Homosexual termite regicide

August 18 2016

A male-male termite pair makes nests, just as heterosexual termite couples do. Male Japanese termites form homosexual couples when no females are around -- and when the chance arises, they take over a heterosexual couple's nest and kill the male so that one of them can mate with the now spouseless female. The study supports a theory that homosexual couplings in invertebrates have evolutionary advantages. Credit: Nobuaki Mizumoto

Termites not only raid people's homes, but also the humble abodes of other happy termite couples.

In new research, Kyoto University scientists have found that male Japanese termites form homosexual couples when no females are around—and when the chance arises, they take over a heterosexual couple's nest and kill the male so that one of them can mate with the now spouseless female. The research team's observations support a theory that homosexual couplings in invertebrates have evolutionary advantages.

The evolutionary paradox of homosexuality has long puzzled biologists. Recent research suggests that there are benefits associated with homosexuality, at least for mammals and birds. As for invertebrates like insects, experts have considered that homosexual behavior results from an inopportune misrecognition of males as females. But lead scientist Nobuaki Mizumoto and colleagues discovered that male termites aren't so inobservant; they behaved differently toward males and females, and when coupling with males, they didn't act as though they were mistaking them for females.

"Japanese termites usually make nests in monogamous, heterosexual pairs," says Mizumoto. "In theory, misrecognizing a female for a male in a monogamous mating system should incur considerable costs for reproduction. There had to be some sort of benefit if this were a common behavior."

In the study, published in *Animal Behaviour*, the researchers report that homosexual male termites built nests together, just as with heterosexual couples. "Male termites aren't able to survive on their own, but those that make nests with another male survived for much longer," continues Mizumoto. "This was especially beneficial in situations when searching for females raises the risk of being preyed upon. It's clear that male-male pairing is a strategy for survival."

The team found that once workers from the heterosexual couple's colony began digging tunnels to patrol, a male-male pair would travel back through the tunnel to invade and attempt to kill the heterosexual couple's nest. From genetic analyses of subsequent offspring, the scientists found that only one of the invading males had been able to mate with the female.

"Pairing with another male isn't the best option, but it gives mateless termites a chance to survive until they find a female, if that happens at all," says Mizutani. "To understand this behavior further, it will be important to consider the effects of other factors such as predators."

More information: Nobuaki Mizumoto et al, Male same-sex pairing as an adaptive strategy for future reproduction in termites, *Animal Behaviour* (2016). DOI: 10.1016/j.anbehav.2016.07.007

Provided by Kyoto University