Same gene, different mating techniques in flies

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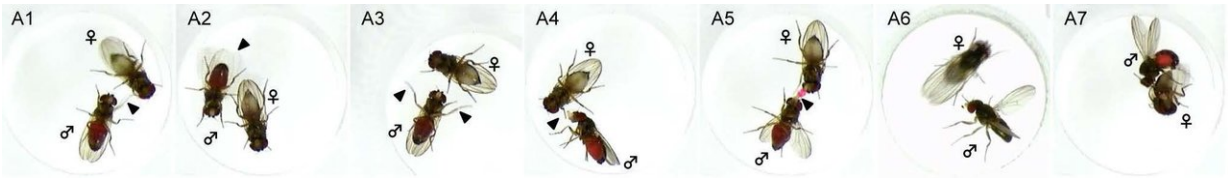

The steps of mating behavior in *Drosophila subobscura* include tapping (A1), scissoring (A2), midleg swing (A3), proboscis extension (A4), nuptial gift (A5), wing extension (A6) and attempted copulation (A7). Credit: Tanaka et al., *JNeurosci* (2017)

A study of two related species of fruit fly published in *JNeurosci* reveals that a gene known to regulate behavior for attracting a mate in one species gives rise to unique wooing techniques observed in the other species.

The neural circuitry underlying courtship behavior has been previously identified in the fruit fly species *Drosophila melanogaster*. These circuits are composed of neurons expressing the fruitless gene, which could form differently in different species.

Daisuke Yamamoto and colleagues explored the fruitless circuity in *Drosophila subobscura*, a related species that engages in unconventional mating tactics such as a male giving a potential mate a regurgitated

"nuptial gift."

The researchers confirmed that these circuits, which are similar to but distinct from those of *D. melanogaster*, are required for courtship and found that artificially activating them with light induced species-specific mating behaviors. The study points to the possibility that the same neurons in both species evolved to generate different behaviors as a result of acquired gene expression.

Further research and new genetic techniques are required to test this hypothesis.

More information: Optogenetic activation of the fruitless-labeled circuitry in Drosophila subobscura males induces mating motor acts, *Journal of Neuroscience*, DOI: 10.1523/JNEUROSCI.1943-17.2017

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