

STUDIES ON THE AQUATIC BIRDS IN PERIYAR LAKE, KERALA

P. MUHAMMED JAFER*, A.K. BHARDWAJ**, K.J. PEEYUSKUTTY*** AND V.J. ZACHARIAS****

Periyar Tiger Reserve, Thekkady (Kerala)

Introduction

Kerala is known to harbour a rich bird fauna (Ali, 1968). Very little information is available on the current status of aquatic birds in the State. Periyar Tiger Reserve in Kerala harbours a rich bird fauna (Ali, 1935-37; Neelakantan, 1964; Jackson, 1971; Vijayan and Balakrishnan 1979; Yahya, 1988; Srivastava *et al.*, 1993). But there are only few aquatic birds. Though no exact estimates are available on the yearly numbers of water birds in Periyar Lake, Gaston (Pers. Comm.) has observed a good number of Little Cormorants (*Phalacrocorax niger*) and Darters (*Anhinga rufa*) in the Lake when he visited the Reserve in 1974. This paper is aimed at determining the population of aquatic birds in Periyar Lake for making comparable studies in future.

Study Area

Periyar Tiger Reserve is situated on the Western Ghats in Idukki District of Kerala, between 9° 80' and 9° 40' N. Lat. and 76° 55' and 77° 25' E. Long. The river Periyar, which originates from Chokkampetty-Kallimalai part of the reserve, is the main drainage system of the area. A lake of about

25 km² which forms the nucleus of the reserve, was formed by impounding the water of Periyar River in 1895. The lake extends from Thekkady boat landing to Thannikudy with diverticula like extensions and has an approximate distance of 30 km from end to end which could be covered in a motor boat in 2½ hours. Human activity is intense in the tourism zone of the lake extending from Thekkady to Mullaperiyar Dam. There is little shallow water areas in the lake. The stumps of dead trees, those still remain in the lake, provide perch, roost and nest sites for aquatic birds.

The climate of Periyar Tiger Reserve can be described as cool and humid with heavy rainfall. The temperature varies from 13.5°C to 31.5°C throughout the year. It has an average rainfall of 2030 mm (Table 1). December to April or mid-May is comparatively dry and the rest of the year is wet.

Methods

The study was conducted from 1st September 1991 to 28th July 1993. Birds associated with the lake were counted twice a month by using a motor boat. All aquatic birds which were met with between

* Junior Zoologist, Zoological Survey of India, Hyderabad (Andhra Pradesh).

** Scientist SE, Wildlife Institute of India, Dehra Dun (U.P.).

*** Data Collector, Thekkady (Kerala).

**** Research Officer, Project Tiger, Thekkady (Kerala).

Thekkady and Thannikudy were counted on a 2½ hours cruise, covering a distance of about 30 km. Nesting of each species was also recorded. Species like Brahminy Kite (*Haliastur indus*), Greyheaded Eagle (*Ichthyophaga ichthyaeus*) and fishing Osprey (*Pandion haliaetus*) which are occasionally seen in the lake, are not included in this list.

Results and Discussions

A total of 23 species of birds associated with Periyar Lake were recorded (Table 3 and 4). Of these, 17 were residents and 6 winter visitors. More bird species were observed between January and June which may be due to the low water level of the lake (Table 2) during this period. Maximum number of Large Cormorants were counted on 15.5.92 (196) and Pond Herons (37) and Darter (36) were counted on 9.4.93. During March and April maximum number of Little Cormorants (156) and Little Egrets (77) were recorded and these birds congregate in shallow water areas of the lake for feeding. A feeding association was observed between

the two species. On half a dozen occasions we could clearly see the prey species of the Little Egrets which was *Heteropneustes fossilis*. We could identify the prey species of Large Cormorants and Osprey on four occasions - constituting mainly the introduced fish *Cyprinus carpio*. The species composition of birds is different in the tourism zone and core zone (at Thannikudy), Darters being more common in the former area and Larger Cormorants in the latter.

Birds like Darters, Little Cormorants and Large Cormorants nest on tree stumps in the lake. The Large Cormorants breed from November to May. Fifty one nests of this species were found in 1991-92 and 50 in 1992-93 (till July 1993). Of the 50 nests observed in 1992-93, 5 were old nests of Darters of 1991-92 period. Darters seem to have an irregular breeding season mostly from July to November. Five nests of Darters were recorded in 1991, nine in 1992 and seven till the end of July 1993. Little Cormorants also have a prolonged breeding season from May to September but actual number of these could not be counted. The

Table 1

The pattern of monthly rainfall in the study area during September 1991 to July 1993 (mm)

Month and Year	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	Apr.	May	Jun.	Jul.	Aug.
1991-1992	8	208	113	5	Nil	36	Nil	46	206	812	716	331
1992-1993	291	304	518	15	Nil	31	47	65	131	340	440	-

Table 2

Water level in Periyar Lake during various months (m)

Month and Year	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	Apr.	May	Jun.	Jul.	Aug.
1991-92	37.18	34.44	35.50	35.50	33.89	34.74	32.73	32.36	36.11	36.39	40.38	41.05
1992-93	39.16	40.38	43.22	40.90	39.86	37.85	35.96	36.11	36.11	36.11	34.90	35.50

Table 3

Occurrence of Aquatic Birds in Periyar Lake during 1991-92 season

No.Species		Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug
1. Little Grebe	<i>Podiceps ruficollis</i>	-	-	-	-	-	-	-	-	-	1	2	1
2. Large Cormorant	<i>Phalacrocorax carbo</i>	21	23	105	116	112	102	119	157	196	148	46	38
3. Indian Shag	<i>P. fuscicollis</i>	-	-	-	-	-	-	-	-	-	-	1	8
4. Little Cormorant	<i>P. niger</i>	1	-	1	-	4	-	-	-	29	5	10	16
5. Oriental Darter	<i>Anhiyaa rufa</i>	3	11	15	13	8	8	14	15	22	13	4	37
6. Grey Heron	<i>Ardea cinerea</i>	2	2	1	3	1	4	2	4	3	5	4	2
7. Little Green Heron	<i>Ardeola striatus</i>	-	1	-	1	2	1	-	1	-	-	-	-
8. Indian Pond Heron	<i>A. grayii</i>	2	1	3	1	10	4	1	12	11	-	-	-
9. Large Egret	<i>Egretta alba</i>	1	2	6	2	1	1	2	-	-	-	-	-
10. Intermediate Egret	<i>E. intermedia</i>	-	1	3	2	4	7	9	11	-	1	-	-
11. Little Egret	<i>E. garzetta</i>	-	33	1	7	3	16	21	11	31	9	-	-
12. Night Heron	<i>Nycticorax nycticorax</i>	-	-	-	-	-	-	-	-	31	9	13	9
13. Black Bittern	<i>Ixobrychus flavicollis</i>	-	-	-	-	-	-	-	-	-	-	-	-
14. Whitenecked Stork	<i>Ciconia episcopus</i>	2	2	3	4	4	4	7	14	5	4	2	3
15. Garganey	<i>Anas querquedula</i>	-	-		50+		16	7	-	-	-	-	-
16. Little Ringed Plover	<i>Charadrius dubius</i>	-	-	-	-	-	-	-	3	-	-	-	-
17. Green Sandpiper	<i>Tringa ochropus</i>			1	2	1	1	-	-	-	-	-	-
18. Common Sandpiper	<i>T. hypoleucos</i>	1	3	2	1	4	1	2	-	-	-	-	-
19. Indian River Tern	<i>Sterna aurantia</i>	1	-	-	-	-	-	-	-	-	-	-	-
20. Common Tern	<i>S. hirundo</i>	-	3	-	-	-	-	-	-	-	-	-	-
21. Lesser Pied Kingfisher	<i>Ceryle rudis</i>	2	4	3	2	2	4	5	2	2	2	4	2
22. Common Kingfisher	<i>Aicedo atthis</i>	1	-	1	2	1	3	1	2	1	-	1	-
23. Storkbilled Kingfisher	<i>Pelargopsis capensis</i>	-	-	-	2	-	1	-	-	1	1	-	1
24. Whitebreasted Kingfisher	<i>Halcyon smyrnensis</i>	-	1	2	1	2	2	-	1	2	1	1	-

Table 4

Occurrence of Aquatic Birds in Periyar Lake during 1991-92 season

No. Species		Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1. Little Grebe	<i>Podiceps ruficollis</i>	-	-	-	-	-	-	-	-	-	2	1
2. Large Cormorant	<i>Phalacrocorax carbo</i>	39	23	57	157	148	114	131	170	142	195	96
3. Indian Shag	<i>P. fuscicollis</i>	1	-	2	-	-	-	-	2	3	2	4
4. Little Cormorant	<i>P. niger</i>	12	-	7	1		1	116	156	20	7	4
5. Oriental Darter	<i>Anhinga rufa</i>	-	-	-	-	-	-	-	-	-	-	-
6. Grey Heron	<i>Ardea cinerea</i>	5	1	5	2	3	1	2	1	4	5	4
7. Little Green Heron	<i>Ardeola striatus</i>	-	1	1	-	1	1	-	-	-	2	-
8. Indian Pond Heron	<i>A. grayii</i>	6	2	1	3	14	5	21	37	34	5	
9. Large Egret	<i>Egretta alba</i>	2	4	-	1	3	2	-	1	2	-	2
10. Intermediate Egret	<i>E. intermedia</i>	2	2	3	2	29	10	17	9	4	7	2
11. Little Egret	<i>E. garzetta</i>	3	-	2	2	2	4	32	77	1	6	2
12. Night Heron	<i>Nycticorax nycticorax</i>	2	-	-	-	-	-	-	-	4	7	-
13. Whitenecked Stork	<i>Ciconia episcopus</i>	4	3	2	2	4	3	4	11	2	4	4
14. Garganey	<i>Anas querquedula</i>	-	-	-	-	4	-	-	-	-	-	-
15. Little Ringed Plover	<i>Charadrius dubius</i>	-	-	-	-	-	-	-	1	-	-	-
16. Green Sandpiper	<i>Tringa ochropus</i>	-	-	1	1	1	1	-	-	-	-	-
17. Common Sandpiper	<i>T. hypoleucos</i>	2	4	2	4	2	1	1	-	-	-	1
18. Indian River Tern	<i>Sterna aurantia</i>	-	-	-	1	-	1	-	-	-	-	-
19. Lesser Pied Kingfisher	<i>Ceryle rudis</i>	5	4	5	3	6	6	2	5	2	4	5
20. Common Kingfisher	<i>Aicedo atthis</i>	-	1	2	2	3	4	-	1	1	-	2
21. Storkbilled Kingfisher	<i>Pelargopsis capensis</i>	-	-	1	2	1	1	-	-	2	1	2
22. Whitebreasted Kingfisher	<i>Halcyon smyrnensis</i>	1	2	1	3	3	2	-	1	1	2	2

Whitenecked Stork nested on a large Silk Cotton Tree *Bombax malabaricum* near the Information Centre between September and February (in 1991, 1992 and 1993). Their number is gradually increasing as only two birds were seen in 1987 and in 1995 as many as 13 birds could be seen.

A roosting colony of Pond Heron was sighted on the river bank at Thannikudy near the end of the lake. Night Herons in small numbers started roosting near Edappalayam during this study period. We have observed one Painted Stork (*Mycteria leucocephala*) on the lake shore near Edappalayam continuously for 3 weeks, in September 1993. Four Openbilled Storks (*Anastamus oscitans*) were sighted near boat landing in November 1993.

Sighting of two Spotbill Ducks (*Anas poecilorhyncha*) from April to July 1996 is worth special mentioning. This is the first sight record of the species in Kerala, though it was recorded breeding in Tamil Nadu.

The occurrence of the Little Grebe (*Podiceps ruficollis*) is also interesting. We have observed one bird with breeding two chicks in July 1993. Several birds with plumage were observed in the tourism zone in July 1996. Ali (1968) however considered them low country species.

The lesser number of water birds in Periyar Lake is probably due to the absence of shallow water areas in and around the lake. The aquatic bird fauna in Periyar is characterised by the absence of Ducks and Teals (except the passage migrants), Garganey (*Anas querquedula*) (in fewer numbers) and by the presence of a large

number of Cormorants (Large Cormorants, Little Cormorants and Shags) which along with the Darters breed in the lake on the dead tree stumps. Earlier investigators like Ali (1935-37), Jackson (1971), Vijayan *et al.* (1979), Yahya (1988) and Gaston (Pers. Comm.) did not see the Large Cormorants in the lake which are now abundantly seen. Gaston (Pers. Comm.) saw a large number of Darters in 1974 which are now represented by small numbers. Every year the number of stumps in the lake are decreasing due to decay. Decreasing number of these stumps which offer a safe breeding and perching ground for Darters and Cormorants, is another management issue to be looked into.

Very little information is available about the breeding season of water birds in Kerala which according to Ali (1968) is related to monsoon. But in Periyar Lake, where the water is available throughout the year, the breeding season of the water birds is not related to monsoon rains, e.g. the Whitenecked Stork starts breeding after the monsoon season.

Most of the nests of the Large Cormorants are seen outside the monsoon season. The Little Cormorants, Shags and Darters also have an irregular breeding season in the lake area. According to Lack (1954) availability of the food for the young ones is an important factor in determining the breeding season of the birds. In the lakes like Periyar there is a steady supply of water and fishes throughout the year. Other factors determining the breeding timing of water birds here are worth investigating.

Acknowledgements

We thank Dr. A.J. Gaston for providing information on the status of water birds of Periyar in 1974. Discussion with the late Prof. K. K. Neelakantan and Angus Hutton were helpful.

SUMMARY

This paper is aimed at determining the population of aquatic birds in Periyar Lake for making comparable studies in future. A total of 23 species of birds were recorded. Of these 17 were residents and 6 winter visitors.

पेरियार झील, केरल के जलीय पक्षियों का अध्ययन

पी० मोहम्मद जाफर, ए०के० भारद्वाज, के०जे० पीयूषकुट्टि, व वी०जे० जकरियास

सारांश

इस अभिपत्र का लक्ष्य भविष्य में तुलनात्मक अध्ययन करने के लिए पेरियार झील के जलीय पक्षियों की संख्या निश्चित करना था। पक्षियों की कुल 23 जातियाँ आलेखित हुईं उनमें से 17 सदा यहां रहने वाली तथा 6 यहाँ सर्दियों में बाहर से आने वाली जातियाँ हैं।

References

- Ali, S (1935-37). Ornithology of Travancore and Cochin with notes by Hugh Whistler. *J. Bombay Nat. Hist Soc.* 35-38 (8 parts).
- Ali, S. (1968). *Birds of Kerala*. Oxford University Press, Madras.
- Jackson, M.C.J. (1971). Random notes on birds of Kerala. *J. Bombay Nat. Hist. Soc.* 68(1): 107-114.
- Lack, D. (1954). *Natural regulation of Animal Numbers*. Oxford University Press.
- Neelakantan, K.K. (1964). List of birds seen in Periyar Wildlife Sanctuary. *Newsletter for bird watchers* 4 (60) : 2-4.
- Srivastava, K.K., V.J. Zacharias, A.K. Bhardwaj and P. Muhammed Jafer (1993). Birds of Periyar Tiger Reserve Kerala, South Indian, *Indian Forester*, 119 (10) : 816-827.
- Vijayan, V.S. and M. Balakrishnan (1979). Periyar Tiger Reserve - A Reconnaissance Report, KFRI, Peechi - Report. 3.
- Yahya, H.S.A. (1988). Habitat preference of Birds in Periyar Tiger Reserve, Kerala. *Ind. J. Forestry*. 12 (4) : 288-295.