

Breeding success of the Brahminy Myna *Sturnus pagodarum* in suburban habitat

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Abstract: *Sturnus pagodarum* is locally abundant in Marathwada region and commonly known as Brahminy Myna. It is seasonal breeder, partial local migratory bird species, therefore the less number was observed in November to February months in the year. There is almost negligible information about nesting, clutch size, incubation period, hatchlings, nestlings, fledging period of this species. The present study, carried out during March 2015 to February 2017 in the suburban habitat of Vaijapur, near Aurangabad (MS), India. A total of 36 nests were recorded from the area and observed for two years. Most of these birds reoccupy the nest on successive seasons and add more material or reconstruct the nest at same spot or site.

Keywords: Clutch size, incubation period, hatchlings, nestlings, fledging period, breeding success, *Sturnus pagodarum*.

1. INTRODUCTION

There are very few species of birds from temperate and tropical regions studied for life history traits such as clutch size, incubation, nestling period (Kemp 1984, Newton 1986, Simmons 1989), but most of the species are unattended. That means there is much scope for the comparative study. Besides, infrastructural developments causing habitat degradation and disturbance appear to be serious threats to the long term survival of various birds. The future conservation strategies, there is need of ecobiological study of birds. The major priorities in conserving birds are to keep watch on monitoring changes in populations and to find out prescriptions for their long term survival. Keeping this view in mind we surveyed the smallest administrative unit as a study area.

During field study we observed that, there are near about 41 passerine birds, which is 10 percent to the species of the order, among these 3 species belongs to family sturnidae. These are Common Myna *Acridotheres tristis*, Rosy Starling *Sturnus rosesus* and Brahminy Myna *Sturnus pagodarum*; out of which we selected Brahminy Myna *Sturnus pagodarum* as a model species to examine breeding success in the suburban area.

Sturnus pagodarum is a glossy bird slightly smaller than Common Myna. The male and female are alike, gray in colour at dorsal and reddish fawn at belly region, with long silky crest, which is recumbent and black.

It is found throughout India, Pakistan, Shri Lanka (Salim Ali 2002). It is an invasive and photoperiodic species, showing seasonal reproductive cycle (Kumar 1993) and undergoes spontaneous seasonal changes (Dawsen et al 2001). But the knowledge of breeding success from tropical region of this area is still unknown, although it is common dweller in the area.

2. STUDY AREA AND METHODS

The present study was conducted in a suburbanized area of a drought prone taluka Vaijapur. (20°.22' N and 74°.58' E) and nearby villages (fig.1). The sea level height of the Vaijapur taluka is 533 m and covering near about 1542.74 Sq.km. (Sathe 2000). Vaijapur is one out of nine talukas of the Aurangabad district of Marathwada, situated on Nashik-Nirmal state highway Maharashtra, India. It is located at the conflux of two small rivers Narangi – Sarangi. Average rainfall for the year is near about 491 to 531 mm.

The study area is suburban Vaijapur town and nearby area (Fig. 2), measuring 2.7 Sq.km. wherein nests were spotted successively for two breeding seasons. The study area comprised of residential areas, especially houses with brick moulds or made up of clay. These are preferred by Brahminy Starling.

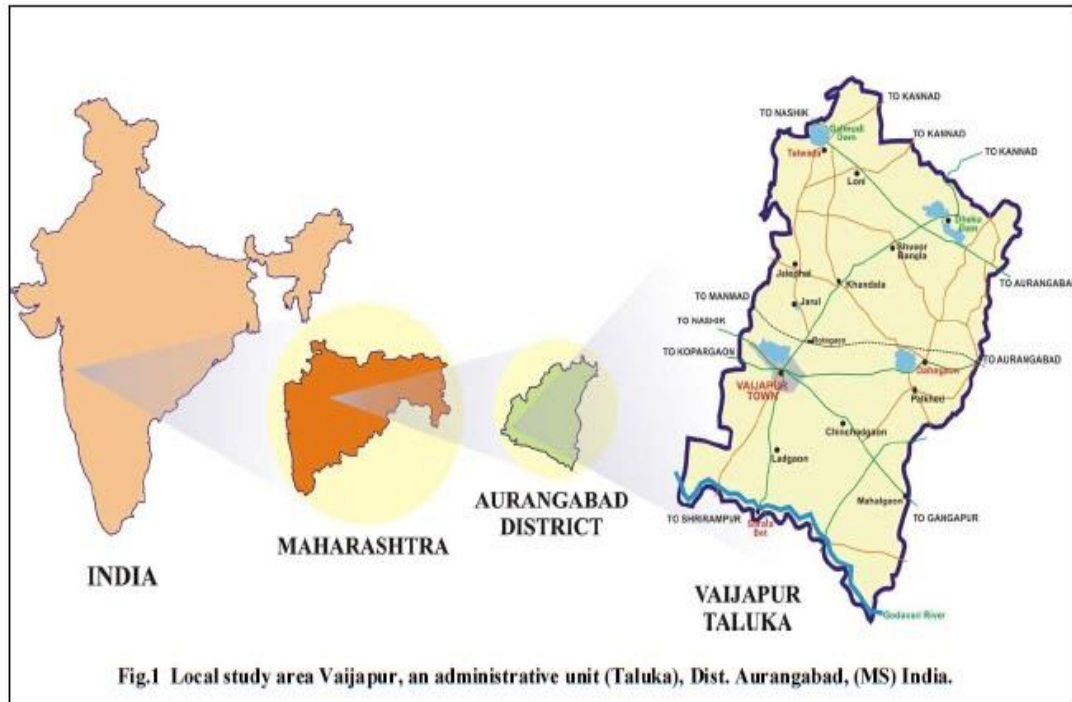


Fig.1 Local study area Vaijapur, an administrative unit (Taluka), Dist. Aurangabad, (MS) India.



Fig. 2. Locality of nesting site in study area through google earth.

The breeding success of the Brahminy Myna *S. pagodarum* carried out from 2016 to 2017 in two successive breeding seasons. In May to July 2015 a single pair nesting in newly constructed concrete wall. After many more attempts and continuous observations we could note the nesting behavior, nest, clutch etc. and successively for two years 2016 and 2017.

During breeding period nesting activities were observed from 5 – 8 m distance. Specifically nesting materials, nesting period was confirmed with date of laying the first egg, date of clutch completion, clutch size, incubation period, the date of last hatching and fledging period etc.

Both male and female Brahminy Myna *S. pagodarum* take part in nest building and start activity late April to early May in ruined walls or its gaps of a house. They do not select straight or large gap in a wall, but in order to have full protection to eggs and young ones they select such a gap which have zig-zag, narrow gap. The nest is built with the help of rachis, leaves of Neem tree *Azadirachta indica*, Kashid tree *Cassia* sp. They also use polythene pieces, plastic bottle pieces, feathers etc. to make a cup-cum-saucer shaped nest.

We also observed the nests built between tin and wall gaps, unused rain water outlets, PVC pipes. The nest is built at the height of 6' - 23' and majority of birds reoccupy the nest on successive seasons and add more material to the nest. It is the special feature observed in this species.

In the first breeding season (2016) we observed 61 eggs in 16 nests, out of which eggs of 5 nests were marked with indelible Indian ink for incubational and hatching success studies. Similarly in the next breeding season (2017) we observed 74 eggs in 20 nests, out of which eggs of 5 nests were marked for incubational and hatching success studies. To reduce disturbance in the breeding cycle, incubation was recorded at fewer of the nests. In second breeding season it was observed that 12 nests were reoccupied by the bird.

During the egg laying and hatching period's nests were observed daily at morning and evening hours. The incubation and fledging periods are calculated as per Skutch (1954), from last egg laid to last hatching and from last hatching to fledging, respectively. Later on to investigate survival success of young ones, each nesting site of the birds was observed twice daily.

3. RESULTS

12 nests among the 16 nests which were spotted in the breeding season of 2016, reoccupied by *S. pagodarum* in next successive breeding season 2017 and 4 nest were destroyed by humans. In next breeding season of 2017 we observed 8 new nests. In the first breeding season 2016 a total of 61 eggs were laid in 16 nests, out of which 14 eggs were destroyed by predators and 13 remained unhatched due to some unknown reasons (Table-1). The incubation period 21.4 ± 2.72 , hatching period 2.8 ± 0.74 and fledging period 39.0 ± 1.67 (mean \pm SD) days were recorded for five marked nests.

Table 1: Showing number of hatchling and fledging of *S. pagodarum* from study area

Year	No.of nest	No.of eggs	No. of hatchling	No. of fledging
2016	16	61	34	31
2017	20	74	42	38
Two Yrs.	36	135	76	69

Table 2: Showing periodic (mean + SD) life history traits of *S. pagodarum*

Year	No.of nest	No.of eggs	Average Incubation period(Days)	Average hatching period (Days)	Fledging period (Days)
2016	5	20	21.4 ± 2.72	2.8 ± 0.74	39.0 ± 1.67
2017	5	18	23.0 ± 2.61	2.6 ± 0.24	39.8 ± 1.17
Two yrs.	10	38	22.2 ± 2.67	2.7 ± 0.49	39.4 ± 1.42

Table 3: Showing nesting data (mean + SD) of *S. pagodarum*

Year	No.of nest	No.of eggs	Clutch size	No. of hatchlings	No. of fledglings
2016	5	20	4.0 ± 0.0	2.2 ± 0.24	2.0 ± 0.63
2017	5	18	3.6 ± 0.49	2.0 ± 0.63	2.0 ± 0.63
Two yrs.	10	38	3.8 ± 0.25	2.1 ± 0.73	2.0 ± 0.63

While in next breeding season 2017 we observed a total of 74 eggs were laid in 20 nests, out of which 17 eggs destroyed by predators and 15 remained unhatched (Table - 1). The incubation period, hatching period & fledging period was recorded for 5 marked nests which is 23.0 ± 2.61 , 2.6 ± 0.24 and 39.8 ± 1.71 (mean \pm SD) days respectively.

Clutches hatched over periods of 3 to 4 days and the hatchlings were altricial and nidicolous. The two years average clutch size was 3.8 ± 0.25 , hatchling period 2.1 ± 0.73 and the fledging period was 2.0 ± 0.63 . In first breeding season out of 61 eggs 34 eggs hatched to produce hatchlings, of which 31, developed into fledglings, and only 28 developed into young ones. Thus indicating 45.9 % breeding success for the first breeding season 2016 and for the next year it was 45.4 %; on an average two years breeding success of the *S. pagodarum* was 45.65 % in sub-urbanized habitat of the area. All the stages of life history of *Sturnus pagodarum* such eggs, Clutch size, hatchlings, fledglings, parental care shown in Plate-A.

4. DISCUSSION

The present results propose the total breeding success (45.65 %) of *Sturnus pagodarum* in the suburban habitat. They are mostly consistent with the findings of the other researchers (Khan 1976, Lamba and Tyagi 1977) in various aspects, as well as other related species breeding in urbanized habitat (Tomialoje 1979, Bentz 1985, Kavanagh et al 1989, Sharma et al 2004). In case of an avian species breeding success depends to a great extent on its ability to decide where and when to nest (Cody 1985, Robertson 1995). Such type of highest breeding rate with 3-4 young ones observed at suburban area of Sangola in artificial nest (Kamble, 2017). Whereas Sethi and Kumar (2018) reported 83% hatching success in *Sturnus contra* and further opined that both parents take part in feeding to their young ones.

In the present study *Sturnus pagodarum* builds nest generally in zig-zag crevices of ruined walls or such gaps of a residential house wall at about 6'-23' height to have full protection to eggs and young ones, and difficult for the predators to find the nest. As a result, because of low predation pressure there were more and more chances of increase in breeding success.

Sharma et al (2004) suggested that factors such as higher ambient temperature, greater food availability (since agricultural fields were closer to urbanized habitat) and fewer predators were contributing to enhance the breeding success of Spotted Munia *Lonchura punctulata* in urban habitat. Besides, observations on the Red-vented Bulbul *Pycnonotus cafer* also indicated more breeding success in urbanized habitat than forest, because of low predation pressure, reducing post fledgling and adult mortality in urban habitat (Bhatt and Kumar 2003).

Similarly, other bird species such as the European woodpigeon *Columba palumbus*, Herring Gull *Larus argentatus*, Eurasian Blackbird *Turdus morula*, Mallard *Anas platyrhynchos* and Magpie *Pica pica* have been found to experience a higher breeding success in the urban environment (Snow 1958, Lack 1966, Cramp 1972, Monaghan 1979, Tomialoje 1979, Bentz 1985, Kavanagh et al 1989).

Lamba and Tyagi (1977) studied period of incubation of Brahminy Myna *Sturnus pagodarum* in artificial nest boxes nailed on trees at an approximate height of 10 m in urban habitat, opined that eggs were laid at the rate of one per day, with clutch size 4-5 eggs and incubation period about 12.4 days.

Whereas, present work was carried out in natural habitat for two successive years (2016-2017), both years did not show too much differences (Table- 1, 2, 3). Observed nests were at approximate height of 6'-23' in suburban habitat. These avian species laid eggs at the rate one egg per day with clutch size 3.8 ± 0.25 (Mean \pm SD), incubation period 22.2 ± 2.67 (Mean \pm SD), hatching period 2.7 ± 0.49 (Mean \pm SD), Fledging period 39.4 ± 1.42 (Mean \pm SD) days; with 2.0 ± 0.63 (Mean \pm SD) fledglings to 3.8 ± 0.25 (Mean \pm SD) clutch size represented higher breeding success in natural nests of suburban habitat.

It was obvious from the result of breeding success in of Brahminy Myna *Sturnus pagodarum*, that suburban habitat was better for breeding, after which both parents and young ones leave the area in more and more towards agricultural fields and they are seen in less numbers from late September to February months of the year in suburban habitat. Now a days, impact of urbanization affecting the habitat of this avian species, if it is not shifted to other habitat, may face various problems in future.

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APPENDIX – A

Figures:

PLATE -A



1. Eggs



2. Atricial hatching



3. Nestling



4. Female at nest



5. Female near nest



6. parents involved in domestic duties

Fig. Life history stages of *Sturnus pagodarum*