

Insects' 'giant leap' reconstructed by founder of sociobiology

January 2 2008

A survey of advanced social organization in insects calls into question the standard explanation for eusociality

The January 2008 issue of BioScience includes an article by biologist Edward O. Wilson that argues for a new perspective on the evolution of advanced social organization in some ants, bees, and wasps (Hymenoptera).

Wilson's article surveys recent evidence that the high level of social organization called "eusociality," found in some Hymenoptera (and rarely in other species), is a result of natural selection on nascent colonies of species possessing features that predispose them to colonial life. Wilson concludes that these features, principally progressive provisioning of larvae and behavioral flexibility that leads to division of labor, allow some species to evolve colonies that are maintained and defended because of their proximity to food sources.

Eusociality is a challenge for biologists to understand because worker castes in eusocial species forgo individual reproduction but rear young that are not their own, a behavior that biologists label altruistic. Wilson's current view about eusociality differs from the assessment in his seminal book *Sociobiology: The New Synthesis* (1975). According to that widely accepted earlier account, selection acting on individuals that are related (kin selection), rather than on whole colonies, explains eusociality in Hymenoptera. Kin selection is thought to be especially powerful in these animals because of an unusual genetic system, known as haplodiploidy, that they share.

Wilson's survey in BioScience, which examines the findings of a number of researchers, points out aspects of the occurrence of eusociality that the standard explanation has difficulty accounting for. Eusociality has evolved only a few times, and not all of them were in haplodiploid species. Furthermore, the great majority of haplodiploid species are not eusocial. Wilson holds that selection acting on traits that emerge at a group level provides a more complete explanation for eusociality's rare instances than kin selection. Kin selection is, he writes, "not wrong" but incomplete.

Source: American Institute of Biological Sciences

Citation: Insects' 'giant leap' reconstructed by founder of sociobiology (2008, January 2) retrieved 26 January 2023 from <https://phys.org/news/2008-01-insects-giant-reconstructed-founder-sociobiology.html>

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