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Research Paper

Selection of Nesting Potentials of Corvus Splendens in Different Trees of Various Sampling Sites of Dindigul, Tamil Nadu

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A B S T R A C T

Every bird present on the earth need a shelter during their breeding season. Shelter home may be in the form of nest, dwelling space on the ground, on tree crevices or on electric poles. Corvus splendens is a cosmopolitan bird with unique nest building characteristic features. Identifying crucial factors involved in nest-site selection is essential for implementing conservation measures for house crow and its population. In the present study an attempt was made to draw the affinity of *C. splendens* with the nesting potential, number of nests per tree, canopy configuration and ramifications in the probable tree species of sampling sites in and around Dindigul, Tamil Nadu. Out of 687 trees surveyed, 39 species of 306 trees belonging to 23 families were found to be suitable for nest construction. Likewise, two branches were chosen for nest platform substratum in the maximum trees studied. More number of nests were constructed on the top canopy of trees located near commercial buildings where mutton stalls available followed by residential buildings with food source proximity than human non inhabitated areas. The study provides the basic information about bird's instinct behaviour of nest construction on suitable tree species near food availability which can be helpful for conservation and study of bird's ethnology.

***Key words*:** Corvus splendens, Nesting potential, Food source, Conservation measures

Crows are considered to be the most intelligent and adaptable birds belonging to the Corvid family. The black color, social behavior and unique calls are the distinct features of it [1]. Nesting phenomena is the key factor in reproduction as well as survival of the offspring in birds. Breeds are successful by the selection of sites for nest construction. Crows may construct a number of primary nests or decoy secondary nests [2]. Nests are usually seen in hidden canopy of tall well-built tree branches in farmland, road ways, residential areas, on the top of tall buildings and electric poles. In villages crows gather to forage in agricultural fields, while in cities near meat shops, fish markets, slaughter houses, hotels, hostels and garbage dump areas are their feeding ground. The present study is focused on the preference of potential nesting trees on the basis of habitat characteristics in the selected sampling areas of Dindigul, Tamil Nadu, India. Therefore, a survey was conducted on the nesting trees of *C. splendens* in different localities of Dindigul, Tamil Nadu, India for a period of six months from May to October 2020 and the findings revealed to ascertain the impact of tree type on the propagation and multiplication of the house crows.

MATERIALS AND METHODS

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Dindigul is a town located in Tamil Nadu of South India. The geographical coordinate of Dindigul is 10.35°N 77.95°E and has an average elevation of 265 m (869 ft) in the foot hills of Sirumalai hills. Summer season is from March to June, while October to January marks the winter season. Dindigul receives rainfall with an average of 812 mm annually. Bulk of the rainfall is received by the north east monsoon in the months of October, November and December. Study site is a semi urban area encircling residential houses, hotels, mutton stalls, fish markets, slaughter houses, schools, hospitals, small ponds and parks. There are lot of stretches of herbs, shrubs, bushes and woody trees on either side of the roadsides. Six sampling stretch areas were selected in the view of its greenery residential, commercial and non-habituated area which indirectly promote the birds nesting and reproductive behavior.

Survey on nest characteristics

A study was carried out for six months period from May to October 2020. Surveys were conducted during different seasons at different sites in and around Dindigul, Tamil Nadu, in six different selected sampling areas of commercial, residential and non-residential areas (Table 1).

Every day regular crow watching was carried out in the early morning hours during the entire period. Crow nests were discovered by systematic searching, numbered when found and recorded with a hand-held GPS unit (Garmin). Pair of binoculars and digital camera was used. The instrument used was Nikon Monarch 7 (8 × 42) binoculars. Lower magnification power of 8X and 42 mm objective lens diameter was used for general nest watching. If the

magnification power is lower, then the image would be brighter and wider. This makes a clear access of the field view at ease for observing nest diversity.

Table 1 Various sampling sites in Dindigul, Tamil Nadu

Sampling sites	Area
Balakrishnapuram	Residential sites
Salai road	Commercial Hotels
RM Colony road	Residential sites
Solai hall road	Commercial Slaughter houses
Collectorate area	Transport green canopy
Mettupatti	Commercial hotel sites

Nest characteristics such as tree species, nesting substrate, number of nests, number of branches required, height of the nest above the ground, number of species with nest placement and were measured by meter stick or by ocular estimation. At the time of survey due attention was given to note the branching pattern of the tree, the number of branches required by the crows to consider as a platform for construction of nest. Nest-site characteristics were measured in the abandoned nests to avoid disturbance in their reproductive behavior [3]. Data were collected from each locality by carrying out survey using tree climbers, farmers at different sampling sites. Statistical methods for ANOVA was applied by using IBM SPSS software version.

RESULTS AND DISCUSSION

Corvus splendens prefers to construct nest close to human habitation of commercial areas followed by residential areas in selected nesting trees species so that they can collect their food at ease (Table 1). They prefer nesting sites that reduce the chances of predation and egg damage [4]. Potentiality of a nesting tree varied to a great extent with the different families (Table 2) and the number of nests varied with the tree in respect to tree species (Table 3). It is fascinating that in spite of lot of potential trees availability they preferred to select the tree of one species rejecting the other [5]. They preferred to construct nests in the trees with good number of ramifications and suitable branches for construction [6]. Though there were more potential trees in the sampling areas the *C. splendens* showed affinity to the trees belonging to certain families compared to others. It is evident that these birds showed preference for nesting potential tree belonging to Fabaceae, Moraceae and Caesalpinaceae than other families.

A total of 687 nesting trees belonging to 23 families were surveyed in course of the study period (Table 2). At the time of survey, a total of 306 nests were counted from these trees (Table 2). Of the total 306 nest-bearing trees 155 had only one nest, 111 had 2 nests, 40 had 3 (Table 3). More number of nests were seen on the top branches of tree varieties like Ficus sp. *Azadirachta indica*, *Mangifera indica*, *Anthocephalus cadamba*, *Alstonia scholaris*, *Albizia lebbeck*, *Acacia catechu* where hard flexible branches help them in nest construction and concealment from natural enemies. Maximum number of nests were found on Ficus tree which had hard wooden branches that help in building their homes thereby protecting their fledglings [7]. House crows tend to gain the maximum benefit by utilizing the food resources available around their nesting area at the expense of minimum energy and to ensure their progeny multiplication [8].

In all cases the nesting sites ensured easy exit and entry by the parent crows. It is seen that the crows find platforms for construction of nest in these trees because of ramification and closeness of sub-branches in the inner circumference area of the branching system [9]. Since such possibilities were less in Caesalpinia pulcherrima the crows perhaps switched over the choice of platform selection for construction of nest, anywhere in the tree except the peripheral region of the branches.

Table 2 Nesting potential trees recorded in the various study sites

English Name	Tree species	Family
Mango	*Mangifera indica*	Anacardiaceae
Sugar apple	*Annona squamosa*	Annonaceae
Indian mast tree	*Polialthia longifolia*	Annonaceae
Devil tree	*Alstonia scholaris*	Apocyanaceae
Sheoak	*Casurina equisitifolia*	Casuarinaceae
Tamarind	*Tamarindus indica*	Caesalpinaceae
Red bird of paradise	*Caesalpinia pulcherrima*	Caesalpinaceae
Flamboyant	*Delonix regia*	Caesalpinaceae
Arjun tree	*Terminalia arjuna*	Combretaceae
White thingan	*Hopea odorata*	Dipterocarpaceae
Jackalberry	*Diospyros glutinosa*	Ebenaceae
Shisham	*Dalbergia sisoo*	Fabaceae
Golden shower tree	*Cassia fistula*	Fabaceae
The Sickle Senna	*Cassia tora*	Fabaceae
Almendro	*Dipteryx oleifera*	Fabaceae
Cornbeefwood	*Barringtonia acutangula*	Lecythidaceae
Silk cotton tree	*Bombax ceiba*	Malvaceae
Neem	*Azadirachta indica*	Meliaceae
Southern Mangolia	*Magnolia grandiflora*	Magnoliaceae
Drumstick tree	*Moringa pterygosperma*	Moringaceae
Black cutch	*Acacia catechu*	Mimosaceae
Flea Tree	*Albizia lebbeck*	Mimosaceae
Hairy fig	*Ficus hispida*	Moraceae
Banyan Tree	*Ficus Bengalensis*	Moraceae
Banyan Tree	*Ficus Bengalensis*	Moraceae
Peepal	*Ficus religiosa*	Moraceae
Jackfruit	*Artocarpus heterophyllus*	Moraceae
Guava	*Psidium guajava*	Myrtaceae
Java plum	*Syzyium cumini*	Myrtaceae
Mahua	*Eukalyptus alba*	Myrtaceae
Indian Plum	*Ziziphus mauritiana*	Rhamnaceae
Kadam	*Anthocephalus cadamba*	Rubiaceae
Wood apple	*Aegle marmelos*	Rutaceae
Bullet Wood Tree	*Mimusops elengi*	Sapotaceae
Mahua	*Madhulika longifolia*	Sapotaceae
Sapodilla	*Achras sapota*	Sapotaceae
Longan	*Euphoria longan*	Sapindaceae
Wild almond	*Sterculia foetida*	Sterculiaceae
Guest tree	*Kleinhovia hospital*	Sterculiaceae

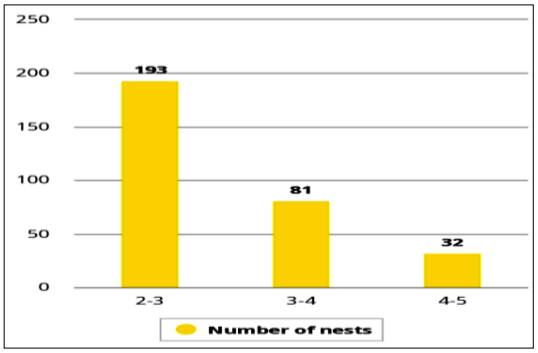

Fig 1 Number of nests constructed using various branches on the sampled trees

Though the crows are in need of different number of branches to find a suitable platform for the construction of nest, it is likely that they would select certain number of branching patterns needed for nesting in one or other trees. Apart from food resource mobilization these nest-tree species had a number of spots, presenting as platform because of agglomeration of suitable branches [10]. It is evident that *C. splendens* are able to construct nest by considering with two branches or more than to create a platform for placement of sticks for construction of nest. Of the 306 nests 193 were constructed by using 2–3 adjacent branches while 81 nests were built on the platform which was shaped due to coexistence of 3–4 branches of the nesting trees concerned (Fig 1). On the contrary, only 32 nests were constructed on a platform which developed due to proper placement of 4 or more branches.

Table 3 Number of potential trees with nesting platform among the trees sampled

Tree species	Nesting trees	Trees surveyed
Acacia catechu	41	45
Achras sapota	4	10
Aegle marmelos	9	16
Albizia lebbeck	31	40
Alstonia scholaris	45	56
Annona squamosa	1	5
Anthocephalus cadamba	26	33
Artocarpus heterophyllus	11	21
Azadirachta indica	63	82
Bombax ceiba	1	3
Caesalpinia pulcherrima	31	37
Cassia fistula	2	4
Cassia tora	4	7
Casurina equisitifolia	5	8
Dalbergia sisoo	2	5
Delonix regia	9	14
Diospyros glutinosa	8	16
Eukalyptus alba	6	15
Euphoria longan	8	14
Ficus Bengalensis	14	21
Ficus hispida	2	5
Ficus religiosa	21	30
Hopea odorata	1	6
Kleinhovia hospita	3	8
Madhuca longifolia	1	4
Magnolia grandiflora	2	7
Mangifera indica	42	54
Mimusops elengi	11	17
Moringa pterygosperma	2	9
Polialthia longifolia	8	15
Psidium guajava	4	8
Sterculia foetida	4	9
Syzyium cumini	5	14
Tamarindus indica	12	20
Terminalia arjuna	5	11
Ziziphus mauritiana	12	18
Total Nests	306	687

Table 4 Number of nests constructed on each sampled tree in different study areas

Tree species	Nest 1	Nest 2	Nest 3
Acacia catechu	8	16	6
Achras sapota	2	1	0
Aegle marmelos	5	2	0
Albizia lebbeck	9	10	1
Alstonia scholaris	10	12	6
Annona squamosa	1	0	0
Anthocephalus cadamba	9	4	9
Artocarpus heterophyllus	4	7	0
Azadirachta indica	23	18	6
Bombax ceiba	1	0	0
Caesalpinia pulcherrima	4	8	4
Cassia fistula	1	1	0
Cassia tora	4	0	0
Casurina equisitifolia	2	0	0
Dalbergia sisoo	2	0	0
Delonix regia	1	4	2
Diospyros glutinosa	3	0	0
Eukalyptus alba	2	1	0
Euphoria longan	4	3	0
Ficus Bengalensis	4	3	2
Ficus hispida	0	0	0
Ficus religiosa	6	4	2
Hopea odorata	0	1	0
Kleinhovia hospita	3	0	0
Madhuca longifolia	1	0	0
Magnolia grandiflora	0	1	0
Mangifera indica	15	8	0
Mimusops elengi	5	1	0
Moringa pterygosperma	2	0	0
Polialthia longifolia	6	0	0
Psidium guajava	3	0	0
Sterculia foetida	2	0	0
Syzyium cumini	4	0	0
Tamarindus indica	0	2	2
Terminalia arjuna	4	1	0
Ziziphus mauritiana	5	3	0
Total Nests	155	111	40

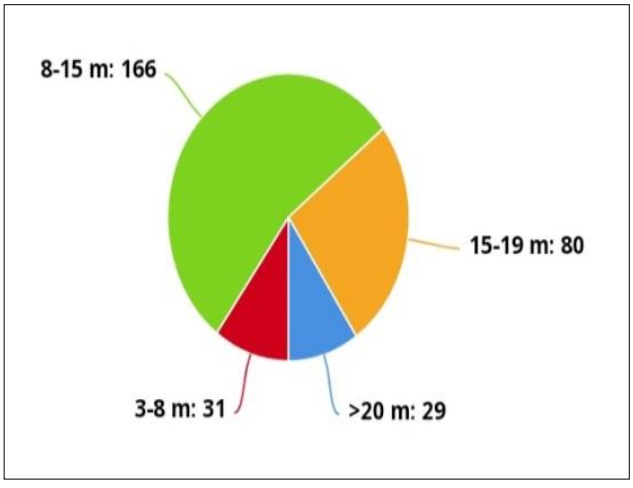

Fig 2 Number of nests on different height of the sampled potential trees

Irrespective of tree species the crows preferred to construct the nest at a maximum height ranging from 8 to 15 m (Fig 2). Of the 306 nests considered for studies 31 nests were located at a height 3–8 m, 164 nests were constructed between 8 and 15 m height, 78 nests were confined at a height 15–18 m and 29 nests were constructed in certain spots locating above 18 m of height. Therefore, potential nesting sites must provide concealment from predators, easy access to forage their food and protection from unsuitable weather conditions [11].

ANOVA was applied to justify whether such variations are statistically significant among the nesting tree species. From the results it is clear that occurrence of shelter varied significantly (F = 11.9, df = 2, P 0.001) with the tree branching and food availability. Statistical findings indicate that the occurrence of 2–3, or 4–5 branches were found to be beneficial for nest substratum in potential trees. Thus, it is concluded that the branching pattern of the suitable tree is the main cause for the development of affinity for nesting by *C. splendens*.

Table 5 Results of ANOVA test to justify the differences between Ivlev's PI and Jacobs D positive values obtained in connection with the data recorded on nesting tree species of *C. splendens*

Source of variation	Sum of squares (ss)	Degrees of freedom (df)	Mean square (MS)	Variance ratio (F)
Between the species	0.2	1	0.42	0.14
Residual	3.7	7	0.72	
Total	3.9	8		

CONCLUSIONS

In the present study, 306 trees of 23 families have been recorded with nest constructed using flexible strong branching pattern of 2 to 5 during their breeding season. Trees having rarely such facilities are obviously avoided by the crows. More over habitat selection was also in close proximity to forage their food and protection from adverse abiotic factors. Hence, our results indicate that animal food availability was also considered as a significant factor influencing the spatial distribution of breeding birds associated with human activities. Therefore, selective plantation and protection of tree species would prove effective in the long run to check the crow population and conserve their progeny.

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LITERATURE CITED

1. Ali S. 2002. *The Book of Indian Birds, 13th Edition*. New Delhi: Bombay Natural History Society, Oxford University Press.
2. Feare, C.J., and Y. Mungroo (1989). Notes on the house crow Corvus splendes in Mauritius. Bulletin of the British Ornithologists'Club 109: 199–201.
3. Peterson, Roger Tory (1990). *A Field Guide to Western Birds*. Boston: Houghton Mifflin.
4. Ehrlich, Paul R., (1988).. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. New York.
5. Washington DC. 2002). National Geographic Society
6. Gadgil, M. (2001). Project lifescape: 9. Crows. Resonance, February: 74–82.
7. Fry, C.H., S. Keith, and E.K. Urban (2000). The birds of Africa, vol VI.London: Academic Press.
8. Dutta, S.K., and S.K. Raut. (2010). Height of the nesting spots of the house crows Corvus splendens in the nest-building trees in Kolkata, India. Enviroment & Ecology 28(1): 194–197.
9. Madge, S., and H. Burn.(1993). Crows and Jays. London: C. Helm.
10. Dutta, S.K., and S.K. Raut (2013). Nesting site of house crow: Tree versus light-post-an impact assessment. Proceedings of the Zooogical Society of Calcutta 66(2): 141–148.
11. Soh, M.C.K., N.S. Sodhi, R.K.H. Seoh, and B.W. Brook (2002). Nest site selection of the house crow Corvus splendens, an urban invasive bird species in Singapore and implications for its management. Landscape and Urban Planning 59: 217–226.