

Use of a Green Tree Ant nest by the jumping spider *Carrhotus viduus* in Maharashtra, India (Araneae: Salticidae: Salticini)

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The jumping spider *Carrhotus viduus* (C. L. Koch 1846) is the most widely-distributed species of the genus *Carrhotus* Thorell 1861 in India. The species has recently been reported to frequently associate with ants (Hill et al. 2021), and to build shelters close to active colonies of the Green Tree Ant, *Oecophylla smaragdina* (Fabricius 1775).

This note adds to the record an observation of construction and occupation of a shelter by a subadult female *Carrhotus viduus*, directly on the outer surface of a Green Tree Ant nest in the first author's garden in Nagaon village, Maharashtra. The shelter was made inside a rolled leaf that comprised part of the exterior of the ant nest enclosure. The ant nest used by the *Carrhotus viduus* female was one of three similar enclosures built by the same ant colony, and was located in between the other two. All three nests were about 5 feet above the ground, in a single shrub of the non-native plant species *Hamelia patens*. Some of the leaves comprising the exterior of this middle nest had begun to age and dry, however there was continuous ant activity at the nest. Worker ants frequently entered the enclosed nest with food items, including an ant of a different species and a tephritid fly (Figures 1, 10). The nest to the right, about 4 inches away, was empty and unused. The one to the left seemed more recently constructed, with fresh green leaves, and was located about 2 feet away.

The first author observed the ant nest with this *C. viduus* shelter for four consecutive days, from 31 January through 3 February 2022 (Figures 1-17, in chronological order). On the first day of observation, the subadult *C. viduus* female was once seen running to a leaf above the shelter for a few minutes. At all other times she was inside her shelter, after her final molt (Figures 14-15). She also appeared to work on the shelter, possibly by adding more silk. On three days out of the four, the first author photographed an adult male *C. viduus* approaching the ant nest enclosure utilised by the female, walking on the nest exterior, briefly entering the enclosure in the presence of ants, and waiting outside the female spider's shelter. On two days the male was seen to enter a small opening in the ant nest's outer surface and hiding in it (Figures 2-4). On 3 February a second male *C. viduus* visited the ant nest at the same time as the first male (Figure 9).

Ants from the nest several times visited the site of the female spider's shelter. The author recorded one ant inspecting and walking over the shelter's silk mesh while the spider was inside. Green Tree Ants are predatory and aggressive and are known to prey on spiders (Nelson et al. 2004). However, the author did not observe any aggression displayed by the ants towards this spider. Both the male spiders displayed extreme caution and alertness, seemingly avoiding encounters with ants. Both males rapidly moved to a safe distance when ants approached them. Although they were observed by ants on several occasions, they were not attacked.



Figures 1-7. 1, Group of *Oecophylla smaragdina* workers with a captured tephritid fly, below their nest within a rolled, dry leaf. 2-4, Male *Carrhotus viduus* pulling silk away and entering his shelter inside of one end of the ant nest. 5, Male *C. viduus* encountering an *O. smaragdina* worker near the shelter of the female *C. viduus*. 6, Male *C. viduus* on the exterior of the ant nest. 7, *O. smaragdina* worker inspecting the entrance previously used by the male (Figures 2-4).



Figures 8-13. 8, Relative position of the female *Carrhotus viduus* nest adjacent to an active *Oecophylla smaragdina* nest enclosed in dried leaves. 9, A second male *C. viduus* (#2) near the first male (#1) at the entrance to his shelter. 10, *O. smaragdina* worker carrying a captured ant into the nest. 11, Male *C. viduus* and nearby *O. smaragdina* worker on the shelter of the female *C. viduus* (see Figure 8). 12, Male *C. viduus* on the active ant nest, watching nearby ants. 13, Male *C. viduus* above the shelter of the female *C. viduus*, looking down at an ant.



Figures 14-17. 14-15, Adult female *Carrhotus viduus* inside of her shelter near the top of an *Oecophylla smaragdina* nest. 16, Another view showing relative positions of the ant nest and the shelters of the female and male (#1) *C. viduus*. 17, *O. smaragdina* worker on top of the nest of the female *C. viduus*.

This utilisation of an active Green Tree Ant colony suggests that this *Carrhotus viduus* female benefitted from the protection offered by the presence of an active *Oecophylla smaragdina* colony. Since none of the spiders that were observed attempted to feed on the ants, or any of their hemipteran associates, food acquisition does not appear to have been the motive for this association. It is possible that *C. viduus*, like the chrysiline salticid *Cosmophasis bitaeniata* (Keyserling 1882), is able to associate with these dangerous ants through chemical mimicry (Allan 1998; Allan & Elgar 2000; Allan et al. 2002; Edgar & Allen 2004, 2006; Hurni-Cranston & Hill 2021).

As an added note, when later inspecting the site with a torch at night (3 FEB 2022), a female *Cheiracanthium* C. L. Koch 1839 was observed running out of this ant nest, to take refuge under a nearby branch. This is a reminder that, although our observations of salticids are usually diurnal, there are also nocturnal events of which we have little knowledge.

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