# Arboreal foraging behavior by cattle egrets on mango trees in Kota district, Rajasthan

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## Abstract

The cattle egret (*Bubulcus ibis*) is a cosmopolitan bird species of egret and they are found in the tropics, subtropics and warm temperate zones. Cattle egrets are active foragers commonly seen chasing insects spread out by cattle's or running to catch insects during ploughing and irrigating of farms. Arboreal foraging by cattle egrets has been reported a unique insight occasionally, although this behavior appears to be rare, less documented and not well understood or ignored because this phenomenon is so common. We observed cattle egrets feeding on insects in mango tree (*Mangifera indica* L.) at four places in Kota district Rajasthan (C.V. Garden, Kunhadi area, Girdharpura and Gandhifali village). Out of these four places two had more mango trees, which led us to observing more flocks of cattle egrets (C. V. Garden & Girdharpura) from last February 2024 to mid-April 2024. We observed Cattle Egrets at all four locations feeding in the canopy of mango trees on swarms of pollinating insects attracted to flowers. Foraging egrets were scattered throughout the canopy; most remained stationary beside the flower cluster to catch insects, although on occasion more active behaviors were employed.

**Keywords:** *Bubulcus ibis,* foraging behavior, *Mangifera indica,* pollinators, urban biodiversity Kota

***Received:*** *24 July 2024* ***Accepted:*** *04 October 2024* ***Published:*** *04 October 2024*

***Suggested Citation***
*Kumar S and Leeladhar, 2024. Arboreal foraging behavior by cattle egrets on mango trees in Kota district, Rajasthan, Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 4 (2) 29-36.*

## Introduction

We all have seen birds sitting on trees somewhere or the other which attract our attention, especially the big birds. Such as eagle, crow, herons, egrets, ibis, spoonbill, storks, cormorants, hornbills etc. Out of the above birds, we see egrets the most outside the rural and urban areas (Kour DN, Sahi DN 2012). The cattle egret is a cosmopolitan bird species of egrets (family: Ardeidae) and they are found in the tropics, subtropics and warm temperate zones (A. Mukherjee, 2000). There are six species of egrets found in India, out of which the most visible is the common egret (F. Ojija, 2015). Here by common egret mean the Cattle Egret (*Bubulcus ibis*). It is called "Bakah" in Sanskrit and "Bagula" in Hindi. Cattle egret is usually seen more in the agricultural fields, barns and pastures with cattle, that is why it has been named Cattle Egret. It is a white bird adorned with buff plumage in the breeding season. It nests in colonies, usually near water bodies and often with other wading birds (Dinsmore JJ, 1973). The nest is a platform of sticks in trees or shrubs. Cattle egrets exploit drier and open habitats more than other egret species (Grubb, R. C., 1976). Cattle Egrets are often found associated with cattle and occasionally with pigs, goats, and horses, and also with moving vehicles such as tractors (A. A. Chaskda, et al., 2018). They usually inhabit and feed in habitats such as dry fields, farmlands, grasslands and artificial grassland such as lawns, parks, road margins and sports fields, wetlands such as rice fields, flood-plains, freshwater swamps, wet pastures, shallow marshes and mangroves (Butchart, et al., 2012).

Mango tree is commonly grown or cultivated in tropical climate. Mango tree is native to South Asia, especially East India, Burma and Andaman Islands. The scientific name of mango is *Mangifera indica* L., which is a member of the Anacardiaceae family. Mango tree is height is usually more than 30 meters. And its canopy is round shaped which spreads more with age. Mango is an evergreen tree. It is identified by gray-brown and rough and shallow cracked bark, long lanceolate leaves, large and many-flowered panicles and large, drupe & juicy fruits. Flowering season of mango tree in the month of February and middle April (Singh KP, et al.,

2003). The clusters of flowers on a mango tree are called 'baura' or 'maura' in local language. When the flowering starts completely on the mango tree, the whole tree looking is bright yellow. The inflorescence of mango is large, branched with clusters in which innumerable small yellow flowers are present. Most of the flowers in these clusters are male, the rest are female flowers (bisexual). Later, fruits are formed from fertilized bisexual flowers only (Naik K.C, et al., 1943).

## Material and Methods:

The study was conducted in the Ladpura tehsil Kota district Rajasthan (N 25° 10' 46.2072", E 75° 50' 19.932"). The methods used for this study was direct human based regular observation. The direct human based observation was involves following the cattle egrets in the early morning 6:30am to 10 am and 4 pm to 6 pm in the evening. The cattle egrets are watched for feeding directly and photographs captured by the Nikon -P900 camera and realme smart phone camera (48mp). The survey covered a period of a month last February to middle April 2024.

## Result and Discussion:

We see innumerable clusters on mango trees. These clusters have flowers with yellow and orange stripes which attract insects. The Insects are considered as important pollinators of flowering plants (Usha, et al., 2014). Worldwide, insects are also considered effective cross-pollinators for many crops (Rader, et al., 2011). Mango tree flowers is usually pollinated by members of the orders Diptera (fruit flies), Coleoptera (ladybugs), Lepidoptera (moths and butterflies), Hymenoptera (honeybees) and Hemiptera (March flies) (Sung, et al.,2006). Among the various insect pollinators of mango, fruit flies, house flies, small bees, and ladybugs, which spend a lot of time visiting flowers and are also effective pollinators, are classified as the main pollinators of mango trees. (Farjado AC, et al., 2008) (Table-A).

***Table- A. List of pollinators visiting Mango flowers***

| Order | Family | Common insects group |
|---|---|---|
| **Diptera** | Calliphoridae | Blow flies |
| | Muscidae | House flies |
| | Syrphidae | Hoverflies |
| | Sarcophagidae | Fleshfly |

| | | |
|---|---|---|
| **Hymenoptera** | Apidae<br>Formicidae | Bees<br>Ants |
| **Coleoptera** | Coccinellidae | Ladybugs |

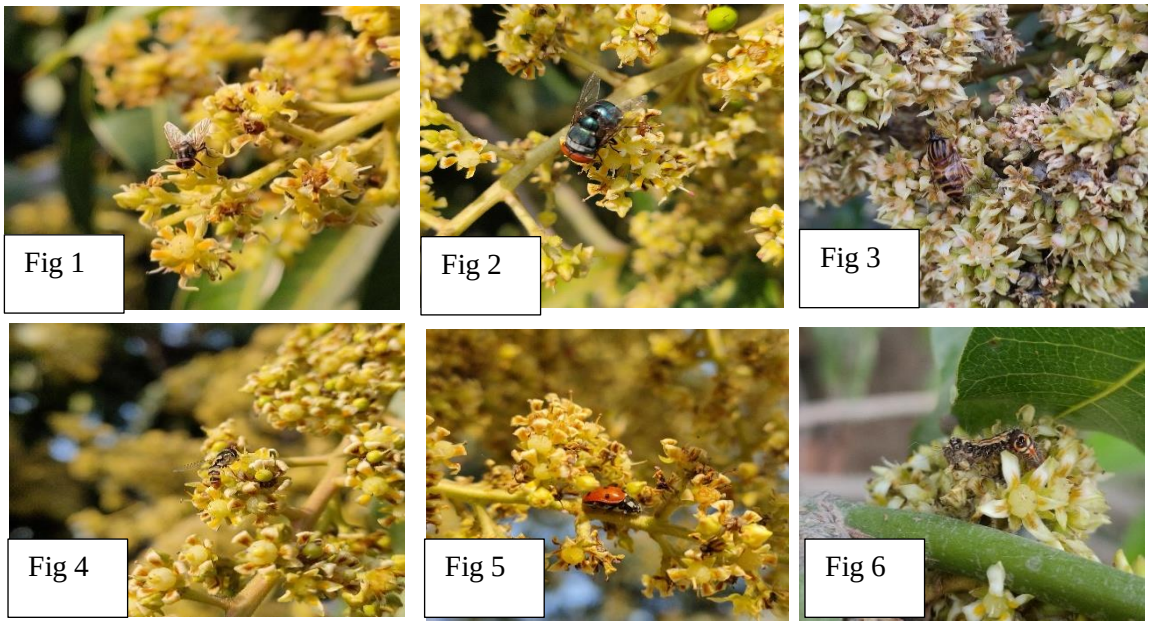


***Figure 1, 2, 3, 4, 5 & 6; Pollinators visiting mango flowers***

The Table – B shows the list of insects consumed by cattle egrets in the selected areas of Ladpura tehsil, it shows that the cattle egrets feeding on wide variety of insects such as flies, bees, ants and caterpillars.

**Table - B. List of insects consumed by cattle egret in mango tree.**

| **Feeding organisms** | **Class** | **Order/ Family** | **Common insects of the Order/ Family** |
|---|---|---|---|
| **Animalia** | Insecta | Diptera<br>Hymenoptera<br>Lepidoptera | Flies (Fig 1, 2, 3, 4)<br>Bees and Ants<br>Butterflies and moth caterpillar (Fig 6) |

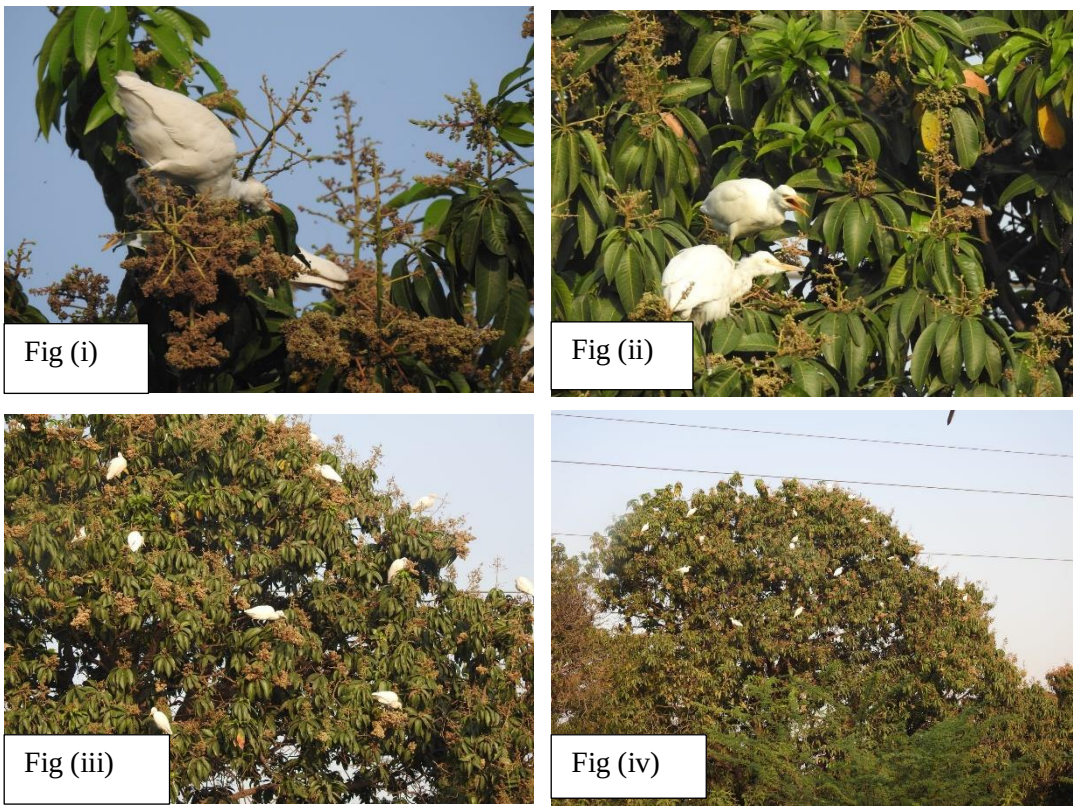


***Figure i, ii, iii, and iv; Cattle egrets feeding on insects on mango trees***

We observed comparatively more pollinators and cattle egrets on mango trees in C. V. Garden and Girdharpura as compared to Gandi Phali and Kunhadi area. During surgery we found in C. V Garden has some old mango trees and their numbers is around 15 to 20. The height of trees is more than 20 m. We noticed that some damaged trees showed less flower clusters, so cattle egrets were also seen less numbers on them. On the other side, there is a mango farm in Girdharpura, where mango is cultivated for the purpose of source of income and there are more than 30 trees cultivated (Deodikar G.B, et al., 1977). The height is 10m to 12m and canopy size is more and there were more mango trees laden with flower clusters. Comparatively more number of cattle egrets were seen stationary beside flower clusters to catch and eat insects in Girdharpura and less numbers of cattle egrets were seen in cv garden because of some anthropogenic activities in the garden during morning hours (Steven G. Platt, et al., 2021) and due to smart city development work less birds were observed on mango trees here. Whereas in Girdharpura due to less anthropogenic activities, being a rural and agricultural area, and having a water source nearby, these birds were seen sitting more on mongo trees and feeding insects. At other two locations of our study area cattle egrets were seen feeding insects on three mango trees

in Gandi Phali village, whereas in Kunhadi area these birds were occasionally seen on seven mango trees those are planted in the road side. The main reason for this is the development works going on in urban areas and noise pollution (J. F. Chace, et al., 2006).

## Conclusion:

The foraging and breeding are driving forces that determine how egret species locate and consume preferred food, and where to place their nests (Kumar S., 2014). This study is highlight on the foraging behaviour of cattle egrets on mango trees. Although mango trees are both self-pollinated and cross-pollinated, cross-pollination is more observed, mostly due to insect species (Abrol, D. P. 2012). By eating these insects, the egrets also act as biological pest control to some extent. Our observations suggest that arboreal foraging by cattle egrets may occur under the following reasons: When crop ripening in nearby agricultural lands reduces insects' population; when insects are concentrated on flowering trees, and when swarms of honey bees and other flies pass at high altitude (Steven G. Platt, et al., 2021). The results show that cattle egret is found in large numbers mostly with flower clusters of mango trees and they are diurnal animals. They are omnivorous bird but they fed mostly on insects of the order Deptera (in case of arboreal foraging), but they also feed on hymenoptera (Veeramani A, et al., 2023). During this time, they spend most of their time eating and least time flying (YS. Chai, et al., 2010). Our study shows that their numbers are comparatively higher during spring in urban areas. Because their food sources are available in sufficient quantity in this season (Verma M, et al., 2021). Therefore, an increase in their population has been observed in the study area as compared to other seasons.

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