

Excessive consumption of green tea impairs development, reproduction in fruit flies, study finds

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Green tea. Credit: Wikimedia Commons

Although green tea is enjoyed by millions for its numerous health benefits, University of California, Irvine researchers have discovered that excessive consumption adversely affected development and reproduction in fruit fly populations.

It's unclear whether overconsumption could have the same impact on humans, but the findings suggest caution when using green tea, or any natural product, in high doses. Nutraceuticals such as green tea, while growing in popularity, are largely unregulated. Study results appear in the *Journal of Functional Foods*.

A UCI team led by Mahtab Jafari, associate professor of pharmaceutical sciences, investigated the effects of green tea toxicity on *Drosophila melanogaster* development and reproduction. Embryos and larvae were subjected to various doses of green tea polyphenols with the following results:

- Larvae exposed to 10 milligrams of green tea were slower to develop, were born smaller and exhibited a dramatic decline in the number of emerged offspring.
- Ten milligrams of green tea made the flies more susceptible to starvation and heat stress but protected them against dehydration.
- Female offspring showed decreased reproductive output and a 17 percent reduction in lifespan; males were unaffected.
- Ten milligrams of green tea caused morphological abnormalities in reproductive organs, such as testicular and ovarian atrophy.

Jafari believes that high doses of green tea may cause "too much" apoptosis, or cell death, but in this study, she said, they did not evaluate mechanisms, which is the focus of her current research.

Derived from the plant *Camellia sinensis*, green tea is popular worldwide for its purported brain and heart health and anticancer properties. However, there are some reports of problems associated with excessive consumption: Jafari noted that in other tests with mice and dogs, green tea compounds in large amounts dramatically reduced body weight and, in mice, negatively affected embryo development.

"While green tea could have [health benefits](#) at low doses, our study and others have shown that at high doses, it may have adverse effects," she said. "Further work is needed to make any definite recommendations, but we can suggest that [green tea](#) be consumed in moderation."

The Jafari group is emerging as a leader in the study of natural food

products - herbs, spices and root extracts, for example - that people have ingested for centuries because of their alleged health benefits. And fruit flies have proven useful in testing pharmaceuticals' and nutraceuticals' [adverse effects](#).

"We are planning to continue to measure total consumption, evaluate metabolic pathways, and identify and quantify the metabolites of natural products in flies," Jafari said. "These experiments will enable us to have a better understanding of toxic doses in humans."

Provided by University of California, Irvine

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