

# Fussy fruit flies can detect bad genes

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Fruit fly. Credit: John Tann/Wikipedia

Researchers at The University of Western Australia have demonstrated the sexual attractiveness of male fruit flies isn't just about how big they are or how nice they smell; it's also about how many mutations they carry.

Fruit fly populations were created in a lab to assess why [females](#) are selective about which [males](#) they mate with, and it appears [physical attractiveness](#) is only part of the reason. The other is the burden of mutations a male carries.

Robert Dugand, from the Centre of Evolutionary Biology said the study aimed to determine why the females of many species are so choosy over which male they mate with.

"If females persistently choose particular males based on certain characteristics (e.g. size, smell), you would assume that the continual selection of these traits should eventually erode any genetic diversity in males," Mr Dugand said.

"Our results show there is [genetic variation](#) in male attractiveness, and it is not limited to easily identifiable physical characteristics (although bigger flies are more [attractive](#)). We found that males with fewer deleterious mutations in their genome were deemed more attractive than males

with a larger burden of mutations."

Researchers conducted the research by competing male flies against one another and finding out which males were preferred by females (the 'studs'), and which males were rejected by females (the 'duds'). Studs and duds were selected for 14 generations, producing populations with an ancestry of highly attractive males and other populations with an ancestry of highly unattractive males.

Mr Dugand said the results revealed that mating success responded to selection, which shows there is genetic variation in attractiveness. Some of this variation is caused by mutations that affect viability.

"This is an important finding because deleterious mutations reduce the health of populations. Therefore we can show that [sexual selection](#) in choosy females is very important for the health of populations," Mr Dugand said.

"This result may have important implications for conservation as many programs remove sexual selection when conservationists decide who gets to mate with whom."

"This removal of sexual selection may be detrimental to the fitness of small populations by allowing mutations to accumulate."

This research is published in *Science Advances*.

**More information:** Robert J. Dugand et al. Evolutionary divergence in competitive mating success through female mating bias for good genes, *Science Advances* (2018). [DOI: 10.1126/sciadv.aag0369](#)

Provided by University of Western Australia

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