

# Age and fertility in social insects

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Fertile and long-lived: A termite queen (white) lays 20,000 eggs per day and can, like the king (brown), live for more than 20 years. The small termites are workers. They are sterile and have a lifespan of just two to three months. Credit: Judith Korb

A new research unit coordinated at the University of Freiburg tackles the question of why the otherwise usual trade-off between fecundity and lifespan in multicellular organisms is not present in social insects like bees, ants, or termites. The German Research Foundation (DFG) has agreed to provide 2.2 million euros for the project in three years. The director of the unit is the Freiburg evolutionary biologist Prof. Dr. Judith Korb.

As a rule, fecundity and [life expectancy](#) are negatively correlated in higher organisms - the higher the fertility, the lower the life expectancy

and vice versa. A common explanation for this is that organisms have limited resources at their disposal. They can invest these resources either to maintain their own body or to produce many offspring. Social insects, on the other hand, do not seem to face this conflict: Fertile individuals live much longer than others. In one termite species, for instance, the queen and the king have a [lifespan](#) of more than 20 years, whereas the workers only live for two to three months.

The research unit wants to shed light on this phenomenon by studying the social systems of ants, bees, and termites. To do so, the scientists will manipulate two key factors - diet and fertility - and observe the effects, for instance on individual hormone and protein production or on fertility and survival rates. The team will use the data to determine how the social behavior of these insects contributes to uncoupling the trade-off between fecundity and lifespan. By uncovering the basis to this apparent escape they expect to achieve a deeper understanding of the fundamental biological rules governing fecundity, longevity, senescence, and health.

Provided by Albert Ludwigs University of Freiburg

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