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HOST PLANTS OF *DENDROPHTHOE FALCATA* (L.F) ETTINGSH. – A PARASITE PLANT IN GSFC TOWNSHIP, VADODARA, GUJARAT, INDIA

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ABSTRACT:

GSFC (Gujarat State Fertilizer Company), Vadodara, is reputed semi-government agency in Gujarat State, India. The township of GSFC harbours native and wild plant taxa. Among them, *Dendrophthoe falcata* (L.F) Ettingsh. (hemi-parasitic plant on stem) received a considerable attention among phanerogamic parasite due to its prolific effect on host plants. Keeping in mind, a methodical survey of six consecutive months (June-December) during the year 2002 was conducted to establish a correlation between *Dendrophthoe falcata* and its host plants. The information on phenology and height of the plant, total number of affected plants, and number of affected branches of particular plant species was documented. Besides, number of dead plants was also recorded (affected by *Dendrophthoe falcata*). A comprehensive checklist of 147 plants and 37 species of birds (dependant on the host plants of *Dendrophthoe falcata*) of GSFC township has been prepared during the present study.

KEY WORD: Host plants, *Dendrophthoe falcata*, parasite, GSFC, Vadodara.

INTRODUCTION:

Among angiosperms, parasitic relationship through the formation of haustorial linkages is known to be a widespread (Wilson and Calvin, 2006). *Dendrophthoe falcata* (L.f) Ettingsh. belongs to family Loranthaceae; comprises about 31 species spread across tropical Africa, Asia and Australia, among which 7 species are found in India; bears grey barks, thick coriaceous leaves with stout flowers. Two of its varieties are widespread in India viz., var. *falcata* (Honey Suckled Mistletoe) and var. *Coccinea* (Red Honey Suckled Mistletoe) distinguished by white and red flowerings, respectively. The plant is a partial stem-parasite; grows on around 401 host plants (especially on tree species such as *Bombax ceiba* L. and *Madhuca indica* L.) ([Moore and Inamdar, 1976](#)); most common of all the mistletoes that occur in India, which does not have an indigenous rooting system, and is dependent on the host for water and minerals. The haustorial connections of the parasite with the plant are devoid of any efficient retranslocation system ([Smith and Stewart, 1990](#)).

Taxonomically, it is a large bushy shrub, dichotomously branched, perennial, partial stem parasite, glabrous with grey-smooth bark, having twiggy and woody branches. Leaves thick, sub-sessile, coriaceous, elliptic ovate to oblanceolate, mostly opposite, obtuse, sometimes acute, entire, slightly shining, variable in size and shape, midrib prominent, usually red, secondary nerves obscure, and with attenuated base. Flowers whitish yellow, red, orange-red or yellowish red and sometimes pink, 5-15 cm. long, axillary to supra-axillary, unilateral spikes with persistent bract. Calyculus 4 mm. long, glabrous and persistent with 4-5 lobes, stamens 5, filament approximately 3-5 mm. long or even upto corolla and epipetalous, glabrous. Style 2.5-3.5 cm. long with capitate stigma. Fruit berries 7-11 mm. long, bright red, globose to ovoid-oblong, seeds minute and oblong ([Cooke, 1908](#); [Shah, 1978](#); [Bole and Pathak, 1988](#); [Shetty and Singh, 1991](#)).

In Sanskrit, *Dendrophthoe falcata* is known as 'Vriksha Bhakshi (Plant Eater)' for its feeding dependence (sucking) behaviour on other plants ([Thaker, 1998](#)). Parasitism by various species of *Loranthus* on different angiosperms as well as gymnosperms including numerous economic and horticultural taxa has been recorded from time to time from several states in India ([Ghosh, 1968, 1971](#)). One of the deciding factors for the establishment of such type of parasitism could be intense osmotic pressure between host and parasite plants ([Narayanasamy and Sampathkumar, 1979](#)). One of the characteristic features of *Dendrophthoe falcata* (L.f) Ettingsh. is its non-specificity for the selection of host plant ([Sampathkumar and Selvaraj, 1980](#)).

With ethnobotanical point of view, the bark of the plant is astringent and narcotic, used in wound healing and subside the menstrual troubles. It has been proved as a panacea for constipation, asthma and insanity. In some tribal pockets of the country, the plant is also reported to be used as a substitute for betel nut as

well as for economic purposes ([Kirtikar and Basu, 1933](#)). The branches and leaves of the plant are used as painting materials, while the dry leaves and boiled flowers are used to cure diarrhea and dysentery. The plant is used in curing some common ailments like cold, nose-bleeding, arthritis, leucorrhoea and rheumatism ([Thaker, 1998](#)).

STUDY AREA:

GSFC (Gujarat State Fertilizer Company) is located about 7 km from Vadodara City on western side towards Ahmedabad -Mumbai bypass. The campus of the company itself is a big township; spanning about 4 sq. km area, with factory units as well as residential quarters. Although it is one of the highly populated and highly industrialized areas of the State, it harbours remarkable diversity of various floristic and faunistic elements. The plant diversity of the area is displayed by dry deciduous elements along with some ornamental varieties. Later are grown along road-sides in the campus under plantation programmes. Most of the landscape elements of the campus area has either been ploughed for development of nurseries or used for construction of roads, small production units, and residential complexes.

METHODOLOGY:

An organized survey was carried out for the enumeration of host plant species in entire campus of GSFC including township and its surrounding area for six consecutive months (June to December, 2002). The investigation was made to enumerate an individual tree, shrub and under-shrub to know the precise distribution of the parasite plant present therein. The area of entire campus was divided into different zones to identify the number of affected host plants. The avifauna dependant on host plants was also recorded during morning as well as evening hours. A particular attention was paid to prepare a checklist of seed pollinator birds to check their dependence of host plants.

RESULTS AND DISCUSSIONS:

Host Preference

Most of the plant species are affected by the plants belongs to the family Loranthaceae, which are parasites on host plants (Sampathkumar and Kunchithapatham, 1968). *Dendrophthoe falcata* (L.f) Ettingsh. is one of them. During the present investigation, 28 species of host plants were found affected by *Dendrophthoe falcata*. In total, 95 individuals of host plants were recorded, affected by a parasite plant. Of these, maximum number of individuals (45) of *Mangifera indica* was found affected, accounted for 47.37% of the total number of individuals affected, followed by five individuals (5.26%) of *Achras zapota*, four individuals (4.21%) each of *Casuarina equisetifolia* and *Manilkara hexandra*, and three individuals (3.16%) each of *Bombax ceiba*, *Holoptelea integrifolia* and *Kigelia pinnata*. On the other

hand, only two individuals each of *Ailanthus excelsa*, *Bauhinia purpurea*, *Cassia fistula*, *Derris indica*, *Ficus religiosa*, *Peltophorum pterocarpum* and *Pithecellobium dulce* were affected by a parasite plant, accounted for 2.11%, while only one individual (1.05%) of *Albizia amara* Boivin, *Albizia lebbeck*, *Azadirachta indica*, *Cordia dichotoma*, *Eucalyptus globules*, *Eugenia jambolana*, *Ficus microcarpa*, *Millingtonia hortensis*, *Mitragyna parviflora*, *Nyctanthus arbortristis*, *Prosopis cineraria*, *Pterospermum acerifolium*, *Punica granatum* and *Psidium guajava* each was found affected by *Dendrophthoe falcata* (Table 1).

Magnitude of Effects

During the entire study period, in total 344 parasite plants (*Dendrophthoe falcata*) were observed affecting 50 host plants (52.63%), which were exhibited by their profuse growth on slightly broad secondary branches (93.02%), and were very rarely reported on primary branches (6.98%) of the host plants. Within the total parasite plants, 56.40% plants were vegetative and 43.60% plants were observed in flowering phenophase. In township area, six plants were found dead, probably owing to be infected by parasite plants. Maximum number of parasite plants (21) was noted on *Mangifera indica*, followed by affected host plant species e.g. *Manilkara hexandra* (2 to 21), *Bauhinia purpurea* (9) and *Syodium guajava* (7). The occurrence of prolific number of parasite plants (*Dendrophthoe falcata*) might be due to occurrence of fissured barks and sizeable diameter of stems of host plants, which perhaps favoured the abundant growth of parasite plants ([Ragupathy and Mahadevan, 1991](#)). The host branches infected with *D. falcata* show a gradual reduction in growth and diameter as compared to other healthy uninfected branches ([Karunaichamy et al., 1999](#)).

During the present investigation, the authors had employed their incessant efforts to draw-out a correlation between the height of affected trees (host plants) and number of parasite plants present therein, but no any significant relationship between height and number was observed. The nature of infection (Light, Moderate, Severe) by a parasite plants and distribution of host plants (Common, Rare) was recorded during the study period. Monocotyledons did not have such parasite infection. Moreover, parasite plants were found to prefer trees rather than shrubs or herbs (among 28 hosts plants, 27 were trees). The reason for such selective preference for host plants (trees) being that *Loranthus* seeds are distributed chiefly by birds, and trees are more likely to receive them than shrubs or herbs ([Balasubramanian and Sugathan, 1986](#)). Till date, only few control measures with application of crude methodical approach have been documented for an absolute eradication of *Dendrophthoe falcata*. Diesel or Powerine oil (30-50 ppm) is sprayed on host plants affected by *Dendrophthoe falcata* to prevent its growth further ([Ragupathy and Mahadevan, 1991](#)).

Host-Parasite-Bird Relationship

Seed dispersal and pollination is mediated by the birds that thrive on fruits from the parasite and/or host plants. Tickel's Flowerpecker is reported to facilitate seed dispersal of *D. falcata* among Neem (*Azadirachta indica*) through fecal excretions or regurgitations ([Hambali, 1977](#); [Karunaichamy et al., 1999](#)). The pollinator bird species such as Hair-crested Drongo and Sunbirds are also known to feed on the nectar from the *D. falcata* flowers ([Kunwar et al., 2005](#)).

The parasite *Dendrophthoe falcata* is a prolific producer of fruits, avidly devoured by some species of frugivorous birds that disperse the seeds of *Dendrophthoe falcata* ([Ragupathy and Mahadevan, 1991](#)). During study, 37 species of birds (seed pollinators for parasite plant) were observed, belongs to 31 genera and 17 families. Of all, 15 bird species were abundant, accounted for 40.54% of the total recorded bird species, followed by 10 (27.03%) species of common occurrence, and 12 (32.43%) bird species were rare on native scale. Among the recorded bird species, 19 species (51.35%) were insectivores (insect-dependent), followed by 8 species (21.62%) of omnivores (multi-feeders), 6 species (16.22%) of granivores (seed-eating), 3 species (8.11%) of frugivores (fruit-eating), and only 1 species (2.70%) was nectarivore (sap-feeders). In terms of activity-time of birds, 17 (45.95%) species of birds were found actively present on host plants during morning hours (6-11 am), followed by 15 bird species (40.54%) during both morning and afternoon hours (4-7 pm), and only 5 species (13.51%) of birds were actively engaged on host plants during noon hours (1-4 pm). Of the total documented bird species, 18 bird species (48.65%) were preferably found at five to eight meters (middle canopy) of the total height of the host plants, followed by use of lower canopy (1-4 m) by 11 species (29.73%), and 8 species (21.62%) on top canopy (more than 8 m) of the host plants as their selective preferred height of the host plants (Table 2). Among birds, *Nectarinia sp.* and *Dicaeum sp.* are the main seed-dispersers or seed-pollinators; feed mainly on seeds of *Loranthus* plant species (Balasubramanian and Sugathan, 1986). Earlier, Thaker (1998) had also enlisted Red vented Bulbul (*Pycnonotus cafer*) as one of the potential pollinator bird species for the studied parasite plant (*Dendrophthoe falcata*). The findings obtained during the present study are well-substantiated with similarly identical studies in previous periods.

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REFERENCES:

- Ali, S. (1996). *The Book of Indian Birds* (12th Revised and Enlarged Centenary Edition). Bombay Natural History Society, Oxford University Press, Bombay.
- Ali, S. and S.D. Ripley (1995). *A Pictorial Guide to the Birds of the Indian Subcontinent*. Bombay Natural History Society, Oxford University Press, Bombay.
- Balasubramanian, P. and D. Sugathan (1986). Some notes on the distribution, nature of hosts of the parasite *Dendrophthoe falcata* (L.f) Ettingsh. in the Point Calimere Wildlife Sanctuary. *Journal of Bombay Natural History Society*. 83: 461-463.
- Bole, P.V. and J.M. Pathak (1988). *The Flora of Saurashtra* (Part - II). Botanical Survey of India, Calcutta.
- Chavan, A.R. and G.M. Oza (1963). New host plants for *Dendrophthoe falcata* (L.f) Ettingsh. at Pavagadh. *Journal of Bombay Natural History Society*. 60: 472-473.
- Cooke, T. (1908). *The Flora of the Presidency of Bombay*. Botanical Survey of India, Calcutta.
- Ghosh, R. B. (1968). Two new hosts of *Dendrophthoe falcata* (L.f) Ettingsh. *Indian Forester*. 94: 778.
- Ghosh, R.B. (1971). Parasitism by three species of *Loranthus* on a single host plant. *Journal of Bombay Natural History Society*. 69:452.
- Grimmett, R., C. Inskipp and T. Inskipp (1999). *Pocket Guide to the Birds of Indian Subcontinent*. Oxford University Press, New Delhi.
- Hambali, G.G. (1977). *On Mistletoe Parasitism*. Proceedings of the 6th Asian-Pacific Weed Science Society Conference, Indonesia, 1977. pp. 58-66.
- Karunaichamy, K.S.T.K., K. Paliwal and P.A. Arp. (1999). Biomass and nutrient dynamics of mistletoe (*Dendrophthoe falcata*) and Neem (*Azadirachta indica*) seedlings. *Current Science*. 76 (6): 840-843.
- Kazmierczak, K. & R. Singh (1998). *A Birdwatcher's Guide to India*. Prion Ltd., Sandy, Devon, U.K.
- Kirtikar. K.R. and B.D. Basu (1933). *Indian Medicinal Plants* (Vol. I). LMB Publications, Allahabad.
- Kunwar, R.M., N. Adhikari and M.P. Devkota. (2005). Indigenous use of mistletoes in tropical and temperate region of Nepal. *Banko Janakari*. 15: 38-42.
- Lushington, A.W. (1902). Identification of the Loranthaceae by their leaves. *Indian Forester*. 28: 58- 68.
- Moore, P.G. and Inamdar, J.A. (1976). *Dendrophthoe falcata* (L.f) Ettingsh. - a parasite on the leaf of *Mangifera indica* Linn. *Current Science*. 45: 305.

- Narayanasamy, C. and R. Sampathkumar (1979). Host parasite relationships in *Dendrophthoe falcata* (L.f) Ettingsh. (*Loranthus longiflorus* Desr.). *Journal of Bombay Natural History Society*. 78:192-193.
- Nayar. M.P. (1985). *Key works To the Taxonomy of Flowering plants of India* (Vol. III), Labiatae to Lythraceae, Botanical survey of India (Series - IV).
- Ragupathy, S. and A. Mahadevan (1991). Additional host species for *Loranthus* and their localities in Thanjavur District, Tamilnadu. *Journal of Bombay Natural History Society*. 89:149-150.
- Rahmani, A.R., J.C. Daniel & R. Manakadan (1997). *Common Name Changes of the Birds of the Indian Subcontinent*. BUCEROS (ENVIS Newsletter: Avian Ecology and Inland Wetlands). pp. 2 (4): 8-32. Bombay Natural History Society, Oxford University Press, Bombay.
- Rao, P.S.J. (1923). A note on South Indian Loranthaceae and their host plants. *Indian Forester*. 49: 416-428.
- Rao, R.S. (1986). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli*. Vol. II (Series - 2), Botanical survey of India, Calcutta.
- Ravindranath, V. and S. Indira (1972). *Cuscuta reflexa* Roxb. - A rival to *Dendrophthoe falcata* (L.f) Ettingsh. in home gardens. *Journal of Bombay Natural History Society*. 72:607-608.
- Ravindranath, V. and V.L.N. Rao (1959). Additional hosts for flowering parasites *Dendrophthoe falcata* (L.f) Ettingsh. (*Loranthus longiflorus* Desr.) *Journal of Indian Botanical Society*. 38: 204- 212.
- Roy, B., A.C. Halder and D.C. Pal. (1998). *Plants of Human Consumption in India*. Botanical Survey of India (Series - 4), Calcutta.
- Sabnis, S.D. (1967). *A study of the flora and vegetation of Vadodara and environs including an account of the Cyperaceae of Gujarat*. Ph. D. Thesis, Submitted in M. S. University, Vadodara.
- Sampathkumar, R. and R.Selvaraj (1980). Some new hosts for *Dendrophthoe falcata* (L.f) Ettingsh. (*Loranthus longiflorus* Desr.). *Journal of Bombay Natural History Society*. 78: 200.
- Sampathkumar, R. and J. Kunchithapatham, (1968). Observation on the host range of *Loranthus longiflorus* Decr. *Journal of Bombay Natural History Society*. 65: 804- 805.
- Santapau, S.J. (1962). *The Flora of Saurashtra (Ranunculaceae to Rubiaceae)*, (Part - I) Saurashtra Research Society, Rajkot.
- Shah, G.L. (1978). *Flora of Gujarat State* (Part-I). University Press, Sardar Patel University, Vallabh Vidyanagar.
- Shetty, B.V. and V. Singh. (1991). *Flora of Rajasthan*, (Vol. II), Botanical Survey of India, Jodhpur.
- Smith, S. and G.R. Stewart. (1990). Effect of potassium levels on the stomatal behavior of the hemi-parasite *Striga hermontica*. *Plant Physiology*. 94: 1472-1476.
- Sonobe, K. & S. Usui (1993). *A Field Guide to the Waterbirds of Asia*. Wild Bird Society of Japan.

Thaker, J.I. (1998). *Vanaspati Shashtra* (Flora of Barda Mountain (Pravin Prakashan, Rajkot, Gujarat). Reprint.

Wilson, C.A. and C.L. Calvin. (2006). An Origin of Aerial Branch Parasitism. In: *The Mistletoe Family, Loranthaceae. American Journal of Botany*. 93(5): 787-796.

**Table 1. Information on Host and Parasite Plant Species
(GSFC Township, Vadodara, Gujarat)**

Host Plant	No. of affected Individuals	No. of Dead Plants	No. of Parasite Plants	Economic Value of Host Plant	Affected Plant-Parts		Phenophase of Host Plant		
					I	II	Vg	Fl	Fr
<i>Achrus zapota</i> L.	5	0	10	Fr	0	10	7	3	0
<i>Ailanthus excelsa</i> Roxb.	2	0	8	Wd	0	8	1	7	0
<i>Albizia amara</i> Boivin var. <i>amara</i>	1	0	2	Tm	0	2	2	0	0
<i>Albizia lebbeck</i> (L.) Bth.	1	1	3	Tm	0	3	0	3	0
<i>Azadirachta indica</i> A. Juss.	1	0	2	Md	0	2	0	2	0
<i>Bauhinia purpurea</i> L.	2	1	9	Wd	0	9	0	9	0
<i>Bombax ceiba</i> L.	3	1	6	Md	2	4	6	0	0
<i>Cassia fistula</i> L.	2	0	5	Md	0	5	0	5	0
<i>Casuarina equisetifolia</i> L.	4	0	20	Fw	0	20	0	12	8
<i>Cordia dichotoma</i> Forst.	1	0	2	Fr	0	2	0	2	0
<i>Derris indica</i> (Lam.) Bennet	2	0	5	Fd	0	5	0	4	1
<i>Eucalyptus globulus</i> Labill.	1	0	1	Md	0	1	1	0	0
<i>Eugenia jambolana</i> Lam.	1	0	3	Fr	0	3	0	3	0
<i>Ficus microcarpa</i> L. f.	1	0	5	Fw, Wd	0	5	5	0	0
<i>Ficus religiosa</i> L.	2	0	6	Rl	0	6	6	0	0
<i>Holoptelea integrifolia</i> (Roxb.) Pl.	3	0	7	Wd	1	6	1	4	2
<i>Kigelia pinnata</i> (Jacq.) DC.	3	0	3	Wd	0	3	0	3	0
<i>Mangifera indica</i> L. f.	45	2	197	Fr	16	181	136	51	10
<i>Manilkara hexandra</i> (Roxb.) Dub.	4	1	24	Fr, Tm	0	24	20	3	1
<i>Millingtonia hortensis</i> L. f.	1	0	4	Tm	0	4	0	3	1
<i>Mitragyna parviflora</i> (Roxb.) Kor.	1	0	1	Rl	0	1	0	1	0
<i>Nyctanthus arbortristis</i> L.	1	0	2	Rl	2	0	2	0	0
<i>Peltophorum pterocarpum</i> (DC.) Backer ex Heyne	2	0	3	Wd	0	3	1	2	0
<i>Pithecellobium dulce</i> (Roxb.) Bth.	2	0	3	Fr, Tm	1	2	0	3	0

Host Plant	No. of affected Individuals	No. of Dead Plants	No. of Parasite Plants	Economic Value of Host Plant	Affected Plant-Parts		Phenophase of Host Plant		
					I	II	Vg	Fl	Fr
<i>Prosopis cineraria</i> (L.) Druce	1	0	2	Fw	0	2	0	2	0
<i>Pterospermum acerifolium</i> Willd.	1	0	2	Wd	0	2	2	0	0
<i>Punica granatum</i> L..	1	0	2	Fr	2	0	2	0	0
<i>Psidium guajava</i> L.	1	0	7	Fr	0	7	0	6	1
Total	95	6	344	0	24	320	192	128	24

Fd = Fodder; Fr = Fruits, Fw = Fuelwood; Md = Medicinal; Rl = Religious; Tm = Timber; Wd = Wood; I = Primary Branch; II = Secondary branch; Vg = Vegetative; Fl = Flowering; Fr = Fruiting; Gradient of Effect: 1 – 10 (Light); 11 – 50 (Moderate); > 50 (Severe)

Table 2. Bird Species observed on Host Plants (GSFC Township, Vadodara, Gujarat)

Species	Common Name	FG	AS	PH (m)	AT
Family: Picidae					
<i>Dinopium Javanese</i>	Golden backed Woodpecker	I	C	3	M
Family: Megalaimidae					
<i>Megalaima haemacephala</i>	Coppersmith Barbet	F	R	3	M
Family: Meropidae					
<i>Merops orientalis</i>	Green Bee eater	I	A	2	M, AN
Family: Cuculidae					
<i>Eudynamis scolopacea</i>	Indian Koel	O	A	2	M
Family: Psittacidae					
<i>Psittacula krameri</i>	Rose ringed Parakeet	F	A	3	M, AN
Family: Columbidae					
<i>Columba livia</i>	Blue Rock Pigeon	G	A	1	M, AN
<i>Streptopelia chinensis</i>	Spotted Dove	G	R	1	M
<i>S. decaocto</i>	Eurasian Collared Dove	G	A	2	M, AN
<i>S. senegalensis</i>	Laughing Dove	G	A	2	M, AN
<i>S. tranquebarica</i>	Red Collared Dove	G	R	1	M
Family: Irenidae					
<i>Aegithina nigrolutea</i>	Marshall's Iora	I	C	2	M, AN
Family: Corvidae					
<i>Corvus macrorhynchos</i>	Jungle Crow	O	C	3	M, AN
<i>C. splendens</i>	House Crow	O	A	3	M, AN
<i>Dendrocitta vagabunda</i>	Indian Treepie	I	C	2	N
<i>Dicrurus macrocercus</i>	Black Drongo	I	A	1	M, AN
<i>Oriolus oriolus</i>	Eurasian Golden Oriole	I	C	2	N
Family: Campephagidae					
<i>Pericrocotus cinnamomeus</i>	Small Minivet	I	R	2	M
Family: Muscicapidae					

Species	Common Name	FG	AS	PH (m)	AT
<i>Copsychus saularis</i>	Magpie Robin	O	C	2	M
<i>Leucocirca aureola</i>	White browed Fantail Flycatcher	I	C	2	N
<i>Saxicoloides fulicata</i>	Indian Robin	O	A	2	M
Family: Sturnidae					
<i>Acridotheres ginginianus</i>	Bank Myna	I	R	1	N
<i>A. tristis</i>	Common Myna	I	A	1	N
<i>Culicicapa ceylonensis</i>	Grey headed Canary Flycatcher	I	R	3	M
<i>Strunus pagodarum</i>	Brahminy Starling	I	C	1	M
Family: Pycnonotidae					
<i>Pycnonotus cafer</i>	Red vented Bulbul	F	A	3	M, AN
Family: Cisticolidae					
<i>Prinia buchanani</i>	Rufous fronted Prinia	I	R	1	M
Family: Zosteropidae					
<i>Zosterops palpebrosus</i>	Oriental White Eye	I	R	2	M
Family: Sylviidae					
<i>Acrocephalus aedon</i>	Thick billed Warbler	I	R	2	M
<i>Hippolais caligata</i>	Booted Warbler	I	R	2	M
<i>Orthotomus sutorius</i>	Common Tailorbird	O	A	1	M, AN
<i>Sylvia curruca</i>	Lesser Whitethroat	I	R	2	M
<i>Turdoides caudatus</i>	Common Babbler	O	C	1	M
<i>T. striatus</i>	Jungle Babbler	O	A	1	M, AN
Family: Nectariniidae					
<i>Nectarinia asiatica</i>	Purple Sunbird	N	A	3	M, AN
Family: Passeridae					
<i>Lonchura malabarica</i>	Indian Silverbill	I	C	2	M
<i>Passer domesticus</i>	House Sparrow	G	A	2	M, AN
<i>Ploceus philippinus</i>	Baya Weaver	I	R	2	M, AN

FG (Foraging Guild): F (Frugivorous); G (Granivore); I (Insectivore); N (Nectarivore);

O (Omnivore); AS (Abundance Status): A (Abundant); C (Common); R (Rare);

PH [Preferable Height (m)]; 1: 1-4 m; 2: 5-8 m; 3: >8 m; AT (Active Time); M: Morning (6-11 am);

N: Noon (1-4 pm); AN: Afternoon (4-7 pm)