International Journal of Fauna and Biological Studies
Available online at www.faunajournal.com

IJFBS International Journal of Fauna And Biological Studies

ISSN 2347-2677
IJFBS 2016; 3(2): 24-28
Received: 21-01-2016
Accepted: 22-02-2016

Vincy MV
Department of Zoology,
St. Berchmans College
Changanacherry

Brilliant R
PG Department of
Environmental Sciences,
St. John's College, Anchal

Prasanth Narayanan S
School of Environmental
Sciences, Mahatma Gandhi
University, Kottayam

Pradeepkumar AP
Department of Geology,
University of Kerala,
Kariavattom

Correspondence:
Vincy MV
Department of Zoology,
St. Berchmans College
Changanacherry

Checklist of riparian avifauna of Meenachil river basin, Kerala, South India

Vincy MV, Brilliant R, Prasanth Narayanan S, Pradeepkumar AP

Abstract
The riparian zones of Meenachil river basin of Kerala state were surveyed during January 2009 to December 2015. A total of 92 bird species belonging to 36 families in 15 orders were recorded. Passeriformes dominated the list with 47 followed by Charadriiformes with seven species. 85% of the bird species recorded was resident forms and 15% migrants. Among the birds reported from the Meenachil river basin, the Oriental Darter, *Anhinga rufa melanogaster* was considered near threatened. Eight species of waterbirds were reported from the study area.

Keywords: Meenachil river basin, riparian zones, Oriental Darter, near threatened

1. Introduction
Bird diversity in India is very high compared to other countries owing to diversity in natural habitats and landscapes. The one thousand four hundred species of birds seen in India contribute to 15% of the total world species showing the importance of conservation. Also, according to Birdlife International, 12% of the word bird population is under the risk of extinction in the near future. Since birds have no boundaries such as protected areas or agricultural lands, their conservation should be looked into while managing agricultural landscapes.

Birds are ideal bio-indicators and useful models for studying a variety of environmental problems [1]. Kerala, the heart of the Western Ghats - one of the 25 hotspots for biodiversity in the world - harbours 476 various species of birds, both resident and migratory. Riparian vegetation has been referred to as the aorta of an ecosystem because of its significance to the perpetuation of bioresources and 'interest in conservation of riparian vegetation has focused primarily upon the value of the vegetation in providing habitat for a locally rich avifauna' [2]. Riparian vegetation also provides habitat for birds, including migratory forms, use river and riparian vegetation as a habitat for feeding, roosting, nesting and breeding. The monumental works of Ali [3] and Ali and Ripley [4] on Indian avian fauna and the publication on the birds of Kerala by Ali [5-7], Neelakantan [8] and Neelakantan *et al*. [9], showed that a variety of birds use rivers for their sustenance.

About 475 species of birds have been recorded in the State, of which 149 species are found in the coastal areas and the remaining in the mid and highlands [9]. These constitute about 25% of Indian avifauna. Eldose and Zacharias (unpublished) have listed 463 species. Kerala has a long history of ornithological surveys. Based on the birds collected by Fulton and Bourdillon, Hume wrote two papers in Stray Feathers [10, 11]. At almost the same time, H. S. Ferguson, another tea planter, collected birds and wrote a series of papers in JBNHS [12, 13]. An exhaustive investigation of the forest birds of Travancore was conducted by Ali and Whistler [14].

The wetlands and other water bodies of Kerala have been explored by many researchers and bird watchers for the avifauna, starting with a series of publications by Neelakantan and his team [15-19]. The Purathur (Bharathapuzha) and Kadalundi estuaries were identified as areas rich in avifauna, particularly the migratory birds. Namassivayan and Venugopal [20], Namassivayam *et al*. [21], Uthaman and Namassivayan [22, 23] investigates the birds having arriving at Kadalundi estuary. Kurup [24, 25] reported on the birds of Kadalundi and Purathur estuaries of the Malabar Coast of Kerala. Of late, Jayson [26] and Nameer [27] conducted detailed ecological studies on the avifauna of Vembanad-Kol wetland, one of the three Ramsar sites in Kerala. Jayson [28] documented the presence of 172 species of birds associated with the wetlands of Kerala.

Despite the ecological importance of the Meenachil river in the Kerala state and the fact that this river basin has been identified as an area rich in avifauna by both professional and amateur ornithologists, there are only few published reports on the bird diversity associated with it.

2. Materials and Methods

The avifauna of the Meenachil river and the riverine vegetation associated with it were surveyed during January 2009 to December 2015, as part of the biodiversity studies of the river. The identification of birds was done by both sight and sound; direct observations were made periodically using binoculars of 8 x and 7x magnification. Spot identification was done using field guides [7, 29-31]. The checklist was prepared using the standardized common and scientific names of the birds of the Indian subcontinent by Manakadan and Pittie [32]. Details regarding the birds with confirmed identity alone are presented in this paper.

3. Results and Discussion

The list of avifauna sighted from the Meenachil river basin during January 2009 to December 2015 is presented in Table 1. A total of 92 species of birds belonging to 36 families in 15 orders were reported from the Meenachil basin (Table 1). However, the low diversity may be due to constant anthropogenic activities within and around the study area. Among the 15 orders, Passeriformes dominated the list with 47 followed by Charadriiformes with seven species; Coraciiformes and Pelecaniformes with six species each; Falconiformes with four species, Apodiformes, Psittaciformes and Cuculiformes with three species; Suliformes, Columbiformes, Piciformes Anseriformes and Gruiformes two species each; Strigiformes and Ciconiiformes and one species each. Out of the 92 species, 85% were resident forms and 15% migrants.

Birds of diverse food habits were observed, viz., insectivores (species), omnivores (species), carnivores (species), granivores (species), scavengers (species) and frugivores (species). Although more than 39% of the birds in the study area were insectivores, food competition was reduced by the utilization of different habitat types, feeding behavior and food items. When insect food was in shortage particularly during the months of January, February and March, largely insectivorous birds like babblers and drongos fed on fruits and seeds of plants like *Macaranga peltata*, *Lantana aculeata*, *Acacia auriculiformis* and nectar of *Erythrina indica* [33], thus, reducing the extent of food competition.

The Meenachil River banks rich in greater vegetation densities and food availability. Along both sides of the river banks, many wooded tree species, scrub and bushy type stumpy vegetation were distributed and it provided roosting and nesting-sites for many bird species. A number of birds were recorded in the agricultural fields. Paddy is the main crop of the study area and is cultivated round the year. Birds such as the Black Drongo, Indian Roller, Small Bee-eater, White-breasted Kingfisher, Common Myna, Pond Heron, egrets, etc., are very common birds in the agricultural lands and feed mostly on insects. Such birds are useful in the control of injurious insects in various crops [34].

All the species have been evaluated as Least Concern by IUCN since 2004, except Oriental Darter, *Anhinga rufa melanogaster* is considered near threatened. Eight species of waterbirds were reported from the study area. Ten species of waterbirds belonging to the families Anhingidae, Phalacrocoracidae, Ardeidae and Threskiornithidae were breeding in the Kumarakom heronry [35]. The range of the Common Myna is increasing at such a rapid rate that in 2000 the IUCN Species Survival Commission declared it one of the world's most invasive species and one of only three birds in the top 100 species that pose an impact to biodiversity, agriculture and human interests [36]. The Wood Sandpiper is one of the species to which the *Agreement on the Conservation of African-Eurasian Migratory Waterbirds* (AEWA) applies.

The major influencing factor on the composition and distribution of bird species is the direct human intervention. The diversity recorded in such a human impacted area must not mislead one to those of large reserves in urban areas, as they support high species diversity because these protected urban areas are the habitat fragments of highly diverse ecosystem [37] while most of the urban habitats are unable to sustain their own biota and they often get the diversity from surrounding less impacted areas.

There are large numbers of trees, which support a good number of avifauna. The study site possesses small water bodies in many numbers resulting mainly due to water overflow from the buildings and rain that supports water birds in the site. It was found that the occurrence of avifauna was significantly varied according to the vegetation patterns and anthropogenic pressure. The study site is rich in avifauna but problems have arisen recently as the habitat of these birds are threatened, due to unplanned activities being carried out in favour of human development, for which the large trees of the area have been cleared. Birds are sensitive to the local landscape and change in vegetation patterns can affect the population of birds in the area [38, 39].

Table 1: Checklist of avifauna of Meenachil river basin, Kerala

No.	English Name	Scientific Name	Status	Feeding Habits
Phalacrocoracidae (Cormorants and Shags)				
1	Little Cormorant	*Phalacrocorax niger* Vieillot	R	CR
2	Oriental Darter (M)	*Anhinga rufa melanogaster* Pennant	R, NT	CR
Ardeidae (Herons, Egrets and Bitterns)				
3	Eastern Cattle Egret (Cattle Egret)	*Bubulcus ibis coromandus* Boddaert	R	CR
4	Little Egret	*Egretta garzetta garzetta* Linnaeus	R	CR
5	Indian Pond-heron	*Ardeola grayii grayii* Sykes	R	CR
6	Purple Heron	*Ardea purpurea manilensis* Meyen	R	CR
7	Median Egret / Intermediate Egret	*Mesophoyx intermedia intermedia* Wagler	R	CR
8	Black-crowned Night Heron	*Nycticorax nycticorax nycticorax* Linnaeus	R	CR
Ciconiidae (Storks)				
9	Asian Openbill Stork	*Anastomus oscitasns* Boddaert	R	CR
Anatidae (Swans, Geese and Ducks)				
10	Cotton Teal	*Nettapus coromandelianus coromandelianus* Gmelin	R	FR

11	Lesser Whistling Duck	*Dendrocygna javanica* Horsfield	R	CR
Accipitridae (Hawks, Kites, Eagles and Vultures)				
12	Crested Serpent-eagle	*Spilornis cheela melanotis* Jerdon	R	CR
13	Brahminy Kite	*Haliastur indus indus* Boddaert	R	SC
14	African Fish Eagle	*Haliaeetus vocifer* Daudin	R	CR
15	Shikra	*Accipiter badius badius* Gmelin	R	CR
Rallidae (Rails, Crakes, Gallinules and Coots)				
16	White-breasted Waterhen	*Amaurornis phoenicurus phoenicurus* Pennant	R	CR
17	Purple Moorhen	*Porphyrio porphyrio poliocephalus* Latham	R	CR
Jacanidae (Jacanas)				
18	Bronze-winged Jacana	*Metopidius indicus* Latham	R	CR
Charadriidae (Plovers, Dotterels, Lapwings)				
19	Pacific Golden Plover (M)	*Pluvialis fulva* Gmelin	M	CR
20	Red-wattled Lapwing	*Vanellus indicus indicus* Boddaert	R	CR
Scolopacidae (Sandpipers, Stints, Snipes, Godwits and Curlews)				
21	Common Sandpiper	*Actitis hypoleucos hypoleucos* Linnaeus	M	IN
22	Common Snipe (M)	*Gallinago gallinago gallinago* Linnaeus	M	CR
23	Wood Sandpiper (M)	*Tringa glareola* Linnaeus	M	IN
Laridae (Gulls, Terns and Noddies)				
24	Whiskered Tern (M)	*Chlidonias hybrida indicus* Stephens	M	CR
Columbidae (Pigeons and Doves)				
25	Rock Pigeon	*Columba livia intermedia* Strickland	R	CR
26	Emerald Dove	*Chalcophaps indica* Linnaeus	R	FR
Psittacidae (Parakeets and Hanging Parrots)				
27	Vernal Hanging-parrot	*Loriculus vernalis vernalis* Sparrman	R	FR
28	Rose ringed Parakeet	*Psittacula krameri manilensis* Bechstein	R	FR
29	Plum headed Parakeet	*Psittacula cyanocephala cyanocephala* Linnaeus	R	FR
Cuculidae (Cuckoos, Malkohas and Coucals)				
30	Greater Coucal	*Centropus sinensis parroti* Stresemann	R	IN
31	Common Hawk-cuckoo (Indian Hawk-Cuckoo)	*Hierococcyx varius* Vahl	R	IN
32	Asian Koel	*Eudynamys scolopacea scolopacea* Linnaeus	R	OM
Strigidae (Owls)				
33	Barred Jungle Owlet	*Glaucidium radiatum malabaricum* Blyth	R	CR
Apodidae (Swifts)				
34	Asian Palm Swift	*Cypsiurus balasiensis* Gray	R	IN
35	Little Swift (House Swift)	*Apus affinis affinis* Gray	R	IN
36	Indian Edible-nest Swiftlet	*Collocalia unicolor* Jerdon	R	IN
Alcedinidae (Kingfishers)				
37	White-throated Kingfisher	*Halcyon smyrnensis fusca* Boddaert	R	CR
38	Small Blue Kingfisher	*Alcedo atthis taporbana* Kleinschmidt	R	CR
39	Stork billed Kingfisher	*Halcyon capensis capensis* Linnaeus	R	CR
40	Lesser Pied Kingfisher	*Ceryle rudis travancoreensis* Whistler and Kinnear	R	CR
Meropidae (Bee-eaters)				
41	Chestnut-headed Bee-eater	*Merops leschenaulti* Vieillot	R	CR
42	Small Green Bee eater	*Merops orientalis orientalis* Latham	R	CR
43	Blue-tailed Bee eater (M)	*Merops philippinus philippinus* Linnaeus	M	CR
Capitonidae (Barbets)				
44	White-cheeked Barbet	*Megalaima viridis* Boddaert	R	FR
Picidae (Woodppeckers)				
45	Lesser Golden-backed Woodpecker	*Dinopium benghalense tehminae* Whistler and Kinnear	R	IN
Pittidae (Pittas)				
46	Indian Pitta (M)	*Pitta brachyura brachyura* Linnaeus	R	CR
Hirundinidae (Swallows and Martins)				
47	Common Swallow	*Hirundo rusica gutturalis* Scopoli	M	IN
48	Red-rumped Swallow	*Hirundo daurica nipalensis* Hodgson	R	IN
Motacillidae (Pipits and Wagtails)				
49	Grey Wagtail	*Motacilla cinerea cinerea* Tunstall	M	IN
50	Large Pied Wagtail	*Motacilla maderaspatensis* Gmelin	R	IN
51	Yellow Wagtail (M)	*Motacilla flava thunbergi* Billberg	M	IN
52	Paddyfield Pipit	*Anthus rufulus* Vieillot	R	IN
Campephagidae (Cuckoo-Shrikes, Flycatcher-Shrikes, Trillers, Minivets, Woodshrikes)				
53	Large Woodshrike	*Tephrodornis gularis* Raffles	R	IN
54	Black headed Cuckoo Shrike	*Coracina melanoptera sykesi* Strickland	R	IN
Pycnonotidae (Bulbuls and Finchbills)				
55	Yellow-browed Bulbul	*Iole indica* Jerdon	R	FR
56	Red-whiskered Bulbul	*Pycnonotus jocosus fuscicaudatus* Gould	R	FR
57	Red-vented Bulbul	*Pycnonotus cafer cafer* Linnaeus	R	FR
Irenidae (Ioras, Chloropsis, Fairy Bluebird)				
58	Common Iora	*Aegithia tiphia multioclor* Gmelin	R	IN

Laniidae (Shrikes)				
59	Brown Shrike	*Lanius cristatus cristatus* Linnaeus	R	IN
Muscicapidae (Old World Flycatchers and Chats)				
Sub Family Turdinae (Thrushes, Shortwings, Robins, Forktails, Wheatears)				
60	Malabar Whistling-thrush	*Myiophonus horsfieldii* Vigors	R	OM
61	Orange-headed Thrush	*Zoothera citrina* Latham	R	OM
62	Eurasian Blackbird	*Turdus merula* Linnaeus	R	OM
63	Oriental Magpie-Robin	*Copsychus saularis ceylonensis* Sclater	R	CR
64	Indian Robin	*Saxicoloides fulicata fulicata* Linnaeus	R	CR
Sub Family Timaliinae (Babblers)				
65	Jungle Babbler	*Turdoides striatus malabaricus* Jerdon	R	IN
Sub Family Sylvinae (Goldcrest, Prinias, Tesias, Warblers)				
66	Zitting Cisticola	*Cisticola juncidis salimalii* Whistler	R	IN
67	Ashy Prinia	*Prinia socialis socialis* Sykes	R	IN
68	Plain Prinia	*Prinia inornata* Blyth	R	IN
69	Thick-billed Warbler	*Acrocephalus aedon* Pallas	R	IN
70	Blyth Reed 's Warbler	*Acrocephalus dumetorum* Blyth	LM	IN
71	Common Tailorbird	*Orthotomus sutorius guzuratus* Latham	R	IN
72	Greenish Leaf Warbler (M)	*Phylloscopus trochiloides nitidus* Blyth	R	IN
Sub Family Muscicapinae (Old World Flycatchers and Chats)				
73	Brown-breasted Flycatcher	*Muscicapa muttui muttui* Layard	M	IN
Sub Family Monarchinae (Monarch-Flycatchers & Paradise-Flycatchers)				
74	Asian Paradise Flycatcher	*Terpsiphone paradisi paradisi* Linnaeus	M	IN
Paridae (Tits)				
75	Great Tit	*Parus major mahrattarum* Hartert	R	IN
Dicaeidae (Flowerpeckers)				
76	Tickell's Flowerpecker	*Dicaeum erythrorhynchos erythrorhynchos* Latham	R	GR
Nectariniidae (Sunbirds and Spiderhunters)				
77	Purple-rumped Sunbird	*Nectarinia zeylonica flaviventris* Hermann	M	IN
78	Loten's Sunbird	*Nectarinia lotenia hindustanica* Whistler	R	IN
Estrildidae Munia (Estrildid Finches)				
79	White rumped Munia	*Lonchura striata striata* Linnaeus	R	GR
Sturnidae (Starlings and Mynas)				
80	Common Myna	*Acridotheres tristis tristis* Linnaeus	R	CR
81	Jungle Myna	*Acridotheres fuscus mahrattensis* Sykes	R	OM
82	Greyheaded Myna (M) / Grey-headed Starling	*Sturnus malabaricus malabaricus* Gmelin	R	OM
Oriolidae (Orioles)				
83	Eurasian Golden Oriole	*Oriolus oriolus* Linnaeus	M	FR
84	Black headed Oriole	*Oriolus xanthornus xanthornus* Linnaeus	R	OM
Dicruridae (Drongos)				
85	Greater Racket-tailed Drongo	*Dicrurus paradiseus paradiseus* Linnaeus	R	IN
86	Bronzed Drongo	*Dicrurus aeneus aeneus* Viellot	R	IN
87	Black Drongo	*Dicrurus macrocercus* Viellot	R	IN
88	Ashy Drongo	*Dicrurus leucophaeus longicaudatus* Hay	R	IN
Artamidae (Woodswallows)				
89	Ashy Wood Swallow	*Artamus fuscus* Vieillot	R	IN
Corvidae (Crows, Jays, Magpies and Treepies)				
90	Rufous Treepie	*Dendrocitta vagabunda parvula* Whistler and Kinnear	R	OM
91	House Crow	*Corvus splendens protegatus* Madarasz	R	CR
92	Indian Jungle Crow (Jungle Crow)	*Corvus macrorhynchos culminatus* Sykes	R	CR
NT - Near Threatened (IUCN Red list Category, BirdLife International, 2001); R - Resident; M - Migrant				
IN - Insectivores; CR - Carnivorous; SC – Scavenger; GR - Granivores; FR - Frugivores; OM - Omnivores				

4. Conclusion

The present study emphasizes the need to conduct a detailed study on the status of riverine ecosystems, and biology of birds to have accurate information on the ecological role of birds associated with wetlands. This region supports important populations of only one globally near threatened bird – Oriental Darter. Unaltered natural patchy vegetation is essential in riverine ecosystems, which makes it very important to take steps to preserve both riparian and wetland flora and fauna for the health of biodiversity of Meenachil river basin. Though Meenachil river basin is subjected to maximum human interferences, both direct and indirect, including collection of firewood, cattle grazing, building construction, etc., the river basin supports a large variety of birds. If the destruction of habitat is continued at the present rate, the bird fauna of the river basin will be adversely affected.

5. References

1. Newton I. The contribution of some recent research on birds to ecological understanding. J Anim Ecol. 1995; 64:675-696.
2. Knopf FL, Samson FB. Scale perspectives on avian diversity in western riparian ecosystems. Conservation Biology, 1994; 8:669-675.
3. Ali S. The Book of Indian Birds. Bombay Natural History Society, Bombay, 1979.
4. Ali S, Ripley SD. Compact Handbook of the Birds of India and Pakistan. 2nd Edition. Oxford University Press, Bombay, 1987.

5. Ali S. The Birds of Travancore and Cochin. Oxford University Press, Bombay, 1953.
6. Ali S. Birds of Kerala. Oxford University Press, Madras, 1969.
7. Ali S. Birds of Kerala. Kerala Forests and Wildlife Department, Thiruvananthapuram, 1999, 520.
8. Neelakantan KK. 'Keralathile Pakshikal' (3rd Ed.). (In Malayalam). Kerala Sahitya Academi, Thrissur, Kerala, 1996, 520-50pls.
9. Neelakantan KK, Sashikumar C, Venugopalan R. A Book of Kerala Birds. Part I. WWF India, Kerala State Office, 1993, 146.
10. Hume AO. A First List of the Birds of the Travancore Hills. Stray Feathers, 1876; 4:351-405.
11. Hume AO. A Second List of the Birds of the Travancore Hills. Stray Feathers, 1878; 7:33-39.
12. Ferguson HS, Bourdillon TF. The Birds of Travancore with Notes on their Nidification. J Bombay Nat Hist Soc. 1903; 15:249-264. 455-474, 654-673.
13. Ferguson HS, Bourdillon TF. The Birds of Travancore. Part III. J Bombay Nat Hist Soc. 1904; 16:1-18.
14. Ali S, Whistler H. The Ornithology of Travancore and Cochin. J. Bombay Nat. Hist. Soc., 1935-1937, 37:814-843; 38:61-92; 282-320; 484-514; 759-790; 39:3-35; 320-342; 569-593.
15. Neelakantan KK. Occurrence of the Terek Sandpiper in Kerala. Journal of the Bombay Natural History Society, 1969, 66(3): 623.
16. Neelakantan KK. Occurrence of Sanderling in Kerala. Journal of the Bombay Natural History Society. 1970; 67(3):570.
17. Neelakantan KK. The Brown-winged Tern: an addition to the birds of Kerala. Journal of the Bombay Natural History Society, 1981; 78(1):83.
18. Neelakantan KK. The Pintail, an addition to the list of birds occurring in Kerala. Journal of the Bombay Natural History Society. 1982; 79(3):67-68.
19. Neelakantan KK, Sureshkumar VK. Occurrence of Black0winged Stilt in Kerala. Journal of the Bombay Natural History Society. 1980; 77(3):510.
20. Namassivayam L, Venugopalan R. Avocet in Kerala. Journal of the Bombay Natural History Society, 1989; 86(3):447.
21. Namassivayam L, Uthaman PK, Venugopalan R. Four additions to the birds of Kerala. Journal of the Bombay Natural History Society. 1989; 86(3):458-460.
22. Uthaman PK, Namassivayan L. The Birdlife of Kadalundi estuary. Blackbuck, 1991; 7(1):3-12.
23. Uthaman PK, Namassivayan L. Three additions to the birds of Kerala with a repeat sight record. Journal of the Bombay Natural History Society. 1992; 89(2):250.
24. Kurup DN. Migrant shore birds in estuarine habitats with special reference to Kadalundi and Bharathapuzha estuaries, 31-32pp. Proceedings of the Third Kerala Science Congress, February-March 1991, Kozhikode, 1991.
25. Kurup DN. Ecology of the birds of Bharathapuzha estuary and survey of the coastal wetlands of Kerala. Final Report submitted to the Kerala Forest Department, Thiruvananthapuram, 1996, 56. (Unpublished).
26. Jayson EA. Ecology of Wetland Birds in the Kole lands of Kerala. Kerala Forest Research Institute Research Report 2002a; 244:102.
27. Nameer PO. Wetlands and waterfowl conservation in Kerala with special reference to Ramsar sites, pp. 97-112. In: Ambat, B. (Ed.). Proceedings of Kerala Environment Congress. Centre for Environment and Development, Thiruvananthapuram, 2005, 274.
28. Jayson EA. Avifauna in the wetlands of Kerala, pp. 50-68. In: Jayakumar, M. (Ed.). Wetland Conservation and Management in Kerala. State Committee on Science, Technology and Environment, Thiruvananthapuram, 2000b, 167.
29. Ali S, Ripley SD. A Pocket Guide to the Birds of the Indian Subcontinent. Bombay Natural History Society, Bombay, 1983, 354.
30. Grimmett R, Inskipp C, Inskipp T. Pocket Guide to the Birds of Indian Subcontinent. Oxford University Press, New Delhi, 1999, 384.
31. Karmierczak K. A Field Guide to the Birds of India. Pica Press, UK, 2000, 351.
32. Manakadan R, Pittie A. Standardized common and scientific names of the birds of the Indian subcontinent. Buceros, 2001; 6(1):1-37.
33. Zacharias VJ, Mathew DN. Ecology of Babblers (Turdoides spp.). Journal of the Bombay Natural History Society. 1988; 85(1):50-63.
34. Asokan S, Ali AMS, Manikannan R. Diet of three insectivorous birds in Nagapattinam District, Tamil Nadu, India - a preliminary study. J Thr Tax. 2009b; 1(6):327-330.
35. Narayanan SP, Vijayan L. Status of the colonial breeding waterbirds in Kumarakom Heronry in Kerala, Southern India. Podoces, 2007; 2(1):22-29.
36. Lowe S, Browne M, Boudjelas S, de Poorter M. 100 of the World's Worst Invasive Alien Species. A selection from the Global Invasive Species Database. The Invasive Species Specialist Group (ISSG), a specialist group of the Species Survival Commission (SSC) of the World Conservation Union (IUCN), Auckland. http://en.wikipedia.org/wiki/2000.
37. Schaefer V. Urban Biodiversity in Biodiversity, pp. 307-308. In: Harding, L.E. and E.O. Mccullum (Eds.) British Columbia. Environment Canada and Canadian Wildlife service, Vancouver, Canada, 1994.
38. Sauvjot RM, Buechner M, Kamradt DA, Schonerwald CM. Patterns of human disturbances and response by small mammals and birds, in chaparral near urban development. In: Urban Ecosystem, 1998; 2:279-297.
39. Savard LJ, Clergeau P, Mennechez G. Biodiversity concept and urban ecosystem. Landscape and Urban Planning, 1998; 48(3-4):131-142.