

## EFFECT OF TREE SPECIES AND SIZE ON THE AVAILABILITY OF NEST CAVITIES OF ROSE-RINGED PARAKEET (*Psittacula krameri*) IN CENTRAL PUNJAB, PAKISTAN

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### ABSTRACT

Forty four roosting sites of Rose-ringed Parakeet (*Psittacula krameri*) located in five districts of Central Punjab were sampled for tree composition and location of nest cavities. In all, 5451 cavities were located, with *Salmaalial malabarica* being the dominant (35.21%) followed by *Eucalyptus* spp. (16.20%), *Terminalia arjuna* (10.84%), *Dalbergia sisso* (7.14%), *Cedrella toona* (2.32%), *Eugenea jambolena* (1.46%), *Mangifera indica* (1.24%), *Jaccaranda mimosifolia* (1.15%), *Ficus bengalensis* (1.01%), and *Erythrina saberosa* (0.40%). All these parakeet roosts consisted of a variety of food items, and it was concluded that the availability of food was a major factor for an overwhelming population in all roosts.

### INTRODUCTION

The Rose ringed parakeet, popularly known as parrot, belongs to the family Psittacidae and the order Psittaciformes. It is a primary consumer and feeds on nutritious parts of the plants as fruits, flowers and seeds. By virtue of its feeding habits, the parakeet competes with man for food resources, and is, therefore, considered as a serious agricultural pest (Forshaw and Cooper, 1978; Khan and Hussain, 1990). The introduction of the canal irrigation system at the beginning of the present century to expand the agricultural practices in this region, has favoured manifold increase in parakeet population. It plunders citrus, guava, mango, dates, pomegranates, mulberry, sunflower, wheat, lentils, brassica and sorghum on a large scale (Ramzan and Toor, 1972; Beg, 1978, Shafi *et al.*, 1986, Karim, 1987; Brooks *et al.*, 1988 and Roberts, 1991). An interesting aspect of life of parakeets is their habit of spending night (nocturnal rest) in communal roosts where they gather at dusk. They begin to arrive at their roosts atleast an hour before sunset in varying parties and their arrival ceases completely at dusk. They vacate their roosts at sunrise or immediately after in search of food. A roost is, therefore, the prime centre of daytime activities of the parakeets, and hardly at any instance parakeets vacate them (Dvir, 1985). Parakeets forage in various sized parties ranging from a few to even hundreds, and feed either perched on the crop heads or in the sitting posture on a given crop (Bashir, 1978).

Parakeets are the wasteful feeders as they frequently drop or discard the partially consumed food items (Ali *et al.*, 1982). This paper provides an information on the effect of tree species in forty four parakeet roosts in Central Punjab, to describe their characteristics, and finally to know about their behavioural rhythms with respect to the roosts.

### MATERIALS AND METHODS

Studies on effect of tree species and size on the availability of nest cavities of Rose-ringed parakeet were extended from May 1996 through December 1997 in 44 roosts located in five districts of Central Punjab i.e., Faisalabad, Jhang, Toba Tek Singh, Hafizabad and Sheikhpura. Of these, two were located within the main city of Faisalabad, one on the Campus, University of Agriculture, Faisalabad, and the other at the Jinnah Garden. In all, 5451 cavities were located at all the roosting sites in the 10 numerically dominant trees (Table 1). The "dbh" (diameter at breast height) served as an index of the age of trees. Circumference of trees was determined using the measuring tape around the trunk of trees. Diameter of trees was estimated by using the formula:  $pr^2$ . Trees were segregated into three dbh categories viz., dbh < 50cm, 50-70cm and > 70cm. To assess the height, trees were carefully examined for several days before making their approximate height. Numbers of parakeets in all the five roosts were also carefully counted. For this, specific points were selected around the roosting sites in order to get a clear image of



the sunrise, and similarly again at the sunset. Besides, the daily activity rhythm patterns of parakeets in all the roosts, like making call notes, flying within or away from the roost, feeding on croplands within the roost, breeding behaviour and scuffles with other cavity-nesting birds, viz., common myna (*Acridotheres tristis*), and owls, were also comprehensively investigated.

## RESULTS AND DISCUSSION

A study on the effect of tree species and size on the availability of nest cavities of Rose-ringed parakeet (*Psittacula krameri*) was extended from May 1996 through December 1997. During which a total of 44 roosts, the canal rest houses, located at the "Jhang Branch" and "Gogera Branch", were sampled in the five districts of Central Punjab.

The Table 1 describes that the Rose ringed parakeet uses the tall tree groves as its nest cavities in different species of trees. Throughout this study, a total of 10 numerically dominant tree species were established to carry the nest cavities for the parakeets (Table 1). Of these, *Salmalia malabarica* contained the maximum percentage 35.21 cavities, followed by *Eucalyptus* species 16.20, *Terminalia arjuna* 10.84, *Dalbergia sisso* 7.14, *Cedrella toona* 2.32, *Eugenea jambolena* 1.40, *Mangifera indica* 1.24, *Jaccaranda mimisifolia* 1.15, *Ficus bengalensis* 1.01, and *Erythrina saberosa* 0.40 (Table 1, Fig. 1).

Girth of the sampled trees proved to be another important factor for the impact of various tree species for the abundance of nest sites. In general, trees with a bigger girth (> 50cm) possessed more parakeet cavities

than with the lesser girth (< 50cm), and as such, there was an increase in the number of cavities in trees with the "dbh" more than 50cm, and this number declined with a lesser "dbh" value (Table 2).

Number of parakeets at all the roosts varied considerably and ranged from 100- 10,000 (Table 1). A variety of factors viz., tree species, age of trees, availability of nest cavities and proximity of food sources play a substantial role in determining the size of the roost. Table 1 suggests that parakeet roosts were mainly located within the University campus, Jinnah garden and canal rest houses where presence of groves of tall trees of different species contained large number of cavities (Beg, 1978; 1985, Panicker 1980). Roosts seemed to be the centre of main diurnal behavioural activities of parakeets, including flying, call notes, scuffles with other cavity nesting birds for the possession of cavities, foraging and feeding and breeding. At no point during the day, parakeets vacated their roosts completely (Paton, 1985). The study also indicates the selectivity of such roosts by the parakeets with nutritious and energy-rich plants to illustrate that parakeets are a potential agricultural threat (Malhi and Brar, 1988; Khan, 1990). Over the past few decades, "grow more tree" campaign has resulted in a massive increase in population of this parakeet, as has been documented during the present study with *Salmalia malabarica* being the dominant of all tree species in providing a maximum cover (35.21) to the parakeets. However, it has been observed that more emphasis has been on the cultivation of *Salmalia malabarica* which would only favour the enhanced parakeet niche in the croplands. The picture with respect to parakeet population would certainly have been different if the roosting sites were devoid of *Salmalia malabarica*, *Eucalyptus* spp., *Terminalia arjuna* and *Cedrella toona*, as has been supported by Saini (1994).

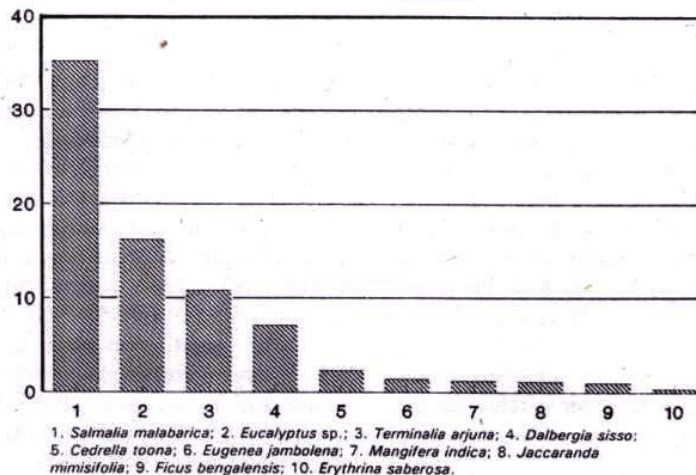


Fig. 1: Tree species depicting the percentage of cavities of different tree species.

Table 1. Tree species examined from the roosting sites of Rose-ringed parakeet (*Psittacula krameri*) depicting the percentage proportion of cavities in various districts of Central Punjab.

District	Trees examined	Cavities		Parakeet per roost
		Number	%age	
Faisalabad	<i>Terminalia arjuna</i>	747	0.09	51950
	<i>Salmalia malabarica</i>	3270	0.41	
	<i>Cedrella toona</i>	248	0.03	
	<i>Dalbergia sisso</i>	160	0.02	
	<i>Eucalyptus</i> sp.	262	0.03	
	<i>Erythrina saberosa</i>	18	0.00	
	<i>Eugeneia jambolena</i>	43	0.00	
	<i>Jaccaranda mimosifolia</i>	20	0.00	
Toba Tak Singh	<i>Salmalia malabarica</i>	540	0.06	6900
	<i>Mangifera indica</i>	16	0.00	
	<i>Dalbergia sisso</i>	30	0.00	
	<i>Eucalyptus</i> sp.	50	0.00	
Jhang	<i>Dalbergia sisso</i>	102	0.01	5950
	<i>Eucalyptus</i> sp.	75	0.00	
	<i>Salmalia malabarica</i>	172	0.02	
	<i>Eugeneia jambolena</i>	16	0.00	
	<i>Terminalia arjuna</i>	10	0.00	
Sheikhupura	<i>Mangifera indica</i>	14	0.00	1500
	<i>Eucalyptus</i> sp.	6	0.00	
	<i>Dalbergia sisso</i>	6	0.00	
	<i>Ficus bengalensis</i>	6	0.00	
Hafizabad	<i>Dalbergia sisso</i>	18	0.00	1600
	<i>Eucalyptus</i> sp.	96	0.01	
	<i>Terminalia arjuna</i>	3	0.00	
	<i>Mangifera indica</i>	7	0.00	

Table 2: "DBH" (diameter at breast height) of trees sampled for Rose-ringed parakeet (*Psittacula krameri*) in various roosts of Central Punjab.

Trees	DBH (cm)						Total T/n(%)
	> 50		50-70		> 70		
	No	%age	No	%age	No	%age	
<i>Salmalia malabarica</i>	144	3.68	227	5.15	169	3.84	42.70
<i>Arjuna terminalia</i>	80	1.81	110	2.50	78	1.77	44.07
<i>Cedrella toona</i>	44	1.00	55	1.25	25	0.56	44.12
<i>Dalbergia sisso</i>	29	0.65	142	3.22	72	1.60	44.42
<i>Eucalyptus</i> sp.	145	3.29	178	4.04	22	0.50	44.11
<i>Eugeneia jambolena</i>	187	4.25	46	1.04	25	0.57	44.02
<i>Mangifera indica</i>	39	0.88	170	3.86	80	1.81	44.18
<i>Ficus bengalensis</i>	55	1.25	217	4.92	188	4.27	44.06
<i>Erythrina saberosa</i>	110	2.50	22	0.50	5	0.11	51.12
<i>Jaccarandia mimosifolia</i>	14	0.31	8	0.18	0	0.00	44.88



## REFERENCES

- Ali, M.H., B.H.L. Rao, M.A. Rao and P.S. Ali. 1982. Bird damage to maize. J. Bomb. Nat. Hist. Soc., 79: 201-204.
- Bashir, El.S.A., 1978. Review of parakeet damage in Pakistan and suggested control methods. Proceedings of Seminar on Bird Pest Problems in Agriculture. July 5-6, 1978, Karachi, Pakistan, pp. 22-27.
- Beg, M.A., 1978. Some observations on the biology of Rose-ringed Parakeet in Punjab. Proceedings of Seminar on Bird Pest Problems in Agriculture, July 5-6, 1978, Karachi, Pakistan.
- Beg, M.A., 1985. Cavities of Rose-ringed Parakeet in canal rest houses and city gardens. Pak. J. Zool., 12(2):120-122.
- Brooks, J.E., I. Hussain and E. Ahmad, 1988. A partial research bibliography of the Rose-ringed Parakeet (*Psittacula krameri*). Technical Report No. 15:1-16.
- Dvir, E., 1985. Ring-necked parakeets are trying to make it in Israel. Israel J. Nat., 10(3):115-121.
- Forshaw, J.M. and T.W. Cooper, 1978. Parrots of the World. T.F.H. Publications, Inc., New Jersey, USA. pp.145.
- Karim, A., 1987. Foraging and feeding behaviour of Rose-ringed Parakeet. M.Phil. Thesis, Deptt. Zoology, University of Agriculture, Faisalabad.
- Khan, A.A., 1990. Bird damage to crops in Pakistan. Technical report, Vert. Pest Control Project, GOP/USAID, NARC, Islamabad, Pakistan.
- Khan, A.A. and I. Hussain. 1990. Parakeet (*Psittacula krameri*) damage to standing maize crop in Pakistan. Sarhad J. Agric., 6(2):185-191.
- Malhi, C.S. and S.S. Brar, 1988. Damage to *Zizypus* sp. at Ludhiana, Punjab, India. Indian J. Forestry, 10(20):156-158.
- Panicker, K.N., 1980. Ecology of the hole nesting birds. J. Bomb. Nat. Hist. Soc., 75:1227-1237.
- Paton, P.W.C., 1985. Rose-ringed Parakeet nesting in Hawaii: A potential agriculture threat. Elepaio, 43(5): 37-39.
- Ramzan, M. and H.S. Toor, 1972. Studies on the damage to guava fruits due to Rose-ringed Parakeet (*Psittacula krameri*) at Ludhiana. The Punjab Hort. J., 12(2-3):144-145.
- Roberts, T.J., 1991. Birds of Pakistan. Oxford Univ. Press, London. pp. 1144.
- Saini, S.S., 1994. An analysis of the gut contents of Rose-ringed Parakeet (*Psittacula krameri*) in Ludhiana, Punjab, India. The Punjab Hort. J., 15(7): 222-226.
- Shafi, M.M., A.A. Khan and I. Hussain, 1986. Parakeet damage to citrus fruit in Punjab, Pakistan. J. Bomb. Nat. Hist. Soc., 83(2): 439-444.