



## Predatory Birds Fauna of Desert Locust, *Schistocerca gregaria* (Forsk.) (Acrididae: Orthoptera) in Barmer, Rajasthan (India)

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### Abstract:

This field study was conducted on birds as natural predators of desert locust, *S. gregaria* and recorded to be the indicator along the movement of hoppers during the occurrence. Eight birds were observed to prey on different stages of locust. Indian myna, common crow, spotted babbler in flocks, desert lark, variable wheatear in small groups and rock bush quail in group were observed to pick and feed on locust. However, Gouriya and Bagula in folks were observed to prey on I to II and III to IV instars hoppers but folks of both seen near villages. The congregation of any one or combination of species of the eight identified bird species can be used as the 'indicators' of

presence of desert locust hoppers for survey by locust surveyors and to strategize further management practices.

**Keywords:** Desert locust, *Schistocerca gregeria*, hoppers, indicators, predatory birds.

### Introduction

The desert locust *Schistocerca gregeria* (Forsk.) belong to short horned grasshoppers group (Family: Acrididae and order: Orthoptera). The *S. gregeria* is polymorphic, polyphagous, polygyny and highly migratory in nature during swarming phase (Uvarov, 1966; Pener and Yerushalmi, 1998; Pener, 1991). Whereas the immature stage hoppers are gregariously active whole day and travel less distances (Ellis and Ashall, 1957; Uvarov, 1977). The desert locust is trans-boundary from neighbouring continents during monsoon periods and caused significant loss to agriculture and forestry crops in North West and Central India. The primary inputs of the

residents of Barmer district of Rajasthan, it was predicted that the year 2020 could be a desert locust swarming year. Therefore, Rajasthan Madhya Pradesh, Uttar Pradesh, Punjab, Haryana and Gujarat were put on high alert in the year 2020.

Natural enemy play a crucial role in population management of locust population and birds are the major predators of this pest in balancing the population of the desert insect-fauna in the arid-ecosystem. People of the Rajasthan serve, water, feed and shelter to birds as a regular practice for augmenting and build-up their population. The folks of the birds were observed to move place to place in search of food-insects. Birds were the



well-known natural enemies of desert locust and the newly hatched hoppers/ nymphs are kept under control and in turn the adults of the desert locust in normal situations. Therefore, present study was undertaken to find out the activities of bird species in the Barmer district of Rajasthan during locust swam.

### Materials and Methods

The summer breeding of *S. gregaria* were noticed regularly in different locations in the Indian arid zone/ thar-desert during May and June. The hopper population was observed abundantly along the pathway during in the month of March 2019 and reported by villagers and cattle grazer to the gram Pradhan of Barmer district. The present study was conducted in different locations of Barmer district of Rajasthan during May 2019 to August 2020. The hatching of hoppers and band formation was recorded in the

Barmer district by the villagers and Gram Pradhans to the revenue officers of the district. Subsequently, jointly field survey was conducted and confirmed the locust incidence by the Patwari and Assistant Agriculture Officer. Later the information was passed to the Locust Circle Office (LCO), Barmer for control operations to be under taken. The newly hatched hoppers were sand-dwelling and become crowded on the sand surface before moving together (Hopper band formation) in search of green vegetation for consumption as food. During the survey and management of *S. gregaria*, activities of many bird species was recorded. The activities of these birds were recorded specifically for their preying habit upon *S. gregaria* and its stages. The pics of birds were taken in the field and species were identified with the help of “The book of Indian Birds” by Ali (2002). We have observed birds as indicators and predators of *S. gregaria* along the movement of hoppers.

**Table 1. List of Bird Species and Their Predation Actively on Locust Stages in the Barmer District of Rajasthan**

Sl. No.	Common Name	Scientific Name	Order/ Family	Nature of Bird	Locust stage (Instars)
1.	Indian myna	<i>Acridotheres tristis</i>	Passeriformes/ Sturnidae	Depredatory	III to IV
2.	Puff-throated or spotted babbler	<i>Pellorneum ruficeps</i>	Passeriformes/ Pellorneidae	Insectivorous	III to IV
3.	Desert lark	<i>Ammomanes deserti</i>	Passeriformes/ Alaudidae	Insectivorous	Newly hatched to II
4.	Variable wheatear	<i>Oenanthe picata</i>	Passeriformes/ Muscicapidae	Insectivorous	Newly hatched to II
5.	Common crow	<i>Corvus splendens</i>	Passeriformes/ Corvidae	Omnivorous	III to IV
6.	Rock bush quail	<i>Perdicula argoondab</i>	Galliformes/ Phasianidae	Depredatory	I to III
7.	House sparrow	<i>Passer domesticus</i>	Passeriformes/ Passeridae	Depredatory	I to II
8.	Cattle egret	<i>Bubulcus ibia</i>	Pelecaniformes/ Ardeidae	Insectivorous	III to IV

**Note:** Depredatory – birds basically insectivorous while in the absence of prey act as vegetarian.

### Results & Discussion

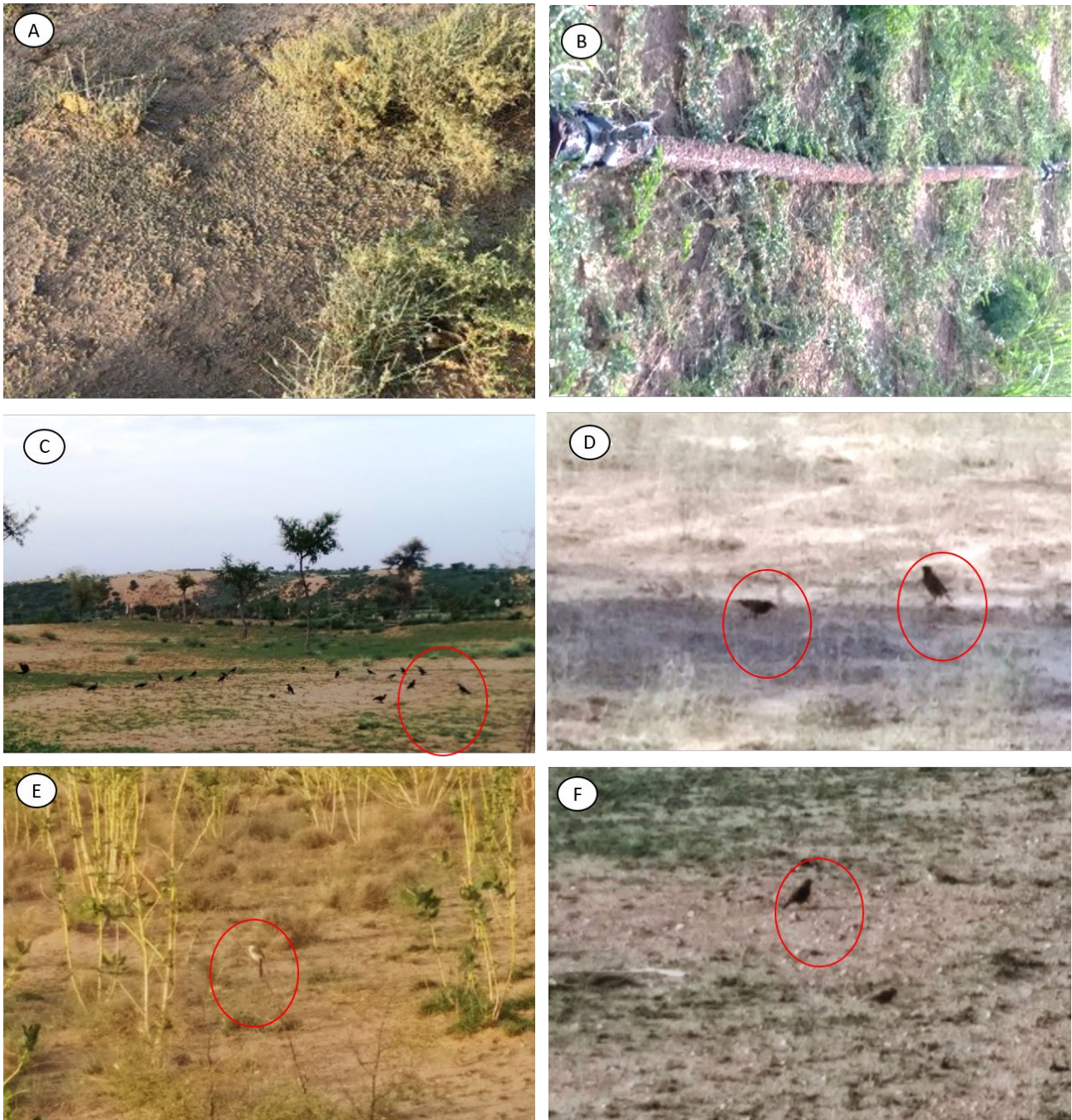
Result revealed (table-1) that eight predatory bird species were performing predatory activities and devouring the hoppers of desert locust in the desert regions of Barmer district of

Rajasthan. The bird species were Indian myna (*Acridotheres tristis*), puff-throated or spotted babbler (*Pellorneum ruficeps*), desert lark (*Ammomanes deserti*), variable wheatear (*Oenanthe picata*), common crow (*Corvus splendens*), rock bush quail (*Perdicula argoondab*), house sparrow



*Passer domesticus* and Cattle egret (*Bubulcus ibia*) recorded. These bird species were exhibited to be predatory on different stages of the hoppers of *S. gregaria*. The Indian myna, common crow and puff-throated/spotted babbler were observed in flocks and fed on III and IV instar

hoppers. The desert lark and variable wheatear were observed to be prey on the newly hatched to II instar hoppers in small groups. Small group of Rock Bush Quail were observed to pick and fed on I to III instars of desert locust hoppers.



**Figure 1 (A-F). Occurrence of *S. gregaria* Hoppers and Predatory Activities of Birds at Hoppers Movement Site of Barmer. A-Newly Emerged First Instars Hoppers, B-Second Instars Hoppers; C-Common Crow Preying on Hoppers; D-Indian Myna Preying on Hoppers, E- Jungle Prinia on Hoppers; F-Puff-Throated or Spotted Babbler**

Birds are well recognised predators of insect pest, one of the earliest classical records of biological pest control was the introduction of the Indian myna, *Acridotheres tristis* in Mauritius during 1762 to control the red locust, *Nomadacris septemfasciata* (Greathead, 1971). Ali, 2002 has also reported, puff-throated or spotted babbler (*Pellorneum ruficeps*), desert lark (*Ammomanes deserti*), variable wheatear (*Oenanthe picata*), rock bush quail (*Perdica argoondah*), house sparrow (*Passer domesticus*) preying on insects; Indian myna (*Acridotheres tristis*) and Cattle egret (*Bubulcus ibia*) preying on grasshoppers, and common crow (*Corvus splendens*) to preying on locusts.

The common crows consumed only the soft abdominal leaving the hardy head and thorax parts of the hoppers. On the other hand, Indian myna, puff-throated/spotted babbler, desert lark, variable wheatear and rock bush quail devoured the whole body of hoppers. However, two birds i.e., house sparrow *Passer domesticus* and Cattle egret, *Bubulcus ibia* were observed as efficient predators of I to II, and III to IV instars hoppers of desert locus, respectively. Though, folk of both the bird species were recorded to be highly active near the villages. Moreau (1930) from Africa, Bradshaw (1934) from Saskatchewan and Knowlton (1941) from Utah were reported several birds to feed on locusts during outbreaks of locusts. Martin et al. (1951) was reported almost universal predation on grasshoppers by insectivorous and omnivorous birds. Control of locusts in grassland of China was achieved by predation of insectivorous birds (Anonymous 1988, Yu 1988).

## Conclusion

In the deserts regions of Rajasthan province of India, swarming occurrence of desert locust is very frequent. The locust swarming destroys the vegetation at a large scale, and at this stage management of locust population become challenging. Therefore, these bird fauna can be conserved and promoted as effective natural predator in the region. These combinations of

eight identified bird species can also be used as the indicators of desert locust hoppers incidence by the locust surveyors and to strategize further management practices. An assessment of feeding potential and density dependent response of birds towards locust hoppers could be of much value to develop and deploy conservation practices for enhancement of predatory role of native birds against *S. gregaria*.

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## Conflict of Interests

All the author declarer that no conflict of interest among the authors for this manuscript.

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