



# Study of Different Breeding Site Activities of Openbill Stork, *Anastomus Oscitans*, in Palghar, Maharashtra

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## ABSTRACT

Different breeding site activities like preening, neck movement, flapping, fighting, movement, yawning, regurgitation and feeding of Asian openbill stork, *Anastomus oscitans* were studied in Palghar during three breeding seasons from 2015 to 2017. Palghar is the newly carved Adivashi district of Maharashtra which is nearly 90 km away from Mumbai on the western railway. It was found that preening and neck movement were exceptionally high which in turn were helpful in social grooming and prevention from predator. In this paper authors have attempted to enumerate the different breeding site activities of Openbill stork.

**Keywords:** Openbill stork, breeding, Palghar.

## I. INTRODUCTION

The Asian Openbilled stork, *Anastomus oscitans*, is a large wading bird in the stork family Ciconiidae. They breed amidst or near water bodies (Ali and Ripley 1995). The Asian Open Bill Stork is found as a resident colonial breeder. It was documented that total of the nineteen species of storks found globally, nine species occurred in India (Ali and Ripley, 1987). The self-maintenance activity is those that serve to remove sources of irritation, extraneous materials, care for the body surface and plumage, and counteracts the effects of muscular activity (Potts 1976). A recurring idea in ecological literature is that the life history strategies of animals are inextricably linked with allocation patterns of time and energy (King 1974). Activity budget analyses have been useful in determining ecological, behavioral and physiological adaptations of avian species (Quinlan and Baldassarre 1984)

There are many studies that have been already documented nesting behavior, breeding behavior,

parental care and foraging behavior, but hardly attempted to study different breeding site activities of Asian Openbill stork. We could find scanty references of these different activities. The present study aims to know different breeding site activities like preening, neck movement, flapping, fighting, movement, yawning, regurgitation and feeding of Asian open bill stork at Palghar railway station.

## II. MATERIALS AND METHODS

The study area of Asian Openbill storks was Palghar district, Maharashtra. Geographic coordinates of Palghar-Latitude: 19°41'48" N Longitude: 72°45'55" Elevation above sea level: 17 m = 55 ft. Palghar railway station was the study site where Asian Openbill storks used to breed regularly. Regular observations were made at different time intervals of the day on different behavioral aspects. Observations were made with the help of binocular, Camera and naked eyes. (Fig. 1a & 1b). We kept observing one

bird continuously for 10 minutes and in another 10 minutes observations were shifted on different bird like this full day was covered from dawn to dusk. Then the average of all the observations of one day was used as the frequency of that particular day. Finally the average of whole month was taken as the frequency of that particular activity for calculation purpose.

### III. RESULT AND DISCUSSION

Monthly different activities of Openbill storks were observed during three subsequent breeding seasons between 2015 to 2017. It was observed that breeding season lasted for 6 months in Palghar area from first week of May to Ist week of November. During the breeding seasons different monthly activities of Openbill Stork were recorded like preening, neck movement, flapping, fighting, movement, yawning, regurgitation and feeding. The frequencies of each activity recorded monthly are given in Table 1 A to 1 C and Figure 2 A to 2 C.



Figure 1a



Figure 1b

**Table 1A.** Different breeding activities of Openbill Stork during 2015

	MAY	JUNE	JULY	AUGUST	SEPTEMBER	average
P	8.11	6.97	9.7	14.71	5.65	9.028
NM	5.05	3.69	5.44	8.33	2.95	5.092
FLP	0.97	1.17	1.03	1	0.75	0.984
PAC	0.9	0.33	0.56	0.63	0.25	0.534
FT	1.2	0.55	0.56	0.75	0.75	0.762
M	0.98	0.78	0.67	0.66	1	0.818
Y	0.66	0.89	1.52	1.41	0.5	0.996
R	0	0	0.76	1	1.15	0.582
FEE	0	0	1.18	1.08	0.83	0.618

**Table 1B.** Different breeding activities of Openbill Stork during 2016

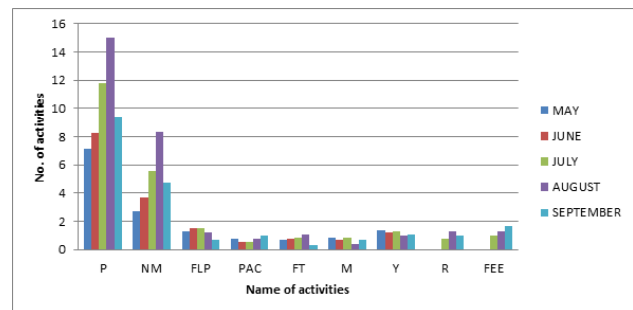
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	average
P	7.13	8.29	11.79	15.01	9.37	10.318
NM	2.74	3.71	5.57	8.34	4.75	5.022
FLP	1.28	1.49	1.54	1.22	0.73	1.252
PAC	0.76	0.53	0.58	0.78	1	0.73
FT	0.71	0.81	0.83	1.07	0.3	0.744
M	0.88	0.73	0.82	0.4	0.67	0.7
Y	1.4	1.23	1.28	1	1.07	1.196
R	0	0	0.75	1.3	1	0.61
FEE	0	0	1.03	1.29	1.67	0.798

**Table 1C.** Different breeding activities of Openbill Stork during 2017

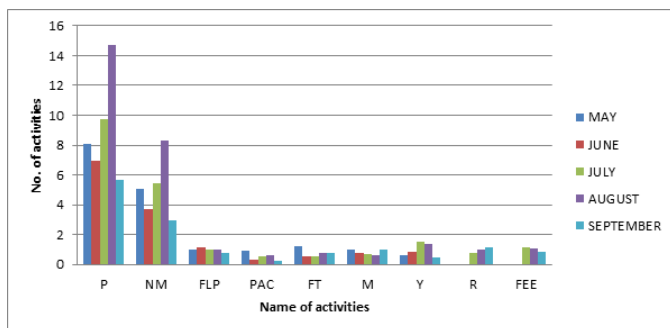
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	average
P	10.33	11.01	16.1	18.2	13.25	13.778
NM	5.35	3.44	6.28	7.13	3.5	5.14
FLP	1.83	2.01	2.04	1.89	1.5	1.854
PAC	1.18	0.93	0.71	1	1	0.964
FT	1.07	1.14	0.93	1.1	0	0.848
M	1.17	0.76	0.93	1.3	0.8	0.992
Y	1.74	1.29	1.91	1.89	1.4	1.646
R	0	0	0.71	1	1.15	0.572
FEE	0	0	1.64	1.67	1.15	0.892

(P-Preening, NM-Neck Movement, FLP-Flapping, P-Packing, FT-Fighting, M-Movement, Y-Yawning, R-Regurgitation and FEE- Feeding)

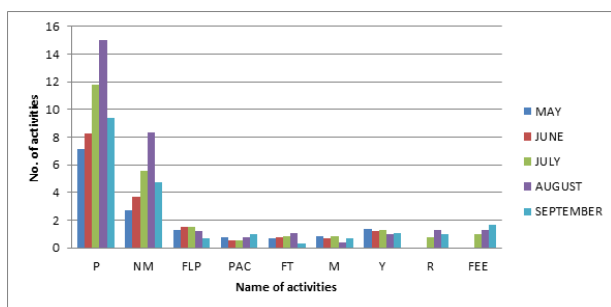
Preening and neck movement were more in August followed by July and in rest of the months i.e. May, June and September it was moderate in the subsequent years (2015, 2016, 2017). Other activities like flapping, packing, fighting, movement, yawning, Regurgitation and feeding were less than moderate in all the three years. (Figure. 2 A to 2 C)



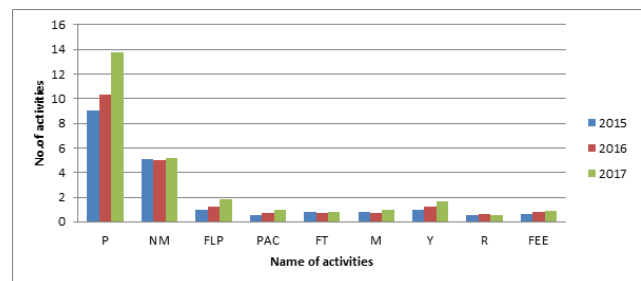
**Figure 2C.** Monthwise different breeding activities of Openbill Stork during 2017.



**Figure 2A.** Monthwise different breeding activities of Openbill Stork during 2015.



**Figure 2B.** Monthwise different breeding activities of Openbill Stork during 2016.



**Figure 3.** Yearwise different breeding activities of Openbill Stork during 2015 to 2017.

Aerial display, allopreening, copulatory behaviors were observed in, Raiganj wildlife sanctuary, west Bengal (Pramanik et al., 2016). Innate behavioral activities of Openbill stork were recorded by Desale and Singh 2017, and opened that it will help to understand the energy budget for this bird and in turn their conservation. Singh et al 2017, studied the nesting site activities of Asian Paradise Flycatcher, Terpsiphone paradise during breeding season like neck movement, eye movement, tail movement, beak movement and yawning. Preening is a type of behavior described and studied in many bird species, mainly in captivity, like budgerigars (Zampiga et al. 2004, Griggio and Hoi 2006, Griggio et al. 2010), domestic canaries *Serinus canaria* (Lenouvel et al. 2009), mallards *Anas platyrhynchos* (Delogu et al. 2010), feral pigeons *Columba livia* (Rózsa 1993, Waite et al. 2012), zebra finches *Taeniopygia guttata* (Kulkarni and Heeb 2007), with only few studies in the wild: swallows *Hirundo rustica* (Møller 1991), terns *Sterna* spp. (Van Iersel and Bol 1958). Varghese 2002 studied in Marottichal and Bhoothathankettu forests self-maintenance activities of Malabar Trogon.

It was found that preening and neck movement were highest in the month of July and August and moderate in May, June and September, which is very much correlated with the incubation and development of fledglings. Incubation started in June and the fledglings were seen in July. Since both the parents were engaged in nurturing the young ones they spent maximum time with their family during the month of July and August. This was also the time when young ones were more vulnerable to the predation. The parents were very much vigilant from predators by showing more neck movement. Preening was also useful to maintain the body of each other and also to protect them from ectoparasites. It seems that preening and neck movement are helpful in nurturing the healthy family.

In our observations on Openbill stork we found that preening and neck movement activities were highest. The birds spent more time for preening and neck movement which helped them in nurturing the healthy family by protecting the young ones from parasites and predators.

#### IV. CONCLUSION

In this study of different activities of Openbill stork, it was found that preening and neck movement were exceptionally high which in turn were helpful in social grooming and prevention from predator.

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