

Double stranded RNA treatment can reduce fertility of adult house fly pests

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House fly. Credit: ep_jhu, Flickr

Double stranded RNA (dsRNA) can effectively reduce house fly fertility, and shows promise as a pest control method, according to a study published January 17, 2018 in the open-access journal *PLOS ONE* by Neil Sanscrainte from the USDA/ARS Center for Medical, Agricultural, and Veterinary Entomology, US, and colleagues.

House flies, *Musca domestica*, are worldwide pests which carry many pathogens, but they rapidly evolve resistance to insecticides. RNA interference using dsRNA has been suggested as an alternative control [method](#). The authors of the present study designed dsRNA to target three fly RNA transcripts, the cytoskeletal protein actin-5C and two ribosomal proteins. They injected the dsRNA into adult female [house](#) flies and investigated its effect on gene expression and reproduction.

The researchers found that flies injected with the ribosomal protein dsRNAs were less fertile, showing a reduction in [egg development](#) and producing significantly fewer eggs. Since flies treated with dsRNA designed for a mosquito species were not less fertile, it appears that the dsRNA treatment is species-specific. Flies treated with *M. domestica* dsRNAs showed reduced levels of expression of the targeted transcripts, suggesting that the dsRNA was successfully targeting RNA transcripts before [protein](#) was produced.

Injection methods are not practical in the field, so future research could investigate alternative delivery methods. Nonetheless, this study demonstrates the efficacy and specificity of dsRNA as a control method in reducing the fertility of adult house flies.

"This study is the first to demonstrate that gene silencing using double

stranded RNA (dsRNA) can be effective as a biopesticide for the adult housefly if improved delivery methods are subsequently developed," says Sanscrainte. "Microinjection of dsRNA targeting two *Musca domestica* ribosomal genes resulted in significant reductions in egg development and oviposition when compared to control dsRNA injected flies."

More information: Sanscrainte ND, Arimoto H, Waits CM, Li LY, Johnson D, Geden C, et al. (2018) Reduction in *Musca domestica* fecundity by dsRNA-mediated gene knockdown. *PLoS ONE* 13(1): e0187353. doi.org/10.1371/journal.pone.0187353

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