

TRAIL-SHARING BY TWO SPECIES OF *POLYRHACHIS*  
(HYMENOPTERA: FORMICIDAE)

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The simultaneous utilization of a foraging trail by two species of formicine ants, *Polyrhachis bihamata* (Drury) and *P. armata* (Le Guillon) is described from the Philippines. Observations suggest that the trail originated with *P. bihamata*. No aggressive interactions between the species were noted. This appears to be the first record of trail-sharing by two congeneric species of ants. The nest of *P. armata* is described.

*Polyrhachis* is a large genus of formicine ants, widespread in the Old World tropics (Wheeler (1922) and easily recognized by the prominent curved spines rising from the thorax and petiole. It is the largest ant genus in the Philippines, comprising 15% of the 256 recorded species (Baltazar 1966).

Brief observations are given here on foraging-trail sharing by two species in the Philippines. Mintzer (1980) has recently reviewed the few reported cases of trail-sharing by ants. These reports usually involve taxonomically very different species, and Mintzer cites his own report (1980) on two species on leafcutters as the first to involve species from the same sub-family and discusses the ecological significance of this. This paper, then, appears to be the first report for two species so similar as to have been placed in the same genus.

*Polyrhachis bihamata* (Drury) and *P. armata* (Le Guillon) were observed on Mt. Makiling above Los Banos, Laguna province, Luzon. I found each species to be fairly common on the upper part of Mt. Makiling, though *P. armata* colonies were much easier to detect, because of the conspicuous nest, described below.

In the early afternoon of 21 August 1980 I found a strong, continuous, two-way foraging column of *P. bihamata* stretching nearly perpendicularly across a dirt road somewhat more than half way up Mt. Makiling. The road, together with shallow ditches at the sides, was about 5 m wide. Also

moving in both directions in the column were workers of *P. armata*. I returned to the site on the late morning of 24 August and found the foraging column in the same place, with the same species-composition, and apparently operating just as it did three days earlier. The two species diverged about 1 m off the road on one side, while on the other side I lost the trail in dense vegetation, so that the shared part of the trail was at least 6 m long.

The two species differed in density and behavior, so that the trail seemed clearly to "belong" to *P. bihamata*:

1. While *P. bihamata* formed a steady column of moving ants, *armata* individuals were widely separated and were no more than 1/10 as numerous. This was the ratio in some short movies taken to show the trail-showing so that they were biased to include *P. armata*. I suggest that the true ratio on each day was closer to 20:1.
2. *P. armata* moved in a much more hesitant manner, backtracking and stopping more often and making slower forward progress. I watched four haphazardly-chosen *armata* workers for varying times as they overtook and passed *bihamata* workers walking in the same direction or were overtaken and passed by these. The *armata* workers were passed 43 times, while they passed *bihamata* workers just 7 times. The two species are of similar size and leg-length.
3. When I put down small sugar-syrup baits at the edge of the trail, *P. bihamata* workers crowded in and drank vigorously from the baits, while *armata* collected only at peripheral drops of bait and kept away from the main mass of *bihamata*.

These observations suggest that the foraging-trail originated with *P. bihamata* and that *P. armata* was present as a guest. The possibility cannot be discounted, though, that it is originated with *armata* and was largely usurped by *bihamata*.

I noted no aggressive interactions between the black *P. armata* and the largely dark-red *bihamata*, and all ants seemed to ignore each other, even though individuals frequently came into direct contact.

I have referred here to a "foraging-trail" and "foraging-column", but in fact this function is merely inferred, not demonstrated. Despite its wide distribution and frequent conspicuousness, *Polyrhachis* is ecologically little studied. Published knowledge of its feeding habits appears to be limited to Wroughton's (1892) comment that "though I have frequently watched them, I have never been able to detect their source of food supply", Mukerjee's (1930) reports of finding coccids in a nest of *P. simplex* and aphids in

association with *P. rastrata* workers in India, and Wilson's (1958) remarks on foraging strata of some New Guinea species and implication that they are probably generalist predators. Despite extensive collecting of *Polyrhachis* by Wallace (1973) and Wheeler (1922), neither remarks on feeding habits. I failed to find any ant in the Mt. Makiling column carrying anything, either at the time of observation or later, on examining movies and slides of the column. These various failures to see food being carried suggest that it is transported as fluid in the crop. Mukerjee's observations and the readiness of the Mt. Makiling ants to take sugar-rich baits are consistent with the hypothesis that honeydew and/or nectar is important in the diet.

Nests of *Polyrhachis* have often been described. They are commonly made of silk and most are constructed in or on the ground or on leaves (Forel 1896, Wheeler 1922, Menozzi 1932, Wilson 1958). Each of the several *P. armata* nests I examined on Mt. Makiling was a simple, grey, silk bag, between 15-30 cm long, broadly attached to the substrate, with walls varying in thickness between 1-3 mm, and with a single hole at the bottom. They resembled many other described nests in heaving earth and debris woven into the nest fabric and coating the outer surface, but differed from most in being built on moderately rough tree trunks, about 1½-4 m from the ground. Of published reports I have seen, only that of Wallace (1873) on *P. rugifrons* in Ceram, Indonesia, indicates a similar nest-site.

I provoked three *P. armata* colonies by tapping the nest bag with various objects, and in each case ants rushed out of the neat hole and moved about in an aggressive manner. Unlike the sympatric silk-nesting formicine *Oecophylla smaragdina*, though, *Polyrhachis* could not be provoked to attack and bite the offending object, even when I slowly rent the entire nest with my bare hands.

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