

# Food Gathering Habit of Birds with special reference to Terrestrial Birds and Insects

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## ARTICLE DETAILS

### Article History

Received: 22 July 2017

Accepted: 09 August 2017

Published Online: 28 August 2017

### Keywords

terrestrial bird food Odonata, Hemiptera, Lepidoptera and Hymenoptera.

## ABSTRACT

As is quite evident from the past studies, in any wetland ecosystems, the main focus always remains on the water dependent organisms while the organisms that thrive in the surrounding are frequently neglected. As the Water birds along with the physicochemical parameters of the three reservoirs selected has already been documented a small component of the terrestrial fauna (Terrestrial Birds and Insects) present in the surroundings of these ecosystems is considered in the present study. Due to the year round availability of water along with the ample amount of food in these habitats, these scrublands around wetlands have become good niches for large number of organisms. In the present study terrestrial bird fauna along with the invertebrate prey base, especially, insects have been investigated.

## 1. INTRODUCTION

They were either purely insectivores like Drongo, Bee-eater and swallows or they preferred insects in addition to other food materials like fruits, grains, nectar, etc. The annual density of these groups suggests the dominance of Graminivore at TIR, Frugivore at JIR while Insectivores at WIR. The differences in the dominance of different groups suggest the potential of each reservoir having different feeding guilds to support different groups. The seasonal density of these groups reflects the seasonal changes in the resources available in the monsoon dependent semi-arid zone of Central Gujarat, India. It is observed that TIR is the most suitable habitat for Graminivores as these were present all throughout the year in larger numbers at this reservoir. Graminivore niche is created during winter at JIR while during post-monsoon at WIR. Due to presence of varied food resource in the form of dead cattle, mostly preferred by the crows, higher density of birds like crows were present at JIR which resulted in the overall higher Omnivores density. Frugivores found JIR as the most suitable habitat among the three reservoirs surveyed as is shown by their highest density around JIR all throughout the year. Insectivores thrived best in post-monsoon over other seasons as this is the most favoured period for insects. The former is more prevalent in the forests and an undisturbed habitat while the latter has heterogeneous preference hence in the absence of optimum resources habitat shifting is observed. Among the three reservoirs the highest species richness was recorded at WIR in annual as well as seasonal representation with exception in monsoon when JIR had highest species richness due to the changes in the habitat at regional level.

## 2. OBJECTIVE

- To understand specificity of food gathering habit of birds
- To know the kinds of food gathering methods by birds

To classify and know the different forms of food collection by birds

## 3. METHOD

Observation and interpretation method has been used in the study

## 4. RESEARCH

The density of total insects present in the study, calculated by three different methods depending on the niche utilized, showed that among all the insects, those present on the ground have the highest density as these basically consist of the social forms like ants and termites that form huge colonies. The annual density of the Ground insects was highest at WIR while that of the Arboreal at TIR and Aerial at JIR. However, the seasonal differences for Ground and Arboreal insects showed their higher density in summer at TIR while in winter for WIR as well as JIR. These differences were mainly due to the population explosion of the Treehoppers and ants in winter and summer at the respective reservoirs. In case of Aerial insects, their density was found to be highest during summer at JIR and WIR while in post-monsoon at JIR and TIR. Aerial insect density was significantly influenced by the Odonates rather than the butterflies. Annual percentage occurrence clearly suggested dominance of the four major orders with maximum population contributed by the Odonates (Dragonflies and Damselflies) and butterflies at all three reservoirs. In the seasonal context Odonates dominated during summer as it is the flight period of many species of dragonflies while in monsoon Lepidopterans dominated due to the availability of the abundant food resources. In post-monsoon both these groups had higher percentage occurrence as it is the most favourable seasons for all the insects. In winter Hymenopterans showed their dominance with the presence of large populations of ants at the two smaller reservoirs while at

WIR in this 273 season too Lepidopterans dominated over all the insect orders. Hemiptera also showed highest percentage occurrence in winter when the Treehoppers were more abundant.

-Odonata As said earlier, Odonata was one of the dominant insect orders with 45 species belonging to 8 families and 2 sub-orders. All together, 27 species of dragonflies (Sub-order Anisoptera) and 18 damselflies (Sub-order - Zygoptera) belonging to 4 families each were recorded around the three reservoirs. Their dominance in the study can be attributed to their life-cycle wherein the eggs are laid on the surface of water as the nymphs are aquatic. As the adult Odonates are aerial predators while the nymphs are the bio-control agents regulating the population of the mosquito larvae in the water, hence they are important ecologically. Among the two Odonates groups the density as well as diversity of dragonflies was high compared to damselflies. Dragonflies have better dispersal ability due to their well evolved flight mechanism while damselflies are weak fliers. Among the Anisopterans, family Libellulidae had the highest number of species while among Zygopterans family Coenagrionidae was a rich family in term of species. Family Protoneuridae was absent at TIR, while Aeshnidae and Cordulegasteridae in addition to the former at JIR. At WIR, Platycnemididae and Aeshnidae were not reported. The common odonate species in the study area include *Brachythemis contaminata*, *Trithemis pallidinervis* and *Crocothemis servilia* which are known to have wide distribution in the Indian sub-continent. The similarity index for these flying species among the three reservoirs was moderate indicating the similarity in the macroclimatic conditions. Among the three reservoirs higher annual species richness was recorded around the undisturbed reservoirs implying that the odonates prefer undisturbed habitats. WIR - the largest habitat provided several micro-habitats for specialist species increasing the overall density. HI was also found to be high at the undisturbed habitats while evenness did not show much differences among the three reservoirs. The seasonal differences in the species richness as well as density suggests post-monsoon to be the most favourable season for odonates when the climatic conditions along with resource availability are maximum. B' did not show much seasonal variations at TIR and JIR except winter while at WIR variations were noted. Evenness was recorded to vary in a narrow range at TIR indicating uniformity in the population while at JIR it dropped nonsignificantly in winter and at WIR in summer manifesting the dominance of some species during the season. With reference to the annual percentage occurrence, family Libellulidae was the dominant family at the

three reservoirs followed by Coenagrionidae. Other families had very low representation. This was mainly due to the presence of only one or two species representatives of all families recorded. The seasonal percentage occurrence also suggests the dominance of Libellulidae followed by Coenagrionidae in all the seasons at the three reservoirs. Although Gomphidae had low percentage occurrence it was present all throughout the year at all reservoirs. Other families had low percentage occurrence and were absent during different seasons of the year.

## 5. RESULTS AND CONCLUSION

However, Evenness was low all throughout the year due to the occurrence of mono-dominant species. The annual as well as seasonal percentage occurrence shows the dominance of Formicidae as it is the largest family of the present study. Apidae was the second dominant family for all the reservoirs in annual as well as seasonal comparison as it includes one of the commonest bees in the Indian climatic conditions. Vespidae and Xylocopidae had higher percentage occurrence at JIR suggesting that they prefer areas with low human disturbance and unmodified vegetation. Hence the present study indicates that the scrublands around monsoon dependent wetlands are good habitats for wide variety of terrestrial fauna like birds and insects. Though the terrestrial birds occur in low numbers compared to wetland birds, with insect density, and diversity they form an important component of this ecosystem at the ecotone between land and water.

The degree of use of a particular type of food at bird-feeders depended on the overall use of food in a bird-feeder—consumption of each of the four types of food was significantly positively correlated with that of the others, and it was positively correlated with the number of birds observed at the feeders. However, birds use bird-feeders during critical periods like winter, because birds are like other animals strongly resource-limited, and provisioning of feeders plays a significant role as a determinant of important life-history traits such as survivorship, phenology and fecundity (Robb et al. 2008). Recent studies carried out in Poland have shown that population density of urban birds has more than doubled compared to that of rural birds (Tryjanowski et al. 2015a), and one reason is supplementary birds feeding by people. Bird-feeders are particularly commonly exploited in urban habitats and in areas where feeders are already available. However provisioning of bird-feeders even in rural habitats has become more popular in recent decades

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