

## A CHECKLIST OF AVIFAUNA OF THE BHARATHAPUZHA RIVER BASIN, KERALA

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### ABSTRACT

The Bharathapuzha river basin of Kerala state was surveyed from Parali to Purathoor estuary region during January 1998 to December 2004 period. A total of 140 species of birds in 49 families were recorded. Sixty-five per cent of the bird species recorded was resident forms and 35% migrants. In Kerala the Greater Flamingo (*Phoenicopterus ruber*) and Brahminy Shelduck (*Tadorna ferruginea*) were recorded only from the Bharathapuzha river basin. Among the bird species recorded from the Bharathapuzha basin, the Darter (*Anhinga melanogaster*), the Painted Stork (*Mycteria leucocephala*), the Oriental White Ibis (*Threskiornis melanocephalus*) and the Black-bellied Tern (*Sterna acuticauda*) are Near Threatened. The river basin has been identified as a preferred breeding site of the Black-bellied Tern.

### KEYWORDS

Bharathapuzha river basin, birds, checklist, conservation, Kerala, wetland

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" (Knopf & Samson, 1994). Riparian vegetation also provides habitat for many species of birds during migration. Further, a variety of birds, including the migratory forms, use river and riparian vegetation as a habitat for feeding, roosting, nesting, and breeding. The monumental works of Ali (1979) and Ali and Ripley (1987) on Indian avian fauna and the publications on the birds of Kerala by Ali (1953, 1969, 1999), Neelakantan (1996) and Neelakantan *et al.* (1993) showed that a variety of birds use rivers for their sustenance.

The wetlands and other water bodies of Kerala have been explored by any researchers and birdwatchers for the avifauna, starting with a series of publications by Neelakantan and his team (Neelakantan, 1969, 1970, 1981, 1982; Neelakantan *et al.*, 1980; Neelakantan & Sureshkumar, 1980). The Purathoor (Bharathapuzha) and Kadalundi estuaries were identified as areas rich in avifauna, particularly the migratory birds. Namassivayan and Venugopal (1989), Namassivayam *et al.* (1989), Uthaman and Namassivayan (1991, 1992) investigated the birds arriving at Kadalundy estuary. Kurup (1991, 1996) reported on the birds of Kadalundy and Purathoor estuaries of the Malabar coast of Kerala. Of late, Jayson (2002a) and Nameer (2005) conducted detailed ecological studies on the avifauna of Vembanad-Kol wetland, one of the three Ramsar sites in Kerala. Jayson (2000b) documented the presence of 172 species of birds associated with the wetlands of Kerala.

Despite the ecological importance of the Bharathapuzha 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. Gaston (1979) recorded the birds of Cheruthuruthi region of Bharathapuzha river. The avifauna of Purathoor estuary of the river was recorded by Kurup (1991, 1996). There are a few other scattered reports on the birds of this river basin (Neelakantan *et al.*, 1993). The bird watchers of the organization "Warblers and Waders" recorded the breeding of the Black-bellied Tern *Sterna acuticauda* in the Bharathapuzha river basin for many years (www.warblersandwaders.org; Susanth, pers. comm.). They also observed the nesting of Asian Openbill *Anastomus oscitans* at Shornur region of the river, and recorded Black Ibis (*Pseudibis papillosa*) and Eurasian Spoonbill (*Platalea leucorodia*) on October 2005. The present study recorded 140 species of birds in the Bharathapuzha river basin, Kerala State.

### MATERIALS AND METHODS

#### Study area

Bharathapuzha river or 'Nila' River (Fig. 1), the second largest river in Kerala State, with a total length of about 209km, takes its origin at Kovittola Betta of Kundra reserve forest of Tamil Nadu in the Western Ghats at an elevation of 2,336m and flows through Coimbatore district of Tamil Nadu, and Palakkad, Malappuram and Thrissur districts of Kerala and finally empties into Lakshadweep Sea at Ponnani (Purathoor or Ponnani or Bharathapuzha estuary). Nearly one-eighth of the total population in the state depends on the river for various resources. The main tributaries of Bharathapuzha river are Gayathripuzha, Chitturpuzha, Kalpathipuzha and Thuthapuzha. From the confluence of Kalpathipuzha and Chitturpuzha at Parali the river acquires the name Bharathapuzha. The Bharathapuzha watershed lies between 10°25'-11°15'N & 75°50'-76°55'E, covering an area of 3,852.04sq.km. (Anon., 1998). The upper reaches of the watershed consist mainly of agricultural land, a few water bodies and forestland. Agricultural land, forestland and wasteland occupy the middle region, while the lower regions are covered mainly by agricultural land and to a lesser extend by water bodies.

#### Survey and Identification

The avifauna of the Bharathapuzha river and the riverine vegetation associated with it were surveyed during January 1998 to December 2004, as part of the biodiversity studies of the river. The survey was limited to the lower reaches of the river from Parali to Purathoor estuary. Observations were carried out on fixed path in 1km radius at each station by using line transect method (Gaston, 1973). The identification of birds

was done by both sight and sound; direct observations were made periodically using binoculars of 8x and 7x magnification. Spot identification was done using field guides (Ali & Ripley, 1983; Ali, 1999; Grimmett *et al.*, 1999; Karmierczak, 2000). The checklist was prepared using the standardised common and scientific names of the birds of the Indian subcontinent by Manakadan and Pittie (2001). Details regarding the birds with confirmed identity alone are presented in this paper.

## RESULTS AND DISCUSSION

The list of avifauna sighted from the Bharathapuzha river basin from Parali to Purathoor estuary during January 1998 to December 2004 is presented in Table 1. A total of 140 species of birds in 49 families were reported from the Bharathapuzha basin. Out of the 140 species, 65% (91) were resident forms and 35% (49) migrants. Further, in Kerala the Greater Flamingo (*Phoenicopterus ruber*) and Brahminy Shelduck (*Tadorna ferruginea*) were recorded only from the Bharathapuzha river basin (Neelakantan *et al.*, 1993; Easa & Jayson, 2004). The important migratory birds in the Bharathapuzha basin include Common Teal, Brahminy Shelduck, Open-bill Stork, White-necked Stork, White Ibis, Greater Flamingo, Brahmini Duck and a variety of plovers, sea gulls and terns (Table 1). Among the bird species recorded from the Bharathapuzha basin, the Darter (*Anhinga melanogaster*), the Painted Stork (*Mycteria leucocephala*), the Oriental White Ibis (*Threskiornis aethiopica melanocephalus*) and the Black-bellied Tern (*Sterna acuticauda*) are considered nearly threatened according to the Red Data Book of Birdlife International. The river basin has been identified as frequent breeding sites of the Black-bellied Tern (Anon., 2001).

During the present study the breeding sites of other species were observed at Kuttipuram and Thirunavaya during the January month of 2002, 2003 and 2004. The bird watchers of "Warblers and Waders" had also reported the nesting of this species in the river basin for the last several years (Susanth, pers. comm.). They had also observed the nesting of Asian openbill, *Anastomus oscitans* at Shornur region of the river. The breeding of Small Pratincole (*Glareola lactea*) had also been reported from Pallam and Thavanoor regions along the Bharathapuzha river basin (Sashikumar, pers. comm.).

The results presented in Table 1 show that the Bharathapuzha river basin, particularly its lower reaches, the Purathoor estuary, is a suitable rendezvous for a variety of birds, including a large variety of migratory forms. The palaeartic migrants that enter the subcontinent through the two principal routes, the Indus valley and the Brahmaputra basin, finally converge in peninsular India (Ali & Ripley, 1987) before spreading out to neighbouring Sri Lanka, Maldives and Lakshadweep archipelago (Hoffman, 1983). Kurup (1991) observed no distinct pattern in the arrival of migrant birds in the Purathoor estuary. The author observed that the migratory gulls and terns start arriving at Ponnani by the month of October, and they leave by the end of January. The large extent of sand and mud flats in the Purathoor region and shallow waters attract the birds in passage to this region

(Kurup, 1991).

Indiscriminate sand mining, demolition of deltas and burning of the vegetation in the river basin were observed as the major threats to the bird population, particularly to their breeding grounds. Eutrophication is yet another problem identified at the lower reaches of the river. Anecdotal evidences also revealed occasional poaching of water fowls in the Purathoor region. Considering the rich bird diversity in the Bharathapuzha river basin and reports on breeding sites of the threatened Black-bellied Tern along the lower reaches of the river, the Purathoor region may be declared as a bird sanctuary.

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Table 1. Checklist of the avifauna of Bharathapuzha river basin, Kerala

	Common Name	Family/Subfamily/Scientific Name	Site record	Status
1	<b>Grebes</b> Little Grebe (5)	<b>Podicipedidae</b> <i>Tachybaptus ruficollis</i> (Pallas, 1764)	Parali	R
2	<b>Cormorants/Shags</b> Little Cormorant (28)	<b>Phalacrocoracidae</b> <i>Phalacrocorax niger</i> (Vieillot, 1817)	Several places	R
3	<b>Darters</b> Darter (29)	<b>Anhingidae</b> <i>Anhinga melanogaster</i> Pennant, 1769	Peringottukurissi, Lakkidi, Shornur	R, NT
4	<b>Hérons, Egrets &amp; Bitterns</b> Little Egret (49)	<b>Ardeidae</b> <i>Egretta garzetta</i> (Linnaeus, 1766)	Several places*	R
5	Western Reef-Egret (50)	<i>Egretta gularis</i> (Bosc, 1792)	Purathoor	R
6	Grey Heron (35-36)	<i>Ardea cinerea</i> Linnaeus, 1758	Purathoor	R
7	Purple Heron (37-37a)	<i>Ardea purpurea</i> Linnaeus, 1766	Thrithala	R
8	Large Egret (45-46)	<i>Casmerodius albus</i> (Linnaeus, 1758)	Purathoor	R
9	Median Egret (47, 48)	<i>Mesophoyx intermedia</i> (Wagler, 1829)	Lakkidi, Shornur, Pattambi	R
10	Cattle Egret (44)	<i>Bubulcus ibis</i> (Linnaeus, 1758)	Several places*	R
11	Indian Pond-Heron (42-42a)	<i>Ardeola grayii</i> (Sykes, 1832)	Several places	R
12	Little Green Heron (38-41)	<i>Butorides striatus</i> (Linnaeus, 1758)	Purathoor	R
13	Black-crowned Night-Heron (52)	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Peringottukurissi, Lakkidi, Ottapalam	R
14	Yellow Bittern (57)	<i>Ixobrychus sinensis</i> (Gmelin, 1789)	Parali, Lakkidi	R
15	Chestnut Bittern (56)	<i>Ixobrychus cinnamomeus</i> (Gmelin, 1789)	Parali, Lakkidi	R
16	Black Bittern (58)	<i>Dupetor flavicollis</i> (Latham, 1790)	Parali	R
17	<b>Storks</b> Painted Stork (60)	<b>Ciconiidae</b> <i>Mycteria leucocephala</i> (Pennant, 1769)	Shornur, Thrithala	R, NT
18	Asian Openbill-Stork (61)	<i>Anastomus oscitans</i> (Boddaert, 1783)	Thrithala, Kuttippuram	R
19	Black Stork (65)	<i>Ciconia nigra</i> (Linnaeus, 1758)	Kuttippuram	M
20	White-necked Stork (62)	<i>Ciconia episcopus</i> (Boddaert, 1783)	Parali, Thrithala	M
21	<b>Ibises &amp; Spoonbills</b> Glossy Ibis (71)	<b>Threskiornithidae</b> <i>Plegadis falcinellus</i> (Linnaeus, 1766)	Pallam, Thrithala	R
22	Oriental White Ibis (69)	<i>Threskiornis melanocephalus</i> (Latham, 1790)	Shornur, Pallam, Thrithala	R,NT
23	<b>Flamingos</b> Greater Flamingo (73)	<b>Phoenicopteridae</b> <i>Phoenicopterus ruber</i> Linnaeus, 1758	Purathoor	M
24	<b>Swans, Geese &amp; Ducks</b> Brahminy Shelduck (90)	<b>Anatidae</b> <i>Tadorna ferruginea</i> (Pallas, 1764)	Purathoor	M
25	Cotton Teal (114)	<i>Nettapus coromandelianus</i> (Gmelin, 1789)	Purathoor	R
26	Spot-billed Duck (97-99)	<i>Anas poecilorhyncha</i> J.R. Forester, 1781	Peringottukurissi	R
27	Common Teal (94)	<i>Anas crecca</i> Linnaeus, 1758	Purathoor	M
28	<b>Hawks, Eagles, Buzzards, Old World Vultures, Kites, Harriers</b> Oriental Honey-Buzzard (129-130)	<b>Accipitridae</b> <i>Pernis ptilorhynchus</i> (Temminck, 1821)	Pallam	R
29	Black Kite (132-134)	<i>Milvus migrans</i> (Boddaert, 1783)	Pattambi, Purathoor	R
30	Brahminy Kite (135)	<i>Haliastur indus</i> (Boddaert, 1783)	Several places	R
31	Greater Grey-headed Fish-Eagle (175-176)	<i>Ichthyophaga ichthyaetus</i> (Horsfield, 1821)	Lakkidi	R
32	Western Marsh-Harrier (193)	<i>Circus aeruginosus</i> (Linnaeus, 1758)	Purathoor	M
33	<b>Osprey</b> Osprey (203)	<b>Pandionidae</b> <i>Pandion haliaetus</i> (Linnaeus, 1758)	Shornur, Pattambi	M
34	<b>Pheasants, Partridges, Quails</b> Indian Peafowl (311)	<b>Phasianidae</b> <i>Pavo cristatus</i> Linnaeus, 1758	Peringottukurussy, Mannannoor	R
35	<b>Rails, Crakes, Moorhens, Coots</b> White-breasted Waterhen (343-345)	<b>Rallidae</b> <i>Amauornis phoenicurus</i> (Pennant, 1769)	Parali, Lakkidi, Thrithala, Pallippuram	R
36	Watercock (346)	<i>Gallix cinerea</i> (Gmelin, 1789)	Parali	R
37	Purple Moorhen (348-349)	<i>Porphyrio porphyrio</i> (Linnaeus, 1758)	Parali, Pallippuram	R
38	<b>Jacanas</b> Pheasant-tailed Jacana (358)	<b>Jacaniidae</b> <i>Hydrophasianus chirurgus</i> (Scopoli, 1786)	Lakkidi, Ottapalam	R
39	Bronze-winged Jacana (359)	<i>Metopidius indicus</i> (Latham, 1790)	Lakkidi	R
40	<b>Plovers, Dotterels, Lapwings</b> Pacific Golden-Plover (373)	<b>Charadriidae</b> <i>Pluvialis fulva</i> (Gmelin, 1789)	Several places*	M
41	Grey Plover (371)	<i>Pluvialis squatarola</i> (Linnaeus, 1758)	Several places*	M
42	Little Ringed Plover (379-380)	<i>Charadrius dubius</i> Scopoli, 1786	Several places*	R
43	Kentish Plover (381-382)	<i>Charadrius alexandrinus</i> Linnaeus, 1758	Several places*	M
44	Lesser Sand Plover (384-384a)	<i>Charadrius mongolus</i> Pallas, 1776	Several places	M
45	Red-wattled Lapwing (366-368)	<i>Vanellus indicus</i> (Boddaert, 1783)	Several places*	R
46	<b>Sandpipers, Stints, Snipes, Godwits &amp; Curlews</b> Common Snipe (409)	<b>Scolopacidae</b> <i>Gallinago gallinago</i> (Linnaeus, 1758)	Purathoor	M
47	Bar-tailed Godwit (391-391a)	<i>Limosa lapponica</i> (Linnaeus, 1758)	Several places	M
48	Whimbrel (385-386)	<i>Numenius phaeopus</i> (Linnaeus, 1758)	Purathoor	M

	Common Name	Family/Subfamily/Scientific Name	Site record	Status
49	Eurasian Curlew (387-388)	<i>Numenius arquata</i> (Linnaeus, 1758)	Purathoor	M
50	Common Redshank (393, 394)	<i>Tringa totanus</i> (Linnaeus, 1758)	Purathoor	M
51	Marsh Sandpiper (395)	<i>Tringa stagnatilis</i> (Bechstein, 1803)	Thirunavaya	M
52	Common Greenshank (396)	<i>Tringa nebularia</i> (Gunner, 1767)	Thirunavaya	M
53	Green Sandpiper (397)	<i>Tringa ochropus</i> Linnaeus, 1758	Several places*	M
54	Wood Sandpiper (398)	<i>Tringa glareola</i> Linnaeus, 1758	Kuttippuram	M
55	Terek Sandpiper (400)	<i>Xenus cinereus</i> (Guldenstadt, 1774)	Purathoor	M
56	Common Sandpiper (401)	<i>Actitis hypoleucos</i> Linnaeus, 1758	Purathoor	M
57	Ruddy Turnstone (402)	<i>Arenaria interpres</i> (Linnaeus, 1758)	Purathoor	M
58	Little Stint (416)	<i>Calidris minuta</i> (Leisler, 1812)	Purathoor	M
59	Temminck's Stint (417)	<i>Calidris temminckii</i> (Leisler, 1812)	Purathoor	M
60	Curlew Sandpiper (422)	<i>Calidris ferruginea</i> (Pontoppidan, 1813)	Purathoor	M
	<b>Courasers &amp; Pratincoles</b>	<b>Glareolidae</b>		
61	Oriental Pratincole (443)	<i>Glareola maldivarum</i> J.R. Forster, 1795	Shornur, Kuttippuram	M
62	Small Pratincole (444)	<i>Glareola lactea</i> Temminck, 1820	Kuttippuram	R
	<b>Gulls, Terns &amp; Noddies</b>	<b>Laridae</b>		
63	Pallas's Gull (453)	<i>Larus ichthyaetus</i> Pallas, 1773	Purathoor	M
64	Heuglin's Gull (450)	<i>Larus heuglini</i> Bree, 1876	Purathoor	M
65	Brown-headed Gull (454)	<i>Larus brunnicephalus</i> Jerdon, 1840	Purathoor	M
66	Black-headed Gull (455)	<i>Larus ridibundus</i> Linnaeus, 1766	Purathoor	M
67	Gull-billed Tern (460-461)	<i>Gelochelidon nilotica</i> (Gmelin, 1789)	Purathoor	M
68	Caspian Tern (462)	<i>Sterna caspia</i> Pallas, 1770	Purathoor	M
69	River Tern (463)	<i>Sterna aurantia</i> J.E. Gray, 1831	Purathoor	R
70	Lesser Crested Tern (479)	<i>Sterna bengalensis</i> Lesson, 1831	Purathoor	M
71	Large Crested Tern (478)	<i>Sterna bergii</i> Lichtenstein, 1823	Purathoor	M
72	Sandwich Tern (480)	<i>Sterna sandvicensis</i> Latham, 1787	Purathoor	M
73	Common Tern (464-465)	<i>Sterna hirundo</i> Linnaeus, 1758	Purathoor	M
74	Saunders's Tern (477)	<i>Sterna saundersi</i> Hume, 1877	Purathoor	M
75	Black-bellied Tern (470)	<i>Sterna acuticauda</i> J.E. Gray, 1831	Kuttippuram, Chamravattom	R,NT
76	Whiskered Tern (458)	<i>Chlidonias hybridus</i> (Pallas, 1811)	Kuttippuram, Chamravattom	M
	<b>Pigeons &amp; Doves</b>	<b>Columbidae</b>		
77	Blue Rock Pigeon (516-517)	<i>Columba livia</i> Gmelin, 1789	Many places	R
78	Spotted Dove (537-540)	<i>Streptopelia chinensis</i> (Scopoli, 1786)	Ottapalam, Shornur	R
	<b>Parakeets &amp; Hanging-Parrots</b>	<b>Psittacidae</b>		
79	Rose-ringed Parakeet (549-550)	<i>Psittacula krameri</i> (Scopoli, 1769)	Several places	R
80	Plum-headed Parakeet (557-558)	<i>Psittacula cyanocephala</i> (Linnaeus, 1766)	Pattambi	R
	<b>Cuckoos, Malkohas &amp; Coucals</b>	<b>Cuculidae</b>		
81	Brainfever Bird (573-574)	<i>Hierococcyx varius</i> (Vahl, 1797)	Ottapalam, Shornur	R
82	Indian Cuckoo (576)	<i>Cuculus micropterus</i> Gould, 1838	Ottapalam, Shornur, Pattambi	R
83	Asian Koel (590-592)	<i>Eudynamis scolopacea</i> (Linnaeus, 1758)	Several places*	R
84	Greater Coucal (600-602)	<i>Centropus sinensis</i> (Stephens, 1815)	Several places	R
	<b>Barn Owls</b>	<b>Tytonidae</b>		
85	Barn Owl (606-607)	<i>Tyto alba</i> (Scopoli, 1769)	Ottapalam	R
	<b>Owls</b>	<b>Strigidae</b>		
86	Brown Fish-Owl (631-632)	<i>Ketupa zeylonensis</i> (Gmelin, 1788)	Parali	R
87	Spotted Owlet (650-652)	<i>Athene brama</i> (Temminck, 1821)	Kuttippuram, Thirunavaya	R
	<b>Swifts</b>	<b>Apodidae</b>		
88	Asian Palm-Swift (707-708)	<i>Cypsiurus balasiensis</i> (J.E. Gray, 1829)	Pattambi	R
89	Alpine Swift (693-695)	<i>Tachymarptis melba</i> (Linnaeus, 1758)	Purathoor	R
90	House Swift (702-706)	<i>Apus affinis</i> (J.E. Gray, 1830)	Kuttippuram	R
	<b>Kingfishers</b>	<b>Alcedinidae</b>		
91	Small Blue Kingfisher (722-724)	<i>Alcedo atthis</i> (Linnaeus, 1758)	Several places*	R
92	Stork-billed Kingfisher (730-732)	<i>Halcyon capensis</i> (Linnaeus, 1766)	Several places	R
93	White-breasted Kingfisher (735-738)	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	Chamravattom	R
94	Lesser Pied Kingfisher (719-720)	<i>Ceryle rudis</i> (Linnaeus, 1758)	Several places	R
	<b>Bee-eaters</b>	<b>Meropidae</b>		
95	Small Bee-eater ((749-752)	<i>Merops orientalis</i> Latham, 1801	Ottapalam, Shornur	R
96	Blue-tailed Bee-eater (748)	<i>Merops philippinus</i> Linnaeus, 1766	Shornur, Thrithala, Chamravattom	M
	<b>Rollers</b>	<b>Coraciidae</b>		
97	Indian Roller (755-757)	<i>Coracias benghalensis</i> (Linnaeus, 1758)	Kuttippuram	R
	<b>Hoopoes</b>	<b>Upupidae</b>		
98	Common Hoopoe (763-766)	<i>Upupa epops</i> Linnaeus, 1758	Ottapalam	R
	<b>Hornbills</b>	<b>Bucerotidae</b>		
99	Indian Grey Hornbill (767)	<i>Ocyrocus birostris</i> (Scopoli, 1786)	Ottapalam	R
	<b>Barbets</b>	<b>Capitonidae</b>		
100	White-cheeked Barbet (785)	<i>Megalaima viridis</i> (Boddaert, 1783)	Pallam	R
101	Crimson-throated Barbet (790-791)	<i>Megalaima rubricapilla</i> (Gmelin, 1788)	Ottapalam	R

	Common Name	Family/Subfamily/Scientific Name	Site record	Status
102	Coppersmith Barbet (792)	<i>Megalaima haemacephala</i> (P.L.S. Müller, 1776)	Ottapalam	R
	<b>Woodpeckers</b>	<b>Picidae</b>		
103	Lesser Golden-backed Woodpecker (818-823)	<i>Dinopium benghalense</i> (Linnaeus, 1758)	Ottapalam	R
	<b>Larks</b>	<b>Alaudidae</b>		
104	Jerdon's Bush-Lark (874)	<i>Mirafra affinis</i> Blyth, 1845	Chamravattom	R
105	Malabar Crested Lark (901)	<i>Galerida malabarica</i> (Scopoli, 1786)	Several places	R
106	Eastern Skylark (904-909)	<i>Alauda gulgula</i> Franklin, 1831	Several places	R
	<b>Swallows &amp; Martins</b>	<b>Hirundinidae</b>		
107	Common Swallow (916-918)	<i>Hirundo rustica</i> Linnaeus, 1758	Kuttippuram	M
108	Red-rumped Swallow (923-928)	<i>Hirundo daurica</i> Linnaeus, 1771	Shornur, Kuttippuram	R
	<b>Wagtails &amp; Pipits</b>	<b>Motacillidae</b>		
109	White Wagtail (1885-1890)	<i>Motacilla alba</i> Linnaeus, 1758	Chamravattom	M
110	Large Pied Wagtail (1891)	<i>Motacilla maderaspatensis</i> Gmelin, 1789	Kuttippuram, Chamravattom	R
111	Grey Wagtail (1884)	<i>Motacilla cinerea</i> Tunstall, 1771	Several places*	M
112	Paddyfield Pipit (1858-1860)	<i>Anthus rufulus</i> Vieillot, 1818	Shornur, Thrithala	R
	<b>Bulbuls &amp; Finchbills</b>	<b>Pycnonotidae</b>		
113	Red-whiskered Bulbul (1118-1122)	<i>Pycnonotus jocosus</i> (Linnaeus, 1758)	Ottapalam	R
114	Red-vented Bulbul (1126-1132)	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Several places	R
115	White-browed Bulbul (1138-1139)	<i>Pycnonotus luteolus</i> (Lesson, 1841)	Ottapalam, Shornur	R
	<b>Ioras, Chloropsis/Leafbird, Fairy-Bluebird</b>	<b>Irenidae</b>		
116	Common Iora (1097-1101)	<i>Aegithina tiphia</i> (Linnaeus, 1758)	Shornur	R
	<b>Shrikes</b>	<b>Laniidae</b>		
117	Brown Shrike (949-950a)	<i>Lanius cristatus</i> Linnaeus, 1758	Several places*	M
118	Rufous-backed Shrike (946-948)	<i>Lanius schach</i> Linnaeus, 1758	Purathoor	R
	<b>Thrushes, Shortwings, Robins, Forktails, Wheaters</b>	<b>Turdinae</b>		
119	Oriental Magpie-Robin (1661-1664)	<i>Copsychus saularis</i> (Linnaeus, 1758)	Ottapalam, Shornur	R
120	Indian Robin (1717-1721)	<i>Saxicoloides fulicata</i> (Linnaeus, 1776)	Several places*	R
121	Pied Bushchat (1700-1703)	<i>Saxicola caprata</i> (Linnaeus, 1766)	Shornur	R
	<b>Babblers, Laughingthrushes, Babaxes, Barwings, Yuhinas</b>	<b>Timaliinae</b>		
122	Jungle Babbler (1261-1265)	<i>Turdoides striatus</i> (Dumont, 1823)	Chamravattom	R
123	White-headed Babbler (1267-1268)	<i>Turdoides affinis</i> (Jerdon, 1847)	Parali, Lakkidi	R
	<b>Goldcrest, Prinias, Tesias, Warblers</b>	<b>Sylviinae</b>		
124	Ashy Prinia (1515-1518)	<i>Prinia socialis</i> Sykes, 1832	Pallam	R
125	Indian Great Reed-Warbler (1550-1552)	<i>Acrocephalus stentoreus</i> (Hemprich & Ehrenberg, 1833)	Lakkidi	M
	<b>Monarch-Flycatchers &amp; Paradise-Flycatchers</b>	<b>Monarchinae</b>		
126	Asian Paradise-Flycatcher (1460-1464)	<i>Terpsiphone paradisi</i> (Linnaeus, 1758)	Thrithala	M
	<b>Sunbirds &amp; Spiderhunters</b>	<b>Nectariniidae</b>		
127	Purple Sunbird (1916-1918)	<i>Nectarinia asiatica</i> (Latham, 1790)	Several places	M
	<b>Munias (Estrildid Finches)</b>	<b>Estrildidae</b>		
128	Black-headed Munia (1976-1978)	<i>Lonchura malacca</i> (Linnaeus, 1766)	Shornur	R
	<b>Sparrows &amp; Snowfinches</b>	<b>Passerinae</b>		
129	House Sparrow (1938-1939a)	<i>Passer domesticus</i> (Linnaeus, 1758)	Pattambi, Kuttippuram	R
	<b>Weavers</b>	<b>Ploceinae</b>		
130	Baya Weaver (1957-1959)	<i>Ploceus philippinus</i> (Linnaeus, 1766)	Thirunavaya, Pattambi	R
	<b>Starlings &amp; Mynas</b>	<b>Sturnidae</b>		
131	Common Myna (1006-1007)	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Several places*	R
132	Jungle Myna (1009-1011)	<i>Acridotheres fuscus</i> (Wagler, 1827)	Shornur	R
	<b>Orioles</b>	<b>Oriolidae</b>		
133	Eurasian Golden Oriole (952-953)	<i>Oriolus oriolus</i> (Linnaeus, 1758)	Several places	M
134	Black-headed Oriole (958-960a)	<i>Oriolus xanthornus</i> (Linnaeus, 1758)	Ottapalam, Shornur	R
	<b>Drongos</b>	<b>Dicruridae</b>		
135	Black Drongo (962-964)	<i>Dicrurus macrocercus</i> Vieillot, 1817	Several places	R
136	Greater Racket-tailed Drongo (976-981)	<i>Dicrurus paradiseus</i> (Linnaeus, 1766)	Lakkidi, Shornur	R
	<b>Woodswallows/Swallow-Shrikes</b>	<b>Artamidae</b>		
137	Ashy Woodswallow (982)	<i>Artamus fuscus</i> Vieillot, 1817	Shornur, Pattambi, Thirunavaya	R
	<b>Crows, Jays, Treepies, Magpies</b>	<b>Corvidae</b>		
138	Indian Treepie (1030a-1034)	<i>Dendrocitta vagabunda</i> (Latham, 1790)	Several places	R
139	House Crow (1048-1051)	<i>Corvus splendens</i> Vieillot, 1817	Several places*	R
140	Jungle Crow (1054-1057)	<i>Corvus macrorhynchos</i> Wagler, 1827	Several places*	R

Numbers within brackets after the common names are the numbers given to species in Ali and Ripley (1987).

NT - Near Threatened (IUCN Red List Category, Birdlife International, 2001); R - Resident; M - Migrant; \* - Sight records including Purathoor

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## A CASE OF ENDOMETRIAL CARCINOMA IN A SPOTTED DEER *Axis axis*

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#### web supplement

Carcinoma of endometrium and cervix are rare in domestic animals. Though cystic endometrial hyperplasia is common, carcinoma is rare and when it does occur, does not seem require prior hormonal conditioning of the endometrium. Carcinoma of the endometrium appears to occur more frequently in cattle than in other domestic animals. The tumours may be single or multiple, hard, nodular masses of varying size in the uterine wall. Umbilication of the serosal surface is a characteristic feature of the neoplasm. The regional lymph nodes and the lungs are the usual sites of metastatic lesions (Jubb *et al.*, 1993).

The female genitalia recovered from a Spotted Deer (*Axis axis*) of Thrissur Zoo during postmortem examination revealed enlargement of uterus. On detailed examination, the left uterine horn showed multiple nodules of varying sizes in the myometrium, which on sectioning revealed brownish-white cheesy exudates (Image 1<sup>w</sup>). On histopathology, the sections revealed sheets of oval and spindle shaped cells with indistinct cell borders and scanty cytoplasm (Image 2<sup>w</sup>). The nuclei were elongated and hyperchromatic and showed mild pleomorphism. The stroma was scanty with infiltration of tumour cells into the adjacent myometrial tissue. Based on the histological appearance of the sheets of pleomorphic, hyperchromatic epithelial cells with occasional mitotic figures without any stromal reaction and any specific pattern of arrangement, the tumour was histologically diagnosed as a case of endometrial undifferentiated carcinoma. All the other organs were apparently normal.

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<sup>w</sup> see Images 1 & 2 in the web supplement at [www.zoosprint.org](http://www.zoosprint.org)

