

# Crematogaster ants in shaded coffee plantations: a critical food source for Rufous Woodpecker *Micropternus brachyurus* and other forest birds

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**T**his brief note recounts the foraging behaviour of Rufous Woodpecker *Micropternus brachyurus* (formerly *Celeus brachyurus*), the specialist ant-eater, and some other bird species associated with ant nests in coffee plantation and natural habitats. It is based on some opportunistic observations made during the past few years.

Rufous Woodpecker is one of twelve species of woodpeckers (Picidae), occurring in the Western Ghats. This woodpecker is known for its unique ability to nest in the carton nests of *Crematogaster* sp. ants as well as its peculiar foraging strategies.

Crematogaster ants are one of the commonest ants seen in Wayanad district (Kerala, India) in coffee plantations as well as natural habitats. Apart from the carton nest they make in trees, they stay in coffee beans by making nest-type wrapping on the coffee beans. They feed on the sweet juice of ripened coffee berries. They also feed on the honeydew excreted by mealy bugs *Planococcus citri* and *P. lilacinus* (Family: Pseudococcidae), a pest of coffee and a scourge in its plantations (Anon. 2000).

## **Ant-feeding behaviour of Rufous Woodpecker**

I have observed Rufous Woodpecker attacking Crematogaster ant nests many times during the the past several years. On 22nd November 2007, I got an opportunity to closely observe a pair of Rufous Woodpeckers hammering an active Crematogaster ant nest in a coffee plantation at Kambalakkad in Wayanad district.

It was around 1130hrs when I saw two Rufous Woodpeckers perched on an Eachil tree *Aporosa lindleyana* that had a three-year-old nest of the Crematogaster ant. At first, the female woodpecker started attacking the upper portion of the nest, while clinging on it. When the nest broke, ants started attacking her by climbing over her feathers, legs and beak. To ward off the attacking ants she often shook her head and after a minute flew to a nearby jackfruit tree *Artocarpus heterophyllus* where, by wing-flapping, shaking head and pecking, she removed the ants crawling over her

body. She also consumed many ants during this process. After a while she returned to the nest and resumed hammering at it. Soon the male joined in and started breaking the nest on its lower portions and sides. The provoked and agitated ants attacked both birds, which continued belabouring the ants' nest. Since the nest was full of ant eggs (pupae) the birds consumed a good number of eggs from the nest.

As a result of the woodpeckers' attack, the ants immediately started shifting all the eggs from their nest—marching down the main stem—to the leafy litter on the floor—to safeguard the pupae. At this juncture, the woodpeckers stopped pecking the nest and moved onto another branch of the tree and began consuming the ants one by one as they came along the twigs. When the ants moved onto the bodies of birds, they flapped their wings to get rid of them. The woodpeckers continued breaking the nest and eating the ants and their eggs for nearly 20 minutes.

After this, the woodpeckers flew away from the nest tree and two Greater Racket-tailed Drongos *Dicrurus paradiseus* approached the nesting tree. (They may have been watching the woodpeckers breaking the nest from a near by tree). They positioned themselves very near the main stem of the tree along which the ants were moving down. Then it was their turn to join the feast. They fed on the eggs carried by the worker ants as well as on 'winged' ants. The drongos picked up the ants by fly-catching in their typical style from a perch and returning to it. They remained on the nest tree for nearly three hours, feeding on the ant eggs.

Around 1350 hrs a cock Oriental Magpie-Robin *Copsychus saularis* joined the drongos—to feast on the bonanza of ants' eggs. Interestingly they sang in low voice throughout the foraging period. Around 1530hrs a hen Oriental Magpie-Robin also joined the orgy.

Around 1540hrs a Common Tailorbird *Orthotomus sutorius* approached the nest tree and consumed a few ants' eggs. It was not that easy for a tailorbird to fight off the Crematogaster ants! The drongo and magpie-robins fed side



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Fig. 1. Rufous Woodpecker (Female?) feeding young in nest inside *Crematogaster* ant nest on 4th October 2006 in Thrikkaipata, Wayanad district, Kerala.

by side without any confrontation, perhaps because there was plenty of food. The white colour of the ants' eggs was easily visible on the dark bark while the ants were carrying them away. This helped the birds to pick up ants easily. The drongo being insectivorous was keen on taking winged ants too. The drongos and magpie-robins left the nest tree at 1615 and 1640hrs respectively. During the course of 290 minutes of observation, the racket-tailed Drongos consumed ants 1155 times and the robin attempted 109 times. The birds periodically cleaned their beaks by rubbing them against branches. However I could not count the number of feeding attempts by Rufous Woodpecker since its feeding method was quiet different from that of Racket-tailed Drongo and Magpie-Robin. Mason & Lefroy (1912) identified 2,600 ants

in the stomach of a Rufous Woodpecker (Ali & Ripley 2001). Santharam (1997) too reported Rufous Woodpeckers consuming several hundred *Oecophylla* ants at Peechi Wildlife Sanctuary, Thrissur district in Kerala.

### Discussion

My first close observation of a similar behaviour of Rufous Woodpecker was in 1992, which I had mistaken as nest building. The hammering was on an ant nest, 2m above ground level, on a cinnamon tree *Cinnamomum malabatum*. On that occasion, a pair of woodpeckers (male and female) had broken down the entire ant nest by hammering it. However, after the woodpecker attack, only one Oriental Magpie-Robin was found feeding on ants.

During the past ten years I have witnessed (opportunistic observations) 37 attempts by Rufous Woodpeckers of breaking down *Crematogaster* ant nests. Of these, 24 nests contained eggs. Of the 37 nests, six were in natural forest whereas 31 were in shaded coffee plantations (Table 1).

### Bird-ant association

Bird-ant association has been a topic of much interest for ecologists in western countries. In Western Ghats, Rufous Woodpecker is the only species of bird that is closely associated with ants. This note reports the association of other insectivorous birds such Greater Racket-tailed Drongo, Oriental Magpie-Robin and Common Tailorbird as secondary predators of *Crematogaster* ant's eggs. Since the tree ants are very aggressive once agitated, Drongos or Robin have never been seen attacking the nest directly as the Rufous Woodpecker does. This may be the reason that these birds wait for Rufous Woodpecker to break down the nest to feed upon either the agitated ants or their eggs.

I have also seen mixed hunting flocks of birds following Rufous Woodpeckers including, Greater Racket-tailed Drongo, Bronzed drongo *D. aeneus*, Black-naped Monarch-Flycatcher *Hypothymis azurea*, Red-whiskered Bulbul *Pycnonotus jocosus*, Red-vented Bulbul *P. cafer*, Velvet-fronted Nuthatch *Sitta frontalis*, Common Golden-backed Woodpecker *Dinopium javanense* and Scarlet Minivet *Pericrocotus flammeus*. Flocks attending tree ants nest raids by Rufous woodpeckers need to be further studied to generate information on number of species feeding on the ants as well as duration of association.

### Conservation

Another interesting aspect is the large number of *Crematogaster* ant nest seen in shaded coffee plantations.

**Table 1: Details of ant nests found and attended by Woodpecker**

Name of host plant species	Category	Number of nests	Habitat
<i>Dalbergia latifolia</i>	Tree	4	Forest + coffee plantation
<i>Aporosa lindleyana</i>	Tree	1	Coffee plantation
<i>Erythrina indica</i>	Tree	2	Coffee plantation
Coffee	Shrub	8	Coffee plantation
Silver oak	Tree	3	Coffee plantation
<i>Mallotus alba</i>	Tree	2	Forest+ coffee plantation
<i>Cinnamomam malabatrum</i>	Tree	3	Coffee plantation
<i>C. verum</i>	Tree	2	Coffee plantation
<i>Olea dioica</i>	Tree	3	Forest + coffee plantation
<i>Gliricidia indica</i>	Shrub	2	Coffee plantation
<i>Hopea parviflora</i>	Tree	1	Coffee plantation
<i>Terminalia bellarica</i>	Tree	2	Coffee plantation
<i>Bischofia javanica</i>	Tree	1	Coffee plantation
<i>Syzygium cumini</i>	Tree	1	Forest
<i>Syzygium jambos</i>	Shrub	1	Coffee+ home garden
<i>Lagestroemia microcarpa</i>	Tree	1	Coffee + forest
Total		37	

Control of ants in coffee plantations is one of the recommended practices by the Coffee Board as these ants *Oecophylla smaragdina* and *Crematogaster* sp., support mealy bugs—a pest of coffee. The ants drive away the natural enemies of mealy bugs and often take away bugs from one plant to another plant and foster them in their nest resulting in the spread of mealy bug infestation in coffee plantation. In the absence of ants, a good proportion of nymphs will get trapped in the honeydew and die. So 'ant control pesticides' have been recommended by coffee research stations as key management practices (Anon. 2000). Branded insecticides like Quinalphos and Parathion are sprayed around the bases of coffee plants as well as around those of shade trees. Application of such a toxic pesticide destroys the ant population *en masse* resulting in reduced number of nesting sites as well as prey base for woodpeckers. Though natural enemies such as *Trimta coccidivora* (Diptera: Cecidomyiidae) *Cacoxenus perspicax* (Diptera: Drosophilidae) are naturally present, farmers and researchers are seldom aware of them.

With the emerging demand for organic shade-grown coffee all over the world, planters are now reluctant to use toxic chemicals in coffee plantations. This helps maintain a reasonable number of *Crematogaster* ant colonies in coffee plantations at the moment. Shaded coffee plantations have a high conservation value, with their diversity of canopy tree species, as they can provide critical habitat for many forest-dwelling species (Perfecto *et al* 1996). It is high time that the conservation value of shaded coffee plantation, as a critical habitat for Rufous Woodpecker and other forest birds, be recognised and proper agro-ecological management practices developed and popularised amongst planters.

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Fig. 2. Male Rufous Woodpecker, Karkala, Karnataka, India. 5th October 2006.