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The cost of inbreeding in a socially polymorphic ant population

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Monogynous and polygynous populations of the same ant species tend to have different dispersal rates and inbreeding coefficients, but the cost-benefit ratios of philopatry and inbreeding have rarely been compared in populations where monogynous and polygynous colonies interact in sympatry. We studied the relative costs of inbreeding (in terms of body size, fluctuating asymmetry and diploid male production) in a *Myrmica rubra* population where monogynous, polygynous and supercolonial nests coexist, and where genetic analysis showed that these colony types had distinct patterns of relatedness and inbreeding. Despite variation in inbreeding we could not detect any difference in wing asymmetry of males, nor did we find any diploid males. However, outbred monogynous nests with high relatedness had males with lower leg-asymmetry and these nests stood out by also having larger workers and males but smaller queens than the other two types. Polygynous nests had both higher relatedness and higher inbreeding than supercolony nests, but there was no difference in morphological traits between the two groups, suggesting that their dispersal strategies are similar. Significant genetic isolation by distance in both polygynous and supercolony nests suggested that queens are inseminated inside or close to the nest where they were raised, which implies that higher numbers of male and female sexuals breeding in such supercolonies could potentially explain lower inbreeding. However, winged virgin queens were exclusively produced in outbred monogynous nests, corroborating earlier findings that supercolonial patches tend to produce only males. Our results show that dispersal, inbreeding, morphology, relatedness and colony sex ratio co-vary when different types of colonies occur in sympatry, and offer relevant understanding of the complex selection forces that gave this ant species the potential to become invasive in Eastern North America. Ongoing genomic studies will help to further understand how social polymorphism is regulated in this species.