

# Research sheds light on benefits of multiple mates

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New research could explain why females of many species have multiple partners. Published on Friday 21 November 2008 in leading journal *Science*, the study was carried out by a team from the Universities of Exeter (UK), Okayama (Japan) and Liverpool (UK).

Females of most species, including many mammals, mate with multiple partners. The driving forces for this practice, known as 'polyandry', have been a mystery for evolutionary biologists for decades. This research suggests that polyandry could be the result of females adapting to avoid producing offspring carrying selfish genetic elements that reduce male fertility.

The research team based the study on the fruitfly *Drosophila pseudoobscura*, which they bred over ten generations. Some males of this species carry a 'selfish gene' on their X chromosome that causes sperm carrying the Y-chromosome to fail. This means that males carrying this gene can only produce daughters, all of which carry the sperm damaging gene.

In this study females evolved to mate with more partners when they were exposed to males carrying this selfish gene. There was no way for the females to tell whether or not a potential mate carried the gene, but they evolved to re-mate more quickly. After ten generations, they re-mated after an average of 2.75 days, compared with 3.25 days among the original population. By mating more frequently, females ensure sperm from different males compete. This competition favours males without

the sperm-damaging selfish genes, allowing females to bias paternity against these males.

Corresponding author Dr Nina Wedell of the University of Exeter said: "Multiple mating by females has puzzled biologists for decades. It's more risky and costs precious time and energy for females. Our study suggests that these significant costs are worthwhile because the female increases her chances of producing healthy offspring of both sexes that do not carry the selfish gene."

Selfish genes occur at random as a result of mutations. They spread quickly through populations because they subvert normal patterns of inheritance, increasing their presence in the next generation.

The researchers believe the findings have relevance for a range of species with polyandrous females, including some primates. Dr Nina Wedell explains: "Selfish genetic elements exist in all living organisms and many compromise male fertility. Our study could provide a new explanation for why polyandry is so remarkably widespread."

At this stage the researchers do not know what implications these findings might have for understanding human reproduction. However, it is possible that some types of male fertility disorder are caused by the manipulation of selfish genes.

Source: University of Exeter

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