
A Defense of Superorganisms

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Abstract

The idea that some highly organized (eusocial) insect colonies are mutually dependent, functional wholes visible to natural selection is widely accepted. More controversial is the claim (Wilson and Sober 1989; Hölldobler and Wilson 2008) that such colonies are ‘superorganisms,’ biological units analogous to organisms in important ways. In this talk I defend the superorganism view on the grounds that it helps us investigate the genetic basis of eusociality.

Superorganism critics (Ghiselin 2011; Haber 2013) argue that thinking of colonies as superorganisms undermines rather than supports the idea that colonies are units of selection. They also worry that the analogy between organisms and colonies is misplaced and may obscure our understanding of colony-level processes. Part of this concern is valid. For instance, appealing to superorganisms to claim that colonies are units of selection is a mistake. However, it does not follow that biologists should discard the superorganism view.

In response to these criticisms, I consider a specific example of the superorganism view in eusocial insect research (Johnson and Linksvayer 2010). I show that in practice, the superorganism view functions as a valuable research tool while avoiding critics’ concerns. First, it reveals explanatory gaps in our current understanding of the genetic basis of eusociality. Second, it generates further research questions in response to these gaps. Third, the view highlights an evolutionary problem faced by organisms and colonies alike, but suggests that they have solved the problem in divergent ways. This result allays the concern about analogies between levels of biological organization.

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