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Innovation The Research Concept

A Study of Rose-Ringed Parakeet As An Agricultural Pest in The Shekhawati Region of Rajasthan, India

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Abstract

Birds form an important component of the agro-ecosystem of India. The rose-ringed parakeet (Psittacula krameri) is the most common and a dominant bird species in the avian community of the Shekhawati region. Shekhawati is a semi-arid region of the North-eastern Rajasthan. Rose-ringed parakeet by virtue of its wide feeding niche, has acquired the status of a potentially dominant pest of agriculture. The food items of rose-ringed parakeet were studied on the basis of a field survey to estimate the impact of this species on agriculture. The food items were visually observed by personal field visits throughout the study area A field survey was conducted using structured questionnaire for gathering information from neighborhood farmers for which eight (8) sites were selected and fifty questionnaires were distributed at each site. On analyzing the results, it was established that a wide variety of food items are consumed or damaged by the parakeets such as cereal grains and cultivated seeds (wheat, pearl millet and sorghum), pulses, oil seeds (sunflower and mustard), fruits (ber, guava, pomegranates, citrus and shahtoot), seeds and fruits of trees like *Dalbergia sissoo* (shisham), *Azadirachta indica* (Neem), *Prosopis cineraria* (khejri), *Acacia arabica nilotica* (Babool), *Albizia lebbeck* (siris) and *Ficus sps*. (peepal and burgad) etc. The analysis of the survey results shows that this noisy species is the most destructive avian pest in agriculture and horticulture. It is exclusively vegetarian bird and has a wide feeding niche as it depredates a variety of food items. We need to keep all existing avian species in balanced numbers in the cultivated landscapes to ensure a sustained agricultural production.

Keywords: Parakeet, Pest, Shekhawati Region, Agriculture and Crop Damage.

Introduction

The rose-ringed parakeet (*Psittacula krameri*) popularly known as parrot, belongs to the family Psittacidae and the order Psittaciformes. It is a medium sized (38-43cm), distinctive grass green colored, long tailed, red curved beaked, very active, very social, gregarious, noisy and sexually dimorphic bird (Plate :1). It is the most common and a dominant bird species in the avian community of this region. It is distributed over agricultural, rural and urban areas throughout the Shekhawati region in quite a large number. In local dialect, it is called '*Tota*' or '*Suwa*' within the study area. The region is rich in population and variety of habitats of *Psittacula krameri.* The Shekhawati region has optimum availability of food, nest and roost sites for this active and energetic bird (Singh et al, 2015; 2016).

The Rose-ringed parakeet is a major crop pest in India as well as Shekhawati region of Rajasthan. The food of Rose-ringed parakeet has been described by numerous authors as consisting of fruits seeds, buds and flowers (Mason and Lefroy, 1912; Whistler, 1949; Ali & Ripley, 1968; Forshaw, 1981; Ahmad et al 2011). Detail studies on the feeding analysis & observation by Mason and Lefroy (1912), Ramzan & Toor (1972), Simwat and Sidhu (1973 a, 1974), Toor and Ramzan (1973, 1974 a, 1974 b), Ramzan & Toor (1972) and Shivanararayan (1980) have confirmed these and have also shown that they are responsible for a considerable amount of crop damage & loss too. Being a strict vegetarian it causes great losses to fruits, cereals & oilseed crops (Smith 1972, Sharma 1976, Bashir et al 1978, 1981, Khan & Hussain 1987). A loss of 25-100% to brassica

(Mustard), Mangoes, Guava & sunflower was reported by Prasad & Verghese (1985) in India.

Plate -1:Male & Female Rose-ringed parakeet;

Plate-2 : Media Image (Newspaper image)

There is vital need of keeping all existing avian species in balanced numbers in the cultivated landscapes as it assists in a sustained agricultural production. However, in the process of study, it was also observed that parakeets act as a pest in India causing major damages to agriculture crops and fruits. The potential economic impacts of *Psittacula krameri* on agriculture and conservation concerns regarding the species have underlined the need to expand effective human management options.

Aim of The Study

The main aim of study is to draw attention of researchers and ornithologists about control aspect of the avian pest (*Psittacula krameri*). Information of the above nature is not available for Shekhawati region of Rajasthan State, so study was conducted to gather information about food of rose-ringed parakeet & to have an idea about farm crops & fruits which are damaged by this green bird.

Material & Methods

Shekhawati is a semi-arid region of the north-eastern Rajasthan which is largely composed of two administrative districts of Jhunjhunu and Sikar. Though a small part of Churu and almost insignificant part of Nagaur, other two neighboring districts are also included in it (Figure :1). From the administrative and geographical point of view, Shekhawati is limited to Jhunjhunu and Sikar districts only. Its overall area is 13789 km^2 which is occupied by Sikar (7732 km^2), Jhunjhunu (5928 km^2) and Churu (129 km^2**).** The Shekhawati is a semi-arid historical region located in the North-eastern Rajasthan and is a part of the Great desert of India with extreme low-high temperatures and a poor rainfall. The Shekhawati region of Rajasthan is endowed with diverse topographic features and a wide range of habitats. Thus semi-deserted scrubland, gardens, orchards, cultivated farmlands etc are available here for this beautiful green bird. Well treed academic campuses, parks, gardens, roadside tree plantations and well wooded town corners are favorable sites of rose-ringed parakeet in the urban situations. If such an urban habitat happens to be close to croplands and orchards, the parakeets have an easy access to such life essentials viz. food, nests, roots etc. For the presence of all these types of urban and cropland habitats, the Shekhawati region is the heaven for *Psittacula krameri* and consequently having an abundant population of this green bird. Its large population is noticed by common people as well as media persons (Plate No.:2; Dainik bhaskar, 22 January 2017).

In the absence of gut content analysis, the food items were visually observed by personal field visits throughout the study area. The feeding activities of parakeets were recorded with the help of a binocular (Nikon, 10 X 50) and using photography by DSLR camera (Canon, Power Shot SX40HS)(Plate :3). A field survey was also conducted using structured questionnaire for gathering information from neighbourhood farmers who are occupationally related to agriculture and have sufficient knowledge about food items of *Psittacula krameri*. They are one who directly bears the damages by parakeet to their crops. A total of eight sites (representing entire study area) were selected for the survey (figure :2).

Fig. 2 : Location map of observation sites for a field survey about food items of rose – ringed parakeets.

Fig.1-Map of Rajasthan Showing Shekhawati Region

Of these, four sites belong to Jhunjhunu district such as Jhunjhunu city, Makhar (Jakharon ki dhani), Islampur and Hetamsar along with three sites from Sikar district-Sikar city, Banthod and Rasidpura in addition to one site from Churu district which was Salasar (figure:2). A total of fifty questionnaires were distributed to farmers at each site and collected after completion by farmers. In two sites, Jhunjhunu city and Sikar city, some questionnaires were distributed to several employees of the Food Corporation of India (FCI) because the storage and transportation of wheat and rice (stored grain) are done by FCI across different parts of India. The FCI has many warehouses in the Shekhawati region and these all are situated nearby railway stations. Because of their work, FCI employees are directly related to stored grain maintenance and face the problem of damage of stored grain by rose-ringed parakeets as well as pigeons.

Plate-3: Different Feeding Activities of Parakeet

Results and Discussion

All results about food items of *Psittacula krameri* and crop damage by parakeets are summarized in the table: 1 and feeding preference is shown in the figure: 3. On analyzing the table and figure, it was established that a wide variety of food items are consumed or damaged by the parakeets such as cereal grains and cultivated seeds (wheat, pearl millet and sorghum), pulses, oil seeds (sunflower and mustard), fruits (ber, guava, pomegranates ,citrus and shahtoot), seeds and fruits of trees like *Dalbergia sissoo* (shisham), *Azadirachta indica* (Neem), *Prosopis cineraria* (khejri), *Acacia arabica nilotica* (Babool), *Albizia lebbeck* (siris) and *Ficus sps*. (peepal and burgad) etc. For rose-ringed parakeets, all the food items are not available at the same site and during the same time periods as all the crops are seasonal, cultivated at different time periods as well as at different sites of this survey.

The surveyed sites are different in their ecological status, so all the farmers cannot cultivate all types of crops due to lack of water sources and the fruit farming is done by only few farmers who have small part of land with permanent water source. A total of 17 food items were observed as food sources of rose-ringed parakeets. Out of 17 food items, nine were observed by about and above 70% farmers because these items are available in large range of the Shekhawati region. It was found that these food items are consumed by parakeets preferably. Of the total, three food items were available in very small pockets of the study area, so only about and below 20% farmers observed them as a food of parakeets.

Majority of farmers reported a tree *Ailanthus excels* (Aadu) also as a food source of this beautiful bird but they were confused about part of tree, which part was eaten by parakeet such as seed, fruit or leaf. So it was concluded that this tree was used by parakeets as a roosting tree not as a food source.

On the analysis of the gut contents of the parakeet, a variety of food items as cereals, oil seeds and tree seeds are almost always likely to be found (Saini *et al*, 1993). In the absence of gut contents analysis, these food items were pointed out purely on the basis of visual observations which were provided by the framers of the Shekhawati region.

Table -2: Farmers Observations in favour of crop damage by Rose-ringed parakeet

S. No.	Name of crop	Damaging stage of crop	Total no. of farmers related to farming	No. of farmers in favour of damage	% of farmers in favour of damage
1	Wheat	S, R, Sg	400	321	80.25
2	Pearl Millet	R, Sg	400	378	94.50
3	Sorghum	R, Sg	400	121	30.25
4	Pulses	S	400	295	73.75
5	Mustard	R	400	319	79.75
6	Sun flower	R	400	81	20.25
7	Ber	Ur, R	80	80	100.00
8	Guava	Ur, R	30	30	100.00
9	Pomegranate	Ur, R	50	50	100.00
10	Citrus	Ur, R	10	10	100.00

Sprouting, R-Ripening, Sg-Stored grain, Ur-Unripe stage

Table – 1:- Food items of Rose-ringed Parakeet According to farmers of study area

Food item /Study areas		Jhunjhunu District				Sikar District			Churu District	Total No. of farmars out of 400	%
		Jhunjhunu city	Makhar	Islampur	Hetamsar	Sikar city	Banthod	Rasidpura	Salasar		
Farms crops	Wheat	48	50	46	45	45	21	48	18	321	80.25%
	Pearl millet	47	50	47	49	40	48	49	48	378	94.50%
	Sorghum	24	31	21	10	9	6	15	5	121	30.25%
	Pulses	37	42	41	36	30	39	41	29	295	73.75%
	Mustard	45	50	47	44	39	25	44	25	319	79.75%
	Sun flower	16	18	15	9	5	4	12	2	81	20.25%
Fruit crops	Ber	40	50	50	25	20	25	48	20	278	69.50%
	Guava	20	21	20	5	22	4	25	2	119	29.75%
	Pomegranate	18	15	19	16	20	25	50	5	168	42.00%
	Citrus	15	16	14	10	10	5	12	2	89	21.00%
	Shahtoot	25	46	42	15	35	10	41	10	229	56.00%
Trees (Seeds & fruits)	Shisham	42	46	41	36	37	31	41	22	296	74.00%
	Neem	48	45	42	37	47	24	35	41	319	79.75%
	Khajerl	40	49	38	41	38	41	42	42	331	82.75%
	Babool	38	48	36	36	32	36	36	41	267	66.75%
	Siras	35	30	24	45	23	31	26	22	237	59.25%
	Pipal & Bargad	10	8	9	5	4	5	6	3	50	12.50%

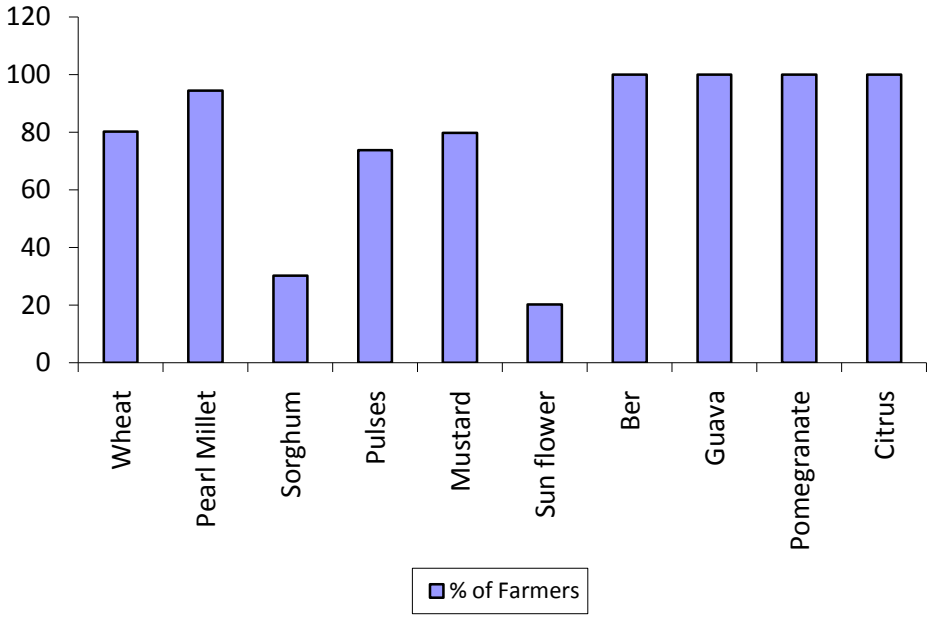

Fig. 3: Showing percentage of farmers in favour of different food items.

The analysis of the survey results shows that this noisy species is the most destructive avian pest in agriculture and horticulture. It is exclusively vegetarian bird and has a wide feeding niche as it depredates a variety of food items (Singh et al, 2015) . Saini et al (1993) analyze the gut contents of rose-ringed parakeets for one year showed that it considered of cereals (45%, tree archards (38%) & oil seeds (16%).

Thus survey was conducted through a specific and a small region, so recorded results were strictly localized which may not be applicable over large areas. However, they do indicate the damage attributed to this species. On analyzing the results depicted in the **table: 2,** it was also pointed out that this elegant species damages cereal crops in all stages, at sprouting, unripe, ripening and stored grain throughout harvesting season. It is also a serious pest of stored grains **(Plate -4)** and a major problem for the FCI in the Shekhawati region as well as in whole India.


दाने-दाने पर खाने वाले

विशाखापट्टनम। कहावत है 'दाने-दाने पर लिखा होता है खाने वाले का नाम'। ये फोटो भी ऐसा ही कुछ कहती है। शौकिया फोटोग्राफर विवेक राठौड़ ने आंध्रप्रदेश के वेस्ट गोदावरी जिले में इसे 22 फरवरी को क्लिक किया था। विवेक के अनुसार पालकोल्लेरू गांव में एक राइस मिल के पास धान के ढेरों पर तोते ऐसे चिपके थे, मानो कोई दावत मिल गई हो। विवेक ने ऐसी 64 तस्वीरें अपने फेसबुक वॉल पर पोस्ट की हैं।

Plate-4: Stored Grains Damaging by Parakeets (Rathod, 2014)

This species causes serious damage to ripening fruits as well as unripe stage of fruits. Parakeets often dropped or discarded partially consumed fruits and thus damaged fruits have no marketing value, therefore, they affect local farmers by economic losses (Singh et al, 2015; 2017). All farmers of the study area agreed with this aspect that rose-ringed parakeet is a problem to their agriculture in many forms. Thus, rose-ringed parakeets are beautiful destroyers to agriculture.

In Asia, especially India, rose-ringed parakeets are regarded as one of the most destructive bird pest in agriculture, coming in enormous flocks to cereals and fruits crops (del Hoyo, 1997; Chakravarthy, 2004). Introduced population also damages trees in orchards, vineyards, parks and gardens (W A Dept Ag, 2007).

In another incident, media reported the loss of stored grains due to parrots. These birds not only play the role in destroying the grain by consuming it but they also render food grain inconsumable by making holes with their beaks in the containers (jute bags specially) resulting in leakage of grain and mixing it with their excreta as well as scattering on the floor. The plate : 4 (Rathod, 2014), need no further explanation.

Conclusion

The *Psittacula krameri* with the status of a serious vertebrate pest damages and destroys both cultivated and fruit crops and incurs substantial damage to farmers and commercial fruit growers in the absence of management devices. Rose-ringed parakeets are abundantly distributed throughout Jhunjhunu district as well as the Shekhawati region of Rajasthan with the availability of suitable roosts and nests on various trees. The roosts of the rose-ringed parakeets occur closely to the food sources and as such, lower levels of energy budgets are required to manifest with the frequent visits from and to their roosts throughout the day inflicting damage and production losses to them.

Thus, the study has highlighted and overall conclusion is that the control aspects for this beautiful avian pest require more logical and eco-friendly approach to improve the crop quality and production in the productive agro-ecosystems of Rajasthan, India.

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