

Reproductive Ethology of Rose-Ringed Parakeet (*Psittacula krameri*) in the Shekhawati Region of Rajasthan



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Abstract

The Rose-ringed parakeet (*Psittacula krameri*) is a component of the avifauna of the agro ecosystem and urban area of Shekhawati region of Rajasthan state in India. The study was carried out from January through July in year 2013 and 2014 on two study areas of Shekhawati region, one of them was a cropland area from district Jhunjhunu (Raj.) and another was city (urban) area from district Sikar (Raj.). In the present study area they are cavity nesters, nest in tree holes and other cavities, including recesses in buildings. Nesting behaviour and nest site selection was observed in January – February. Mating was observed from January to March. Egg-lying took place in last week of February through March. The normal clutch size was 2 to 6 eggs, with a mean of 3.86 eggs per studied clutch. The average incubation period is 22 to 24 days. The nestlings were fledged from 21st March to 13th April. The estimated average no. of fledged birds was 2.20 chicks per nest and average fledging rate was estimated as 54.2% in this study region. Only male bird fed the nestlings and female for about five weeks from hatching. At the age of eight weeks the fledglings leave the nest for food. About 12th week from hatching, young ones were eaten by themselves and join the flocks in its flight to the roosting site.

Generally the rose-ringed parakeet produced only single brood in a season and the breeding season lasted from January to July.

Keywords: Rose-Ringed Parakeet, Shekhawati Region, Nesting, Mating and Fledgling.

Introduction

The Rose-ringed parakeet (*Psittacula krameri*) is the most widely distributed species of parrot in the order of Psittaciformes (Forshaw et. al 1981). In its native range in south Asia, the rose-ringed parakeet inhabits the lightly timbered areas, cultivated farmlands, urban gardens and parks (Paton et. al, 1982). In India and Pakistan the parakeet nests largely in tree holes but in some cases suitable recess and cracks in buildings and telegraphic poles may also be used for nesting (Ali & Ripley, 1969; Sarwar M. 1987, Sarwar et. al 1989 Roberts, 1991). The parakeet actively searches for the nest holes in small parties of 2 to 5 birds from January through February (Sarwar et al 1989).

There is little information of the breeding behaviour of rose-ringed parakeet in Rajasthan, except for that available in general references. Hence a study into reproductive ethology of this bird was undertaken.

Aim of the Study

Main aim of this study is to know about reproductive behavioural activities and breeding efficiency of this beautiful bird in the Shekhawati region of Rajasthan.

Materials and Methods

Shekhawati region is located at north east part of Rajasthan state (Fig:1) and it is a semiarid zone, with a mean annual rainfall of around 450 to 600 mm and temperature of this region from 0^oc in winter to about more than 48^oc in summer.

Study area I, which is a cropland and located at Jhunjhunu district (Fig:2) have different tree species like *Azadirachta indica* (Neem) *Ailanthus excels* (Aadu), *Albizia lebbbeck* (Siris), *Dalbergia sissoo* (Shisham), *Acacia arabica* (Babul) and a dominant species, *Prosopis cineraria* (Khejri) etc. Study area II, which is an urban area, comprised with parks and roadside plantation, located at Sikar district (Fig:2) and have also many tree species like *Dalbergia sissoo*, *Azadirachta indica*, *Albizia lebbbeck*, *Ailanthus excels*, *Eucalyptus spp.*, *Ficus religiosa* and *Ficus bangalensis* etc.



The Study was carried out from January through July in year 2013 and year 2014 on study area-I of Jhunjhunu district and study area-II of Sikar district respectively. Study area-I was visited twice in a week, morning and evening hours and weekly one whole day throughout the study time of year 2013. Other study area (II) was visited only one time in a week through the entire length of the study in year 2014. In all 95 visits were made the study areas, 70 in the year 2013 and 25 visits in the year 2014. The duration of these visits ranged from 6 to 10 hours. In all 666 hours were spent in the field.

During each of these visits, the reproductive ethological activities of rose-ringed parakeet in reference of breeding season, nesting and nest site selection courtship behaviour, clutch size, incubation period and parental care of young ones were recorded with the help DSLR video camera and a telescope on the basis of focal animal method and continuous sampling method.



Results and Discussions

Breeding Season

Rose- ringed parakeets have a fairly long breeding season in India, from January, when prenesting and mating activities takes place to the end of July, when the fledglings leave the nests.

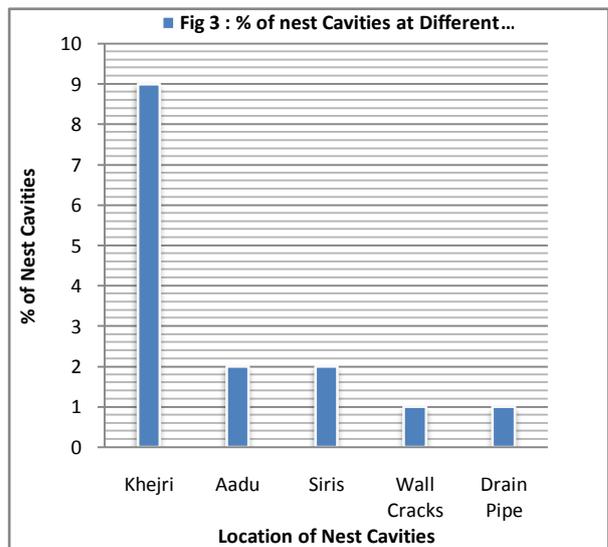
Casual observations over the study period revealed that the breeding season of this bird in these study areas lasted from January to July. Mating started in February and all brood of the season was generally fledged by mid July. The breeding pairs produced only one brood in every season. Although second clutches have been reported in other populations (Hossain et. al, 1993), no second clutches were found over the courses of this study.

Nesting Behaviour and Nest Site Selection

The rose-ringed parakeet in the present study area mainly nested in cavities, found in the rotten or hollow limbs and trunks of trees.(Plate:1) A total of 15 nest cavities were observed during study period, which were located at three tree species (*Prosopis cineraria* -9, *Ailanthus excels* -2 and *Albizia lebbeck* -2.) and all were mainly natural and woodpecker cavities. Only a small proportion (13.3%,only 2 out of 15) of the nests were found ,located in cracks of walls (1) and drain pipes (1) (Figure-3).



The parakeets began occupying the nest cavities in January, February and there after it defended them vigorously against its own kind and other birds, throughout the breeding season. Some casual observations indicated that the common Myna is main competitor for nest site selection. As the common Myna used tree cavities for nest, they must have been competing with the Rose-ringed parakeet for suitable nesting sites, due to the overlapping of breeding season of them (Siddique et. al, 1993).



During study it was also observed that if the tree hole opening is too small, the female uses her beak and feet to widen and prepare the nest, often using the discarded wood chips as part of the nest material. Mated female spend more time in nest hole selection, inspection and preparation. While the female prepares the nest throughout the courtship, and mating process, her mate gathers food and feeds her. This division of labour continues until the nestlings appear at the nest entrance.

Courtship and Mating Behaviour

Parakeets are monogamous pairing for life. Mating was recorded from January to March, mainly in February. It took place in the vicinity of the nest cavities as well as away from them. Displays include stretching and bowing of legs and breast, leg salute, serving food beak to beak by the male to the female and mutual allopreening. Rose- ringed parakeet have a vast array of courtship behaviours including sparring with bills, kissing, eaessing, entwining necks, nibbling at each other's and side by side body contact to ensure that breeding will occur(Plate:2).

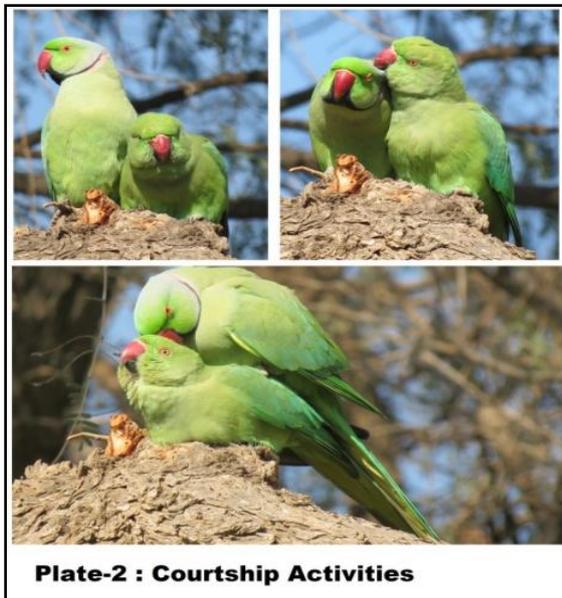
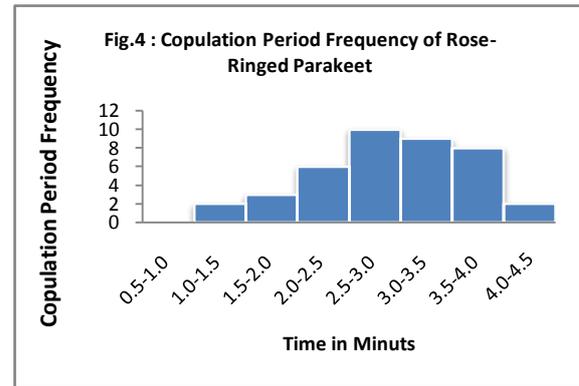


Plate-2 : Courtship Activities

The whole mating act (copulation) that is comprising posture of the female, puffing, bowing and mounting by the male and the cloacal kiss was completed in

one to four minutes (Figure-4), both birds remaining silent (A total 40 observation of copulation period were recorded by DSLR Camera).



Clutch Size and Incubation Period

All results were according to observation table. The normal clutch size is 2 to 6 eggs with a mean of 3.86 eggs per clutch. Eggs were first recorded on 2nd march but may have been laid as early as 27th February (back calculated from hatching date). A total of 15 nests were observed during study period, of which seven nests were from study area 1 in year 2013 and eight were from study area 2 in year 2014. Thus the subsequent observations regarding incubation and brooding behaviour were mainly restricted to 15 nests. Of the 15 clutches under observation, two failed to hatch at all. The incubation period lasted for 22 to 24 days. The eggs were incubated only by the females and the male continued to gather food, calling the female to come and eat, which she does by emerging from the nest to a nearby branch and eats the food served to her beak to beak.

Mean clutch size (3.86) during this study was similar to the mean clutch size reported elsewhere (Lamba, 1966; Simwat and Sidhu, 1973; Shivanara an et al, 1981; Hossain et al, 1993; Pithon and Dythan, 1999a)

The date for the first recorded egg is much later than that reported for southern India (Shivanarayan et al, 1981-21 December), but very similar to that reported in nouthern India (Simwat and Sidhu, 1973) and Bangladesh (Hossain et al, 1993).

Study Area No.-I (Cropland Area of Jhunjhunu) Year-2013								Study Area No.-II (Urban Area of Sikar) Year-2014								Total/ Mean
No. of observed nests	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	15
Location of Nest	Khejri Tree	Aadu Tree	Aadu Tree	Khejri Tree	Wall Cracks	Drain Pipe	Siris Tree	Siris Tree	Khejri Tree							
Date of egg Laying	3-3-13	22-3-13	2-3-13	10-3-13	27-2-13	5-3-13	3-3-13	1-3-14	5-3-14	3-3-14	10-3-14	6-3-14	15-3-14	14-3-14	11-3-14	11-March
Date of fledgling	24-3-13	13-4-13	25-3-13	3-4-13	21-3-13	27-3-13	25-3-13	24-3-14	28-3-14	25-3-14	2-4-14	28-3-14	7-4-14	7-4-14	4-4-14	1-April
Date of Leaving nest	18-6-13	11-7-13	20-6-13	28-6-13	15-6-13	22-6-13	24-6-13	20-6-14	23-6-14	21-6-14	1-7-14	25-6-14	5-7-14	6-7-14	2-7-14	29-June
Clutch Size	5	4	4	2	3	4	4	6	4	3	5	4	2	4	4	3.86
No. of fledgling young	4	3	0	1	2	3	2	4	2	2	3	2	0	3	2	2.20
Fledgling Rate	80	75	0	50	66	75	50	67	50	66	60	50	0	75	50	54.2

Table : A Total Observations about Reproductive behavior of Rose-Ringed Parakeet

Parental Care of Young Ones

A total of 15 clutches hatching took place according to observation table. The nestlings were fledged from 21st March to 13th April. thus the nestlings were fledged in about 22 to 24 days. The nestlings emerged naked, their beaks are yellow, turning red gradually. The young are blind, the eyes open on the 9th day and the first feathers appear at 15th day. Within two more weeks they are fully feathered except for the rump area.

Only male bird fed the nestlings and female for about 5 weeks from hatching. After 5th week a drastic change in nestling life occurs, when they begin to look out the entrance hole (Plate:3). By now the female also brings in food and the male spends the night near the nest for special care and watchfulness.

At the age of 8 weeks the fledglings leave the nest for food. From then on it is the male that mainly cares for them. During the next week the young birds are hidden among broad leaves in trees so that they cannot be seen only heard. Parents coming to feed their young also disclose their hidings places. The young try to follow the parent as it flies off. These first flights are clumsy and the young birds have trouble landings. It is at this stage that they are most vulnerable. Within a short time, however, the fledglings gain proficiency in flying and in eating by holding their food in one foot. In their third week outside the nest, the young parakeets already have become quick flyers. Another week they are eating by themselves and join the flock in its flight to the roosting site.

The estimated average number of birds fledged was 2.20 chicks (observation table). The estimate of 2.20 young fledged per nest during 2013-2014, was comparable to that found in Bangladesh and Southern India (Shivanarayan et. al 1981, Hossain et. al 1993), but considerably lower than that reported elsewhere in India (Lamba 1966). Given that Lamba's (1966) estimate of fledgling success is roughly twice that reported in Bangladesh and Southern India (Shivnarayan et. al 1981, Hossain et. al 1993), it is possible that predation rates

were lower at his study sites. Nesting success is not high only about average 54.2% of all eggs laid ended up as fledgling birds (observation table).



Plate-3 : Male with Nestlings

Conclusion

Overall it was concluded that this beautiful noisy bird have been able to reproduce very efficiently in Shekhawati Region of Rajasthan leading to their large population build ups.

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