

Food and Feeding Behavior of Red Vented Bulbul (*Pycnonotus cafer*) and Role in Seed Dispersal at Urban Area, Udaipur, Rajasthan, India

Nadim Chishty^{1,*}, Rehana Parveen², Narayan Lal Choudhary¹, Pritesh Patel¹, Pushkar Kumawat¹

¹Wildlife, Limnology and Toxicology Research Laboratory, Department of Zoology, Government Meera Girl's College, MLSU, Udaipur, Rajasthan, INDIA.

²Department of Zoology, Government Meera Girl's College, MLSU, Udaipur, Rajasthan, INDIA.

Submission Date: 16-02-2021; Revision Date: 24-03-2021; Accepted Date: 01-04-2021

ABSTRACT

Red vented bulbul (*Pycnonotus cafer*) was mostly forage on *Lawsonia inermis*, *Delonix regia*, *Aurocaria* species, *Bougainvillea spectabilis*, *Asparagus racemosus*, *Psidium guovava*, *Lantana camara* and *Ziziphus nummularia* and *Ziziphus mauritiana*. In non-breeding season they mainly feed upon ripe fruits and insects. During breeding season they most preferred protein rich diets, helpful in development of newly hatched young once. They are usually feed upon insects, grasshopper, aphids, spiders, cockroaches, honey bee and dragonflies. During observation, we records two pair of red vented bulbul feed upon junk food (Bikaji sev Bhujia). Junk food was more preferred as compare to other food materials. This observation was very rare and interesting performed by adults, behavior indicate birds are change feeding preferences. Udaipur region are highly affected by invasion of *Lantana camara* and *Prosopis juliflora*. Bulbul plays role in dispersal of various types of plant species.

Key words: Forage, Newly hatched, Junk food, Feeding, Invasion, Udaipur.

Correspondence:

Dr. Nadim Chishty
(Associate Professor)
Wildlife, Limnology and
Toxicology Research
Laboratory, Department
of Zoology, Government
Meera Girl's College,
MLSU, Udaipur,
Rajasthan, INDIA.

Phone no: +91 7976914733
Email: nadimchishty@gmail.com

INTRODUCTION

Frugivorous birds ingested large amount of food in winter and breeding season as compare to other seasons. Frugivorous birds plays important role in dispersal of seed in ecosystem).^[1-11] The Pycnonotidae are well known frugivorous family and found in all region of world- Malaysian lowland rainforest (Lambert, 1989),^[12] Scrubland and bush land in India,^[13] eastern mediterian scrubland,^[14-16] mixed date palm citrus orchard in Iraq,^[17] gardens and palm land in western Arabia^[18] and Ethiopian lowland and Human statement area.^[19] The red vented bulbul categorized in Pycnonotidae family and widely distributed in Passerine bird group.^[20] Distributed in Asia, especially in the tropical

forest of south Asia and southwest Asia where high amount of vegetation present.^[21] Red vented bulbul living in all types of habitat like dry scrub, forests, grassland and also resides near human settlement areas.^[22] Fruits contain seed and pulp; different species consume different part of fruits. Some species feed only seed and remove pulps,^[23] while other species feed upon both part of fruits seed and pulp.^[23-25] Small size birds have fast metabolic rate so have higher food consumption power as compare to larger birds,^[26,27] difference noticeable at low temperature of environment.^[28] The main food of Red-vented bulbuls includes fruits, berries, and petals of flowers, nectar, insects and occasionally geckos.^[29,30] They have also been seen feeding on the leaves of *Medicago sativa*.^[31] It also feed on petals of the flowers of *Bauhinia variegata*, *Tecomella undulata* and *Pisum sativum*. It feeds mainly on fruits, petals of flowers, nectar, insects and occasionally geckos. The noisy, gregarious bulbuls act as seed dispersers of the plants such as those of *Carissa spinarum*.^[32] They also disperse seeds of Neem, Plum, *Grewia tenex*, *G.fleviscence*,

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DOI:
10.5530/ajbls.2021.10.6

Rhus mysorensis etc. bulbuls are host to coccidian blood parasites (*Isospora* species) while some bird lice such as *Menacanthus guldum* have been described as ectoparasites.^[33] Bulbuls are agricultural pest, which damages fruits, flowers, beans, tomatoes and peas in fields and orchards.

A detailed study was carried out to assess the food and feeding behavior, foraging ecology, Junk food preference by red vented bulbul and role in seed dispersal in urban area of Udaipur with specially invasion of *Lantana camera* herbs.

Study Area

Udaipur is located at 24.58°N latitudes and 73.68°E longitudes in southern Rajasthan. It has an average elevation of 598.00 m (1,962 ft). Udaipur has a tropical climate. The summer season is tolerably hot, with the average temperature fluctuating around 48.3°C (max.) to 28.8°C (min.). The climatic conditions of Udaipur are quite pleasant in winters. The average temperature falls in the range of 28.3°C (max.) to 4°C (min.). Udaipur weather experiences scanty rainfall in the monsoon season, somewhere around 62 cm, approximately.

MATERIALS AND METHODS

Study was done by direct observation with the help of binoculars Nikon 8X40, and photography, video-grapey done by Nikon Coolpix P900, Canon D-60 camera, sigma 150-500. Data were collected by visual encounter and scat analysis for determining food composition of red vented bulbul.

RESULTS

Feeding Behavior

Foraging is an important aspect of life for the survival, sustenance and maintenance of individual. Bulbuls showed diverse foraging behavior in different conditions. Nests were located by seeing the birds carrying nesting or feeding material. In the month of July 2018, some birds were found foraging mostly on mehndi (*Lawsonia inermis*), Gulmohar (*Delonix regia*), Christmas tree (*Aurocaria* sp.), *Bougainvillea spectabilis*, Shatawar (*Asparagus racemosus*), Guava (*Psidium guovava*), *Lantana camara* and *Ziziphus nummularia* and *Z. mauritiana*. *Pycnonotus cafer* takes plenty of ripe as well as unripe fruits of *Lantana camara*, *Ziziphus nummularia* and *Ziziphus mauritiana*. In their excreta undigested seeds were found, which indicate that this species plays a vital role in dispersal of local fruits species including *Lantana camara* which is an invasive weed. During non-breeding season the birds feed on variety of seeds, ripe fruits and insects. During

breeding season, they use to feed on insects of different sizes like grasshoppers, aphids, spiders, cockroaches, honeybees and dragonflies. These insects are very much liked by the birds owing to their nutritive value, especially for protein, which helps in healthy egg laying. For feeding chicks the bulbuls also embraced grass hoppers, spiders, dragon flies etc. as these organisms are soft bodied, rich source of proteins and easy to digest (Figure 4). Rich protein diet helps in the fast growth and timely molting of young ones.

While nursing newly hatched young ones, they softened the insect food by beating them against some tough objects (Figure 3). It was observed that to feed the chicks, individual parent was engaged in bringing food at an interval of 3 -7 min from early morning to late evening. The young ones, who fed actively, grew faster and molt earlier than others who lagged in feeding. Such young ones even died due to starvation owing to competition. It was also seen that in late stage, many young ones fall down from the nest in an urge to grab the food first eventually sacrificing their lives. This continues up to first flight which generally takes from 11 to 16 days; depend upon the rate of growth of fledglings. In present study, it was observed that berries



Figure 1: Red vented bulbul feeding on Rice and Roti (Indian bread).



Figure 2: Red vented bulbul adults feeding on Sev (Bikaji bhugiya) and avoid rice and breads.

of *Lantana* were scrupulously eaten by *Pycnonotus cafer*. In the excreta of bulbuls undigested seeds of *Lantana* were found which could be the major cause for the rapid spreading of *Lantana* plants in Udaipur regions.

Junk Food Preferred by Red-vented Bulbul

In the present study, two pairs of Red-vented bulbuls (*Pycnonotus cafer*) were observed building a nest on two different trees, Gulmohar (*Delonix regia*) and meetha neem (*Murraya koenigii*), near the house of Mr. Mehta, RSEB quarters. These quarters are situated near 'The Study School' which faces Fatehsagar Lake's canal. One of the pairs laid two eggs in the nest made on Gulmohar (*Delonix regia*) and the other laid three eggs in the nest placed on meetha neem (*Murraya koenigii*). The eggs were hatched on 14th – 15th October 2018 and both the pairs of the Red-vented bulbuls started feeding their chicks. Two of the chicks came out from the nest after nine days of feeding. Parents of both the families used to feed their young ones one by one. When the young ones tried to feed on their own, parents did not allowed them to feed themselves by beating them with wings or sitting on them. For three days, they could not be traced by us. On the fourth day, at about 7 A.M. the chicks were spotted with their parents – two chicks with

one pair and three with the other. We observed their behavior every day at the same time. Everyday Mrs. and Mr. Mehta go for a morning walk and return back at around 6.45 A.M. Thereafter, they take morning tea with light snacks. From the very first day we spotted the chicks around the Mehta's. The couple began to keep rice and small pieces of *roti* (Indian bread) for the birds at one corner of their table, placed in the courtyard, at their breakfast time. The two pairs of chicks, initially hesitated but slowly, sensing no danger, became familiar and lost their reticence. Now, the Mehta's family started feeding rice and *roti* to the chicks (Figure 1, 5). From third day onwards, Mr. and Mrs. Mehta started spreading some *sev* (Bikhaji bhujia, Indian snack of finely ground gram with red chilies, which is very hot and supposed to be Indian junk food) for the birds (Figure 2, 6). To our great surprise, it was observed that the birds started taking these *sev* readily and didn't touch the rice and rootis.

It was even more astonishing that both the pairs (the parents of the chicks) did not allow the chicks to feed independently and demonstrated the same behavior every time they tried to do so. Rather, the parents took

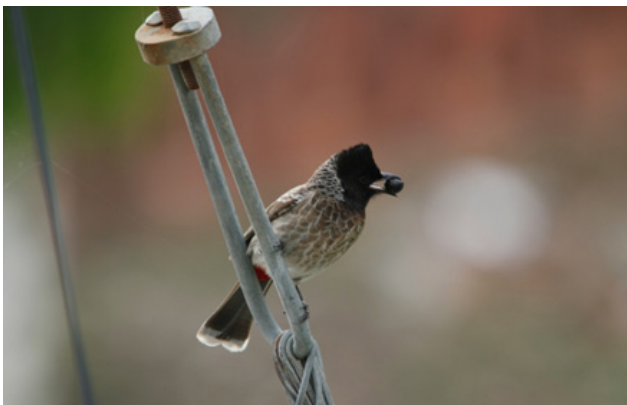


Figure 3: Red vented bulbul feeds fruit like berry.



Figure 4: Red vented bulbul catch dragon fly during breeding seasons.



Figure 5: Red vented bulbul and hose sparrow feeding on Rice's and Wheat grains near road side.

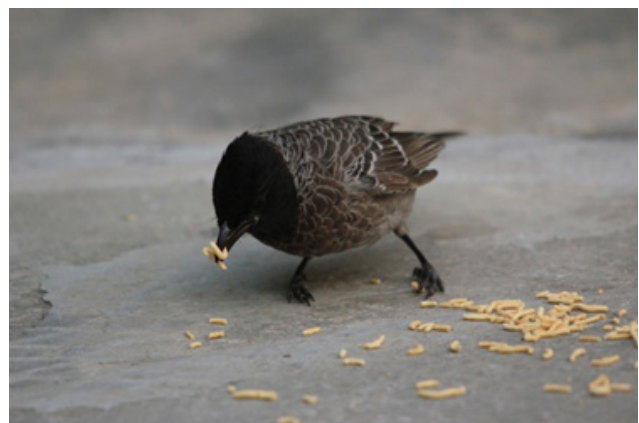


Figure 6: Red vented bulbul juvenile feeding on Sev (Bikhaji bhujia) in Urban area.

the *sev* in their beak themselves and fed the chicks. It is inquisitive to learn that what made them realize that *sev* was edible because it is not their staple diet. It was also noted that every time after gulping a few bits of *sev*, they rubbed their beaks on the ground or hopped towards the pipe, from where there was a leakage, to drink water. There was a small water filled pots also kept for the birds. The chicks readily ate the *sev* given to them by their parents and the chicks too rubbed their beaks on the ground and went to drink water repeatedly. This peculiar behavior may be attributed to the reason that perhaps the birds found the *sev* to be too spicy. Moreover, on regular observations for few more days it was found that if Mr. Mehta didn't placed the *sev* for them any day, the birds wouldn't touch the rice and *roti* and would keep approaching and buzzing around Mr. Mehta or hovered above the table, until he spread the *sev* for them. In the light of above observations it can be concluded shows that some taste buds are present in the mouth of red-vented bulbul, which registered the spicy taste of food. It seems that the taste is more prominent than the nutritional value in these birds. The observation does not end here. Further after ten days, we observed that the adults didn't allow the chicks to feed on the *sev* or any other food placed on the table. If a chick ventured to take *sev*, they beat them with their wings. After eighteen days, both the pairs did not allow their chicks to feed with them and chased them away. This was something very different yet interesting feeding behavior observed in family of Red-vented bulbuls.

Role in Seed Dispersal

Lantana (*Lantana camara*) berries are eaten by the red-vented bulbul and viable seeds are subsequently passed through the bird's system. This serves as an effective means of spreading this plant. Also *Miconia calvescens*, which has devastated many areas of Polynesia, is spread in the same way by the red-vented bulbul.^[34] Bulbuls are dominant or important frugivores and seed dispersers of open secondary vegetation throughout tropical and subtropical Asia.^[35-37] Until now very little information was available on the feeding behavior of the Red-vented Bulbul.^[38,39] The consumption of leaves of *Medicago sativa* was an interesting observation because leaf consumption is rare in birds. Recently, we also observed Red-vented Bulbuls feeding on petals of the flowers of *Bauhinia variegata*, *Tecomella undulata* and *Pisum sativum* in an agricultural area of urban habitat. It feeds mainly on fruits, petals of flowers, nectar, insects and occasionally geckos. They have also been seen feeding on the leaves of *Medicago sativa*. They are important dispersers of seed of plants such as *Carissa spinarum*,

Lantana (*Lantana camara*) berries are eaten by the red-vented bulbul and viable seed are subsequently passed through the birds system. This was brought from Sri Lanka by this bird by study of this bird population we can check the spreading of such noxious plant. We have seen that it also play very important role in spreading *Santalum album* (Chandan plant). This will be interesting to find out that this bird is useful in some manner because *Santalum album* is not spread in either way. Mehndi (*Lawsonia inermis*), Gulmohar (*Delonix regia*), Christmas tree (*Aurocaria species*), *Bougainvillia spectabilis*, Shatawar (*Asparagus racemosus*), Guava (*Psidum guovava*), *Lantana camara* and *Ziziphus nummularia* and *Ziziphus mauritiana*. *Pycnonotus cafer* takes plenty of ripe as well as unripe fruits of *Lantana camara*, *Ziziphus nummularia* and *Ziziphus mauritiana*. In their excreta undigested seeds were found, which indicate that this species plays a vital role in dispersal of local fruits species. In the excreta of bulbuls undigested seeds of lantana were found which could be the major cause for the rapid spread of this plant in this area. It feeds mainly on fruits, petals of flowers, nectar, insects and occasionally geckos. They are important dispersers of seed of plants and also play special role in controlling the different insects and mosquitoes because it has large varieties of food selection at the time of young ones brought up so it was good biological controller for pest and insects.

DISCUSSION

Red vented bulbul is common, resident and wider spreading passerine birds in Udaipur regions. There occurrences seen in all habitat like urban area, semi urban area as well as abundantly distributed in forest and agricultural dominated areas. They are generally foraged and feed upon fruits of native busy and small trees as well as invasive plant species *Lantana camara*. Generally, they are feeding on plants fruits but during breeding season; they are preference feeding on various species of insects, grasshopper, aphids, cockroaches, honey bees, dragonflies, damson flies and butterflies. During the study some time we observed young once and adult feed upon junk food (like – bikaji namkeen or sev) as compare to fruits and grains.

CONCLUSION

Red vented bulbul play functional and active role in ecosystem by performed wide ranges of functions like insect population controls and dispersion of plants seed from one place to another places. They are also responsible for dispersion and invasion of *Lantana* species in various habitat of Udaipur region.

ACKNOWLEDGEMENT

Narayan Lal Choudhary, Pritesh Patel, Pushkar Kumawat as research scholar is extremely thankful to CSIR-UGC for financial support. We want to thanks Principal Govt Meara Girls college, Udaipur for providing us infrastructure and facility needed to carried out our research work. We sincerely thankful for Dr. Satish Sharma for their valuable suggestions. Last but not least Dr. Nadim Chishty (Assoc. Professor) acknowledges to Commissionerate of College education Jaipur Rajasthan for encouragement to do research work.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

SUMMARY

Lawsonia inermis, *Delonix regia*, ripe fruits, insects, grasshopper, aphids and spiders are considered as main diet of Red vented bulbul (*Pycnonotus cafer*) but during the study we observed dramatical change in its feeding preferences which is now shifted more toward junk food and specially *Bikaji Sev Bhujia* rather than above mentioned foods. Red vented bulbul (*Pycnonotus cafer*) is also responsible for dispersion and invasion of *Lantana* species in various habitats of Udaipur region.

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Cite this article: Chishty N, Parveen R, Choudhary NL, Patel P, Kumawat P. Food and Feeding Behavior of Red Vented Bulbul (*Pycnonotus cafer*) and Role in Seed Dispersal at Urban Area, Udaipur, Rajasthan, India. *Asian J Biol Life Sci.* 2021;10(1):40-4.