

Full Length Research Paper

Artificial nest box for house sparrow: An apt method to save the dwindling species in an urban environment

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House sparrow *Passer domesticus* belongs to Passeriformes order and Passeridae Family. It has a worldwide distribution living in all continents and many of oceanic Islands. Some of the ecologists believe that this bird is a symbiotic species with human, hence recognizing and identified as a bird species depended on human environments. A lack of holes suitable for nest sites on modern or renovated buildings has been proposed as a possible cause of the house sparrow population decline. There has been an increase in the use of plastic fascia boards and the use of contoured tiles or roofing sheets to prevent the entry of birds on modern housing. House sparrows predominantly nest in holes and gaps in soffit boards and under tiles, therefore this tendency may have an impact of the availability of nest sites. Hence the present study was undertaken to apt a suitable method to conserve the house sparrow population in urban areas of Sivakasi town by erecting artificial nest boxes in Sivakasi town from October 2012 - October 2013 and obtained a positive response by the house sparrow towards the artificial nest boxes.

Key words: Worldwide distribution, symbiotic species, renovated buildings, impact.

INTRODUCTION

House sparrows *Passer domesticus* are the commonest and widest distributed bird species in nature. The widespread and once abundant house sparrow which is universally familiar in appearance has become a rare bird at many localities in recent times. House sparrow numbers have declined by about 60% in urban and suburban areas and the habitat composition and quality in urban-suburban landscapes is likely to have changed over this period (Dadam, 2009). In large cities, the number of house sparrows decreased significantly in recent decades. High reduction of sparrow population in London (60%), Glasgow (99%) and Hamburg (77%) have led to the inclusion on the UK Conservation Red List (Crick et al., 2002; Prowse, 2002; Smith, 2005). The main reasons for

the decline of this species in the urban-suburban landscape were the loss of suitable foraging habitat (Robinson et al., 2005) and the loss of suitable nesting sites. According to the survey at different places of India on the occurrences of house sparrow, it was reported that their population also has decreased considerably at present (Rajashekar and Venkatesha, 2008; Daniels, 2008; Khara et al., 2010; Bhattacharya et al., 2011; Ghosh et al., 2010).

The aim of this study was to determine the effect of artificial nest boxes for the house sparrows in urban areas in order to escalate the population of house sparrow in few selected study area of Sivakasi town in India.

METHODOLOGY

Study species

The house sparrow is a member of the family Passeridae and it is one of the larger sparrows, with a length typically of 160-165 mm and a wingspan of 210-255 mm. It is rather a large headed, heavy billed and robust passerine. The sexes are dimorphic with the male being boldly patterned. The male is warm brown above, with a grey crown and nape. It has grey cheeks and grey under parts with black round the eyes. The mantle and scapulars are boldly streaked black, chestnut and buff and the tail is dark brown. The bib has black feathers with white tips that are gradually abraded so that by the beginning of the breeding season the bib becomes uniformly black. The female is rather featureless with a grey brown crown, a pale-buff super cilium, two wing bars and an unmarked throat and breast. The bill becomes darker during the breeding season and a few birds have a completely black bill (Lowther and Cink, 1992). The nest is built in holes of structures, under the tiles or around roof area of houses. It feeds on grain, insects, weed seeds, fruit buds, nectar etc. They usually form colonies having 10 to 20 pairs and do not spread far from the natal colony.

The study was conducted during the period of October 2012 to October 2013. Artificial nest boxes were placed on housing within ten study sites in Sivakasi town (Figure 1). The artificial boxes were made up of paper board because of its easy availability and economically cheap when compared with the wooden boxes. Sivakasi Taluk is located at 9.45°N 77.8167°E and has an average elevation of 101 m above mean sea level. Nest boxes were 29 cm in height, 13 cm in width and had an entrance hole 3.2 cm in diameter. Straw, fur, moss raked from the lawn were also supplied to the sparrow as nesting materials (modified from Chetan, 2012). Feeding stations were placed above the nest boxes for easy food access of sparrows, and a stick was inserted near the entrance hole for standing on it and feeding of young ones (Plate 1). Ten places were selected for the erecting of artificial nest boxes based on the disturbances from the environment and availability of natural nesting sites. The disturbed places selected were Market area, Muslim colony, Bus stand, N. R. K. R Road and Bye pass road. In each study site, five nest boxes were erected in different houses 20 meters apart from each other. The boxes were erected at heights of approximately 4-5 metres on each house (Plate 2).

The nest boxes were watched at three days interval during the study period. Nest observations were done in the morning from 07:00 h to 11:00 h (IST) at regular interval. The entry and exit of sparrows are noted by visual observations while the nest activities are recorded by using camera.

Observations made on the response of House sparrows to the nest boxes were categorized into attempted, unattempted and productive. In the attempted category the house sparrows visit the box regularly but they didn't lay eggs. In the unattempted category the sparrows didn't approach the boxes, and in the productive category the house sparrows inhabited permanently in the nest box and started to lay eggs and nourish its young ones.

RESULTS AND DISCUSSION

Out of 50 boxes, 30 boxes are found to be attempted by the House sparrows. as the frequency of use of nest boxes are shown in the Table 1. The productivity in nest boxes was maximum in the Reserve line (3), Muslim colony (2), Bose colony (2) when compared to other places in which the artificial nest boxes were erected. In these nest boxes the House sparrow has stayed for a long time and laid eggs and nourishes the young ones

with insects and plant materials (Plates 3 and 4).

Being a cavity nesting bird, use of artificial nest boxes may be an attempt to reduce the population decrease of House sparrow in the urban-suburban environment. This work highlights the response of house sparrow *Passer domesticus* to artificial nest boxes at different habitats of Sivakasi town during the breeding season of the sparrow. Loss of nest sites, especially in buildings, as a consequence of present construction and renovation style in building, may be one of the potential causes of house sparrow decline in Europe (Pineda et al., 2013). On the other hand, it is suggested that house sparrow is especially connected with urban areas of lower socioeconomic status, therefore with buildings in worse condition that offer more nesting sites. Additionally, being flexible in choice of nest sites, house sparrow is expected to build the nests in other available places (including nest-boxes), when those in buildings are lacking (Shaw et al., 2008).

The response of House sparrow to the artificial nest boxes were higher for boxes placed in the undisturbed areas of Coronation colony, Reserve line, Ayyanar colony, Bose colony and Velayutha Rastha. Loss of nest sites, especially in buildings, as a consequence of present construction and renovation style in building industry, may be one of the potential causes of House sparrow crisis in Europe. On the other hand, it is suggested that House sparrow is especially connected with urban areas of lower socioeconomic status, therefore with buildings in worse condition that offer more nest sites. Additionally, being flexible in choice of nest sites, house sparrow is expected to build the nests in other available places (including nest-boxes), when those in buildings are lacking (Shaw et al., 2008). Similar kinds of results were found by Anderson (2006) who reported that the availability of nest sites is one of the most important factors influencing sparrow abundance in urban places.

In India, a similar kind of response by house sparrows towards artificial placed nest boxes was reported by Balakrishnan et al. (2011) from Manjeri municipality, Kerala. They studied the nest site characteristics of House sparrow and found that majority of the nests (89.3%) were placed above the roller shutter boxes followed by the artificial boxes provided by the shop keepers (4.8%), shelter boards in front of the shops (3.57%) and the ventilators (2.4%).

House sparrow clearly prefers nesting in buildings, and uses other sites only when those in buildings are not available (Shaw et al., 2008). Where as in the Market area, Bye pass road and Bus stand, the response towards artificial nest boxes were too low which may be due to the presence of olden buildings and availability of food within their home range. A study by Wegrzynowicz (2012) in suburban housing estate of Wrzecion in Warsaw, Poland, reported that the number of house sparrows decreased in the years of the study from 53 pairs in 2005 to 20 in 2012. This decline was caused by the renovation of buildings (insulation) that was carried out gradually

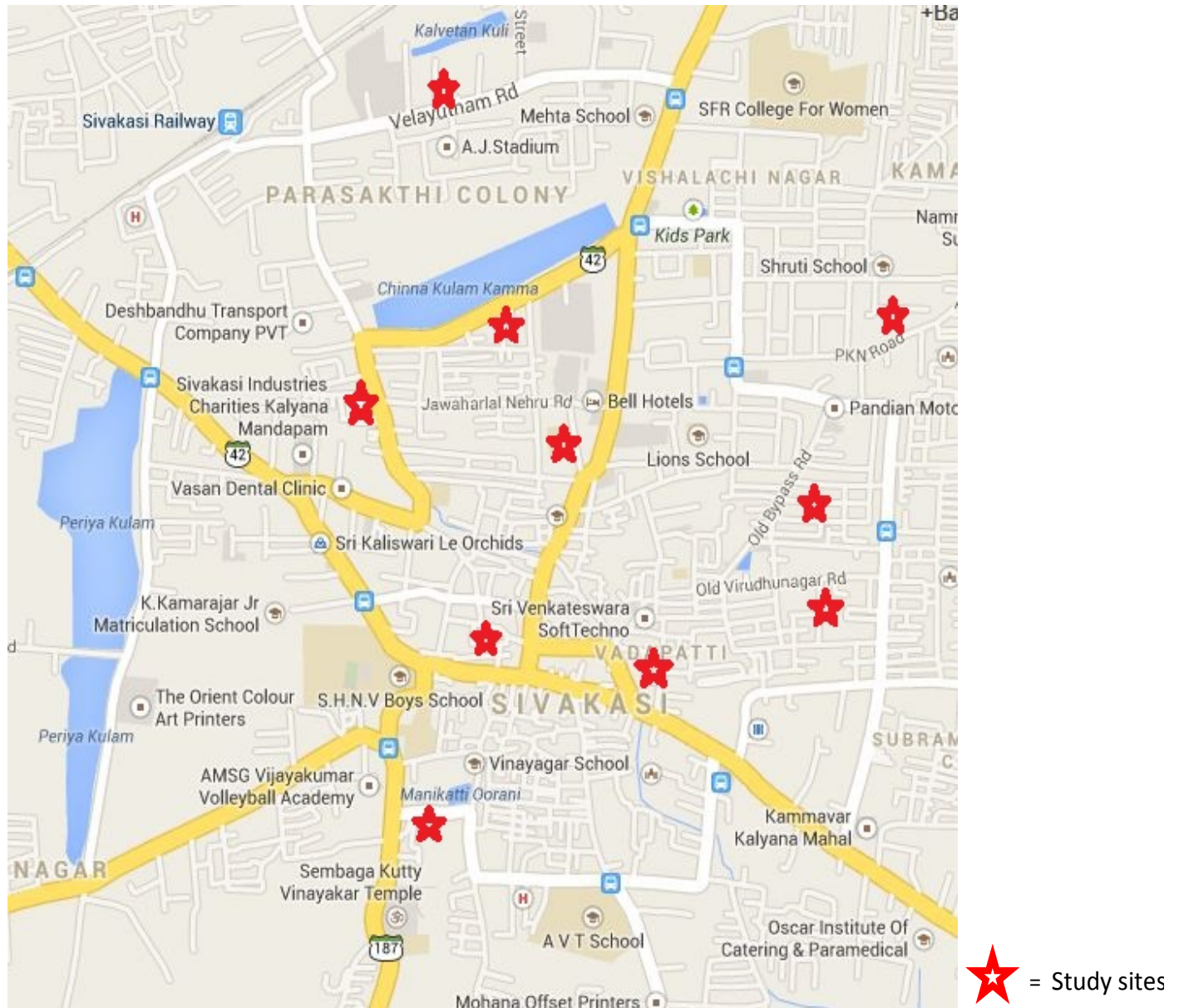


Figure 1. Map of Sivakasi town showing locations of artificial nest boxes erected Courtesy: www.GoogleEarth.com.

in the time of the study and resulted in loss of nest sites for house sparrows.

In some areas the competition and disturbances by Indian Myna (*Acridotheres tristis*) were recorded in the artificial nest boxes which were kept in the Reserve line and Muslim colony, and similar kinds of disturbances were reported from Bhattacharya et al. (2011) whom found that the artificial nest boxes was disturbed by woodpeckers at several sites and a pair of Pied cuckoo (*Clamator jacobinus*) is trying to enter the box but are defeated by a pair of house sparrow in competition.

Conclusion

This study highlights the response of House sparrow to

artificial nest boxes erected at different places of Sivakasi town. From the study it was inferred that the response of house sparrow were maximum in urbanizing areas of Sivakasi town which was due to absence of nesting sites in the modern architecture of buildings. Hence artificial nest box was a suitable measure to increase the dwindling House sparrow population from the urban eco-system.

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Plate 1. Design of the artificial nest box.



Plate 2. Erection of artificial nest box above 5 feet from ground level.

Table 1. Response of House sparrow, *Passer domesticus* to nest boxes in Sivakasi town, Virudhunagar District from October 2012 - October 2013.

Study site	Number of boxes	Attempted ^a	Un attempted	Productive
Market Area	5	1	4	1
Muslim colony	5	4	1	2
Coronation colony	5	4	1	1
Bye Pass Road	5	1	4	0
N.R.K.Road	5	3	2	0
Reserve line	5	4	1	3
Ayyanar colony	5	4	1	1
Bose colony	5	4	1	2
Bus stand	5	2	3	0
Velayutha Rastha	5	3	2	0
Total	50	30	20	10

^a Number of attempted nest boxes was varied significantly (calculated t value = 2.88, $df = 9$, t_9 (0.05) = 2.44).



Plate 3. The chicks being nourished by the mother house sparrow.



Plate 4. Adult male sparrow feeding the older chicks with plant materials.

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