

Tire-Wear Particles Pose Health Risks to Aquatic Organisms

GA, UNITED STATES, October 25, 2024 /EINPresswire.com/ -- A recent study highlights the hepatotoxicity of tire-wear particle (TWP) leachates in aquatic environments, impacting gut-liver axis and inducing oxidative damage. The findings suggest potential health risks for aquatic organisms.

In a study published in *Environmental Chemistry and Ecotoxicology*, researchers from Hangzhou Normal University uncovered the adverse health effects of tire-wear particles (TWPs) on aquatic organisms.

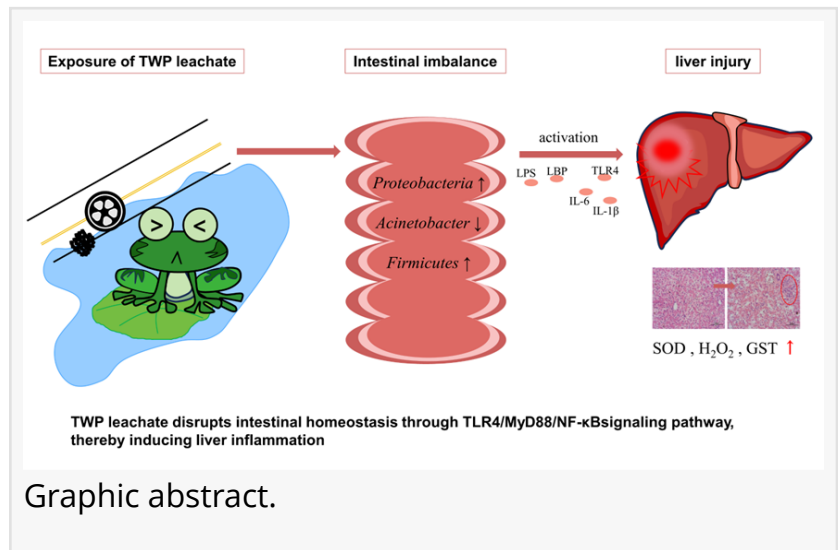
The study, led by Zhiquan Liu, focused on the hepatotoxicity of TWP leachates, revealing significant impacts on the gut-liver axis and oxidative stress levels in test organisms.

“TWPs, primarily produced through tire-road friction, are released into the environment in vast quantities,” says Liu. “Each year, approximately 6.1 million tons of TWPs are estimated to enter aquatic ecosystems, posing a significant threat to biodiversity.”

This prompted the researchers to investigate the effects of TWP leachates on black-spotted frogs (*Pelophylax nigromaculatus*), a highly susceptible amphibian species.

“We found that TWP leachates induced hepatic oxidative stress, inflammation and histopathology changes in the frogs. Specifically, increased levels of reactive oxygen species (ROS) and activation of signaling pathways closely related to immunity were observed,” shares Liu.

These changes were accompanied by disruptions in the gut microbiota, with a notable increase in Proteobacteria, a major source of gut-derived endotoxic lipopolysaccharide (LPS). Such disruptions in the gut-liver axis and oxidative stress levels can lead to long-term health issues for affected organisms.



Graphic abstract.

The team also found that zinc, a trace metal commonly found in TWP leachates, accumulated in the intestine, liver and kidney of the test frogs, further confirming the absorption and bioaccumulation of TWP leachates by aquatic organisms.

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