

# Invited Commentary

## Seeing the forest and the trees

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Moffett (2012) misrepresents the position of Gordon, Heller, and others on supercolonies. We recognize the existence of Argentine ant supercolonies, populations of colonies all descended from common ancestors. A substantial body of work shows the common origins of certain Argentine ant populations of colonies, or supercolonies (e.g., Vogel et al. 2010).

We consider that a colony, unlike a supercolony, involves functional ecological interactions among the ants. A group of ants functions as a colony when it shares resources and reproduction. Heller et al. (2008) showed that nests share resources only at scales of about 100 m. Ingram and Gordon (2003) showed that there is isolation by distance, demonstrating limited genetic mixing, also at scales of 100 m. These results indicate that there are colonies on the scale of 100 m at the study site in northern California. Ants that belong to the same supercolony have a shared ancestry, but if the supercolony spans many kilometers, or regions that ants cannot cross, then it includes ants that cannot possibly meet and thus cannot possibly share resources or interact ecologically.

Many studies of Argentine ants show that ants from different locations are unlikely to fight (e.g., van Wilgenburg, Clemencet, et al. 2010). For ants, the absence of fighting is not equivalent to belonging to the same colony. It is not the case, as Moffett says, that “in a healthy society, [ants] invariably avoid or kill alien ants with different cues.” In fact, ants of different colonies do not always fight. Many studies of nestmate recognition show variation, in trials with ants of the same colony or in repeated trials with the same individual, in the extent of fighting or avoidance. Species differ in propensity to fight, and within a species, whether ants fight depends on context. For example, Roulston et al. (2003) showed that whether Argentine ants fight in bioassays depends on the number of ants. As the recent work of Newey (2011) and others shows, the extent of fighting is not necessarily a measure of genetic relatedness or of similarity in hydrocarbon profile. Instead, the extent of fighting, genetic relatedness, and similarity in hydrocarbon profile are related in complex ways (Sturgis and Gordon 2011) and in Argentine ants depend on many factors, including food supply (Liang and Silverman 2000), social context (Buczowski and Silverman 2005), and familiarity (van Wilgenburg, Torres, et al. 2010).

Moffett’s article proceeds by means of journalistic hyperbole rather than specific statements; as he says, many of his argu-

ments are “semantic” arguments, not based on facts. He extols the unity of the Argentine ant supercolony without clearly distinguishing evidence from opinion. We hope that continued discussion of the intriguing biology of Argentine ants will be based on scientific investigation. What is needed is not further discussion of definitions but further data on the organization of tasks and resource sharing among nests within colonies, on the interactions among colonies within supercolonies, and on how these produce the spatial and genetic structure of populations of colonies.

**Key words:** aggression, Argentine ant, supercolony.

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