Zoology

STUDIES ON POPULATION DENSITY OF HOUSE SPARROW (PASSER DOMESTICUS) AT VILLAGE SAJWANI , DISTRICT BARWANI,MADHYA PRADESH, INDIA

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ABSTRACT House sparrow (Passer domesticus) belongs to the order Passeriformes and the family Passeridae. The bird is closely related with human habitations. In Barwani town (22.0363° N, 74.9033° E), due to awareness related to this bird, led to the growth of the population. Barwani Town is surrounded by small villages which are close and connected by Road. On this, semi urban areas, Household food waste, local restaurants, Dhabas and agriculture spoilage, are providing a good feeding habitat to the bird. This particular study was done in Village Sajwani, District Barwani for Two months, from September to October. The village is situated 5 KM far from the Barwani Town, the gap in between is full of Agricultural fields and Temporary Kaccha Houses which is the most preferable nest site of the bird. The objective of the paper is to find a pre winter data of the bird's population, to observe their feeding preferences, to find nest sites after Monsoon. The study was conducted for two months i.e. from September to October. Field trips were made twice a day (Morning 7 AM-9AM and Evening 5PM-6PM). Line transects and Point count Methods are used to collect the data. Total 577 birds were counted out of which 323 were female and 254 were male. Distribution percentage was 19 % near residential area, 48 % near restaurants and 33% near agricultural mud houses. The House sparrow is an agricultural pest, to eradicate the bird, different methods were used and this killed a huge portion of the bird's population, later we realized that even the bird is a pest but a part of our eco-system and the loss of the bird will give future ecological disturbances. There are many organizations which are working in the direction to save the House sparrow, this data will be a small part of it.

KEYWORDS : Habitats, House sparrow, Line transect, Point count, Barwani

INTRODUCTION

The house sparrow (Passer domesticus) is a bird of the sparrow family Passeridae, found in most parts of the world. The house sparrow is highly associated with human habitations. Sparrows are sedentary bird and do not travel more than a kilometre or two to find food. The nest sites are usually electricity poles, rooftop, tubelight holders, ceiling fan etc. In India population of house sparrow is declining but the exact cause of this is not yet ascertained, a number of hypothesis such as urbanization, change in the architecture of human habitation (Baskaran et al.,2010) lack of nest sites, pollution (Summers-Smith,1988), non availability of food(proper handling of spoiled food), use of pesticides etc have been implanted as possible cause of the decline of the bird. Habitat loss is the greatest threat to most of the Indian birds.

MATERIALS AND METHODS

Barwani emerged as a district on 25th May 1998 and is situated towards the south west part of the state. Barwani is located at 22.03°N 74.9°E. The Narmada River flows through Barwani (5 km from city center). The maximum temperature of Barwani in April and May used to go as high as 48°C, making it one of the hottest place in Central India. However, in recent years, it has cooled a little bit.

Barwani is surrounded by the great hills of Satpura and in the raining days it becomes one of the most beautiful places in central India. The city is also called the Paris of Nimar. Nimar region is split into East Nimar and West Nimar. Nimar, in local terms, means "area beyond Neem Trees". Barwani lies in West Nimar. The annual rainfall of Barwani is around 15 inches, though since 2006, it has increased a lot. Barwani is famous for its Papitas (Papayas) and Bawangaja (a Jain holy place 8 km from Barwani).

The study area is Sajwani District Barwani (Image 3). Sajwani is a village in Barwani Tehsil in Barwani District of Madhya Pradesh State, India. It belongs to Indore division. It is located 5 KM towards East from District head quarters Barwani, 6 KM from Barwani Khurd and 337 KM from state capital Bhopal.

Three different areas were taken:
1) 22.010862°N,74.937845°E(Agricultural)
2) 22.007805°N,74.939281°E(Residential)
3)22.003858°N,74.942429°E(Restaurantal)

The study was conducted for two months i.e., from September 2019 to October 2019, in each month 10 days of field trip was done, so the data is about total 20 days. The study was done to find population density at selected areas of village Sajwani, District Barwani, the population status was compared of all three areas (Different habitats), the data was collected by two different methods, i.e., Point count method (Richard et al. 1986) and Line Transects Method, the number of individuals were recorded during field surveys.

With the help of Google Map, area was divided into three parts and location marker was used to tag locations. Birds were seen, recorded and still images were taken with SONY 50X Point and shoot camera (Image 1).

RESULTS AND DISCUSSION

Month wise distribution of bird is depicted in Table 1, in September 2019, 317 birds were recorded and in October 2019, 260 birds were recorded. In Table 2, based on sexual dimorphism, the female and male birds were depicted. Total area was approximately 22 Hectare, total female birds were 323 and males were 254. The percentage wise distribution of Passer domesticus in residential area was 19%, near Agriculture fields it was 33% and near Restaurants, it was 48% (Chart 1).

Table 1

| Field Trips	September data	October data
1	27	34
2	33	39
3	19	26
4	41	21
5	20	28
6	39	15
7	31	19
8	25	33
9	47	30
10	35	15
Total counts	317	260

Image 1: Birds feeding in groups
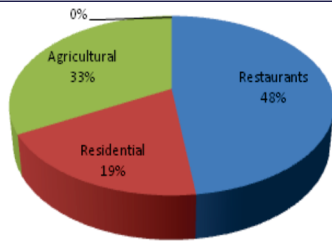
Chart 1

A Chi square test was done to find about if sexual dimorphism affects month-wise distribution, the chi-square statistic is 0.0601.The p-value is 0.806391, not significant at $p < .05$. In this case p is greater than 0.05, so we believe the variables are independent (i.e. not linked together).

The study states that habitats play very critical role on population density of Passer domesticus, the number of male and female birds were not same so to find correlation between reported birds were done using Pearson Correlation Coefficient Calculator.

(X Axis is taken for Female, Y Axis is taken for Male) Image 2 is showing graphical distribution of both sexes.
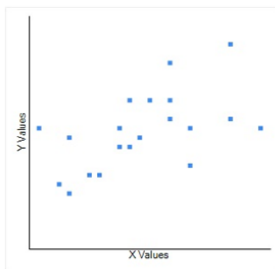
Image 2

The value of r is 0.5499. This is a moderate positive correlation, which means there is a tendency for high X variable scores go with high Y variable scores (and vice versa).

Image 3: Google map of study area

It has been noticed that population in September was higher than in October, September was the approximately end of the breeding season and October was about Deewali cleanings which may include nest destruction so a new habitat was preferred by birds which resulted in less number of recorded birds. It was seen that Bullock cart is replaced by Trucks which removed the dispersed grains and heavy motor vehicles make road feeding very dangerous to the bird (Summers-Smith, 2005). Monika (2005) recorded maximum numbers of house sparrows in residential areas as compared to agricultural areas.

Table 2: Habitat wise and Sexes wise distribution of House sparrow

Day	Total count	Density/ Hectare	Residential	Agricultural	Restaurants	Female	Male
1	27	1.2	5	9	13	14	13
2	33	1.5	6	11	16	19	14
3	19	0.9	4	6	9	11	8
4	41	1.9	8	14	20	28	13
5	20	0.9	4	7	10	12	8
6	39	1.8	7	13	19	19	20
7	31	1.4	6	10	15	15	16
8	25	1.1	5	8	12	14	11
9	47	2.1	9	16	23	25	22
10	35	1.6	7	12	17	19	16
11	34	1.6	6	11	16	21	13
12	39	1.8	7	13	19	25	14
13	26	1.2	5	9	12	15	11
14	21	1.0	4	7	10	9	12
15	28	1.3	5	9	13	16	12
16	15	0.7	3	5	7	8	7
17	19	0.9	6	6	7	6	13
18	33	1.5	2	11	20	17	16
19	30	1.4	6	10	14	21	9
20	15	0.7	3	5	7	9	6
Total	577	Average= 1.31	108	190	279	323	254

CONCLUSIONS

It is difficult to make a conclusion that the most probable reason for the low abundance of the house sparrow in the semi urban study area. It might be a combination of one or more factors. In the restaurant and agricultural area, where the conditions seem to be favorable because of availability of feeding habitats, a higher density of house sparrow was observed. Therefore, it is recommended that change of the built structure of the Green spaces within the cities by humans is leading to a change in habitats for bird. The bird's population has changed in response to urbanization, which have made a challenge for conservationists and naturalists.

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