Selfish Progeny of Great Societies - dispersal and supercoloniality in Formica ants

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The correlation between poor dispersal and complex societies in ants is well documented – but the underlying causal mechanisms are not clear. In this study, we investigate the dispersal ability of six closely related but socially different *Formica* species from three different subgenera. There is extreme variation in social systems and dispersal strategies in *Formica*: in some of the species all young daughter queens disperse and found new independent colonies, whereas in others a large majority of them stays in their natal colonies as extra queens. These societies may eventually develop into supercolonies with thousands of egg-laying queens. Queens of all *Formica* species do have wings, but it is unclear if the ability to fly and disperse is weakened in the supercolonial species. The flight ability of males of these species is even less studied. Investigating the resource allocation in the bodies of daughter queens and males allows us to compare the connection of dispersal ability and social system. We collected a dataset of 1500 individuals of both sexes of six *Formica* species. We measured the wing muscle ratios, glycogen, fat and protein resources and mitochondria and myofibril areas in wing muscles with transmission electron microscopy. Our results suggest that the physiological condition of individuals does not predict dispersal patterns as clearly as assumed, contrary to earlier studies. This would suggest that poor dispersal is actually a behavioral trait rather than an expression of the physiological condition in Formica ants. The young daughter queens choose not to disperse even when the society provides them with the resources for it. This raises new questions about conflicts over dispersal in the supercolonial *Formica* species.