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Breeding Habitats of the Rose-Ringed Parakeet (*Psittacula krameri*) in the Cultivations of Central Punjab

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ABSTRACT

Six breeding habitats viz. croplands, villages, roadside forest plantations, canalside forest plantation, city road avenues and University campus, of the rose-ringed parakeet (*Psittacula krameri*) were surveyed during the four months viz. February through May of the breeding season of the parakeet. It was concluded that the type of trees and their age were the significant factors in frequency of tree cavities, and the parakeet nests in a mixture of habitats.

Key Words: Croplands; Villages; Plantations; Tree cavity; Nest cavity

INTRODUCTION

In its native range, the rose-ringed parakeet inhabits lightly timbered areas, cultivated farmlands, urban gardens and parks (Paton *et al*., 1982). In the Central Punjab, it affects wooded areas in cultivations where it largely nests in tree holes available in the farmlands, forest plantations and in tree groves present in urban and rural habitations (Sarwar *et al*., 1989a). In Pakistan, the parakeet has been recorded to breed in the spring season (Whistler, 1986). Most of its nests are located in the tree holes, but in some cases suitable recess and cracks in buildings and telegraphic poles, are used for the nesting (Ali & Ripley, 1969; Roberts, 1991). The parakeets in Punjab commence the search for the nest holes in small parties of 2 to 5 birds from December through May, and from late August till October. Copulations take place in February through April (Sarwar *et al*., 1989b). Egg laying begins in late January and February, and March which continues till April in Andhrapradesh, India and Hawaii. The nestling leaves the nest for good in six to seven weeks. The nestling quit the nest in eight weeks time and that it is mainly the father who cares for the young outside the nest. In about four weeks time the young parakeet are able to eat by themselves and join the foraging flocks (Shivanarynan *et al*., 1981). Furthermore, the role of environmental, dietary and hormonal factors in the regulation of seasonal breeding of the free living female rose-ringed parakeets is also important particularly for the formation of a pair bond between September and December. It is often associated with increase in the levels of the plasma LH following no change in plasma estradiol (Sailaja *et al*., 1988). The present studies were aimed at knowing the number and tree composition in the various breeding habitats to determine the cavities and potential nests used by them particularly during the breeding phase.

MATERIALS AND METHODS

Six major habitats considered to be important from the breeding point of view of the rose-ringed parakeet were surveyed from May, 1997 through 1998 to record the various species of trees, their numbers, and the number of tree cavities and parakeet nests harboured by them. The survey, carried out during the four months viz. February through May, of the breeding season of the parakeet. All cavities with a mouth diameter about 7 cm or more were considered to be important. To determine as to which of the cavities were being used by the parakeets as nests, activities as the entry of the females into the cavity mouth at least five times within the duration of an hour, sitting posture of the female near the cavity for varying amounts of time, occurrence of the male near a cavity mouth and infrequent calls by both male and female, were regarded as the potential parakeet nests. This methodology was applied to all the six major parakeet habitats in knowing about the potential breeding nesting sites of the parakeets. Employing of the field binoculars (7 x 50 mm) was also made wherever necessary to get a better view of the proceedings.

RESULTS AND DISCUSSION

Croplands were the largest of all the sampled habitats and under a variety of food crops. It is evident from Table I that in the croplands, although the *Dalbergia sissoo* comprised maximum number of trees, but no parakeet nest was recorded. In the *Mangifera indica*, only 16 parakeet nests were recorded, while the highest number, 72 was present in *A. lebbek* (Table Ia). Of the 600 trees sampled from the villages, 458 comprised the *Azadirachta indica*, with 20 cavities and only 4 parakeet nests occurred. It augments that the high incidence of trees in any habitat, is not correlated with the occurrence of the parakeet nests. Usually, in villages and tree groves, the trees, harboured only a few nests (Table Ib). Of the 248 parakeet nests recorded from the roadside forest plantations, 208 (84%) were carried alone in the trunks and limbs of the *Acacia*, whereas the number was fewer in other tree species (Table Ic). From a total of 3952 trees, only *Acacia* and *Tamarix*

Table I. Occurrence of tree cavities and nest cavities of the rose-ringed parakeet in different species of trees in the six major habitats of Central Punjab

Trees	No. trees	No. cavities	No. cavities per tree	No. nests	No. nests per tree
a. Cropland (area surveyed = 1000 acres)					
D. sissoo	1110	08	0.28	-	-
M. indica	672	184	0.27	16	0.025
M. alba	80	72	0.90	08	0.002
A. lebbek	72	128	1.78	40	0.556
Acacia	32	-	-	-	-
A. indica	10	-	-	-	-
E. cumini	24	-	-	-	-
Zizyphus	08	-	-	-	-
M azedarach	08	-	-	-	-
F. carica	08	-	-	-	-
Total	2224	392	0.18	64	0.029
b. Villages and the tree groves (Area sampled = 100 acres)					
A. indica	458	20	0.37	04	0.007
A. lebbek	70	30	0.80	07	0.100
S. oleoides	16	07	0.44	-	-
C. obliqua	12	-	-	-	-
F.bengalensis	12	04	0.33	-	-
Acacia	08	-	-	01	0.125
D. sissoo	08	07	0.87	-	-
Zizyphus	12	07	0.58	-	-
P. spicegera	04	-	-	-	-
Total	600	75	0.13	12	0.020
c. Roadside plantation (area surveyed = 72 acres)					
Acacia	1234	912	0.74	208	0.170
D. sissoo	672	32	0.03	08	0.008
T. aphylla	124	168	0.75	32	0.140
S. oleoides	24	16	0.67	-	-
Zizyphus	24	24	1.00	-	-
P. spicegera	16	-	-	-	-
Total	2094	1152	0.55	248	0.118
d. Canalside plantation (Area surveyed = 72 acres)					
Acacia	3000	408	0.14	80	0.027
D. sissoo	826	36	0.78	-	-
P.juliflora	48	-	-	-	-
T. aphylla	22	80	3.62	16	0.500
P. spicigera	20	80	4.00	-	-
S. oleoides	12	-	-	-	-
Zizyphus	16	-	-	-	-
P.datylifera	08	-	-	-	-
Total	3952	604	0.152	96	0.024
e. City road avenues (Civil Lines, Faisalabad) (Area sampled = 16 acres)					
D. sissoo	78	28	0.35	16	0.25
T. arjuna	68	70	1.02	08	0.12
S.malabarica	52	32	0.61	20	0.38
C. toona	52	100	1.92	12	0.24
F.bengalensis	04	04	1.00	-	-
F.religiosa	04	-	-	-	-
Total	258	234	0.91	56	0.217
f. University Campus (area sampled = 40 acres)					
T. arjuna	40	48	1.20	12	0.30
P.roxburghii	32	52	1.61	04	0.12
J.mimosifolia	28	18	0.65	-	-
F. religiosa	28	08	0.29	-	-
E. suberosa	24	12	2.00	12	0.50
D. sisso	16	04	0.25	-	-
S. malabarica	07	32	4.57	12	1.71
A. procera	08	03	1.50	08	1.00
B. variegate	04	04	1.00	-	-
F.bengalensis	04	-	-	-	-
Pinus spp	04	12	3.00	-	-
C. toona	04	08	2.00	04	1.00
Total	199	201	1.01	52	0.26

aphylla contained 80 and 16 nests, while other trees, evidenced none of them, mainly due to the fact that most of the trees along the canalsides, were relatively young and contained no parakeet nests (Table Id). Only 16 acres of area sampled from the city road avenues (Jinnah Garden), in all 258 trees, *Salmalia malabarica* (with 52 trees) contained 20 parakeet nests, whereas *D. sissoo, Cedrella toona, Terminalia arjuna*, comprised 16, 12 and 8 nests, respectively (Table Ie). The Old campus of University of Agriculture was sampled for the presence of the parakeet nests, and here, 199 trees consisted of 52 nests. Of these, the highest number, 12 was recorded in the *T. arjuna* (Table If).

The various breeding habitats of the rose-ringed parakeet in the study area were treed with *Dalbergia* or *Acacia* mixed with one to several of the following species: *Albizzia* spp, *S. malabarica*, *C. toona*, *T. aphylla*, *T. arjuna*, *E. suberosa*, *M. alba* and *M. indica.* before the introduction of the canal irrigation system such basic essentials as the nest cavities and food of the parakeets must have been scarce. The obvious conclusion is that agroecosystems which has extensively replaced the tropical thorn forest has greatly favoured the parakeets as it has done so in the case of several of other birds and mammals (Taber *et al*., 1967; Roberts, 1977, 1991).

Trees like *S. malabarica*, *E. suberosa*, *Albizzia*, *C. toona*, *T. arjuna* and *P. roxburghii* harboured more cavities and parakeet nests (per tree) than the other trees of the study area. However, the trees like *Acacia*, *Dalbergia* and *M. indica,* by virtue of their numerical superiority, contributed most of the cavities and parakeet nests in the study area. *Albizzia*, *S. malabarica*, *T. aphylla* and *T. arjuna* in spite of being present in much lesser numbers contributed significantly towards expanding the nesting niche of the parakeet as they were seemingly more prone to the formation of cavities in their trunks and limbs. With the exception of *Acacia, M. indica* and *Dalbergia*, the above mentioned trees were generally concentrated in urban settings and irrigation rest houses. *Albizzia*, *Acacia* and *D. sissoo* which were scattered all over the croplands, and roadside and canalside plantations provided the parakeets in general and the breeding pairs in particular an easy access to the parakeets to the food present in the fields and the orchards. The parakeet roosts in the premises of the canal rest houses are mostly in the midst of the croplands. As such, besides providing ample nests and shelter to the parakeets, they also lend proximity to a surfeit of nutritious food resources (Iqbal, 1998; Khan & Beg, 1998).

Presently there is a trend in the province of Punjab to remove old trees for varied reasons in the different habitats. Pure stands of *Eucalyptus*, *Salmalia* and *Populus* are reducing the existing diversity in the habitats under consideration. Even in the croplands pure strands of *Salmalia* have appeared during the past ten years. *Eucalyptus* along the highways and other roads is fast becoming common. This is happening mostly at the cost of *Dalbergia* and *Acacia*. This trend is reducing the tree diversity will not be adversely affecting the rose-ringed parakeet alone but also a host of other birds and animals. A variety of birds and mammals affect the agroecosystem because of its phytological heterogeneity (Roberts, 1977, 1991; Taber *et al.*, 1967; Beg & Qureshi, 1972; 1980). The diversity of life in the agroecosystem, which also happens to be the largest of all the systems in Pakistan, is faunistically very rich. In countries like Pakistan the agroecosystems are havens for many animals. Thoughtless tampering with the tree composition and unintelligent use of toxicants for inhibiting the pest species in the agroecosystems is not desirable. Rather, the management of such pest populations should be based on necessary basic studies made in the ecological setting of the agroecosystem. It is apparent from these studies that while most of the parakeet roosts are located near the food crops throughout the Central Punjab; thus, the availability of food is not a limiting factor to the parakeets. Certain other factors viz. age and size of trees, tree composition, also contribute significantly in enhancing the parakeet breeding dimensions. It thus augments that such key factors should be visualized before planning any strategy for the control of parakeet breeding and nesting stages.

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