

Chapter 2

Nesting behaviour of Red-vented Bulbul (*Pycnonotus cafer*) in urban areas

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Abstract

Deforestation, urbanization, pollution, and other anthropogenic activities have been creating havoc on the reproduction cycle of small native birds like red-vented bulbuls. Day by day, the population of bulbuls is declining in urban areas, although their IUCN status is of least concern. However, these birds are essential for fruiting and increasing the population of trees in urban areas through pollination and seed dispersal, respectively. Keeping in mind the diminishing population of red-vented bulbuls in urban areas, field surveys were carried out to document the nesting behaviours of these birds in Cuttack and Bhubaneswar cities of Odisha state and Jamtara Forest Division (JFD) of Jharkhand state from April 2023 to June 2024. The survey revealed nesting of red-vented bulbuls in *Lagerstroemia speciosa*, *Madhuca longifolia*, and *Pterospermum acerifolium* trees, and from the literature study, preferred nesting plants of bulbuls were listed to motivate people to plant more of the listed trees and shrubs to conserve the population of red-vented bulbuls.

Keywords: Breeding, population decline, habitat destruction, conservation

Introduction

Nesting is a beautiful part of any bird or any other animal species in their journey of life. It is a very intricate step that ensures successful breeding and helps prevent species extinction. The nesting sites are chosen based on some factors like food supply, predation risk, growth habits, suitable weather conditions, etc. for the survival of the new hatchlings (Khan *et al.*, 2020). Nesting is a natural process protected by the forces of nature which get disturbed by the negative human influence on the ecosystem. Urbanization, pollution, cutting down the forests for conversion into agricultural lands, climate change, etc. lead to habitat destruction and population decline of native bird species like red-vented bulbuls. Red-vented bulbuls are frugivorous birds but consume insects during the breeding season to fulfill the protein requirements for egg formation. They also feed insects to their young ones as they require protein most for their development (Chishty *et al.*, 2021).

Red-vented bulbuls are resident breeders widely spread all over Asia and found in dry deciduous woodlands, dry scrubs, orchards, gardens, plains, and cultivated lands (Latha, 2024). They generally build nests at the junction of branches covered by leaves to protect the eggs and young ones from predators. The nests are cup-shaped made of twigs, grasses, dried leaf fragments, and coconut husk, and covered with spider webs or cotton available nearby on the outside. When their nests are disturbed by humans, other birds, or any other animal then they abandon their chosen nest site and avoid rebuilding the nest. The bird lays about 2-4 pinkish-white eggs with dark and light brown spots (Rao *et al.*, 2013). Both parents show parental care but the female bird shows more inclination toward feeding the newly hatched birds and the male bird is more involved in training the young ones to fly and search for food (Latha, 2024).

According to the IUCN Red List of Threatened Species, red-vented bulbuls are categorized as Least Concern, but their population has been declining in urban areas (Bhole, 2022). In the contemporary situation, due to the unavailability of tall trees and nesting materials, the birds are constructing their nests using plastic, paper, and other household waste materials, limiting their rate of survival (Chishty *et al.*, 2020). The red-vented bulbuls help in pest control in agricultural fields by

feeding on the insects found in the food crops. Their metabolic waste as bird droppings provides first-class fertilizer to the soil providing a good amount of nitrogen. Being critical frugivores, the bulbuls also play a major role in pollination and seed dispersal of many plants. Therefore, knowledge about every aspect of the life cycle of the bulbuls should be known to protect the small native birds and conserve their declining population in urban areas. Keeping this in mind, field surveys were carried out in Cuttack and Bhubaneswar cities of Odisha, and Jamtara Forest Division (JFD) of Jharkhand state in April-June 2024 to observe the nesting pattern of red-vented bulbuls. The authors found nesting of red-vented bulbuls on *Lagerstroemia speciosa*, *Madhuca longifolia*, and *Pterospermum acerifolium* in the study areas. The authors also felt the need to acknowledge the issues these birds face in the nesting process and recommend planting more trees and shrubs to save the diminishing population of these birds.

Morphology of *Lagerstroemia speciosa*

Lagerstroemia speciosa is a branched tree belonging to the family Lythraceae whose bark is light grey or pale brown, smooth, peeling off in irregular flakes. Leaves elliptic, oblong-elliptic or oblong-lanceolate, 10-20 x 4-8 cm, acuminate, glabrous on both sides; petiole 5-10 mm long. Flowers purple, 5-7.5 cm across in terminal panicles up to 30 cm long; ultimate branches cymosely 1-3-flowered; pedicels stout pubescent, jointed below the middle. Calyx-tube turbinate, 1.2-1.5 cm long, grey- or brown-tomentose, ribbed, ribs 12-14, alternately broad and narrow; teeth 6-7, spreading acute. Petals 6-7, 2.5-3.5 cm long, clawed, much crumpled and wavy with deeper coloured veins, margin erose, capsule subglobose or oblong-ovoid, 2-3.5 cm diameter, smooth, seated on the persistent somewhat woody and prominently ribbed enlarged calyx-tube, 5-6-valved. Seeds including the wing ca. 1.2 cm long. The flowering period is from April-August and the fruiting period is from September to December (Saxena and Brahman, 1995a).

Morphology of *Madhuca longifolia*

Madhuca longifolia is a large or moderate-sized tree belonging to the family Sapotaceae with brown bark, nearly smooth; branchlets pubescent or tomentose. Leaves clustered near the ends of the branches, elliptic, elliptic-oblong or ovate, 15-

20 x 7-10 cm, acuminate, pubescent or rusty tomentose beneath when young; petiole 2.5-4.5 cm long, elongating to 4.8 cm in fruit. Calyx-lobes ovate, rusty tomentose. Corolla-tube ovoid, 1-1.2 cm long; erect in flower, 7-14, often 8 in two series with the outer series twisted, the inner imbricate, elliptic or narrowly elliptic, 5.5-7.5 mm long. Stamens subsessile, anthers dorsally hairy, aristate, 3-seriate. Berry ovoid, 2.5-5 cm long, tomentose. Seed ellipsoid, 1 double convex, or 2-4 more or less flattened on one or two sides, pale-brown, 3-3.5 cm long with a long hilum; testa soft, with milky juice. The flowering period is from February to April and the fruiting season is from May to July (Saxena and Brahmam, 1995b).

Morphology of *Pterospermum acerifolium*

Pterospermum acerifolium is an evergreen tree 10-12 m long belonging to the family Malvaceae with branchlets rusty-tomentose. Leaves broadly ovate-oblong to oblong-obovate, 15-30 x 10-20 cm, deeply toothed, coriaceous, glabrous above, white-tomentose beneath; petiole to 4 cm; stipules entire or bifid. Flowers white, fragrant, 12-15 cm across. Sepals 4-5, linear-oblong, 8-12 cm long, thick, brown or yellow-tomentose within. Petals linear-oblong, 9-12 cm long, glabrous. Gynandrophore up to 5 cm long. Staminodes white, 6-8 cm long. Ovary oblong; style filiform, 6-7 cm long; stigma obscurely 5-grooved. Capsule oblong, woody, 10-15 cm long, acutely 5-angled, brown-tomentose, rough. Seeds up to 5 cm long. The flowering period is from March to July and the fruiting season is from August to December (Saxena and Brahmam, 1994).

Morphology of Red-vented Bulbul

Red-vented bulbul, *Pycnonotus cafer* have chocolate-brown ear-coverts and the whole head, neck, upper back, chin, throat, and upper breast deep glossy black; the lower breast black, margined with white; and the remainder of the lower plumage ashy brown, except the under tail-coverts, which are crimson; the lower back blackish margined with grey. Iris brown; bill and legs black. The wing is blunt and the tail is very slightly rounded (Oates, 1889).

Methodology

Field surveys were carried out in Cuttack and Bhubaneswar cities of Odisha state, and Jamtara Forest Division (JFD) of Jharkhand state to observe the nesting behaviour of red-vented bulbuls from April-June 2024. The nesting pattern of the birds was recorded through direct observation and interviewing the people living in the nearby areas through semi-structured questionnaires. Literature studies were done to list the most preferred plants of red-vented bulbuls for their nesting so that these trees could be planted more and more to conserve the declining population of these birds. The authors identified the observed plants and bird species through available literature (Grimmett *et al.*, 2011; Kumar *et al.*, 2022).

Observations

In the present study, nests of red-vented bulbuls were observed on *L. speciosa*, *M. longifolia*, and *P. acerifolium* indicating the trees as the most preferred nesting trees (Figures 1-3).

Table 1: Nesting plants of Red-vented Bulbul

Scientific name	Common name	Family	Source
<i>Acacia leucophloea</i>		Fabaceae	Khan <i>et al.</i> , (2020)
<i>Acacia nilotica</i>	Egyptian acacia	Fabaceae	Rao <i>et al.</i> , (2013) and Gupta <i>et al.</i> , (2011)
<i>Aegle marmelos</i>	Wood apple	Rutaceae	Rao <i>et al.</i> , (2013)
<i>Annona squamosa</i>	Sugar apple	Annonaceae	Kavane, (2023)
<i>Azadirachta indica</i>	Neem	Meliaceae	Yadav <i>et al.</i> , (2018)
<i>Bauhinia racemosa</i>	Bidi leaf tree	Fabaceae	Rao <i>et al.</i> , (2013)
<i>Bauhinia variegata</i>	Mountain ebony	Fabaceae	Khan <i>et al.</i> , (2020)
<i>Bougainvillea spectabilis</i>	Great bougainvillea	Nyctaginaceae	Khan <i>et al.</i> , (2020)
<i>Carissa carandas</i>	Bengal currant	Apocynaceae	Sohi and Kler, 2017
<i>Citrus limon</i>	Lemon	Rutaceae	Sohi and Kler, 2017

<i>Citrus reticulata</i>	Mandarin	Rutaceae	Khan <i>et al.</i> , (2020)
<i>Commiphora caudata</i>	Hill mango	Burseraceae	Yadav <i>et al.</i> , (2018)
<i>Delonix regia</i>	Gulmohar	Fabaceae	Verma <i>et al.</i> , (2022) and Chishty <i>et al.</i> , (2021)
<i>Duranta repens</i>	Golden dewdrop	Verbenaceae	Khan <i>et al.</i> , (2020)
<i>Emblica officinalis</i>	Indian gooseberry	Phyllanthaceae	Rao <i>et al.</i> , (2013)
<i>Ficus benjamina</i>	Weeping fig	Moraceae	Yadav <i>et al.</i> , (2018)
<i>Hibiscus rosa-sinensis</i>	China rose	Malvaceae	Rao <i>et al.</i> , (2013) and Khan <i>et al.</i> , (2020)
<i>Lagerstroemia indica</i>	Crepe myrtle	Lythraceae	Yadav <i>et al.</i> , (2018)
<i>Lagerstroemia speciosa</i>	Queen's crepe myrtle	Lythraceae	Verma <i>et al.</i> , (2022)
<i>Lawsonia inermis</i>	Henna tree	Lythraceae	Chishty <i>et al.</i> , (2020)
<i>Litchi chinensis</i> (Figure 4)	Litchi Tree	Sapindaceae	Present study
<i>Mangifera indica</i>	Mango	Anacardiaceae	Verma <i>et al.</i> , (2022)
<i>Melia azedarach</i>	Chinaberry tree	Meliaceae	Sohi and Kler, (2017)
<i>Morinda tinctoria</i>	Indian mulberry	Rubiaceae	Yadav <i>et al.</i> , (2018)
<i>Morus alba</i>	Common mulberry	Moraceae	Rao <i>et al.</i> , (2013)
<i>Murraya koenigii</i>	Sweet neem	Rutaceae	Chishty <i>et al.</i> , (2021)
<i>Murraya paniculata</i>	Orange jasmine	Rutaceae	Yadav <i>et al.</i> , (2018)
<i>Parkia speciosa</i>	Twisted cluster bean	Fabaceae	Verma <i>et al.</i> , 2022

<i>Polyalthia longifolia</i>	False Ashoka	Annonaceae	Rao <i>et al.</i> , (2013) and Khan <i>et al.</i> , (2020)
<i>Prosopis cineraria</i>	Shami	Fabaceae	Rao <i>et al.</i> , (2013)
<i>Prunus avium</i>	Wild cherry	Rosaceae	Verma <i>et al.</i> , (2022)
<i>Psidium guajava</i>	Guava	Myrtaceae	Latha, (2024)
<i>Saraca asoca</i>	Ashok tree	Fabaceae	Yadav <i>et al.</i> , (2018)
<i>Syzygium cumini</i>	Jamun	Myrtaceae	Rao <i>et al.</i> , (2013) and Khan <i>et al.</i> , (2020)
<i>Tabernaemontana divaricata</i>	Pinwheel flower	Apocynaceae	Yadav <i>et al.</i> , (2018)
<i>Tecomella undulata</i>	Rohida	Bignoniaceae	Rao <i>et al.</i> , (2013)
<i>Terminalia arjuna</i>	Arjun tree	Combretaceae	Khan <i>et al.</i> , (2020)
<i>Thuja occidentalis</i>	Arborvitae	Cupressaceae	Yadav <i>et al.</i> , (2018)
<i>Tithonia diversifolia</i>	Tree marigold	Asteraceae	Verma <i>et al.</i> , (2022)
<i>Ziziphus jujuba</i>	Chinese jujube	Rhamnaceae	Rao <i>et al.</i> , (2013)



Figure 1: Nest of red-vented bulbul on *L. speciosa*



Figure 2: Nest of red-vented bulbul on *P. acerifolium*



Figure 3: Nest of red-vented bulbul on *M. longifolia*



Figure 4: Red-vented bulbul on *Litchi chinensis* (Photo credit: Dr. Niraj Kumar)

The bulbuls build small cup-shaped nests on trees, bushy shrubs, garden plants, etc. They mainly build nests on fruiting plants so that they can have a surplus supply of fruits for feeding while building nests. They build nests at the junction of branches using twigs, grasses, dried leaf fragments, and coconut husk, and are covered with spider webs or any other material available nearby. Pollution have compelled the birds to use plastics for padding and exterior covering of the nests which is plays a hazardous role in the survival and health of the newly hatched birds diminishing their population. From the literature study, the authors listed the 39 most preferred nesting plants of red-vented bulbuls like *Ficus benjamina*, *Mangifera indica*, *Melia azedarach*, *Murraya koenigii*, *Polyalthia longifolia*, *Prosopis cineraria*, *Psidium guajava*, *Saraca asoca*, *Syzygium cumini*, *Ziziphus jujuba*, etc. in Table 1.

Conclusion

From the study, it was concluded that the red-vented bulbuls are essential for the maintenance of the balance in the ecosystem. They help in the smooth functioning of several ecological processes like fruit formation with the help of pollination and seed dispersal. However, their population is declining continuously in the urban

areas due to urbanization, agricultural lands, industrialization, pollution, etc. Therefore, there is a need to pay closer attention to the nesting behaviour of these birds to protect them. The present study highlighted the use of *L. speciosa*, *M. longifolia*, and *P. acerifolium* trees by the bulbuls for building nests. The authors also recommend to plant more of the listed plants in the urban areas to protect red-vented bulbuls.

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