NOTES ON INTERSPECIFIC, MIXED COLONIES IN THE HARVESTER ANT GENUS *POGONOMYRMEX*

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During our long-term investigations on colony interactions and communication in the harvester ants (*Pogonoymrmex*) in the Chihahuan desert near Portal, Arizona and Rodeo, New Mexico, we occasionally observed interspecific, mixed colonies of *P. rugosus* and *P. barbatus*. In all cases it appeared that *P. barbatus* workers were incorporated into a *P. rugosus* nest, because *P. barbatus* were by far in the minority.

We first noted this phenomenon in July 1974, when we encountered a *P. rugosus* nest, where approximately 5% of the workers emerging from the nest entrance were *P. barbatus*. Between 1974 and 1988 we observed 9 additional such incidents. The percentage of *P. barbatus* workers recorded at the nest entrance of *P. rugosus* nests varied from 3% to 11%. In most cases the *P. barbatus* workers were engaged in foraging, and no difference in behavior was noticed between the *P. barbatus* foragers and their *P. rugosus* nestmates. There was, however, one remarkable exception. In July 1988 we observed a large *P. rugosus* colony where workers of this species were carrying *P. barbatus* workers out of the nest and were releasing them a few centimeters to approximately 2 m from the nest entrance. During transportation the *P. barbatus* workers assumed a pupal posture, with the appendages tightly folded to the body. When released they often remained in this position for a few seconds until they "unfolded" and returned to the nest. From a total of 20 *P. barbatus* workers marked with fast drying enamel, we verified that individual *P. barbatus* workers may be carried out repeatedly. In one case we recorded a worker being evicted from the nest 19 times within 3 hours. We observed this behavior for 12 days, when it finally began to wane and within the following two days it ceased

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completely. From the appearance of the cuticle and the development of their ovaries and fat bodies we concluded that these *P. barbatus* workers were young ants. During the following 3 weeks we noticed only occasionally a few *P. barbatus* workers patrolling the vicinity of the nest entrance, but we did not see them foraging.

How do these interspecific mixed colonies originate? During our investigations of intra- and interspecific interactions in *Pogonomyrmex* populations, we repeatedly observed mature *P. rugosus* colonies raid smaller colonies of other congeneric species. We recorded such raids on conspecific nests (3 times), on nests of *P. barbatus* (4 times), on *P. desertorum* (once) and on *P. maricopa* (once). We also twice observed raids conducted by *P. barbatus* on small *P. rugosus* colonies that were approximately 1–2 years old. In several of these cases we noted that the raiders completely wiped out the raided colonies, pillaging live and dead workers, and brood. In one case we observed a mature *P. rugosus* colony raiding a *P. barbatus* nest 12 m away and capturing at least 46 pupae and 22 larvae. We checked this site two years later and did not find any sign of the raided colony, whereas the *P. rugosus* colony was still at the same location.

These observations suggest that interspecific mixed colonies in *Pogonomyrmex* might result from territorial raids. Although laboratory experiments indicate that a large portion of the captured brood of other *Pogonomyrmex* species is eaten by the raiders, *P. rugosus* readily adopts brood of *P. barbatus* (and *vice versa*), so that the foreign pupae may eclose in the raiders' nest and can subsequently serve as slave workers.

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