.	*Panthera uncia*Schreber, 1775	6, 42
125.	*Orcaella brevirostris* Owen in Gray, 1866	16, 17, 27
126.	*Panthera tigris* Linnaeus, 1758	22, 27
127.	*Panthera pardus* Linnaeus, 1758	4, 5, 14,22, 28, 31, 38
128.	*Procapra picticaudata*	8
129.	*Ovis ammon hogdsoni*	8, 42
130.	*Ovis vignei* Blyth, 1841	42
131.	*Prionailurus viverrinus* Bennett, 1833	16, 17, 22, 25, 27, 40
132.	*Equus hemionus*Khur	3
133.	*Equus kiang*Moorcroft, 1841	8, 42
134.	*Lutrogale perspicillata*	30
135.	*Hyelaphus porcinus*Zimmermann, 1780	25
136.	*Rusa unicolor* Kerr, 1792	4, 5, 14, 22, 29
137.	*Dugong dugon* Müller, 1776	16

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138.	*Python molurus*Linnaeus, 1758	3, 4, 13, 14,15, 20,27, 29, 31, 33, 40

139.	*Crocodylus palustris* Lesson, 1831	14, 25
140.	*Crocodylus porosus*Schneider, 1801	17, 27
141.	*Melanochelys tricarinata* Blyth, 1856	27
142.	*Melanochelys trijuga* Schweigger, 1812	4, 13, 25, 41
143.	*Gavialis gangeticus*Gmelin, 1789	14, 25, 29, 30
144.	*Nilssonia gangetica* Cuvier, 1825	4, 14, 25, 27, 30, 40
145.	*Batagur dhongoka* Gray, 1832	25
146.	*Batagur baska* Gray, 183027	
147.	*Lissemys punctata punctata* Bonnaterre, 1789	3, 4, 16, 25, 26, 27, 29, 32, 36, 39
148.	*Lepidochelys olivacea* Eschscholtz, 1829	27
149.	*Nilssonia gangetica* Cuvier, 1825	4, 14, 25, 27, 30, 40
150.	*Chitra indica* Gray, 183120,25, 27,32, 36	
151.	*Geoclemys hamiltonii* Gray, 1831	4, 20,25, 27, 29, 30
152.	*Hardella thurjii* Gray, 183125,	30

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