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Roosting Behaviour and Population of Indian Mynas; & its Correlation with Sunset (light intensity) and the Time of Arrival

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Abstract*: Communal roosting behaviour is a very fascinating phenomenon that has been observed in numerous avian species wherein many birds stay together during night or daytime. Size of communal roosts may range from 5-6 individuals (e.g. Peafowl, drongo) to over 10,000 birds (e.g. Indian myna, crow, parakeets). Such birds have tendency to flock on their roost-ward journey. In this research, we observed communal roosting behaviour and population of Indian Myna (Acridotheres tristis). We identified one of the communal roosts of Indian Myna in Vaikunth Crematorium, Navi Peth area Pune and counted their population size at the time of their arrival to the roost during sunset on a fortnightly basis for a year by point count method. Census records were taken at 5 minutes interval on the number of flocks and flock sizes of these birds arriving to the communal roost in the evening. Also, recorded the light intensities over those intervals with the help of photometer. Our objective was to find out their population size and changes in the size at this particular roost and also to find out the correlation between the time of sunset (light intensity) and their time of arrival to the roost. This study illustrates the effect of light intensity on their roosting behaviour and analysis of any seasonal and monthly changes observed during the data collection period from 2 consecutive post breeding periods.

Keywords: communal roost, fortnight, Indian Myna, roosting, Acridotheres tristis, point count method, flock size

I. INTRODUCTION

The Indian myna (Acridotheres tristis) is a member of the family Sturnidae, and is native to Asia. It has a brown body with a black hooded head, bare yellow patch behind the eye and bright yellow bill and legs. It is an omnivorous bird with strong territorial instincts. Its aggressive nature often poses a threat to native bird species in various countries.

Studies on roosting behaviour of birds have constituted a popular subject in ornithological research in the world for many years. Such studies on roosting behaviour of Indian mynas have been reported by some researchers in India and in other countries (Hindwood 1948; Gadgil 1972; Counsilman 1974; Feare 1976; GreigSmith 1982; Sengupta 1982).

Indian myna Acridotheres tristis (Linnaeus) Sturnidae: Passeriformes is a familiar urbanized bird dispersed over the entire Indian subcontinent. Mynas are sociable in their habits. They are generally seen in pairs or in small flocks during the daytime. In all the seasons, they roost communally at night in groups of 100-10,000 birds, either independently or forming a mixed roost along with some other species of birds. Apart from the detailed study by Counsilman (1974), research study (Anil Mahabal and V G Vaidya 1989) on roosting behaviour of Indian Mynas, and few others, there is very little information on awakening and roosting behaviour of Indian mynas. We present in this paper the results of our observations on the various aspects of roosting behaviour of Indian mynas at Pune, Maharashtra.

Table 1. Characteristics of Indian Myna

Characteristics	**Indian Myna**
Scientific Name	*Acridotheres tristis*
Family Name	Sturnidae
Status	Common Resident
Food Habits	Omnivorous
Life cycle	• Pre-breeding: November-March • Breeding: April-July • Post-breeding: August-October
Social Behaviour	They pair for life.
Speed at arrival Time	Moderate

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II. METHODOLOGY

1) *Material Used:* Squared book, pen, Photometer (measure light intensity at 5-minute intervals in every fortnight reading to help understand seasonal changes with the time of arrival)
2) *Method:* Point Count Method (categorizing and counting arrival flock size by tally marks)
3) *Location of the Roost:* Vaikunth Crematorium, Navi Peth, Pune
4) *Observation Point:* S. M. Joshi Bridge, Navi Peth, Pune which runs over Mula river
5) *Observation Period:* From August 2021- October 2022 on fortnightly basis (Total observations -30)
6) *Type of the Roost:* Mixed Communal Roost (Mynas, Parakeets, Kites, pond herons, crows, cattle egrets)
7) *Bird Observed:* The Indian myna (*Acridotheres tristis*)



Figure 1: The Indian myna (*Acridotheres tristis*)



Figure 2: Point Count Method used throughout the study

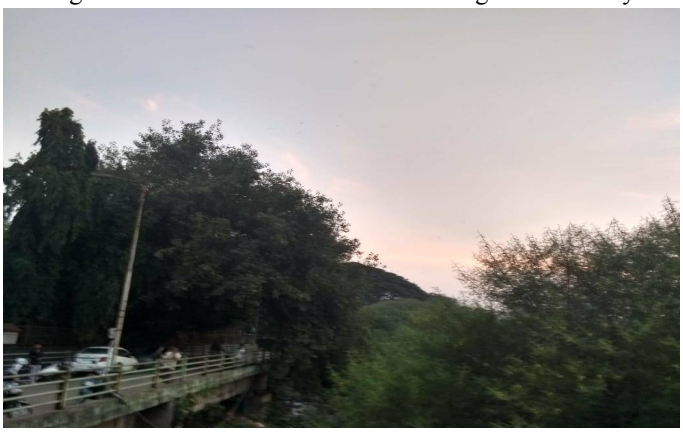


Figure 3: S. M. Joshi Bridge, Navi Peth, Pune

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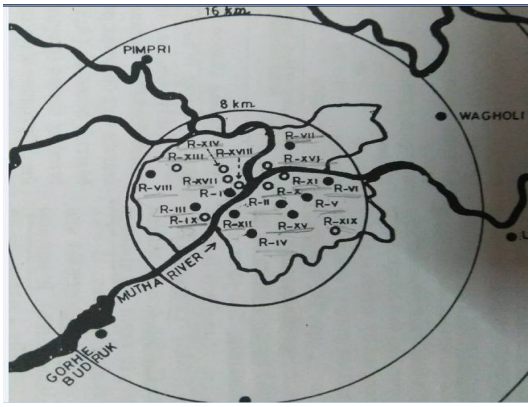


Figure 4: Location of the roost that we observed (R-XII), Vaikunth Crematorium, Navi-Peth area Pune

III. DISCUSSION

The arrival activity of mynas was recorded at the communal roost (R-XII) in the evening during the entire study period. Figure 5 indicates the monthly and seasonal changes in the arrival activity of mynas during 2021-22.

Throughout the post breeding season from August to October, the time of sunset occurs earlier successively. In the pre-breeding season, it also occurs successively earlier till December in 2021 and then successively later from January-March in 2022. In the breeding season, the time of sunset occurs successively later from April- June and then earlier in the month of July.

The time of arrival of the first and the last myna changes according to the time of sunset in all the seasons. The time of arrival of the first and the last myna was always before and after the time of sunset respectively. The duration between the time of sunset and that of the last myna was not constant, and showed seasonal variations. In the month of January 2022, the time of arrival of the first myna was the earliest (55 minutes before sunset) and in the month of May 2022, it was much later (23 minutes before sunset). Similarly, in the month of May 2022, the time of arrival of the last myna was found to be during sunset period (11 minutes after sunset) and it was much later (20 minutes after sunset) in September 2022 as compared to other months of the years 2021-22.

The seasonal changes in the median time of arrival of mynas (i.e. the time at which 50% of the total population of mynas have arrived at the roost) were almost consistent with the changes in time of sunset. The total time span of arrival (i.e. time between arrival of the first and the last bird) medium in the breeding season and equally more in the post breeding and pre breeding season and it was maximum (84 minutes) in the month of July 2022. In the two consecutive post breeding seasons observed in 2021 and 2022, a similar trend was observed with a peak in August, and then a continuous decline by the end of October. This illustrates similar monthly light intensities and time span of arrival of mynas to the roost.

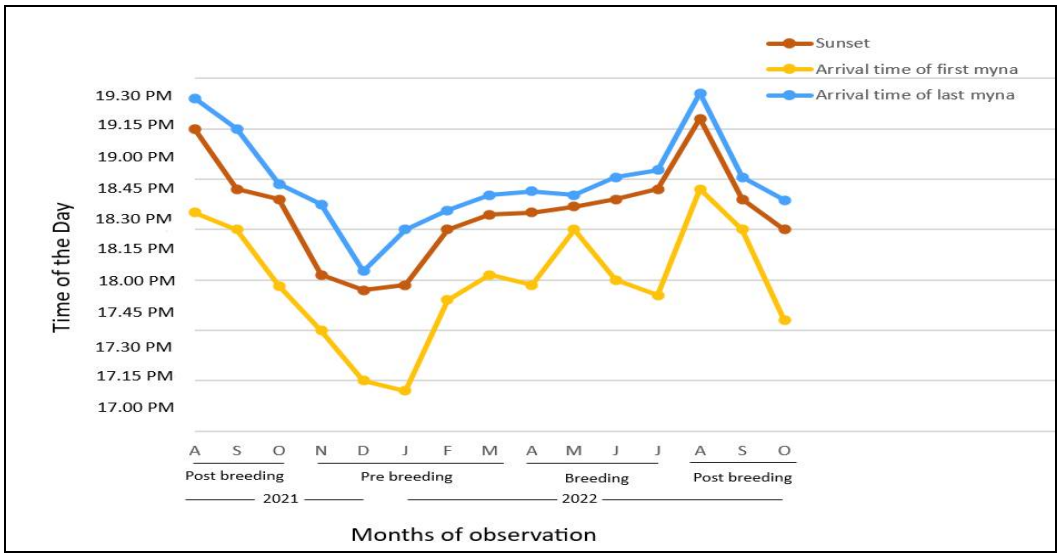


Figure 5: Monthly and seasonal changes in the time of arrival in relation to light intensity of Indian mynas during a year at R-XII.

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In figure 6, a similar trend agreeing to figure 5 can be seen in the month of November (Pre breeding season) as the season transitions from post breeding to pre breeding season. In the following months, mynas start to arrive earlier to their roosts and the timing of sunset also decrease successively. The arrival of mynas peaked 5-10 minutes before the sunset in Novemeber and decreased steeply with almost nil mynas arriving at the roost after 20-30 minutes past sunset.
Moreover, a sharp decline of light intensity measure by photometer elucidates quicker arrival of mynas and at a shorter time span to the roost.

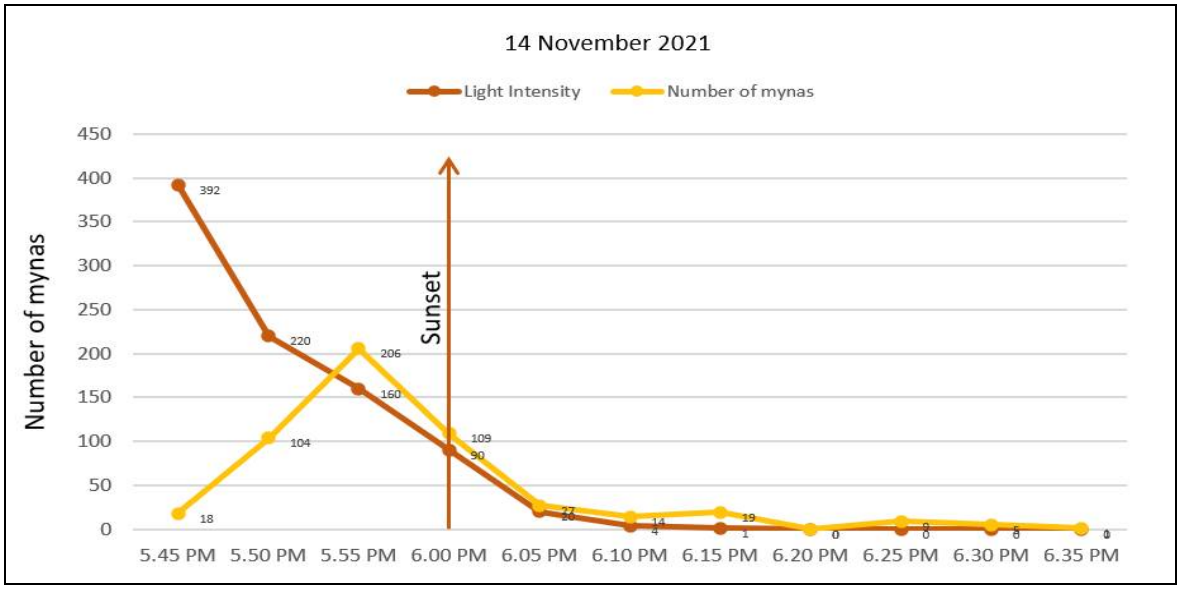
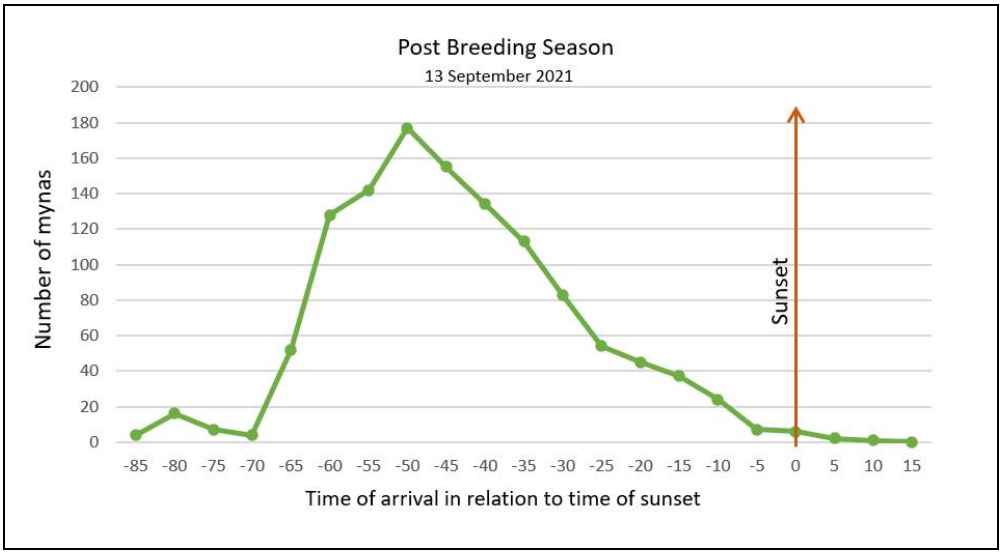
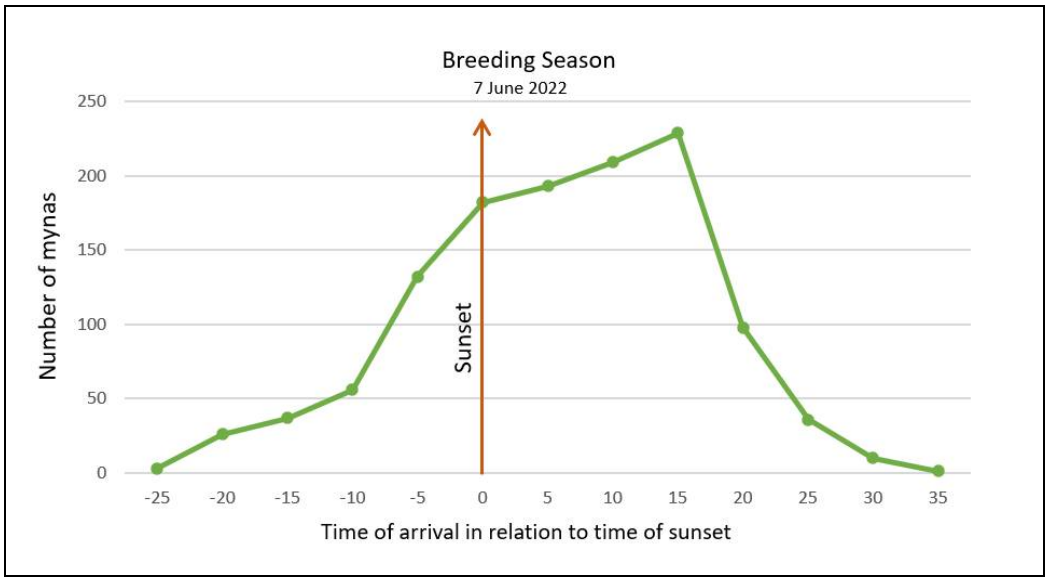


Figure 6: Time of arrival of Mynas in relation to sunset & light intensity

As per data collected, depicted in figure 7, the time of arrival in relation to time of sunset and the number of mynas arriving at R-XII has been indicated for each of 3 seasons in figure 7. This figure indicates that in the post-breeding and pre-breeding season is more than 78% of the total population of mynas arrived at the communal roost before sunset.
However, during June (in breeding season) only about 27% mynas arrived at the roost before sunset. In September 2021, the time span 100- 120 minutes and with maximum number of mynas (177) arriving 50 minutes before sunset. In June 2022, the time span 60- 80 minutes and with maximum number of mynas (229) arriving 15 minutes after sunset. In January 2022, the time span 60- 80 minutes and with maximum number of mynas (231) arriving 15 minutes before sunset.





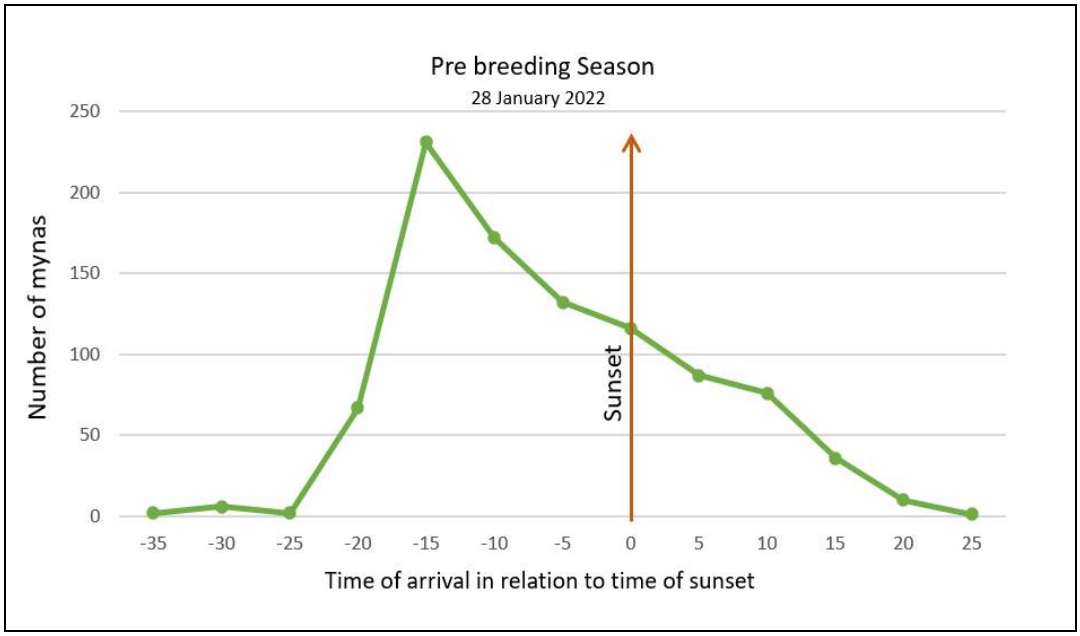


Figure 7: Seasonal variations in number of mynas arriving before and after sunset at roost R-XII.

Table 2 illustrates the relative percentage of flock sizes of Mynas in different weeks of post-breeding season. Mynas flock size throughout the post breeding season can be seen abundant in pairs or in flocks of 3-5 at R-XII. However, during the pre-breeding season, Mynas can be seen in a frequent flock size of 6-14 and pairs. Additionally, in breeding season, Indian myna flock solitary and 3-5 more often as deciphered from the study. Maximum number of flocks of 747 were seen in August 2021 and the least number of flocks of 380 were seen in September 2021. Flock size greater than 15 was scarcely seen in the post breeding season and non in the month of early August and early October.

Table 2. Relative % of flock sizes of Mynas in different weeks of post-breeding season

Flock size/dates	20/8/21	6/9/21	21/9/21	1/10/21	15/10/21
1	22.43	17.68	11.56	16.17	5.97
2	50.00	53.14	62.42	63.97	67.91
3 to 5	20.23	23.12	12.71	16.91	17.91
6 to 14	6.61	5.46	9.85	2.95	5.98
>15	0.73	0	3.46	0	2.23
TOTAL %	100	100	100	100	100
Total No. of flocks	747	380	600	583	682

IV. RESULTS AND DISCUSSION

Our studies clearly show that there are monthly and seasonal in the roosting activity of mynas. These are influenced by environmental, physiological and behavioural factors. The Common Myna roosts on dense canopy of the tall tree.

Communal roosting serves birds to protect from danger. The Common Myna had evolved primarily as an antipredator adaptation (Sengupta, 1973). Assemblages of birds could attract predators and acquired protected position for the inactive period and anti-predator behaviour while the birds were assembling (Ward and Zahavi, 1973; Feare et al., 1974). Mixed roosting strongly supports the notion of avoidance of predation being an important function of communal roosting (Gadgil, 1975; Elgar, 1989).

Throughout the year, there was long time span of arrival of mynas in the evening. Time span of arrival is noticed to be decreasing from September to October and from October to November.

mynas are sociable in their habits. They are generally seen in pairs or in small flocks during daytime. In all the seasons, they roost communally at night in groups of 100-10,000 birds, either independently or forming a mixed roost along with some other species of birds.

A. Communal Display

This could perhaps be related to their dispersion in the feeding arena and the availability and amount of food in the arena. Some abiotic factors such as wind speed, cloud cover could also be the reasons for longer time for assembly. Greig-Smith (1982) has stated that arrivals represent the end of flights from a variety of places.

V. CONCLUSION

This study has contributed to deeper understanding of roosting behavior and the correlation of light intensity of Indian myna at R-XII in 2021-22. In the post breeding season from August to October or early November, the total population of Indian Mynas seems to be fluctuating fortnightly (from 150-350). It was noticed that the mynas have come well before the sunset during the post breeding season. The maximum number of mynas have arrived about 20-25 minutes before the time of sunset. In general, it can be noticed that pairs are predominant in population followed by flocks of 3-5 and mynas in pairs.

In pre breeding season from November to March, the total population of Indian Mynas seems to be fluctuating fortnightly (from 250-650). It was noticed that the mynas have come just before the sunset during the pre-breeding season. The maximum number of mynas have arrived about 5-10 minutes before the time of sunset. In general, it can be noticed that pairs are predominant in population followed by flocks of 6-14 and mynas in pairs. In breeding season from April to early August, the total population of Indian Mynas seems to be fluctuating fortnightly (from 200-550). It was noticed that the mynas have come after the sunset during the breeding season. The maximum number of mynas have arrived about 10-20 minutes after the time of sunset. In general, it can be noticed that pairs are predominant in population followed by flocks of 3-5 and solitary mynas.

Further research in the field will contribute to study of natural science history. For example, before 1990, the House Sparrows used to roost communally in thickly populated areas of Pune city particularly Wada system in Peth area. They used to set few trees for roost and many nesting places inside the houses specially lofts. But after 1990, there was a tremendous increase in concrete flats and the Wadas demolished. These nesting and roosting places diminished which resulted to a sudden drop in their population size. So now the number of House Sparrows in city areas has significantly decreased. So, because of the habitat destruction the population of the house sparrows has decreased and so we must conserve the habitats.

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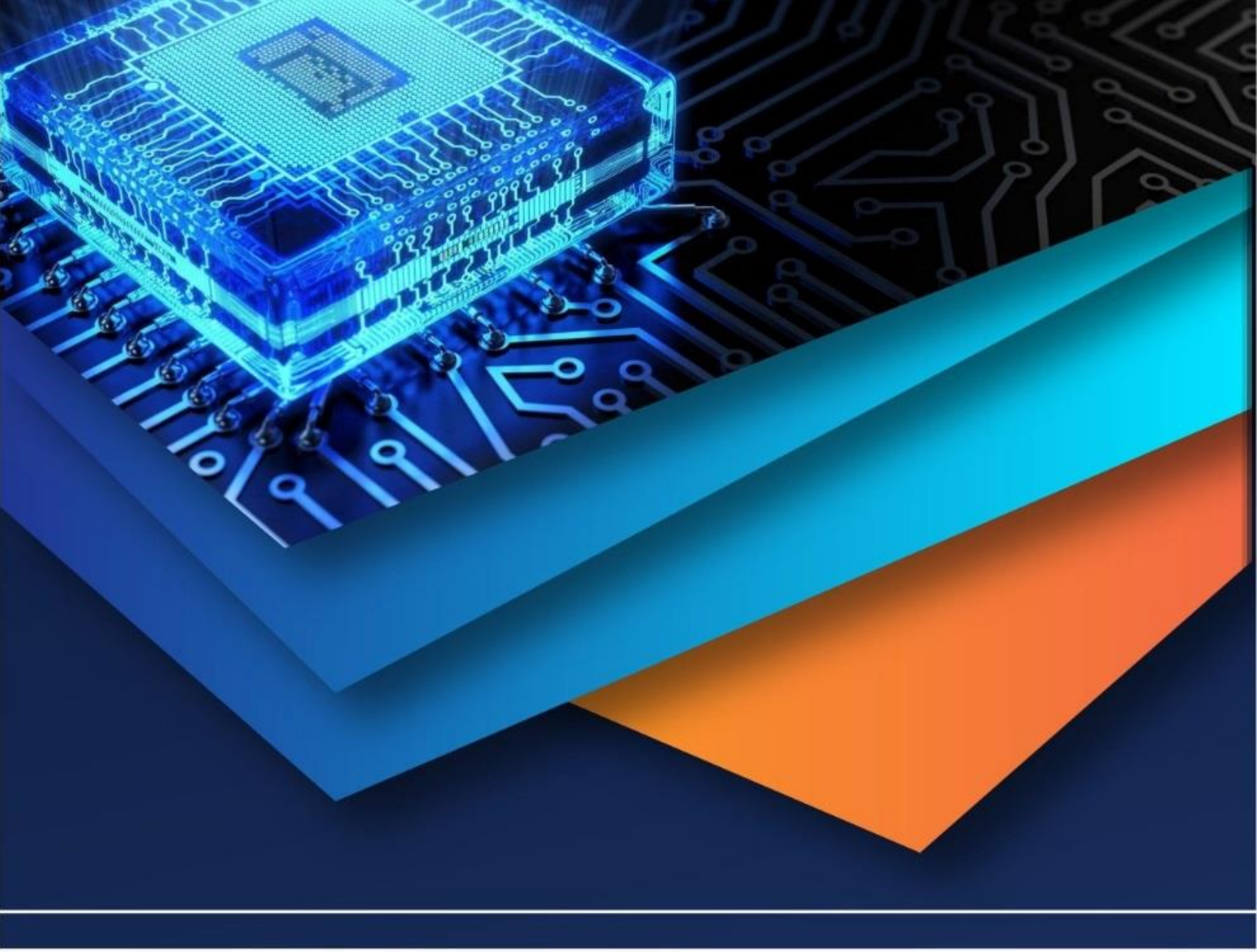
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REFERENCES

[1] Salim Ali and S. Dillon Ripley (1999) Handbook of the Birds of India and Pakistan. 2(10) ed. Oxford University Press.
[2] Mahabal Anil (1993): Diurnal rhythms and Seasonal changes in the flocking behaviour of Indian Myna *Acridotheres tristis* (Linnaeus).
[3] Biovigyanam,19(1&2):55-64 Anil Mahabal and B. D. Bastawade (1982) Population and social biology of Rose-ringed Parakeet, Psittacula Krameri in Pune, Maharashtra
[4] Gadgil, M. (1975). The function of communal roost: relevance of mixed roosts. Ibis 9. 114: 531-533. 10.
[5] Gadgil M. and S. Ali (1975). Communal roosting habits of Indian birds, J. Bombay Natural History Society 72 (3) 716-727. 11.
[6] Greig-Smith, P. (1982). Behaviour of Birds Entering and Leaving Communal Roosts of Madagascar Fodies Foudia- Madagascariensis and Indian Myna Acridotheres tristis, Ibis 124 (4): 529-534.
[7] J. J. Counsilman (1974) Waking and Roosting Behaviour of the Indian Myna, Emu - Austral Ornithology, 74:3, 135-148,
[8] Investigation has on roosting ecology of common myna, A. tristis (Sengupta, 1973)
[9] bank myna, Acridotheres ginginianus (Khera & Kalsi, 1986)
[10] Hindwood K A 1948 A communal roost of Indian myna; Emu 47 315-317
[11] Feare C J 1976 Communal roosting in the mynah Acridotheres tristis; J. Bombay Nat. His: Sac. 73 525-527

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