

Some female termites can reproduce without males

September 24 2018



Cooperative colony foundation by multiple queens of an asexual female population of *Glyptotermes nakajimai*. Credit: University of Sydney

Populations of the termite species *Glyptotermes nakajimai* can form successful, reproducing colonies in absence of males, according to a study published in the open access journal *BMC Biology*.

The findings by researchers at the University of Sydney, Australia and Kyoto University, Japan suggest that males are unnecessary for the maintenance of some advanced animal societies in which they previously played an active social role.

Toshihisa Yashiro, corresponding author of the said: "The complete loss of males from social insects has been previously reported only in ants and honey bees. Termite colonies were always found to have equal numbers of males and females, and to undergo sexual reproduction. Our paper is the first demonstration that termites can do away with males completely, and get along fine just with females."

The authors discovered populations of *G. nakajimai* with no evidence of any [males](#) in remote coastal areas of Japan. They compared the morphology of individuals from 37 colonies in these areas with those from 37 mixed-sex colonies found elsewhere in Japan. Queens in all-female colonies had empty spermathecae (an insect organ where sperm is stored after mating), whereas the queens in the mixed-sex populations had plenty of stored sperm. The eggs in the all-female colonies were all unfertilized.

Toshihisa Yashiro said: "Interestingly, we observed the occasional development of unfertilized eggs in the mixed-sex populations too. This suggests the ability to produce offspring from unfertilized eggs may have originated in mixed-sex ancestors and provided a potential pathway to the evolution of all-female colonies. We also found that all-female colonies had a soldier caste with a more uniform head size than their mixed-sex counterparts and fewer soldiers overall. This suggests that uniform female soldiers are more efficient at defense which may have

contributed to the persistence and spread of the all-female colonies."

Further studies are required to find out if all-female colonies also occur in other termite species.

More information: Toshihisa Yashiro et al, Loss of males from mixed-sex societies in termites, *BMC Biology* (2018). [DOI: 10.1186/s12915-018-0563-y](https://doi.org/10.1186/s12915-018-0563-y)

Provided by BioMed Central

Citation: Some female termites can reproduce without males (2018, September 24) retrieved 10 May 2024 from <https://phys.org/news/2018-09-female-termites-males.html>

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