Earthworms avoid tyre abrasion

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Tyre abrasion gets from the road into adjacent soils and affects soil organisms. A joint study by the Ecotox Centre, the aquatic research institute Eawag and the EPFL now shows that earthworms avoid soil that is heavily contaminated with tyre particles. However, the particles had no negative effects on the survival and reproduction of the animals.

Car tyres wear out while driving. Tyre abrasion forms. These small particles contain rubber, minerals, bitumen and numerous chemicals, some of which come from the tyres themselves and some from the road surface. These include substances that are harmful to aquatic organisms. It is estimated that more than 3 million tonnes of such particles are released worldwide every year, and the trend is rising.

Because tyre abrasion gets into the soil along roads, the animals living there, such as earthworms and nematodes, are particularly exposed to it due to their way of life - namely digging through and eating soil. Most of the tyre chemicals from heavily contaminated soils could also be detected in the tissue of earthworms examined. The earthworms absorbed them by eating the soil.

Avoidance but no negative effect on reproduction

An avoidance test was used to analyse whether the animals actively avoid the contaminated soil when given the choice. The earthworms were kept in a container with contaminated soil on one side and clean soil on the other. It was then analysed which half of the container the worms moved to. At higher tyre abrasion concentrations, the worms strongly avoided the contaminated soil, while no effect was observed at lower concentrations. "At higher concentrations, we therefore expect negative effects on earthworms and the soil may no longer be suitable as a habitat for the animals," says first author Thibault Masset from EPFL. The heavily contaminated soil also smelled strongly of tyre chemicals, which indicates that the tyres released volatile substances. The researchers also investigated how the

tyre particles affect the survival and reproduction of earthworms. No significant effects were observed.

This text is a summary of the more detailed information (author: Anke Schäfer) available in German and French on the website of the Ecotox Centre.

Cover Picture: Earthworms play an important role in soil ecosystems (Photo: Ecotox Centre).

Original article

Masset, T.; Breider, F.; Renaud, M.; Müller, J.; Bergmann, A.; Vermeirssen, E.; Dudefoi, W.; Schirmer, K.; Ferrari, B. J. D. (2025) Effects of tire particles on earthworm (Eisenia andrei) fitness and bioaccumulation of tire-related chemicals, *Environmental Pollution*, 368, 125780 (9 pp.), doi:10.1016/j.envpol.2025.125780, Institutional Repository

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