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On the nesting behaviour of *Polyrhachis illaudata* Walker, 1859 (Hymenoptera: Formicidae)

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ABSTRACT

Polyrhachis illaudata Walker, 1859, is known to have variability in nesting locations ranging from nesting in the ground to nesting under the bark of tree trunks. Here I describe the brood chambers of *P. illaudata* from the nests encountered beneath the bark of Silver Oak (*Grevillea robusta* A.Cunn. ex R.Br.) and report the presence of pupal cocoons in this species.

Keywords: Bark, Formicidae, *Polyrhachis illaudata*, nest location, pupae, India

INTRODUCTION

Ants of the genus *Polyrhachis* Smith, F., 1857, are distributed across the Afro-tropical, Oriental, and Australasian regions and are conspicuous due to their size and their above-ground foraging habits (Mezger & Moreau 2016). The subgenus *Myrma* Billberg, 1820, inhabits both open and forested areas and is widespread across the Indo-Malayan, Oriental, Australasian and Ethiopian regions (Kohout 2013).

Polyrhachis illaudata Walker, 1859, is a species included in the subgenus *Myrma* and is widespread in forested areas of the South and South-East Asian regions. It is often encountered foraging on the ground, in shrubs, or trees. Hashimoto *et al.* (2006) classified *P. illaudata* under the 'above ground- nesting on tree trunk' category. Robson & Kohout (2007) classified this species as having both lignicolous (nests within cavities of plants, the base of epiphytic ferns in trees, cavities under bark, or within myrmecophyte plants) and terrestrial types of nests based on studies by Liefke *et al.* (1998) in Malaysia, and by Hung (1962) in Taiwan, which capture observations on the nesting variability seen in this species.

OBSERVATIONS AND DISCUSSION

Here I describe the brood chambers of *Polyrhachis illaudata* that were observed nesting under the bark of trees. The observations were made in the Heggala reserve forest (Lat: 12.130334°, Long: 75.765830°) and on Tadiandamol Hill (Lat: 12.231307°, Long: 75.627827°), Kodagu, Karnataka, during February and March 2021. At Heggala, when I peeled the bark of a snag searching for ants, I came across a nest of *P. illaudata* nesting under the bark. Having been disturbed, the workers quickly moved off with the brood to the other end of the trunk revealing the chambers in which they had kept the brood. The chambers were made of soil particles stuck together to form saucer-shaped structures, parallel with the ground (Fig. 1) in the gap between the bark and the main stem. There were no signs of silk having been used in building these chambers. Pupae were enclosed in cocoons, a

Fig. 1. — Nest of *P. illaudata*: the chambers are made of soil particles stuck together forming a saucer-shaped structure; (Inset) the stem of the silver oak tree where the nest was observed.

characteristic that is widespread in the sub-genus *Myrma* (Robson & Kohout 2007). The pupae and larvae were kept nearby to each other but in separate chambers.

On the way to Tadiandamol Peak, another nest of *P. illaudata* was encountered underneath the bark of a live Silver Oak (*Grevillea robusta* A.Cunn. ex R.Br., 1830). It had chambers similar to the previous one (Fig. 2A). The ants gathered the brood and quickly moved off into holes interconnected by tunnels in the wood, probably dug by wood-boring insects (Figs 2B & C). The tunnels were further observed to be sealed with soil. The ants were seen actively using the tunnels present in the wood, indicating the chambers described here might be just outer structures used for providing the optimal temperature for the brood. The trails connecting these chambers to the tunnels were bordered by soil particles. No effort was made to check whether the colony had multiple nests or not, nor was the queen, which might have been residing inside the tunnels, encountered on either occasion.

The species was also observed at the Wildlife Institute of India, Dehradun, Uttarakhand (Lat: 30.285309°, Long: 77.974090°) during nuptial flights. They were observed nesting in the ground with the nest opening through the walkway side of a wall, which was level with the ground on the other side. The nuptial flights occurred just after heavy rain in the middle of the night around 0030 on 17 July 2021. The alates were seen near lights ~100m away from the nest. Two workers were collected on each occasion (along with brood and alates whenever present) and their identities

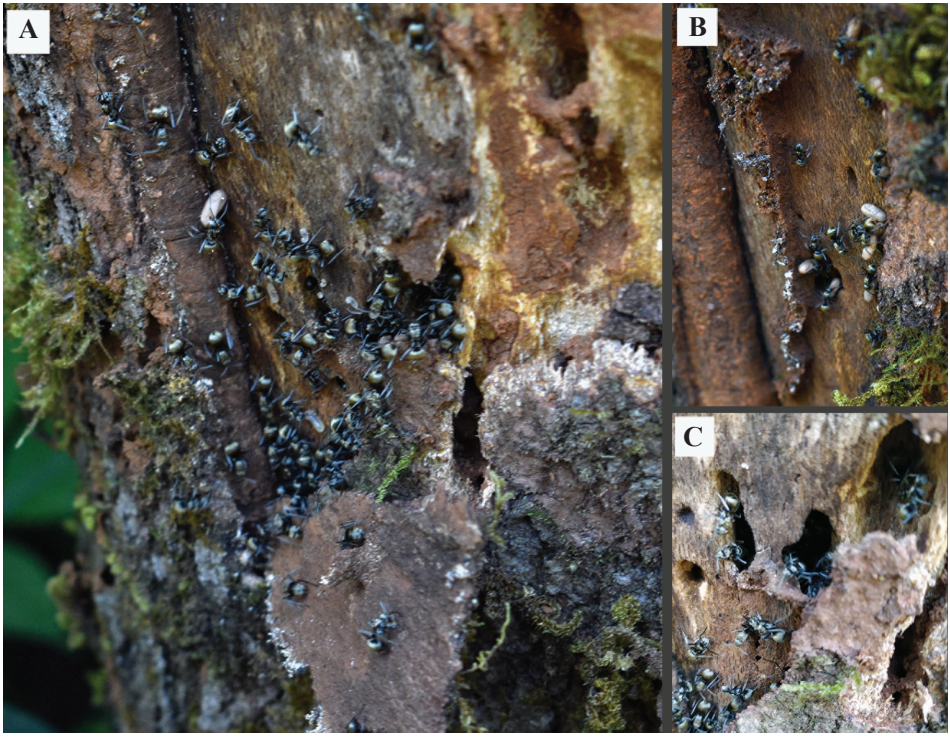

Fig. 2. — Nest of *P. illaudata* encountered on a silver oak: A, peeling the bark of the oak revealed the colony along with the brood; B–C, the workers use the tunnels in the wood to carry the pupae (enclosed in a cocoon) to safety.

were confirmed using the keys available on AntWiki (AntWiki 2022) and *Fauna of British India* (Bingham 1903).

Further studies are required to understand this variation and identify the factors determining the nest location of *P. illaudata*. It is also necessary to rule out whether there is an actual variation in the selection of nesting sites or is it that this species has polydomous nets (a single nest that has multiple nesting locations) with different locations used as a coping mechanism by relocating across different nest types in response to environmental stressors.

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