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Social antics in ants inherited like sex chromosomes

18:00 16 January 2013 by [Douglas Heaven](#)
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Fire ants are a family divided. When setting up a new colony, young queens go one of two ways. Some strike out on their own and remain independent, stockpiling fat reserves and creating workers that kill rival queens. But others prefer the communal life, joining colonies in which multiple queens reign side by side.

Laurent Keller at the University of Lausanne in Switzerland and colleagues have now identified the genes behind this ant's split personality – and they turn out to share many of the properties of sex chromosomes.

A chromosome is a sequence of DNA that gets passed on as a block from generation to generation, instead of being reshuffled like most other genes. The X and Y chromosomes, for example, are inherited as whole sections, joining up as XX and XY pairs to determine sex.

Keller's team discovered that two chromosome regions, social B (SB) and social b (Sb) determine the two types of behaviour seen in the ants. Each is made up of several hundred genes and inherited as SB/SB or SB/Sb pairs.

This is the first time that such a "supergene" for social behaviour has been described.

Keller suggests that the same mechanism is likely to lie behind the different behaviours found in other insect species. Formica ants, for example, also form multiple types of colony, and certain butterflies uniquely feed on different types of flower. He thinks the mechanism might also be found in higher organisms. "If you have two or more very different types of behaviour within a single species, I'd be ready to guess that this is what's going on," he says.

Daniel Kronauer at the Rockefeller University in New York, who was not involved in the work, describes it as "a very important finding".

"There are many other ant species with variable social organisation, but so far nobody knows what the genetic basis of this is," he says. "It is time for scientists to look more closely at other species to see whether this could be a more general pattern."

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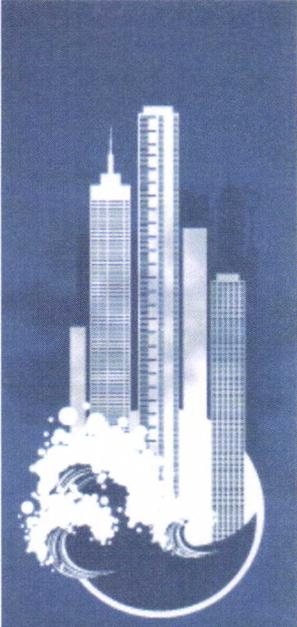
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