

# Researchers reveal systemic health impact of microplastic exposure using fruit fly model

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A research team led by Prof. Li Lei and Prof. Liu Chang from the Shenzhen Institute of Advanced Technology (SIAT) of the Chinese Academy of Sciences (CAS) has revealed the significant systemic health

impact of microplastic (MP) exposure, using the terrestrial model organism *Drosophila melanogaster* (fruit fly). The study was [published](#) in *Zoological Research*.

Plastics, including microplastics, have become pervasive in our environment. According to the United Nations, more than 400 million tons of plastic are produced globally each year, with tens of millions of tons of plastic waste polluting oceans worldwide. Addressing plastic pollution has become a critical global imperative.

In this study, the researchers assessed the systemic toxicity of MPs in [fruit flies](#) by concentrating on key aspects of general [health](#), including sleep patterns, lifespan, and fecundity. The fruit flies were fed diets spiked with two distinct concentrations of MPs: 1×MPs at 0.02 mg/mL and 10×MPs at 0.2 mg/mL. The exposure periods encompassed various developmental stages, spanning from 2 days to 10 weeks.

Experimental results showed that MP exposure led to intestinal damage, disrupted sleep patterns, reduced ovary size, shortened lifespan, and genotoxic effects revealed by RNA-seq analysis.

Moreover, while microplastics did not penetrate the brain or ovaries, transcriptome analysis showed genotoxic effects impacting inflammation, circadian regulation, and [metabolic processes](#) in the ovary, proteolysis, and carbohydrate metabolism processes in the brain.

"Our research indicates that microplastics pose a comprehensive threat to the health and longevity of organisms, extending far beyond the previously understood organ-specific effects," said Prof. Li and Prof. Liu.

This underscores the urgency of addressing environmental [microplastic](#) pollution, given its widespread detrimental impacts on health and

[ecological systems](#), Li added.

**More information:** Wei Yan et al, Microplastic exposure disturbs sleep structure, reduces lifespan, and decreases ovary size in *Drosophila melanogaster*, *Zoological Research* (2024). [DOI: 10.24272/j.issn.2095-8137.2024.038](#)

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