

Bird diversity of Siruvani and Muthikulam Hills, Western Ghats, Kerala

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Introduction

The Western Ghats, a biodiversity hot spot, are a 1,500 km long series of hills running parallel to the western coast of the Indian peninsula. The Palghat (Palakkad) Gap is a 40 km wide lowland that breaks this otherwise continuous range. It forms a major natural barrier between the high hills of the Nilgiris and Anamalais, isolating the endemic life forms of the two high altitude habitats. Almost all endemic species found north of the Palakkad Gap are well represented in the Nilgiris—a plateau that rises from the rest of the hills to an elevation of c. 1,800–2,600 m. However, there are other high altitudinal habitats in the Western Ghats north of Palakkad Gap like Bababudan Hills, Kudremukh, Kodachadri, Pushpagiri, Thadayandimol, Brahmagiris, Camel's Hump Mountains and Muthikulam-Palakkad Hills that also have at least some of the endemic birds. All these areas, though each of them may be much smaller when compared to Nilgiri Plateau, are important for avoiding a genetic bottleneck in the Nilgiri Plateau. Assessment of bird diversity and bio-diversity is vital for all these areas. The present bird survey of Siruvani intends to fill this void in our knowledge of its avifauna.

Study area

Siruvani and Muthikulam Hills are part of a wider hill range known as Palghat (Palakkad) Hills. The northern tip of the Palghat Gap rises abruptly from near the Walayar-Madukkara area, as a narrow steep ridge which runs west and curves north along a series of ridges known as the Palamala-Elival-Muthikulam Hills, and then continues north along the Attappady Plateau up to the base of the Nilgiris. These hills, in general are called the Palghat Hills. They include a series of high, steep, almost east-west ridges with fairly undisturbed high elevation tropical moist forests called the Palamala-Elival Hills. This continues to a compact high plateau called the Siruvani (Muthikulam) Hills, which in turn continues east and north-east along the edge of Attappady, the Varadimala-Bolampatti Hills and the outer rim of hills along the Attappady western edge (Nair, 1991). The eastern outer slopes of Palghat Hills are in Tamil Nadu. The eastern ridge encloses the Bolampatti Valley drained by Noyil River. Tributaries of the Bharathapuzha drain the

southern and western faces of Palghat Hills, and the east flowing Bhavani and its tributaries drain the Siruvani and Attappadi plateaux (Nair 1991).

The study area lies between 10°56'–11°04'N 76°37'–76°41'E, forming part of Western Ghats immediately north of Palakkad Gap. The region is in Mannarkad taluk, Palakkad district, Kerala. Most of the forest zone comes under the Agaly range (129.10 km²) of Mannarkad forest division (Fig. 1) with some part of the southern hills falling in Mannarkad and Olavakode ranges. Agaly range is bordered on the north by forest ranges of Attappady, in the west by Mannarkad forest range, east by Coimbatore Forest Division, Tamil Nadu and south by a narrow strip of Mannarkad forest range separating it from the Olavakkod and Walayar ranges of Palakkad division (Ramankutty 2001).

The altitude of Siruvani forests ranges between c. 500–2,060 m, the latter being the height of Elival peak, which lies on the southern border with Mannarkad and Olavakode range. The southern ridges around Muthikulam and Karimala lie above c. 1,300 m and form a unique high altitudinal habitat. The hills gradually descend to the Siruvani reservoir, which lies at about c. 800 m. Evergreen and semi-evergreen forests are more common at this altitude. Apart from a few peaks on the northern side, much of the area is drained by Siruvani River and has good patches of riparian forest. Further north are Sholayur coffee plantations and surrounding habitations. After this point the topography merges with the Attappady Plateau, which is a rain-shadow area of the Western Ghats. Towards the east, the terrain descends to the plains of Bolampatty in Coimbatore division. Towards west, the hills descend to numerous rubber plantations around Kanjirapuzha and Palakkayam. Most of the runoff from these hills collects in Siruvani reservoir, the water source for Coimbatore town. However, parts of the southern ridges also serve as the catchment for Malampuzha reservoir, while the south-western slopes provide water to Kanjirapuzha dam (Ramankutty 2001). Towards the south-western margins, beyond Karimala peak, are a series of fantastic waterfalls known as Meenvallam falls, which are rapidly emerging as a tourist destination.



Fig. 1. Mannarkad division and Agaly range [Pale orange areas are non-forest land.]

Climate

The area enjoys an equable, tropical climate. It receives both, south-west (the predominant one) and north-east monsoons. The average rainfall is 2,000–4,500 mm. The coldest months are December–January when the minimum temperature may dip to -10°C . There are four to five dry months, spanning December–April.

Soil & vegetation

The maximum temperature is 30°C – 32°C . The different soil types range from shallow gravel on the upper hill slopes to deep fine textured soil in the valleys and lower slopes (Ramankutty 2001).

The Siruvani-Muthikulam forests fall under the Indo-Malayan biogeographic zone and Western Ghat Biotic province. Based on the revised system of classification of Indian forests by Champion & Seth (1968) following forest types met within the study area (Ramankutty 2001).

West coast tropical evergreen forests

Most of the forest in the study area is of this type. Its predominant tree species are *Cullinia exarillata*, *Calophyllum polyanthium*, *Mesua ferra*, *Palaquim ellipticum*, *Dysoxylum malabaricum*, etc. The critically endangered evergreen tree *Veteria macrocarpa* is endemic to this region.

West coast tropical semi-evergreen forests

This type of vegetation is found in transitional zone of evergreen and moist deciduous forests in the brim area of Siruvani Reserve abetting private land and adjoining the border area of Tamil Nadu. The tree species found here

are *Dipterocarpus indicus*, *Bombax ceiba*, *Polyalthia fragrans*, *Terminalia bellerica*, *Ficus* sp., *Stereospermum chelonoides*, etc.

Southern mountain wet temperate forests and grasslands

This type of vegetation is met with in the higher elevation above 1,700 m at Muthikulam and Karimala. Rolling grasslands and stunted evergreen vegetation in protected folds are found in this area. The stunted evergreen forests seen among these high altitude grasslands are known as shola forests.

Previous studies

Siruvani Hills have been largely unstudied in terms of avi-fauna. Unlike the Nelliampathies where A. P. Kinloch (1921a, b; 1923a, b) documented birdlife in the early 1920s, there have been no such studies in this region. The ornithology of Silent Valley National Park, north-west of these hills and separated by Attappady plateau, has been quite extensively worked (Bashir & Nameer 1993; Nameer 1995; Pramod 1999; Uthaman in prep.). Similarly the southern lower ridges of Palakkad Hills around Walayar, Malampuzha and Dhoni have also been reasonably well worked (Praveen et al. 1994, Praveen et al. 1997). However, the scanty information on birds of Siruvani Hills that we have from individual birdwatchers has never been collated and published and hence very little is known about the bird communities in this region. Hence, this survey fills an important gap in the ornithology of Kerala.

Methodology

A four-day long bird survey was conducted at Siruvani from 10–13.ii.2007, in which about 35 birdwatchers from various parts of southern India participated. There were six base camps selected for this survey namely, Muthikulam, Karimala, Kuravampady, Singampara, Koodam and Pattiyar. The base camps were selected in such a way that all the representative habitats of the region were covered. Each camp comprised three to four birdwatchers. Prefixed transects radiating from the base camps were worked from 07:30–11:00 hrs and again from 14:30–18:00 hrs. All birds spotted on transects were recorded species wise. Apart from this the number of individuals per species was also counted. This was done for the first two hours after which only those species that were not seen on that transect, on that day, were recorded. Transects were walked at a uniform pace of approximately half a kilometer per hour. Altogether 36 transects were covered in four days. All the birds opportunistically sighted/heard were also recorded separately. This information was used mainly for the preparation of the checklist. The data thus collected were recorded on prescribed datasheets. Each species was then assigned to various feeding guilds such as aerial (AER), aquatic (AQ), bark surface feeders (BAR), canopy insectivores (CAN), carnivorous (CAR), frugivores (FRU), nectarivore–insectivore (NEC), omnivore (OMN), parasitic cuckoos (PAR), piscivores (PIS), terrestrial insectivores (TER), understory insectivores (UND), modified after Raman et al. (1998). The birds were identified using binoculars (10 x 50 or 8 x 40) and field guides of Ali & Ripley (1987), Grimmett et al. (1998) and, Kazmierczak (2000). The data were analyzed using the software BIODIVERSITY PRO Version2 (McAleece 1997).

Each survey team had at least one seasoned birdwatcher who could identify all the forest birds with confidence. Moreover on the last day of the survey there was a plenary session, wherein all participants assembled at one place. Each team made a brief presentation about their findings during the survey. Each team leader had to clarify unequivocally all queries that participants raised during the course of his/her presentation. All the doubtful entries were rejected.

Results & discussion

The present study tallied a checklist of 158 avian species (Appendix 1). Fourteen species endemic to Western Ghats were recorded while nine Red Data book species were also noted.

Significant sightings

The following were significant observations during the study.

Common Buzzard *Buteo buteo*

A single sighting from Singampara base camp by P. A. Vinayan on 11.ii.2007.

Bonelli's Eagle *Hieraetus fasciatus*

Two sightings of a juvenile from the high altitudinal grasslands around Muthikulam on 11–12.ii.2007. It is interesting to note that a juvenile was also recorded from Silent Valley National Park (SVNP) during December 2006. (Uthaman *in prep.*)

Lesser (?) Grey-headed Fish-Eagle *Ichthyophaga humilis*

Two sightings near Siruvani Dam, Pattiyar, on 12–13.ii.2007. Initial observations in the field suggested this species. During the second sighting, the bird was photographed by Praveen Mohandas. However, experts feel that the photograph is not good enough to clearly differentiate it from Greater Grey-headed Fishing Eagle *I. ichthyaeetus*, as the upper tail coverts are not visible. IUCN Category: Near Threatened.

Nilgiri Wood-Pigeon *Columba elphinstonii*

A total of nine encounters recorded during transects from Pattiyar and Muthikulam base camp. The bird was quite vocal around the southern slopes of Elival ridge. Compared to previous studies in SVNP, Siruvani region seems to have a healthier population of this species. IUCN Category: Vulnerable.

Oriental Bay-Owl *Phodilus badius*

Calls recorded on 10.ii.2007 from Kuravampady base camp by P. O. Nameer and his team. This bird has also been recorded from SVNP on two previous occasions. One sighting was by P. O. Nameer and P. K. Uthaman identified the other from a photo taken by V. Premkumar (Uthaman 1999).

Ceylon Frogmouth *Batrachostomus moniliger*

Calls recorded on 10.ii.2007 from Kuravampady base camp by P. O. Nameer and his team.

Blue-eared Kingfisher *Alcedo meninting*

Single sight record from Pattiyar base camp by Bimal Nath on 12.ii.2007. There are also records of this species from SVNP.

Great Pied Hornbill *Buceros bicornis*

Strangely absent during most of the survey, though ideal habitats were present and covered. E. Kunhikrishnan heard one bird calling while trekking from Singampara to Muthikulam base camp on 10.ii.2007.

Speckled Piculet *Picumnus innominatus*

Two sightings from Pattiyar base camp on 11.ii.2007 & 13.ii.2007.

Great Black Woodpecker *Dryocopus javensis*

Four sightings during transects from the base camps of Pattiyar and Kuravampady.

Blue Rock-Thrush *Monticola solitarius*

One sighting of a male at Pattiyar by Bimal Nath on 13.ii.2007.

White-bellied Shortwing *Brachypteryx major*

Single sighting in thick shrubby undergrowth of *Strobilanthus* sp., from Muthikulam by Praveen J., and Shashank Dalvi. During a pilot survey in 2005, Praveen saw one bird near the higher reaches of Karimala in similar habitat. It has also been reported at the base of Muthikulam falls (P. Balakrishnan, verbally xii.2006). Hence, this is the third report of this species from these hills. These reports also form the southern most distribution of the nominate race of this species. The first report of this species from Kerala was from Nilikkal region of SVNP on 26.xii.1990 (Neelakantan et al. 1993). This was later also reported from Aralam Wildlife Sanctuary (Sashikumar et al. 2005). IUCN Category: Vulnerable.

Nilgiri Laughingthrush *Garrulax cachinnans*

There were 18 sightings of 33 individuals, from Muthikulam to Elival ridge, mostly above c. 1,600 m. The team from Muthikulam, comprising of Kunhikrishnan, E, Praveen, J, Shashank Dalvi and Siddharth Nubro made this remarkable discovery—the first record outside the Nilgiri Plateau. About five encounters of 13 individuals were from the southern ridge of Elival peak, which is in Palakkad division. Potentially, this might be the largest population in Kerala. The other known population in Kerala is from Sispara region in SVNP, which extends farther east into Upper Bhavani area near Thodukky in Attappady and west through the western cliff face of Nilgiris in the New Amarambalam forests. IUCN Category: Endangered.

Tytler's Leaf-Warbler *Phylloscopus tytleri*

A few birds recorded by the Muthikulam team in the sholas on the southern slopes of Elival ridge. A very similar local distribution was also noted in Sispara, SVNP during the recent bird surveys (Uthaman in prep). IUCN Category: Near-threatened.

Broad-tailed Grass-Warbler *Schoenicola platyura*

One sighting near a marshy area adjoining Siruvani Dam near Pattiyar on 13.ii.2007 by Bimal Nath. This has also been reported from SVNP (Uthaman in prep.). IUCN Category: Vulnerable.

Black-and-Orange Flycatcher *Ficedula nigrorufa*

Several sightings and call records from Muthikulam. One from Karimala by Sandilya. This species is reasonably common in several areas in SVNP. IUCN Category: Near-threatened.

Breeding records

Since the bird survey was conducted in late winter/early spring, many of the resident species had started breeding. Those breeding at Siruvani are listed in Table 1.

Species diversity analysis**Bird species richness and diversity at Siruvani**

The number of species and the total number of individuals of each, from the six base camps at Siruvani are given in

Table 1. Breeding records of the birds at Siruvani during the present survey between 10–13.ii.2007

Species	Location
Great Cormorant	Siruvani Dam
Malabar Grey Hornbill	Kuravampady
Small Sunbird	Singampara
Chestnut-headed Bee-eater	Siruvani Dam
Crimson-throated Barbet	Kuravampady
Asian Fairy Bluebird	Koodam
Indian Scimitar Babbler	Singampara

Table 2. Bird species and population at different base camps at Siruvani and Muthikulam Hills, southern Western Ghats. [Legend: PT=Pattiyar, SP=Singampara, MK=Muthikulam, KD-Koodam, KA=Karimala, KU=Kuravampady]

Base camps	PT	SP	MK	KD	KA	KU
Number of species	117	87	46	57	39	88
Number of individuals	3579	1250	415	441	632	666

Table 2. Using this data, the diversity indices were calculated and are shown in Figs. 3–5. Kuravampady had the highest diversity, understandably, due to the mix of plantations and natural forests leading to several ecotones. Pattiyar followed this, again, due to the proximity of the reservoir and the diverse habitat types found there. Muthikulam and Karimala recorded the least diversity among the base camps.

Similarity of birds among the different locations and habitats at Siruvani

Bray-Curtis cluster analysis of similarity of birds within the six study sites and three habitat types is given in Fig. 3. This illustrates the degree of commonality that exists between the birdlife of each base camp. Birdlife of Pattiyar and Kuravampady differs from the rest of the base camps, mainly due to the presence of the reservoir, in the case of the former, and plantations, of the latter. Karimala, though a high altitude habitat, shows slightly more likeness towards Singampara, which is nearest to Karimala as compared to Muthikulam to which the habitat and altitude are closer.

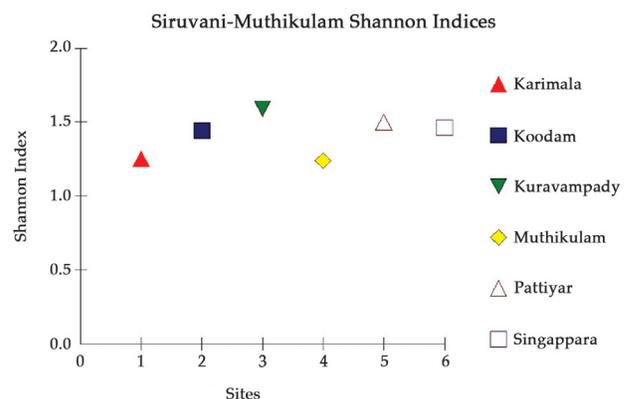


Fig. 1. Diversity of birds at different base camps at Siruvani and Muthikulam Hills, southern Western Ghats.

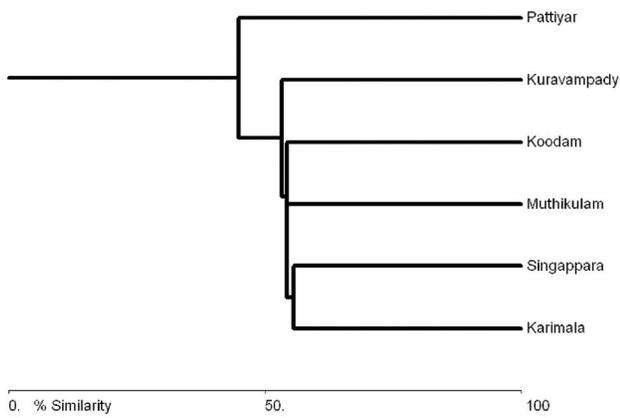


Fig. 3. Bray-Curtis Cluster Analysis (single link) of similarity of birds at different base camps at Siruvani

This is due to the fact that the Karimala team was hampered by problems of logistics and hence resorted to more transect counts at mid-altitudes rather than higher. Koodam and Singampara, which are close by locations, also show much similarity.

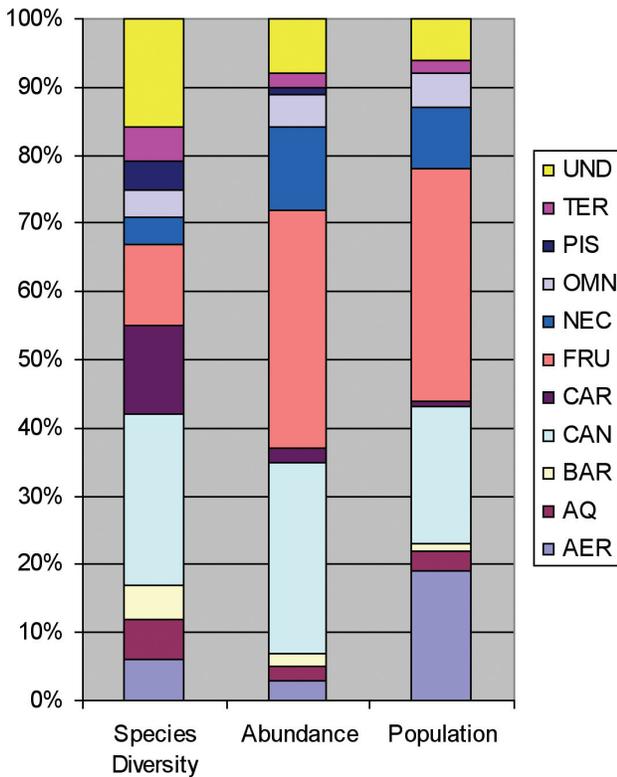


Fig. 4. Feeding guild structure of birds of Siruvani-Muthikulam

[Legend: aerial (AER), aquatic (AQ), bark surface feeders (BAR), canopy insectivores (CAN), carnivorous (CAR), frugivores (FRU), nectarivore–insectivore (NEC), omnivore (OMN), parasitic cuckoos (PAR), piscivores (PIS), terrestrial insectivores (TER), understorey insectivores (UND)]

Feeding guild structure

The feeding guild structure demonstrates a lot of interesting facets about the birdlife of a place. In the specific case of Siruvani, it can be noted that frugivorous birds are the dominant group (35% in terms of abundance) constituted by just 12% of the total species (Fig. 4). Canopy species come next (28% in abundance), constituting 25% of the species, indicating a more uniform coverage. Nectarivores comprise 4% with an abundance of 12%, mainly due to the ubiquitous Small Sunbird. 16% of under-storey species have only 12% abundance—this may be because most of the under-storey species are shy and they don't figure prominently in the numbers (e.g. White-bellied Shortwing)—however, it is important to note that a good number of under-storey and terrestrial (6%) species were recorded at Siruvani. 6% of aerial feeding species with only 3% abundance but a population of 19%, indicating a large flock size (e.g. Indian Edible-Nest Swiftlet).

Future monitoring

The present study has given several insights into the birdlife of Siruvani and Muthikulam Hills. It confirms the conjecture that all the high-altitudinal birdlife found in the Nilgiri Plateau is expected to occur in these ranges. The discovery of Nilgiri Laughingthrush in these hills is significant in establishing the importance of these habitats. However, regular long-term monitoring of the birdlife of Siruvani would help us understand the dynamics of its birdlife and would also give interesting insights of its bird community structure and population fluctuations. The studies by Sashikumar et al. (2005) on the birds of Aralam Wildlife Sanctuary, monitoring birds of the sanctuary since 2000, have provided interesting insights into the bird community dynamics of Aralam, which should contribute in the formulation of conservation policy for birds at Aralam. Similar long-term surveys should be conducted at Siruvani.

Shola forests are one of the most sensitive habitats in the Western Ghats. Siruvani and Muthikulam Hills have a fairly good cover of this habitat. A more extensive year-round monitoring of shola bird populations should be carried out, if possible with bird ringing, to estimate the population of high altitudinal endemics like Black-and-Orange Flycatcher, White-bellied Shortwing and most importantly Nilgiri Laughingthrush. A rough estimate of the population of Nilgiri Laughingthrush from Siruvani-Muthikulam region is 200–250 individuals. However, a more extensive survey will reveal more accurate numbers. Such a survey is urgently required to understand the status of this endangered species in these hills.

Recommendations

Many of the undisturbed forests of Kerala lie outside her protected area network. This is true with Siruvani too. Lying on the southern tip of the Nilgiri Biosphere, its avian diversity is almost on par with Silent Valley National Park. Some of the specific recommendations for the conservation of these hills are given below.

1. Forests of Siruvani, Muthikulam Hills, forests around Elival Ridge and the high peaks of Palakkad division, together, should be constituted into a wildlife sanctuary, preferably named Muthikulam Wildlife Sanctuary.
2. Forests of Siruvani and Muthikulam along with certain areas of Palakkad Hills should be notified as an Important Bird Area (IBA) as per the BirdLife International guidelines.
3. Conduct a more detailed study on the population assessment of Nilgiri Laughingthrush in these hills.

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Appendix 1. Checklist of birds of Siruvani and Muthikulam Hills

[Legend: MK=Muthikulam, KA=Karimala, PT=Pattiyar, SP=Singampara, KD=Koodam, KU=Kuravampady, Enc=Number of times a species was sighted/heard during the survey, Num=Total number of individuals of a species counted during the survey.]

Species	MK	KA	PT	SP	KD	KU	Encounters	Numbers
Little Grebe <i>Tachybaptus ruficollis</i>			x				8	63
Little Cormorant <i>Phalacrocorax niger</i>			x			x	5	7
Great Cormorant <i>Phalacrocorax carbo</i>			x	x			7	15
Darter <i>Anhinga melanogaster</i>			x				3	3
Little Egret <i>Egretta garzetta</i>			x				1	1
Indian Pond-Heron <i>Ardeola grayii</i>			x	x	x	x	15	51
Little Green Heron <i>Butorides striatus</i>			x				1	1
Oriental Honey-Buzzard <i>Pernis ptilorhynchus</i>			x	x			11	12
Black-shouldered Kite <i>Elanus caeruleus</i>						x	1	1
Brahminy Kite <i>Haliastur indus</i>			x				7	7
Lesser Grey-headed Fish-Eagle <i>Ichthyophaga humilis</i>			x				2	2
Crested Serpent-Eagle <i>Spilornis cheela</i>			x	x		x	20	22
Crested Goshawk <i>Accipiter trivirgatus</i>	?			x	x		2	2
Shikra <i>Accipiter badius</i>			x				1	1
Besra Sparrowhawk <i>Accipiter virgatus</i>			x	x			3	3
Common Buzzard <i>Buteo buteo</i>				x			1	1
Black Eagle <i>Ictinaetus malayensis</i>	x	x	x	x	x	x	13	17
Bonelli's Eagle <i>Hieraetus fasciatus</i>	x						1	1

Species	MK	KA	PT	SP	KD	KU	Encounters	Numbers
Booted Eagle <i>Hieraaetus pennatus</i>			x	x			1	1
Rufous-bellied Eagle <i>Hieraaetus kienerii</i>	x				x		2	2
Changeable Hawk-Eagle <i>Spizaetus cirrhatu</i>					x		1	1
Osprey <i>Pandion haliaetus</i>			x				1	1
Common Kestrel <i>Falco tinnunculus</i>	x						1	1
Red Spurfowl <i>Galloperdix spadicea</i>	x		x	x			7	9
Grey Junglefowl <i>Gallus sonneratii</i>	x	x	x	x	x	x	41	64
Red-wattled Lapwing <i>Vanellus indicus</i>			x				17	26
Green Sandpiper <i>Tringa ochropus</i>			x				1	1
Common Sandpiper <i>Actitis hypoleucos</i>			x				3	8
Nilgiri Wood-Pigeon <i>Columba elphinstonii</i>	x		x				9	11
Spotted Dove <i>Streptopelia chinensis</i>			x			x	18	29
Emerald Dove <i>Chalcophaps indica</i>	x	x	x	x	x	x	54	57
Pompadour Green-Pigeon <i>Treron pompadora</i>			x	x	x	x	51	84
Mountain Imperial-Pigeon <i>Ducula badia</i>	x	x	x	x	x	x	75	94
Indian Hanging-Parrot <i>Loriculus vernalis</i>		x	x	x	x	x	155	212
Rose-ringed Parakeet <i>Psittacula krameri</i>			x				1	1
Plum-headed Parakeet <i>Psittacula cyanocephala</i>			x			x	5	18
Blue-winged Parakeet <i>Psittacula columboides</i>		x	x	x	x	x	78	119
Brainfever Bird <i>Hierococcyx varius</i>				x			1	1
Greater Coucal <i>Centropus sinensis</i>			x	x		x	25	26
Oriental Bay-Owl <i>Phodilus badius</i>						x	1	1
Oriental Scops-Owl <i>Otus sunia</i>				x		x	1	1
Collared Scops-Owl <i>Otus bakkamoena</i>						x	1	1
Brown Fish-Owl <i>Ketupa zeylonensis</i>				x			1	1
Jungle Owlet <i>Glaucidium radiatum</i>				x		x	1	1
Brown Hawk-Owl <i>Ninox scutulata</i>			x	x	x	x	1	1
Ceylon Frogmouth <i>Batrachostomus moniliger</i>						x	1	1
Indian Jungle Nightjar <i>Caprimulgus indicus</i>			x				1	1
Indian Edible-nest Swiftlet <i>Collocalia unicolor</i>		x	x	x	x	x	57	1026
White-rumped Needletail-Swift <i>Zoonavena sylvatica</i>			x				2	31
Alpine Swift <i>Tachymarpis melba</i>		x	x	x		x	16	37
Crested Tree-Swift <i>Hemiprocne coronata</i>						x	1	2
Malabar Trogon <i>Harpactes fasciatus</i>	x	x	x	x	x	x	17	19
Small Blue Kingfisher <i>Alcedo atthis</i>				x		x	3	3
Blue-eared Kingfisher <i>Alcedo meninting</i>			x				1	1
Stork-billed Kingfisher <i>Halcyon capensis</i>			x		x		5	5
White-breasted Kingfisher <i>Halcyon smyrnensis</i>			x			x	15	17
Lesser Pied Kingfisher <i>Ceryle rudis</i>			x				3	5
Blue-tailed Bee-eater <i>Merops philippinus</i>			x				1	2
Chestnut-headed Bee-eater <i>Merops leschenaulti</i>		x	x	x	x	x	32	92
Malabar Grey Hornbill <i>Ocyrceros griseus</i>		x	x	x	x	x	36	42
Great Pied Hornbill <i>Buceros bicornis</i>			x				1	1
White-cheeked Barbet <i>Megalaima viridis</i>	x	x	x	x	x	x	231	368
Crimson-throated Barbet <i>Megalaima rubricapilla</i>			x	x		x	34	38
Coppersmith Barbet <i>Megalaima haemacephala</i>			x				1	1
Speckled Piculet <i>Picumnus innominatus</i>			x				2	2
Brown-capped Pygmy Woodpecker <i>Dendrocopos nanus</i>						x	1	1
Great Black Woodpecker <i>Dryocopus javensis</i>			x			x	4	4
Common Golden-backed Woodpecker <i>Dinopium javanense</i>	x		x	x		x	10	13
Lesser Golden-backed Woodpecker <i>Dinopium benghalense</i>			x				1	1
Greater Golden-backed Woodpecker <i>Chrysocolaptes lucidus</i>		x	x	x	x	x	16	23
Heart-spotted Woodpecker <i>Hemicircus canente</i>			x	x	x	x	16	21
Indian Pitta <i>Pitta brachyura</i>					x		1	2
Dusky Crag-Martin <i>Hirundo concolor</i>	x		x	x			4	11
Common Swallow <i>Hirundo rustica</i>			x	x		x	17	150
House Swallow <i>Hirundo tahitica</i>	x		x	x			17	76
Red-rumped Swallow <i>Hirundo daurica</i>			x				1	10
Forest Wagtail <i>Dendronanthus indicus</i>				x			4	7
Large Pied Wagtail <i>Motacilla maderaspatensis</i>			x	x		x	6	10
Grey Wagtail <i>Motacilla cinerea</i>	x	x	x	x	x	x	22	29
Paddyfield Pipit <i>Anthus rufulus</i>	x		x				2	5
Large Cuckoo-Shrike <i>Coracina macei</i>			x				1	1
Black-headed Cuckoo-Shrike <i>Coracina melanoptera</i>			x			x	1	2
Small Minivet <i>Pericrocotus cinnamomeus</i>			x				1	1
Scarlet Minivet <i>Pericrocotus flammeus</i>	x	x	x	x	x	x	33	67
Pied Flycatcher-Shrike <i>Hemipus picatus</i>			x				1	1
Large Woodshrike <i>Tephrodornis gularis</i>			x	x		x	9	17
Common Woodshrike <i>Tephrodornis pondicerianus</i>			x				1	1
Grey-headed Bulbul <i>Pycnonotus priocephalus</i>	x	x	x		x	x	17	35

Species	MK	KA	PT	SP	KD	KU	Encounters	Numbers
Black-crested Bulbul <i>Pycnonotus melanicterus</i>			x				1	1
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	x		x	x	x	x	133	274
Red-vented Bulbul <i>Pycnonotus cafer</i>						x	3	4
Yellow-browed Bulbul <i>Iole indica</i>	x	x	x	x	x	x	267	557
Black Bulbul <i>Hypsipetes leucocephalus</i>	x	x	x	x	x	x	169	406
Common Iora <i>Aegithina tiphia</i>			x	x		x	7	8
Jerdon's Chloropsis <i>Chloropsis cochinchinensis</i>			x		x		2	3
Gold-fronted Chloropsis <i>Chloropsis aurifrons</i>			x	x		x	17	24
Asian Fairy-Bluebird <i>Irena puella</i>		x	x	x	x	x	44	56
Brown Shrike <i>Lanius cristatus</i>			x	x		x	3	3
Blue-headed Rock-Thrush <i>Monticola cinclorhynchus</i>	x	x		x		x	7	7
Blue Rock-Thrush <i>Monticola solitarius</i>			x				1	1
Malabar Whistling-Thrush <i>Myiophonus horsfieldii</i>	x	x	x	x	x	x	49	55
Orange-headed Thrush <i>Zoothera citrina</i>		x		x	x		7	7
Eurasian Blackbird <i>Turdus merula</i>	x		x	x		x	7	9
White-bellied Shortwing <i>Brachypteryx major</i>	x						1	1
Indian Blue Robin <i>Luscinia brunnea</i>	x			x	x		4	4
Oriental Magpie-Robin <i>Copsychus saularis</i>						x	1	1
Wynaad Laughingthrush <i>Garrulax delesserti</i>	x	x	x	x			9	45
Nilgiri Laughingthrush <i>Garrulax cachinnans</i>	x						8	11
Spotted Babbler <i>Pellorneum ruficeps</i>	x		x	x		x	23	21
Indian Scimitar-Babbler <i>Pomatorhinus horsfieldii</i>	x	x	x	x	x	x	125	156
Black-headed Babbler <i>Rhopocichla atriceps</i>	x		x	x	x	x	23	47
Indian Rufous Babbler <i>Turdoides subrufus</i>				x		x	13	34
Jungle Babbler <i>Turdoides striatus</i>			x				1	1
Quaker Tit-Babbler <i>Alcippe poioicephala</i>	x		x	x	x	x	75	138
Blyth's Reed-Warbler <i>Acrocephalus dumetorum</i>	x	x	x	x	x	x	90	100
Common Tailorbird <i>Orthotomus sutorius</i>						x	1	1
Tickell's Warbler <i>Phylloscopus affinis</i>	x	x					4	6
Greenish Leaf-Warbler <i>Phylloscopus trochiloides</i>	x	x	x	x	x	x	177	256
Large-billed Leaf-Warbler <i>Phylloscopus magnirostris</i>	x	x	x	x	x	x	114	121
Tytler's Leaf-Warbler <i>Phylloscopus tytleri</i>	x						2	6
Western Crowned Warbler <i>Phylloscopus occipitalis</i>	x		x	x	x	x	5	5
Broad-tailed Grass-Warbler <i>Schoenicola platyura</i>			x				1	1
Asian Brown Flycatcher <i>Muscicapa dauurica</i>			x	x	x	x	13	14
Rusty-tailed Flycatcher <i>Muscicapa ruficauda</i>		x	x	x	x	x	36	41
Brown-breasted Flycatcher <i>Muscicapa muttui</i>		x	x	x	x		8	10
Black-and-Orange Flycatcher <i>Ficedula nigrorufa</i>	x	x					6	6
Verditer Flycatcher <i>Eumyias thalassina</i>			x	x	x	x	6	6
Nilgiri Flycatcher <i>Eumyias albicaudata</i>	x		x	x			17	18
White-bellied Blue-Flycatcher <i>Cyornis pallipes</i>		x	x	x	x	x	13	19
Blue-throated Flycatcher <i>Cyornis rubeculoides</i>			x	x		x	3	3
Tickell's Blue-Flycatcher <i>Cyornis tickelliae</i>			x	x			1	1
Grey-headed Flycatcher <i>Culicicapa ceylonensis</i>	x						11	14
Asian Paradise-Flycatcher <i>Terpsiphone paradisi</i>		x	x	x	x	x	40	43
Black-naped Monarch-Flycatcher <i>Hypothymis azurea</i>		x				x	1	1
Black-lored Yellow Tit <i>Parus xanthogenys</i>	x			x	x	x	5	6
Velvet-fronted Nuthatch <i>Sitta frontalis</i>			x	x	x	x	9	13
Thick-billed Flowerpecker <i>Dicaeum agile</i>			x	x			9	15
Tickell's Flowerpecker <i>Dicaeum erythrorhynchos</i>			x				20	21
Plain Flowerpecker <i>Dicaeum concolor</i>	x		x			x	20	24
Purple-rumped Sunbird <i>Nectarinia zeylonica</i>			x	x	x		10	12
Small Sunbird <i>Nectarinia minima</i>	x	x	x	x	x	x	357	515
Purple Sunbird <i>Nectarinia asiatica</i>			x				4	7
Little Spiderhunter <i>Arachnothera longirostra</i>				x	x	x	7	10
Oriental White-eye <i>Zosterops palpebrosus</i>	x	x	x	x	x	x	68	156
Common Rosefinch <i>Carpodacus erythrinus</i>					x	x	1	2
Jungle Myna <i>Acridotheres fuscus</i>						x	2	11
Southern Hill-Myna <i>Gracula indica</i>			x	x	x	x	82	208
Eurasian Golden Oriole <i>Oriolus oriolus</i>		x	x	x	x	x	34	42
Black-naped Oriole <i>Oriolus chinensis</i>			x				1	1
Black-headed Oriole <i>Oriolus xanthornus</i>						x	1	1
Black Drongo <i>Dicrurus macrocercus</i>			x				1	1
Ashy Drongo <i>Dicrurus leucophaeus</i>	x	x	x	x	x	x	42	62
Bronzed Drongo <i>Dicrurus aeneus</i>				x		x	1	1
Greater Racket-tailed Drongo <i>Dicrurus paradiseus</i>			x	x	x	x	69	80
Ashy Woodswallow <i>Artamus fuscus</i>						x	1	1
Indian Treepie <i>Dendrocitta vagabunda</i>			x				1	1
White-bellied Treepie <i>Dendrocitta leucogastra</i>		x	x	x	x	x	82	104
Jungle Crow <i>Corvus macrorhynchos</i>				x		x	3	4