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Cover: Dorsal view of Mantis Shrimp *Cloridina ichneumon* (Fabricius, 1798) & *Gonodactylellus demanii* (Henderson, 1893). © Fisheries Research Station, Junagadh Agricultural University, Sikka.

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COMMUNICATION

Nesting habits of the Baya Weaver *Ploceus philippinus* (Linnaeus, 1766) in the agricultural landscape of Tindivanam, Tamil Nadu, India

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Abstract: This paper pertains to the nesting habits of *Ploceus philippinus* (Linnaeus, 1766) with specific reference to the agricultural landscape of Tindivanam Taluk, Villupuram District, Tamil Nadu during the breeding period between April and October 2021. A total of 11,386 nests (wad stage-840, ring stage-478, helmet stage-3,980, egg-chamber closed stage-2,865, completed nests-2,028, abnormal nests-938, and damaged nests-257) and 12,600 birds were observed on 832 nest-supporting plants. Nest-supporting plants belonged to 27 species, 26 genera, and 17 families. The three principal nest-supporting palm species—*Borassus flabellifer*, *Cocos nucifera*, and *Phoenix sylvestris*—represented 85.21% of the total nest-supporting plants. The number of nests (including all the stages) per colony varied from 1 to 109 and 70.16% nests were oriented towards the east. Abnormal nests constituted 8.24% of the recorded nests with 17 variations and 90.12% helmet stage nests contained plastering of clay on the inner walls. Nest predation by House Crow, Large-billed Crow, Asian Koel, Black Drongo, & Rufous Treepie and killing of adult Baya Weaver by Shikra were recorded.

Keywords: Abnormal nests, associate birds, clay deposits, foraging behaviours, nest colonies, nest predation, Villupurum District.

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INTRODUCTION

Globally, India is among the 10 top countries with highest bird species richness harbouring about 1,332 species (Lepage 2016; Praveen et al. 2020). The family *Ploceidae* includes 15 genera and 118 species (Oiveros et al. 2019). The Afro-Asian region has 64 species of weavers, the genus *Ploceus* spp. (Dickinson & Christids 2014), of which four species occur in India (Baya Weaver *Ploceus philippinus*, Black-throated Weaver *Ploceus benghalensis*, Streaked Weaver *Ploceus manyar*, and Finn's Weaver *Ploceus megarhynchus)* (Ali & Ripley 1987). The IUCN Red List of Threatened Species has classified Baya Weaver as 'Least Concern' species (BirdLife International 2016). Baya Weaver is a social, gregarious, and polygamous bird, occurring throughout the Indian subcontinent (Ali & Ambedkar 1956) and also in Java and Sumatra (Wood 1926). In India, the Baya Weaver breeds between June and November (Rasmussen & Anderton 2005). Baya Weavers prefer *Cocos nucifera* along the western coast of the Indian peninsula, *Borassus flabellifer* along the eastern coast, and *Vachellia nilotica* in the arid north-west (Sharma 1989). Males usually build partial nests and complete them only after courting females (Ali et al. 1956). Several authors have stated that nests almost invariably hang exposed towards an easterly direction so as to be the least affected by battering winds of the south-west monsoon (Ali 1931; Ambedkar 1964; Davis 1971; Quader 2003; Borges et al. 2012; Pandian & Ahimas 2018; Pandian 2021a). Nests are built as colonies and the sizes of nest colonies have been found to vary (Sharma 1989; Borkar & Komarpant 2003; Pandian 2018, 2021a).

The behaviour of Baya Weaver constructing different types of abnormal nests were reported by Ali et al. (1956), Ambedkar (1958, 1980), Sharma (1985, 1988, 1995), Borkar & Komarpant (2003), and Pandian (2018). Plastering of mud/clay on the inner walls of helmet stage nests is prevalent among Baya Weaver *P.* philippinus (Crook 1962). Baya Weavers strictly followed mixed communal roosting and foraging (Zahavi 1971; Gadgil 1972; Ward & Zahavi 1973; Gadgil & Ali 1975; Pandian 2020). The occurrence of nest predation by avian predators and fall of nests due to abiotic factors like monsoon rains and battering winds, also by rival male birds and various anthropogenic factors were reported by Ali (1931) and Pandian (2021a,b).

In this paper, I document the quantitative analysis of nests, birds, nest-supporting plants, roosting and foraging behaviours of Baya Weaver with specific reference to the agricultural landscape of Tindivanam Taluk, Villupuram District, Tamil Nadu. The following objectives were kept in mind in the study: (i) Nest tree use pattern and its microhabitat (power cables, roads, and human dwellings, water bodies), (ii) Features of nest building including sources of nesting materials, stages of nest development, orientation, plastering of clay on inner walls, and abnormalities, (iii) Roosting and foraging behaviours including preference of crops, and (iv) Interactions with other bird species and threats faced.

MATERIALS AND METHODS

Study area

The present study was carried out in 115 villages (Appendix-I) in Tindivanam Taluk (12.236N—79.649E), Villupuram District, spread over 80 km^2. The human population of the district is c. 500,000 (2011 Census). Agriculture is the primary occupation of the people here. The major crops of the area are Paddy *Oryza sativa*, Jowar *Sorghum bicolor*, Pearl Millet *Pennisetum glaucum*, Finger Millet *Eleusine coracana*, Foxtail Millet *Setaria italica*, Sugarcane *Saccharum officinarum* (Poaceae), Green Gram *Vigna radiata*, Groundnut *Arachis hypogaea* (Fabaceae), and Cassava *Manihot esculenta* (Euphorbiaceae). Small-scale cultivation of ornamental flower, vegetable, fruit, and monoculture of *Cauariana equisetifolia* (Equisetaceae) also occurs. The maximum and minimum temperatures of the district are 36°C and 20°C, respectively. The average annual rainfall of the district is 1,060 mm (www.viluppuram.nic.in) (Figure 1).

Methods

With help of two field assistants, I identified 115 villages in Tindivanam taluk having a history of habitations of Baya Weavers. These villages were surveyed daily between 0545–1200 h and 1500–1830 h when the birds were active between the first week of April and the second week of October 2021. The heights of the nest-supporting trees were measured using Silva Clinometer while GBH (Girth at breast height) and distances between the nesting trees and power cables, road, human dwellings, various type of crop fields were measured using a 100 m measuring tape. The canopy width was obtained by cross method (Blozan 2006) by measuring the edge of the canopy shadow on the ground. The distances between nest-supporting plants and the above-listed factors were grouped under 01–50 m, 51–100 m, 101–150 m, 151–200 m, and >200 m or

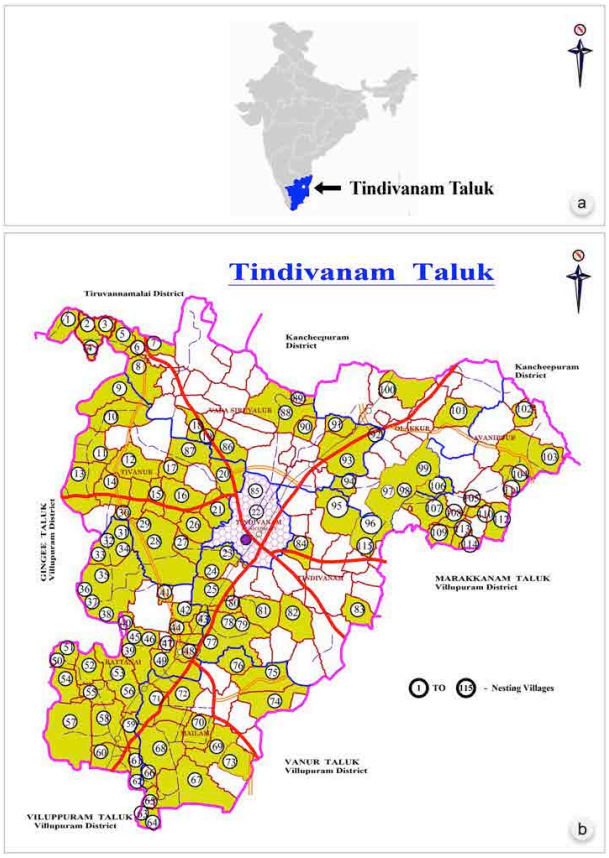

Figure 1. Study area map: a—India map showing Tamil Nadu and marked Tindivanam taluk as a white dot | b—Tindivanam taluk map showing villages (yellow color) containing nesting habitats of Baya Weaver.

01–100 m, 101–200 m, 201–300 m. The locations of the inventoried 832 nest-supporting plants were determined using a standard GPS (Garmin Etrex 20x). The total number of nests observed on one nest-supporting plant was considered one nest colony. Using Super Zenith 20 x 50 field binoculars, the number of nests in the colonies, their developmental stages, abnormalities, damaged nests, clay deposits on inner walls of helmet stage nests, and number of birds were enumerated. The orientations of the nests were determined using a 'Compass App' in a smart phone iPhone (Model A1530). Every nest-supporting plant was observed uninterruptedly for 60 min and the maximum number of birds perched at one time on the nest-supporting plants during the observation period was determined as the number of birds per plant. The fallen nests spread over on the ground under the nest-supporting plants were enumerated. Roosting and foraging behaviours of flocks, preferred plants for foraging were observed for 20 days (10–29 July 2021) from 0545 to 1830 h, nest predation by avian predators and interactions with other birds were observed using binoculars. Utmost care was taken not to disturb the nests or birds, maintaining a minimum distance of c. 30 m during observations. No live nests, eggs, chicks, or adult birds were disturbed. Nikon P1000 digital camera was used for photography and videography.

Data analysis

One-way Analysis of Variance (ANOVA) was applied to test the differences among the total number of nests and total number of birds observed on the nest-supporting plant species such as *Borassus flabellifer*, *Phoenix sylvestris*, *Cocos nucifera*, *Prosopis juliflora*, *Morinda tinctoria*, *Casuarina equisetifolia*, *Phyllanthus reticulatus,* and others by using Statistical Package for Social Sciences. Those nest-supporting plant species (n = 19) which represented more than 10 individuals per species were taken as separate variables and the plant species which represented less than 10 individuals were grouped as 'others' for analysis. Test of significance was assessed at p = 0.05. The correlation between variables such as GBH (cm), heights (m) and canopy sizes (m) of nest-supporting plants and the number of nests enumerated on them was calculated using Pearson's Correlation Coefficient test. Collected data were tabulated, analysed and shown as graphical representations.

RESULTS

Baya Weavers and their plant preference to build nests

A total of 832 nest-supporting plants belonging to 27 species, 26 genera, and 17 families bearing nests of Baya Weaver were observed in 115 villages in Tindivanam Taluk. Among the 17 families, three families such as Arecaceae, Musaceae, and Poaceae are monocotyledons. Family Fabaceae represented a maximum of seven species, followed by Arecaceae representing three species, Moraceae and Phyllanthaceae are representing two species each and other 13 families representing one species each. A total of 12,600 adult birds were counted on those 832 nest-supporting plants. Maximum 73.69% birds (n = 9,285) were observed on *Borassus flabellifer* trees, followed by 11.38% birds (n = 1,434) on *Cocos nucifera*, 8.94% birds (n = 1,127) on *Phoenix sylvestris*, and the remaining 5.99% birds (n = 754) were enumerated on 24 other nest-supporting plant species (Table 1).

Table 1. Details of nest-supporting plants, number of birds, nests, various developmental stages of nests and nest orientation (as on 2nd week of October 2021) in the study area.

	Name of the plant	Total no. of nest-supporting plants	Life-form	Developmental stages of nests					Abnormal nests	Damaged nests	Total no. of nests	Orientation of nests				Total no. of birds
				Wad	Ring	Helmet	Egg- chamber closed stage	Completed nests				East	West	North	South	
1	*Borassus flabellifer*	490	Tree	519	309	2683	2246	1518	807	222	8304	5586	963	1298	457	9285
2	*Phoenix sylvestris* (Arecaceae)	118	Tree	163	63	509	175	112	49	12	1083	899	72	100	12	1127
3	*Cocos nucifera* (Arecaceae)	101	Tree	56	44	499	353	262	51	12	1277	919	124	171	63	1434
4	*Prosopis juliflora* (Fabaceae)	28	Shrub	32	14	85	16	31	6	2	186	148	29	3	6	194
5	*Morinda tinctoria* (Rubiaceae)	16	Tree	4	4	24	7	18	7	0	64	60	0	0	4	66
6	*Casuarina equisetifolia* (Casuarinaceae)	10	Tree	24	16	62	0	0	0	0	102	100	0	2	0	104
7	*Phyllanthus reticulatus* (Phyllanthaceae)	10	Shrub	7	4	8	4	6	0	2	31	27	0	4	0	32
8	*Vachellia nilotica* (Fabaceae)	10	Tree	2	4	22	11	0	2	0	41	19	1	21	0	53
9	*Azadirachta indica* (Meliaceae)	9	Tree	5	1	10	6	14	3	0	39	38	0	0	1	50
10	*Flueggea leucopyrus* (Phyllanthaceae)	8	Shrub	6	2	13	11	21	1	4	58	28	0	16	14	59
11	*Ficus benghalensis* (Fabaceae)	6	Tree	8	11	37	18	25	11	3	113	79	13	15	6	87
12	*Lantana camara* (Verbanaceae)	4	Shrub	1	2	3	3	2	1	0	12	12	0	0	0	14
13	*Pithecellobium dulce* (Fabaceae)	3	Tree	1	0	9	0	0	0	0	10	9	0	1	0	12
14	*Senna siamea* (Fabaceae)	3	Tree	1	0	3	3	1	0	0	8	8	0	0	0	8
15	*Chromolaena odorata* (Asteraceae)	2	Shrub	1	1	1	0	0	0	0	3	3	0	0	0	3
16	*Ficus religiosa* (Moraceae)	2	Tree	2	0	0	4	2	0	0	8	8	0	0	0	14
17	*Leucaena leucocephela* (Fabaceae)	2	Tree	0	1	7	6	7	0	0	21	21	0	0	0	30
18	*Albizia lebbeck* (Fabaceae)	1	Tree	1	0	0	2	9	0	0	12	12	0	0	0	12
19	*Cortaderia selloana* (Poaceae)	1	Herb	1	0	0	0	0	0	0	1	1	0	0	0	1
20	*Passiflora foetida* (Passifloraceae)	1	Climber	0	1	0	0	0	0	0	1	1	0	0	0	1
21	*Tamarindus indica* (Tamarindus indicus)	1	Tree	1	0	2	0	0	0	0	3	3	0	0	0	3
22	*Eheretia pubescens* (Boraginaceae)	1	Tree	1	0	0	0	0	0	0	1	1	0	0	0	1
23	*Ziziphus oenopolia* (Ramnaceae)	1	Tree	1	0	0	0	0	0	0	1	1	0	0	0	1
24	*Cocculus carolinus* (Menispermaceae)	1	Climber	1	0	0	0	0	0	0	1	1	0	0	0	1
25	*Solanum trilobatum* (Solanaceae)	1	Climber	1	0	0	0	0	0	0	1	1	0	0	0	1
26	*Musa paradisiaca* (Musaceae)	1	Herb	0	0	1	0	0	0	0	1	1	0	0	0	1
27	*Moringa oleifera* (Moringaceae)	1	Tree	1	1	2	0	0	0	0	4	3	0	1	0	6
	Total	832		840	478	3980	2865	2028	938	257	11386	7989	1202	1632	563	12600

Preference of birds to primary nest-supporting trees to build nests

Among 27 species, the three primary nest-supporting plant species were palms (Arecaceae), (*B. flabellifer* 58.9%, n = 490; *P. sylvestris* 14.18%, n = 118; and *C. nucifera* 12.14%, n = 101), which represented 85.21% (n = 709) of the total nest-supporting plants (Table 1). Among 490 *B. flabellifer* trees, 55.10% were male trees (n = 270) bearing 58.72% nests (n = 4,876) and other 44.9% were females trees (n = 220) bearing 41.28% nests (n = 3,428). One rare instance of Baya Weaver constructing a nest on *Musa paradisiaca* using a torn leaf lamina was recorded. In another instance, a nest was found attached to the rachilla of inflorescence of *C. nucifera* as against the usual practice of birds constructing nests from tip of leaflets (Image 1).

ANOVA test reveals that significant differences existed between the type of nest-supporting plant species and the number of nests (F-value = 7.691, p <0.001) and birds (F-value = 7.269, p <0.001) at 5% (p <0.05) level of significance. Analysis also revealed that there existed significant differences among the three primary nest-supporting plant species and the number of nests (F-value = 11.155, p <0.001) and number of birds (F- value = 10.589, p <0.001) at 5% (p <0.05) level of significance. Positive correlation was observed (r = 0.231) between the number of nests and GBH and tree height of nest-supporting plants but negative correlation (r = -0.043) existed between the number of nests and canopy sizes of nest-supporting plants.

Preference of type of lands

The study on the preference of Baya Weaver towards the type of lands revealed that 89.30% nest-supporting plants (n = 743) which bore 90.81% nests (n = 10,340) occurred in cultivated lands; 7.33% nest-supporting plants (n = 61) bearing 2.86% nests (n = 326) occurred near water bodies; 2.16% plants (n = 18) with 4.72% nests (n = 537) occurred in fallow lands; and 1.20% plants (n = 10) with 1.61% nests (n = 183) occurred in residential areas (Figure 2).

Preference of Baya Weaver to build nests close to grain crops

The study revealed that 65.6% of nest-supporting plants bearing 65.67% of nests enumerated were situated in crop lands where cereal grain crops were under cultivation, such as paddy, pearl millet, finger millet, sorghum, and foxtail millet. Apart from this, 12.5% of the nest-supporting plants were within 500 m of such crops, while another 21.9% plants were at a distance of 500–1,000 m from cereal grain crops. This shows overwhelming preference for crop lands or their vicinity as choice of nesting colonies (Table 2).

Preference of Baya Weaver in building nests on plants occurring close to power cables, roads and human dwellings

The study also tested the relationship between proximity of overhead transmission power cables, roads, human dwellings, and selection of nest-supporting plants by populations of Baya Weaver. The study revealed that maximum nest-supporting plants, nests and birds occurred within 50 m distance from power cables (Figure 3). The study also revealed that maximum nest-supporting plants, nests, and birds occurred within 100 m distance from the adjacent roads (Figure 4). Similarly, maximum nest-supporting plants, and birds occurred within 100 m distance from human dwellings (Figure 5).

Hedges under nest-supporting trees

Study on the type of vegetation covered around the stems of nest-supporting plants revealed that 81.97% nest-supporting plants (n = 682) lacked any bushes/ shrubs around the stems/trunks, whereas dense shrubs were growing around the bases of stems of 18.03% nest-supporting plants (n = 150). The shrubs around the stems were indentified as *P. juliflora*, *L. camara*, *A. indica*, *S. trilobatum*, *S. xanthocarpum*, *C. carolinus*, and *F. leucopyrus*. These plants were found thickly covering the basal parts of stems of nest-supporting plants/ trees and probably prevented humans or monkeys from accessing the plants/trees.

Source of nest materials

The study on the source of nest materials revealed that Baya Weavers had plucked fibres from three plant species, such as leaves of Sugarcane, Narrow Leaf Cattail *Typha angustifolia*, and leaflets of Indian Date Palm.

Various stages of nests

The enumerated 11,386 nests were under various developmental stages, viz., wad stage-7.38% (n = 840), ring stage-4.20% (n = 478), helmet stage-34.96% (n = 3,980), egg-chamber closed stage-25.16% (n = 2,865), complete nests-17.81% (n = 2,028), abnormal nests-8.24% (n = 938), and damaged nests-2.26% (n = 257). The study revealed that each nest-supporting plant bore an average of 13.68 nests (Figure 6).

Orientation of nests

The study revealed that, 70.16% nests (n = 7,989)

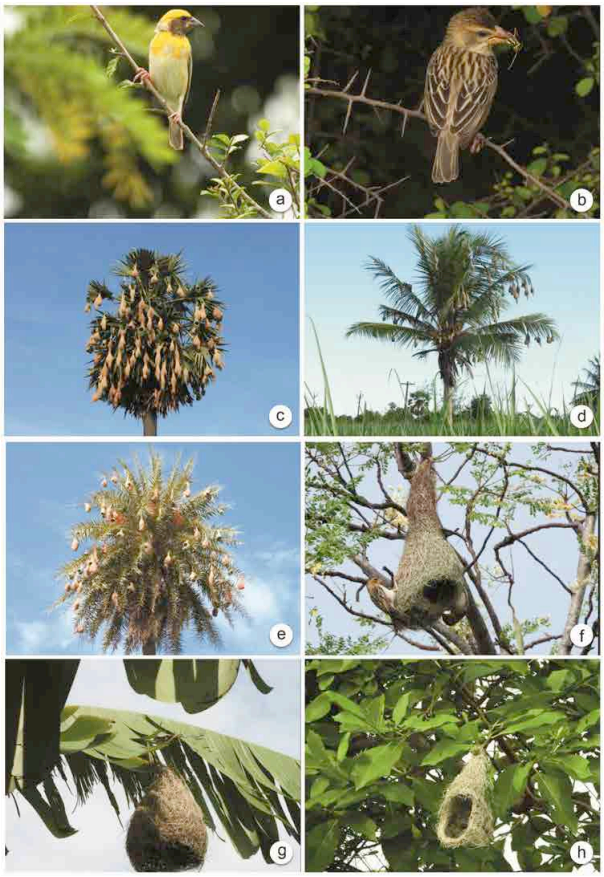

Image 1. Pictures showing various nest-supporting plants bearing nests: a—Male bird with breeding plumage | b—Female bird carrying prey | c—Nest colony on *Borassus flabellifer* | d—Nest colony on *Cocos nucifera* | e—Nest colony on *Phoenix sylvestris* | f—Solitary nest on *Moringa olifera* | g—Solitary nest on *Musa paradisiaca* | h—Solitary nest on *Morinda tinctoria*. © M. Pandian.

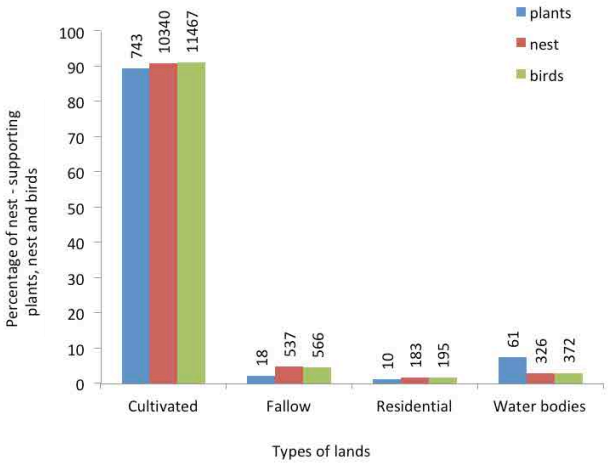

Figure 2. Preference of Baya Weavers' in selection of nest-supporting plants close to types of lands.

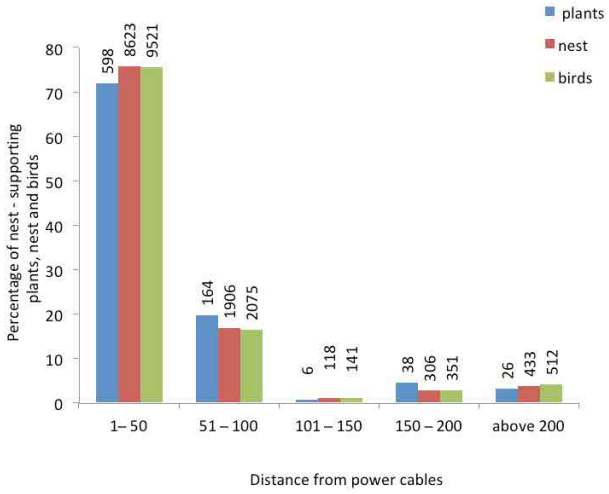

Figure 3. Relationship between the distance of nest-supporting plants and nearest overhead power transmission cables.

were oriented towards the east, facing the rising sun, followed by 10.55% (n = 1,202) nests oriented towards the west, 14.33% (n = 1,632) nests facing north, and only 0.49% of nests (n = 563) facing south. Out of 89 solitary nests, 87 nests were found facing an east orientation and one nest each was found facing north and south orientations. Of the total nests (n = 7,989) facing towards the east, 69.92% nests (n = 5,586) were found on *B. flabellifer*, 11.5% nests (n = 919) on *C. nucifera*, 11.25% nests (n = 899) on *P. sylvestris*, 1.85% nests (n = 148) on *P. juliflora*, 1.25% nests (n = 100) on *C. equisetifolia* and 4.23% nests (n = 337) were found on the remaining 20 nest-supporting plant species.

Nest colonies

The number of nests (including all the stages) in each nest colony varied: 78.13% of nest-supporting plants (n = 650) bore nests between 01–20, whereas 13.46% of

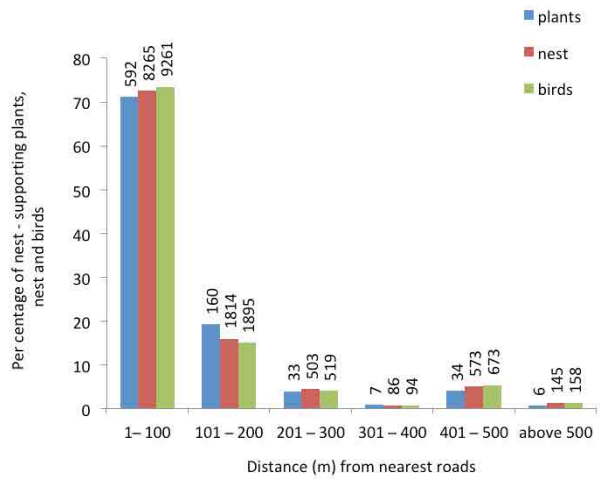

Figure 4. Relationship between the distance of nest-supporting plants and nearest roads.

nest-supporting plants (n = 112) bore 21–40 nests, 5.5% plants (n = 47) bore 41–60 nests, 2.20% plants (n = 20) bore 61–80 nests, 0.24% plants (n = 2) bore 81–100 nests, and one plant (0.12%) bore above 100 nests, i.e., 109 nests. A maximum of 109 nests in a colony were observed on a single *B. flabellifer* tree in Vengadur Village (12.228°N, 79.566°E). The study revealed 89 nest colonies contained solitary nests.

Nests overhanging water bodies

The study revealed that 2.86% nests (n = 326) including 140 abnormal nests on 61 nest-supporting plants were overhanging water bodies, i.e., irrigation wells, river, lakes, ponds, and sewage stagnant water occurring in 20 villages. A total of 372 individuals of Baya Weavers (2.95%) were observed on those 61 nest-supporting plants. Those nest-supporting plants (n = 61) belonging to 12 species, such as *B. flabellifer, V. nilotica, P. juliflora*, *L. camara*, *A. lebbeck, A. indica, F. benghalensis, F. religiosa, F. leucopyrus*, *P. reticulatus*, *M.tinctoria* and *S. siamea* were found growing on the edges of water bodies. Among 326 nests, 244 nests attached to 46 nest-supporting plants were found in irrigation wells. The remaining 82 nests were attached to 14 nest-supporting plants were observed on the edges of lakes, ponds, river, and sewage stagnant water. The number of nests per colony was found to be varied. A maximum of 28 nests was counted on one *F. benghalensis* tree, followed by 25 nests on one *B. flabellifer* tree, and 15 nests on one *A. indica*. Solitary nests were observed on 15 nest-supporting plants. The study revealed that an average

Table 2. Relationships between the type of crops and selection of nest-supporting plants by Baya Weaver.

	Name of the crops/ groves	No. of plants bearing nests	Total no. of nests	Total no. of birds
1	Cereal grain crops	546	7477	8236
2	Sugarcane	119	1641	1807
3	Pulses & oil seeds	47	767	852
4	Fallow lands	37	381	355
5	Casuarina groves	44	568	719
6	Residential area	10	173	191
7	Flower crops	7	106	130
8	Other groves	22	273	310
	Total	832	11386	12600

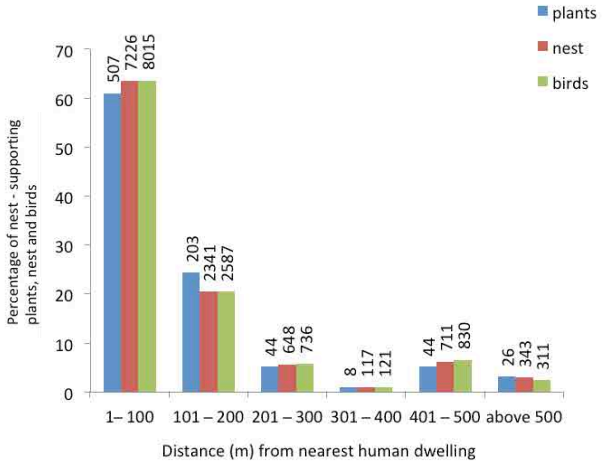

Figure 5. Relationship between the distance of nest-supporting plants and nearest human dwellings.

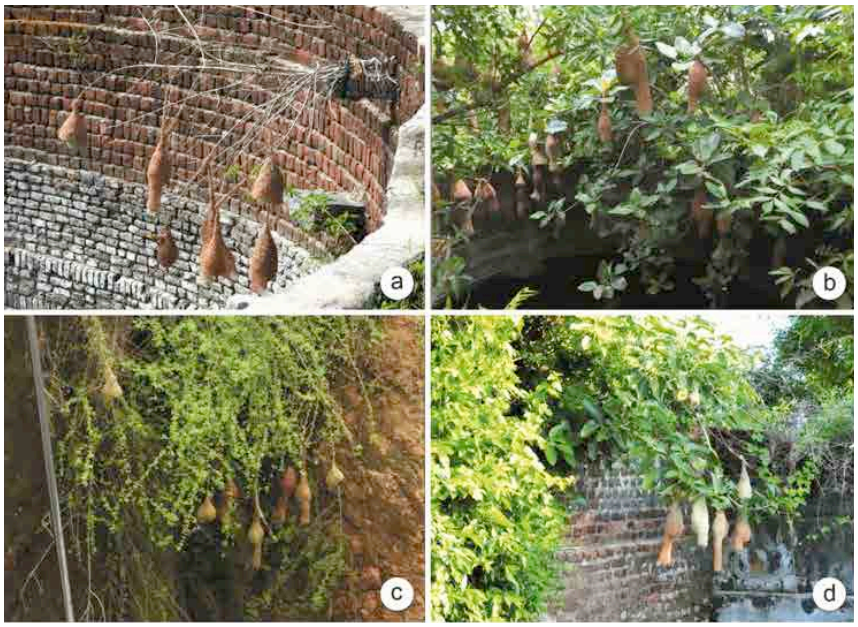

Image 2. Pictures showing nests overhanging water bodies: a—Birds built nests on dried *L. camara* twigs tied in the well | b—*A. indica* and *F. benghalensis* bearing nests | c—Overhanging nests attached to *P. reticulatus* |d—Overhanging nests attached to *F. benghalensis*. © M. Pandian.

of 5.34 nests per nest-supporting plant was observed. In one instance, a landholder in Periyathatchur village (12.115°N, 79.523°E) had cleared all the bushes for the safety of the well and had tied a bunch of dried *L. camara* twigs in the well during the fourth week of April 2021 to facilitate Baya Weavers to build nests and accordingly the birds built seven nests on those dried twigs during May–June 2021. In Kambur village (12.303°N, 79.771°E), one nest colony containing eight nests was submerged in a well due to the rising of the water level (Image 2).

Abnormal nests

Abnormal nests constituted 8.24% (n = 938) of the recorded nests and 17 different types of variations in nests were noticed: 86.03% (n = 807) abnormal nests were found on *B. flabellifer* trees (n = 188), 5.43% (n = 51) abnormal nests on *C. nucifera (*n = 24), and 5.22% (n = 49) on *P. sylvestris* (n = 19), and the remaining 31 abnormal nests were found on 10 other nest-supporting plant species. Out of 938 abnormal nests, 56.07 (n = 526) abnormal nests were found on male *B. flabellifer* trees whereas 29.95% (n = 281) abnormal nests were found on female *B. flabellifer* trees. Seventeen different types of abnormal nests were recorded: 28.99% (n = 272) abnormal nests belonged to multi-stalked type, 26.65% (n = 250) were 1+1/2 storeyed type, 25.79% (n = 242) were 1+1 storeyed, and 4.69% (n = 44) were mixed abnormal types. The remaining 13.86% (n = 130) abnormal nests belonged to other 13 types of abnormal nests. A solitary nest abnormally having two egg-chambers attached to a common stalk and another helmet stage nest containing three openings were noticed. Each nest-supporting plant bore an average of 3.76% abnormal nests (Table 3; Image 3).

Deposit of clay in the nests

The males had plastered the inner walls of helmet stage nests with wet clay immediately after the completion of construction of helmet stage nests and before selection of such nests by females. Out of a total of 11,386 nests, 3,980 nests (35.24%) were found in the helmet stage. Observation of the inner walls of those helmet stage nests through binoculars and digital camera revealed that 90.12% helmet stage nests (n = 3,587) contained plastering of clay on the inner walls. The remaining 9.88% helmet stage nests (n = 393) had no such smearing of clay on their inner walls. It was not possible to view and study the nature of clay deposits in the completed nests through binoculars, as the nest chambers were found closed. Continuous observations revealed no incidents of males taking readily available

Table 3. Details of nest-supporting plants bearing various types of abnormal nests of Baya Weavers in the study area (as on 2nd week of October 2021).

	Name of the nest-supporting plant	Total no. of plant	Total no. of nest	Abnormal	Multi-stalked nest	1+½ Storeys	1+1 Storeys	Mixed abnormal nest	Chain storeyed nest	½+½ Storeys	Wide stalked nest	½+1 Storeys	Buttressed nest	Fused nest	Bell-jar shaped	Fused Branching nest	Helmet with three openings	Meshed nest	Free branching nest	Symmetrical nest	Double egg chamber
1	*Borassus flabellifer*-female	113	3682	526	169	137	138	21	12	9	11	11	4	6	2	3	0	1	1	0	1
2	*Borassus flabellifer*-male	75	2272	281	81	71	77	14	10	8	4	1	3	4	5	1	1	0	0	1	0
3	*Cocos nucifera*	24	776	51	7	13	15	3	0	5	2	0	4	0	0	1	1	0	0	0	0
4	*Phoenix sylvestris*	19	452	49	12	20	6	0	4	2	2	2	0	0	0	0	0	1	0	0	0
5	*Morinda tinctoria*	5	43	7	1	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0
6	*Prosopis juliflora*	5	73	6	1	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7	*Vachellia nilotica*	2	11	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	*Azadirachta indica*	1	15	3	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
9	*Ficus benghalensis*	3	90	11	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
10	*Flueggea leucopyrus*	1	10	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	*Lantana camara*	1	7	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**249**	**7431**	**938**	**272**	**250**	**242**	**44**	**26**	**25**	**20**	**14**	**13**	**11**	**9**	**5**	**2**	**2**	**1**	**1**	**1**

wet clay from paddy fields. Between 0600 and 0800 h daily, all the males swarmed to the adjacent wet fallow lands (200 to 700 m distance from nest-supporting plants) and scooped the bulk of wet clay through their beaks in many trips and carried it to helmet stage nests. It was not possible to ascertain whether the birds added clay on the inner walls after closing of the egg-chamber and construction of the entrance tube. No females were seen on wet soil surfaces, scooping clay or carrying it to the nests (Image 5a,b).

Communal roosting and foraging

The study on 20 flocks engaged in roosting and foraging revealed that the individuals of Baya Weaver always moved as flocks, the flock size ranging 40–75 birds. All the flocks flew in close formations by performing complicated manoeuvers and moved out of roosting sites such as sugarcane crops and *P. juliflora* bushes between 0600 and 0630 h daily for foraging. Baya Weavers strictly followed communal roosting and foraging. They foraged mainly on cereal grain crops but occasional foraging on other crops/grasses was also observed. Out of twenty flocks studied, 13 flocks were found foraging on paddy crops. During foraging the flocks used nearby overhead power transmission cables as transit roosting sites. After foraging, the flocks split and returned to their nesting colonies in various directions. Then nest construction activities, roosting and preening continued on the nest-supporting plants, and adjacent roosting sites. Again they moved as small flocks for foraging between 1030 and d 1130 h and afterwards some birds returned to their nesting trees and the remaining roosted on adjacent sugarcane crops and *Prosopis juliflora* trees for day roost. Third foraging trips were observed in the evening period between c. 1600 and 1740 h. After evening forage, some birds returned to their nesting trees and others moved to adjacent sugarcane and *P. juliflora* trees for night roosts. The foraging continued for a short span of time, i.e., 20 to 50 min and the flocks moved frequently from one site to another on the foraging crops. Apart from grain crops, the birds also consumed unripe seeds of *S. indicum*, *C. annuum*, *L. camara*, and grasses such as *S. pallide-fusca* & *P. geminatum* (Image 4). The foraging flocks contained individuals of other bird species, such as Tricolored Munia *Lonchura malacca*, Scaly-breasted Munia *Lonchura punctulata*, and White-rumped Munia *Lonchura striata* (Table 4).

No individual of Baya Weaver was found night roosting on the nesting trees during the entire study period. After evening forage, all the birds used to flee from the nest colonies and roost on the shrubs/

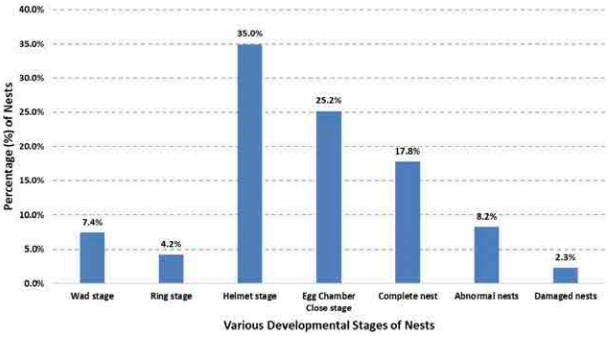

Figure 6. Number of various developmental stages and damaged nests of Baya Weaver enumerated in the study area.

sugarcane crops and return to their nest colonies the next morning. Continuous monitoring on nest colonies revealed that some females entering their nests during the evening hours did not come out and it was presumed that those females might have been incubating their eggs or nestlings.

Threats

A total of 257 nests were found torn and dangling from the nest-supporting plants, of which 86.38% of damaged nests (n = 222) were found attached to fronds of *B. flabellifer* trees, 4.67% damaged nests each (n = 12) were found on *C. nucifera* and P. sylvestris, respectively, and the remaining 4.28 % damaged nests (n = 11) occurred on other nest-supporting plants, such as *P. reticulatus*, *P. juliflora*, *F. benghalensis*, and *F. leucopyrus*. Among 257 nests, 47 nests had circular openings opposite egg-chambers (Image 5c,d,e).

The survey revealed that apart from 11,386 nests enumerated, a total of 1,050 nests in various stages (helmet stage-45.80%, n = 481; egg-chamber closed stage-21.90%, n = 230; complete nests-30%, n = 315; and abnormal nest-2.28%, n = 24) had fallen from 163 nest-supporting plants and were found scattered on the ground. During the study period, 25 eggs and 18 dead chicks were found in the fallen nests. Among 1,050 fallen nests, 72.66% nests (n = 763) were found under 113 *B. flabellifer* trees, whereas 16% fallen nests (n = 168) were under 25 *P. sylvestris* trees, 9.71% fallen nests (n = 102) were under 21 *C. nucifera* trees, 1.05% fallen nests (n = 11) under two *P. reticulatus*, 0.48% fallen nests (n = 5) under solitary *C.equisetifolia* tree, and a solitary nest (0.10%) was found under one *V. nilotica* tree (Image 5f,g,h).

Threats

The study revealed that the farmers have the

Table 4. Details of flocks containing individuals of Baya Weaver foraging on various crops in the study area.

	Name of the plants	Common name	Family	No. of forages observed	No. of birds observed
1	*Oryza sativa*	Paddy	Poaceae	13	60–75
2	*Sorghum bicolor*	Jowar	Poaceae	1	60
3	*Pennisetum glaucum*	Pearl Millet	Poaceae	3	60
4	*Eleusine coracana*	Finger Millet	Poaceae	1	60
5	*Setaria italica*	Foxtail Millet	Poaceae	1	60
6	*Setaria pallide-fusca*	Pigeon Grass	Poaceae		
7	*Paspalidium geminatum*	Egyptian Panic Grass	Poaceae		
8	*Sesamum indicum*	Sesame	Pedaliaceae	1	40
9	*Capsicum annuum*	Chilli	Solanaceae		
10	*Lantana camara*	West Indian Lantana	Verbenaceae		

Table. 5. Details of nest predations and interactions between Baya Weaver and other bird species.

	Name of the birds observed	No. of sighting of the birds	No. of damaged nests of Baya Weavers	No. of adult Baya Weavers killed
1	House Crow	21	2	0
2	Large-billed Crow	14	1	0
3	Shikra	12	0	2
4	Rufous Treepie	39	6	0
5	Black Kite	11	0	0
6	Black Drongo	85	7	0
7	Asian Koel	6	1	0
8	White-rumped Munia	11	0	0
9	Common Myna	72	0	0
10	Indian Roller	4	0	0
	Total	275	17	2

practice of clearing bushes around irrigation wells every year for their safety. When it involved destruction of nest-supporting plants, it would cause lack/scarcity of nesting substrata for the birds. Burning of herbs/shrubs under nest-supporting trees before commencement of cultivation every year resulting in smoke and fire drove away birds. In Kilvailamur villages, the land holders pruned the leaves of *C. nucifera* trees to avoid nesting of Baya Weavers with the intention of protecting cereal grain crops and 34 nests were found attached to the pruned leaves. It was observed that farmers of Rettanai had plucked the nests from trees using a hook tied to bamboo sticks to avoid possible damage to grain crops by Baya Weavers. In Kambur Village, a nest colony containing eight nests had been submerged in the irrigation well due to the rising of the water level after monsoon rains and the birds had to abandon the site (Table 5).

There were opportunistic sightings of 10 species of other birds, such as House Crow *Corvus splendens*, Large-billed Crow *Corvus macrorynchus*, Shikra *Accipiter badius*, Rufous Treepie *Dendricitta vagabunda*, Black Kite *Milvus migrans*, Black Drongo *Dicrurus macrocercus*, Asian Koel *Eudynamys scolopaceus*, White-rumped Munia *Lonchura striata*, Common Myna *Acridotheres tristis*, and Indian Roller *Coracias benghalensis* on the nest colonies. Seventeen incidents of nest damages by House Crow, Large-billed Crow, Rufous Treepie, Black Drongo, and Asian Koel were observed during the study, whereas no antagonistic relationships existed between Baya Weavers and Common Myna and Indian Roller. Rufous Treepie had plucked fibres and made a circular opening on the anterior side of egg-chamber and inserted their heads (Image 5a). In seven instances, individuals of Black Drongo had plucked fibres from nests and caused damage to the nests. Seven nests (helmet-1 & complete nests-6) of Baya Weaver were occupied by White-rumped Munia and no antagonistic relationship was observed between these two species. It was not possible to ascertain whether the individuals of White-rumped Munia occupied abandoned nests or by usurping the nests from resident Baya Weavers. No incident of either damage to nests or killing of adult birds by Black Kites was noticed, but Baya Weavers were seen to be frightened and fleeing from the nesting colonies when a Black Kite landed on nesting trees (Table 5; Image 6).

DISCUSSION

Baya Weavers and their preference of plants to build nests

Baya Weavers used *B. flabellifer* trees extensively for construction of nests in the eastern parts of peninsular India (Sharma 1989). Davis (1974) indicated that 60% of nests occurred on both *B. flabellifer* and *C. nucifera.* In the present study, I found that Baya Weavers preferred *B. flabellifer* (58.9%; n = 490), since 72.93% of nests (n = 8,304) occurred on them. It was also observed that Baya Weavers preferred more male *B. flabellifer* trees (55.10%; n = 270) than female trees (44.9%; n = 220) for construction of nests. The probable reasons for preferring male trees might be due to less human disturbance faced by male trees as compared to female trees. However the exact causes for such a preference will require further investigation. In one instance, a male bird constructed a nest by plaiting a knot encircling the stems of *Cocculus carolinus*, *Prosopis juliflora*, and rachis of *Phoenix sylvestris.* In another case the nest was found attached to the tip of stems of *Prosopis juliflora* and *S. trilobatum*.

Ambedkar (1969) had stated that Baya Weavers of different regions preferred different plant species for construction of nests. He also recorded six species in Tamil Nadu, viz., *B. flabellifer*, *P. sylvestris*, *C. nucifra*, *P. dulce*, *T. indica*, and *Acacia* spp. Birds used 25 plant species as nesting substrata in Uttar Pradesh (Mathew 1972) and 17 plant species in Arakkonam taluk of Tamil Nadu (Pandian 2021a). In the present study, 27 plant species have been recorded including the six species as recorded by Ambedkar (1969).

Preference of Baya Weavers in building nests on plants occurring close to power cables, roads and human dwelling

As a social bird, Baya Weavers generally prefer to live near agricultural areas with significant human activity. For example, Ali (2009) found that the Weaver populations used electricity lines as fetching sites for collection of food and nesting materials. Ninety-three percent of nest-supporting plants occurred in close proximity to power cables, 64% nest-supporting plants near roads, and 86% nest-supporting plants near human dwellings were reported in Villupuram district (Pandian & Ahimas 2018). In the present study, the maximum nest-supporting plants occurred close to power cables that passed through crop fields and they were used as fetching and roosting sites while foraging, collection of nesting materials and feeding broods. The birds selected apparently nest-supporting plants that occurred in close proximity to roads with busy vehicular traffic and human dwellings close to cultivated lands hence, this matches with the findings of Ali (2009) and (Pandian & Ahimas 2018).

Source of nest materials

The nest materials used by Baya Weavers were found to vary according to the locality. In India, the birds used leaf fibres of *C. nucifera* and *P. sylvestris* except in the north (Dewar 1909). Baya Weavers used fibres from grass and palm fronds to construct nests in the Northern Province of Sri Lanka, India, Africa, and Seychelles (Wood 1926; Crook 1962), leaves of *Phoenix* sp., coarse grass and paddy in Kolaba district, Maharashtra (Ali 1931), and *Phoenix* sp., paddy, millets, coconut, and lemon grass in Cuddapah district of Andhra Pradesh (Mathew 1972). The present findings of birds using fibres of *P. sylvestris* for construction of nests partly matches with the observations of Dewar (1909), Wood (1926), Ali (1931), Crook (1962), Mathew (1972), and Davis (1974). Apart from *P. sylvestris,* the birds used leaves of *S. officinarum* and *T. angustifolia* as nest materials in the study area.

Orientation of nests

Nests of Baya Weavers were found hanging in an easterly direction to protect the nests from winds of the south-west monsoon in the Northern Province of Ceylon (Wood 1926). Many authors have commented on the occurrence of more nests on the eastern side (windward) of the plants as protection from strong monsoon winds (Ali 1931; Ambedkar 1964; Davis 1971; Quader 2003). The nests of the White-browed Sparrow (*Plocepasser mahali)* constructed on the windward side of trees suffered more damage than those on leeward side (Ferguson & Siegfried 1989). It was reported that 40.4% nest colonies in Rajasthan (Sharma 1990), 87% nests in Chorao Island, Goa (Borges et al. 2012), 88.6% of nests in Tindivanam taluk (Pandian & Ahimas 2018), and 80.86% of nests in Arakkonam taluk, Tamil Nadu (Pandian 2021a) were oriented towards the east probably to protect their nests from the battering south-west monsoon winds. In the present study also, 70.16% nests were found hanging towards the east, hence it matches with the findings of Wood (1926), Ali (1931), Ambedkar (1964), Davis (1971), Quader (2003), Borges et al. (2012), Pandian & Ahimas (2018), and Pandian (2021a). Sharma (1990) observed all solitary nests faced other than the eastern side in Rajasthan whereas in the present study, 97.7% solitary nests (n = 87) were found facing the eastern side, hence it contradicts the observations of Sharma (1990).

Image 3. Pictures showing abnormal nests: a—Multi-stalked nest | b—Fused branching nest | c—Buttressed nest | d—Chain-storeyed nest | e—Bell-jar shaped nest | f—A bistoreyed nest with both the alive storeys | g—Wide stalked nest | h—1+1 storeys nest | i—Nest with two egg-chambers attached to a common stalk | j—1+1/2 type nest | k—Fused branching nest | l—Helmet stage nest with three openings. © M. Pandian.

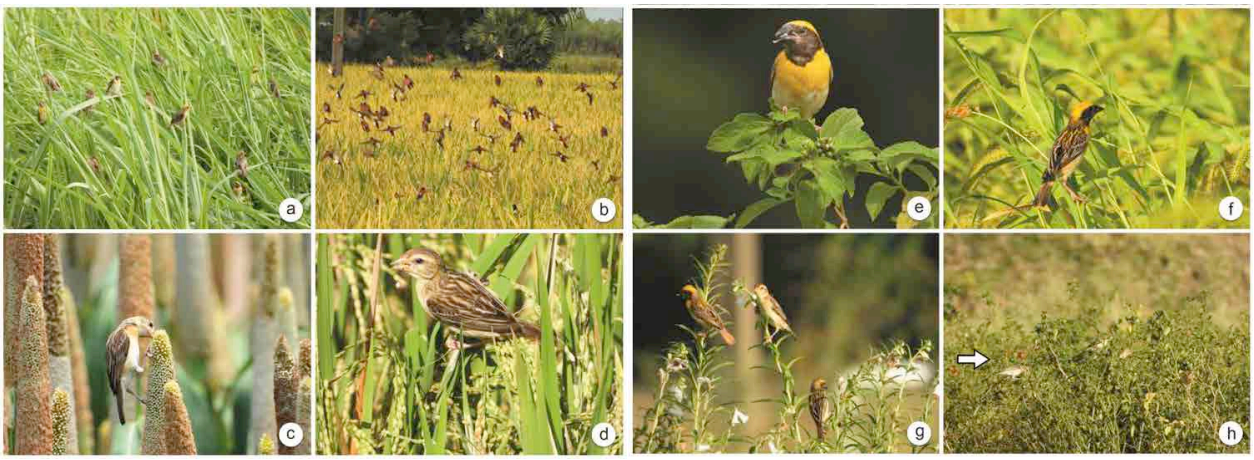

Image 4. Pictures of Baya Weavers showing forage on various seeds. A — Baya Weavers transit roost on Sugarcane crop before forage |— b A flock containing Baya Weaver with associate birds foraging on paddy crop| c— A female bird gleans grains of Pearl millet| d— A female bird gleans paddy grains| e— A male bird forages on fruits of Lantana camara| f— A male bird forages on foxtail millet crop| g— Birds foraging unripe fruits of Sesame crop, and |h— Birds forage on Chilli fruits. © M. Pandian.

Nesting colonies

Baya Weaver is a colony-nester and the number of nests in each colony has been reported to be varied: 1–250 nests in Rajasthan (Sharma 1989), 5–24 nests in South Goa (Borkar & Komarpant 2003), 1–93 nests in Villupuram district (Pandian 2018), and 1–61 nests in Vellore district, Tamil Nadu (Pandian 2021a). In the present study also, the number of nests per colony was found between 1–109.

A total of 27 solitary nests were recorded on *A. Arabica* trees in Satna district of Madhya Pradesh (Pandey 1991), 22 solitary nests in Arakkonam taluk (Pandian 2021a) and now I recorded 89 solitary nests in the study area. Nest colonies with small numbers of nests tend to be more likely to be abandoned than large and established ones, as Baya Weavers are of a more shifting nature (Ali et al. 1956). The present enumeration of less than 20 nests in 78.13% of nest colonies (including solitary nests

on 89 nest-supporting plants) indicates that the present nest colonies are found weak, not well-established as stated by Ali (1931).

Nests overhanging water bodies

Many authors have reported the occurrence of nests of Baya Weaver hanging over water bodies (Ali 1931; Ambedkar 1964; Collias & Collias 1964; Crook 1964; Davis 1974; Khan 1799; Subramanya 1982; Sharma 1987). Nests on plants hanging over water bodies in South Goa were reported by Borkar & Komarpant (2003), in Parbati hill, Poona by Crook (1960), in Nanded region, Maharashtra by Achegawe *et al*. (2016), and in Assam, by Yashmita-Ulman *et al*. 2017. In Tamil Nadu, 3.2% of nests in Tindivanam taluk (Pandian 2018) and 4.38 % nests in Arakkonam taluk, Tamil Nadu (Pandian 2021a) were found hanging over water bodies. During the present study, 2.86% nests (n = 140) were found hanging over irrigation wells, canals and ponds, as reported in many other studies (Khan 1799; Ali 1931; Ambedkar 1964; Collias & Collias 1964; Crook 1964; Davis 1974; Subramanya 1982; Sharma 1987; Borkar & Komarpant 2003; Pandian 2018, 2021a). The reason for birds selecting nest-supporting plants close to water bodies is attributed to the safety of the nests and broods from terrestrial predators (Davis 1974). Sharma (1987) recorded four nest-supporting plants, namely *Calotropis procera*, *Cordia gharaf* (= *Cordia sinensis*), *Adhatoda vasica*, and *Cynodon dactylon,* bearing nests found hanging over wells and water bodies in Rajasthan. Pandian (2021a) had recorded eight nest-supporting plant species bearing nests, namely *V. nilotica*, *P. juliflora*, *B. flabellifer*, *P. sylvestris*, *C. nucifera*, *P. reticulatus*, *F. religiosa*, and *Ziziphus oenoplia* growing on the edges of water bodies in Arakkonam Taluk, Tamil Nadu. But in the present study, 12 plant species bearing nests which were not recorded by Sharma (1987) in Rajasthan were observed. It indicates that the preference of nest-supporting plants by Baya Weavers near water bodies is found to vary in different geographic regions.

Abnormal nests

Abnormal nesting behaviour of Baya Weaver was reported by Ali et al. (1956) and Ambedkar (1958, 1980) in Pune, Maharashtra, and Sharma (1985, 1988, 1995) in Rajasthan. Borkar & Komarpant (2003) listed 13 distinct types of anomalous nests in South Goa. In Tamil Nadu, 15 types of abnormal nests in Tindivanam Taluk and eight types of abnormal nests in Arakkonam taluk were reported (Pandian 2018, 2021a). Now 17 types of abnormal nests were recorded in the study area, hence it matches with the observations of the above said authors.

Abnormal nesting behaviour also occurs in other species of the genus *Ploceus.* For example, Southern-masked Weaver *P. velatus* constructs one of the most abnormal nests among the Weaver birds in South Africa, Angola, Zambia and Mozambique (www.weavers.adu.org). Black-throated Weaver *P. benghalensis* builds an abnormal entrance tube of more than a metre length (Mishra 2004) and Spectacled Weaver *P. ocularis* constructs an abnormal entrance tube with a two-metre length in southern Africa (Maclean 1985). African Weaver *P. cucullatus* constructs an abnormal nest with supernumerary antechamber or bottomless or canopy type nests with variations in the entrance tubes (Collias & Collias 1962; Crook 1963). Intraspecific variations in the length of entrance tubes are found in the nests of Streaked Weaver (*P. manyar*) and Sakalava Weaver (*P. sakalava*). The Streaked Weaver constructs a nest with a short entrance tube in reeds in India, but with a long entrance tube in trees in Java (Delacour 1947) and the Sakalava Weaver constructs a nest with a short entrance tube in the arid habitats and a long entrance tube in the other habitats in Madagascar. Hence, like other species of *Ploceus*, Baya Weavers are also found to have constructed abnormal nests with 17 variations in the study area.

Deposition of clay

It was found that plastering of clay by males started when the nest construction was in the helmet stage, as also reported in other studies (Dewar 1909; Ali 1931; Borkar & Komarpant 2003). According to Davis (1973), wet mud smudging in nests takes place prior to pairing with females. The behavior of deposition of mud on the inner walls of nests is also prevalent among the other species of *Ploceus*, *viz*., Black-breasted Weaver *P. benghalensis* and Streaked Weaver *P. manyar* (Crook 1962). Wood (1926) suggested that plastering of clay helps to stabilize the nest in strong winds and also speculated that it might have been the habit of some ancestors of Baya Weaver, which built nests entirely or partly made of mud. Crook (1963) and Davis (1973) opined that mud plaster gives reinforcement to the fibres when the female conducts violent examination prior to her selection of nests. Ali (1931) and Sharma (1996) stated that intricate ethology is behind this peculiar habit of plastering and hence it requires further research. In this study, 90.12% helmet stage nests (n = 3,587) contained clay deposits on the inner nest walls and the exact reasons for plastering of clay needs further

Image 5. Pictures showing damaged and fallen nests: a—A male scoops clay | b—Helmet stage nest with plastering of clay | c—Partly torn nest | d—Dangling damaged nests | e—A circular opening opposite to egg-chamber | f—A fallen nest containing damaged eggs | g—Fallen nests | h—Fallen nest containing dead chick. © M. Pandian.

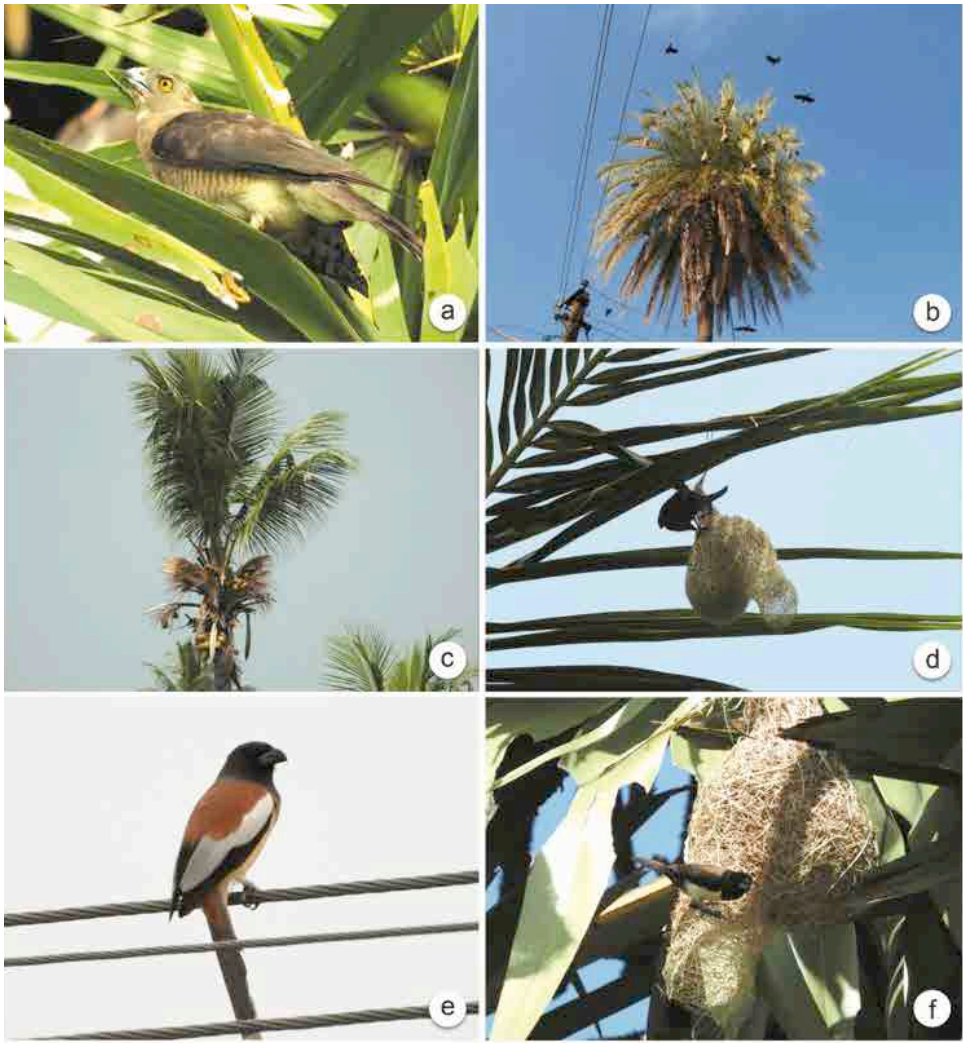

Image 6. Baya Weavers and their interactions with other bird species: a—Shikra chasing Baya Weaver on *Borassus flabellifer* tree | b—House Crows chasing nest colony | c—Pruned nest-bearing leaves of *Cocos nucifera* | d—Black Drongo damaging a nest | e—Rufous Treepie perching on power cable adjacent to nest colony | f—White-rumped Munia occupied a comlete nest of Baya Weaver. © M. Pandian.

study as stated by Ali (1931) and Sharma (1996).

Communal roosting and foraging

The mixed communal roosting consisting of different bird species serves as a centre for the exchange of information regarding the locations of food sources and warning signals about the approach of predators (Zahavi 1971; Gadgil 1972; Ward & Zahavi 1973; Gadgil & Ali 1975). Pandian (2020) had observed communal foraging and roosting of Baya Weaver in Ranipet district, Tamil Nadu. In the present study, flocks containing individuals of Baya Weaver, Tricolored Munia, Scaly-breasted Munia, and White-rumped Munia moved collectively without any competition over sharing of food and roosting sites. The behaviour of mixed roosting of four different species might have shared information on sources of cereal grain crops and protection from predators as stated by Gadgil (1972), Zahavi (1971), Ward & Zahavi (1973), Gadgil & Ali (1975). The food of the adult Baya Weaver comprises of cereal grains, grasses, weeds, flower nectar, and insects (Ali & Ripley 1987), paddy and weed seeds (Mukherjee & Saha 1974), paddy grains followed by bajra and sorghum (Ali et al. 1978). In the present study, the birds preferred cereal grain crops mainly paddy, pearl millet, finger millet and foxtail millet, grasses and a weed *L. camara* as observed by Ali & Ripley (1987) and Ali et al. (1978). Additionally Baya Weavers foraging on seeds of sesame and chilli crops were observed in the current study.

Threats

The males made openings on the nests from the outside directly into the egg-chamber to feed the chicks (Wood 1926). Borges et al. (2002) observed eight nests with a hole near the egg-chamber in Goa. Ali et al. (1956) felt that most circular holes bored opposite the egg-chamber recorded in nests in Pune, Maharashtra, could have been caused by predators. Rufous Treepie made a circular opening near the egg-chamber and predated eggs/chicks (Pandian 2021a). In the present study, a total of 257 damaged nests were found attached to the nest-supporting plants, of which 47 nests had circular holes near the egg chambers confirming that individuals of Rufous Treepie made circular holes on six nests corroborating the findings of Ali (1931) and Pandian (2021a). Another 11 nests were damaged by House Crows, Large-billed Crows, Black Drongos, and Asian Koels. The reasons for damages in the remaining 240 nests were not possible to ascertain during the present study.

Many complete nests were blown down due to recurring spells of bad weather during June–August in the Bombay area and the males cutting down the nest of rival cocks was common when the owner had gone to fetch nesting materials in Poona City (Ali et al. 1956). The males usually had the habit of cutting down their own nests, including those rejected by females and complete nests after broods have departed (Collias & Collias 1959, 1962). An instance of male Baya Weaver cutting down a complete nest occupied by White-rumped Munia was recorded in Villupuram district (Pandian 2021b). In the present study, a total of 1,050 nests had fallen down from the nest colonies. A total of 25 eggs and 18 dead chicks were found spread near fallen nests. The occurrence of such a great number of fallen nests may have been due to various biotic and abiotic factors as suggested by Ali et al. (1957), Collias & Collias (1959, 1962), and Pandian (2021b) and it needs further study.

House Crows and Large-billed Crows were the major predators of nests, eggs and broods (Ali 1956). Nest predation by Rufous Treepie was reported in Arakkonam taluk, Tamil Nadu (Pandian 2021a). Agitated behaviour of birds when Crow Pheasants *Centropus sinensis* appeared in close proximity of nesting trees and a Shikra making an unsuccessful stoop on a nest colony was observed in Kolaba district, Maharashtra (Ali 1931). In the present study, individuals of Baya Weavers had exhibited an agitated behaviour when House Crows and Large-billed Crows landed on nesting trees and two incidents of predation on adult male birds by Shikra and 17 incidents of nest damages by avian predators, such as House Crow, Large-billed Crow, Asian Koel, Black Drongo, and Rufous Treepie were observed as stated by Ali (1931), Ali (1956), and Pandian (2021a) hence, these predators posed a threat to the populations of Baya Weaver in the study area.

CONCLUSION

This is a systematic quantitative study on the preference of Baya Weaver towards various nest-supporting plants as nesting substrata, stages of nests, abnormal nests and probable threats to the nests on such nesting plants in the study area. The survey revealed that out of 27 plant species, Baya Weavers preferred three primary nest-supporting palm species, such as *B. flabellifer*, *C. nucifera*, and *P. sylvestris* for nesting. These three palms are an integral part of rural areas and they are also associated with rural cottage industries. The birds preferred nests on plants close to power cables, roads and human dwellings. Maximum nest-supporting plants occurred in cereal grain crop land. Probably the

nests are located on the eastern side of trees to protect them from the strong south-west monsoon winds. High variations of nests (17 types of abnormal nests) were reported. The birds strictly followed mixed communal roosting and foraging. Nest predation by avian predators was also found. Increasing urbanization by conversion of cultivated lands into residential areas, industrialization, widening of roads along with indiscriminate felling of these principal nest-supporting plants that are vital for Baya Weaver is a conservation issue in this landscape. Increasing practice of monoculture of *Casuarina*, sugarcane, vegetables, and flower crops, declining areas of cultivation of cereals and millets cause shortage of food grains to adult birds. Destruction of nests due to various anthropogenic factors and abiotic factors (monsoon winds and rains) may also affect the breeding of the Baya Weaver. The survey is limited to one taluk, but this is part of a larger geographical area that has a potential for high nesting population of the Baya Weaver which, however, faces threats from the changing rural landscape. Therefore, a conservation program focused on Baya Weaver could be taken up in the area, primarily through protection of nests and birds, keeping a check on anthropogenic threats, along with a sensitization program for local farmers towards conservation.

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Appendix I. List of villages having nesting habitats of Baya Weaver in Tindivanam taluk, Villupuram district.

	Name of the village		Name of the village		Name of the village
1	Mambakkam	41	Muppuri	81	Then Kalavay
2	Sembakkam	42	Pandamangalam	82	Annamputtur
3	Mel Siviri	43	Kenippattu	83	Kovadi
4	Konalur	44	Kodima	84	Manur
5	Attippakkam	45	Manthagapattu	85	Roshanai
6	Neduntondi	46	Alagraman	86	Ural
7	Vellimedupettai	47	Soli Sokkunam	87	Karuvapakkam
8	Vada Siruvalur	48	Kutterippattu	88	Vairapuram
9	Taniyal	49	Chinna Nerkunam	89	Tengapakkam
10	Puliyanur	50	Kizhavaliyamur	90	Evallur
11	Ilamangalam	51	V. Nallalam	91	Purangarai
12	Akkur	52	Se. Kotamangalam	92	Konerikuppam
13	Vilukkam	53	Nedi	93	Saram
14	Tivanur	54	V. Panchalam	94	Kil Gudalur
15	Salai	55	Sendiyambakkam	95	Vithalapuram
16	Kollar	56	Mozhiyanur	96	Kattalai
17	Kattusiviri	57	Periathachur	97	Nolambur
18	Pampundi	58	Perani	98	Ayyanavaram
19	Peramandur	59	Palapattu	99	Eppakkam
20	Pattanam	60	Chittani	100	Kuttikulattur
21	Pelakuppam	61	Elay	101	Kambur
22	Tindivanam	62	Andipalayam	102	Vada Kalavay
23	Bootheri	63	Pombur	103	Avanippur
24	Singanur	64	Ganapathipattu	104	Sendamangalam
25	Then Pasiyar	65	Anganikuppam	105	Kil Mannur
26	Vempundi	66	Athikuppam	106	Andappattu
27	Muttiyur	67	Vidur	107	Kil Serur
28	Peramandur	68	Padirippuliyur	108	Kil Buderi
29	Goplalapuram	69	Ten Alappakkam	109	Senalur
30	Mel Peradikuppam	70	Kuralur	110	Vandarampundi
31	Vengandur	71	Chendur	111	Naramagani
32	Kongarampet	72	Velangambadi	112	Kil Nemali
33	Nanalmedu	73	Siruvai	113	Kunnapakkam
34	Narerikuppam	74	Veliyanur	114	Mandaperumbakkam
35	Rattanai	75	Kallakulattur	115	Mettunatham
36	Annankulathumedu	76	Nallamur		
37	Maroor	77	Kannigapuram		
38	Thavalapattu	78	Kil Idaiyalam		
39	Then Puthur	79	Vairampattu		
40	Peramapttu	80	Avanampattu		

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