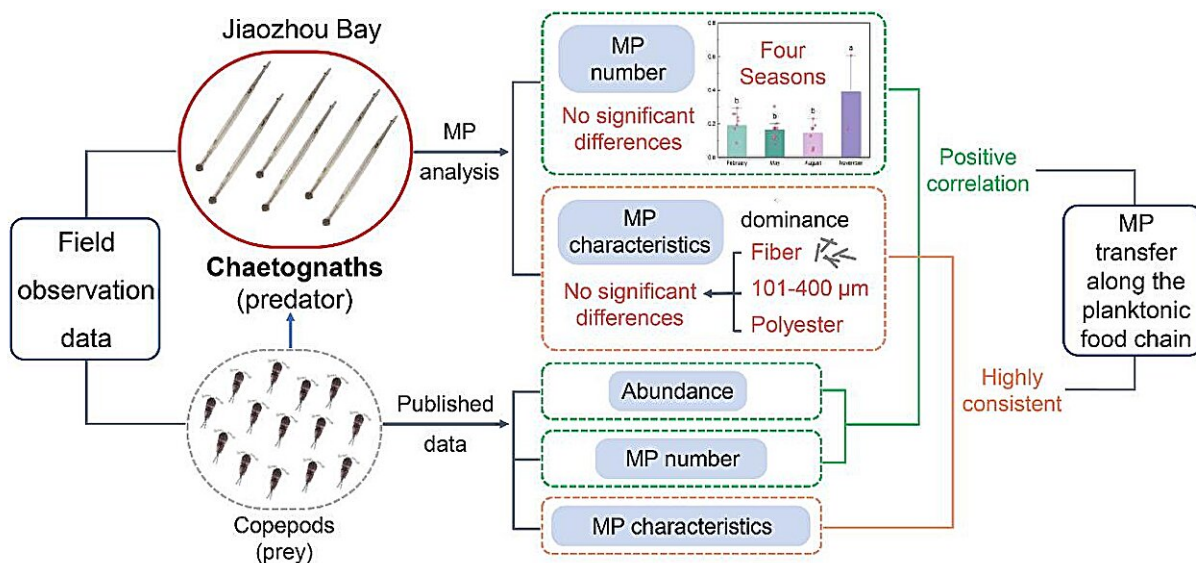


Field observations reveal microplastic transfer in marine planktonic food chains

August 28 2024



Field evidence of microplastic transfer along the planktonic food chain (copepods–chaetognaths). Credit: Sun Xiaoxia's group

Microplastics widely distributed in the ocean are readily ingested by marine organisms, particularly zooplankton, whose food particles are similar in size to microplastics.

Chaetognaths, typical carnivorous zooplankton in the ocean, feed primarily on [copepods](#). They play a crucial role in linking secondary producers (such as copepods) to higher trophic level organisms within

the food chain.

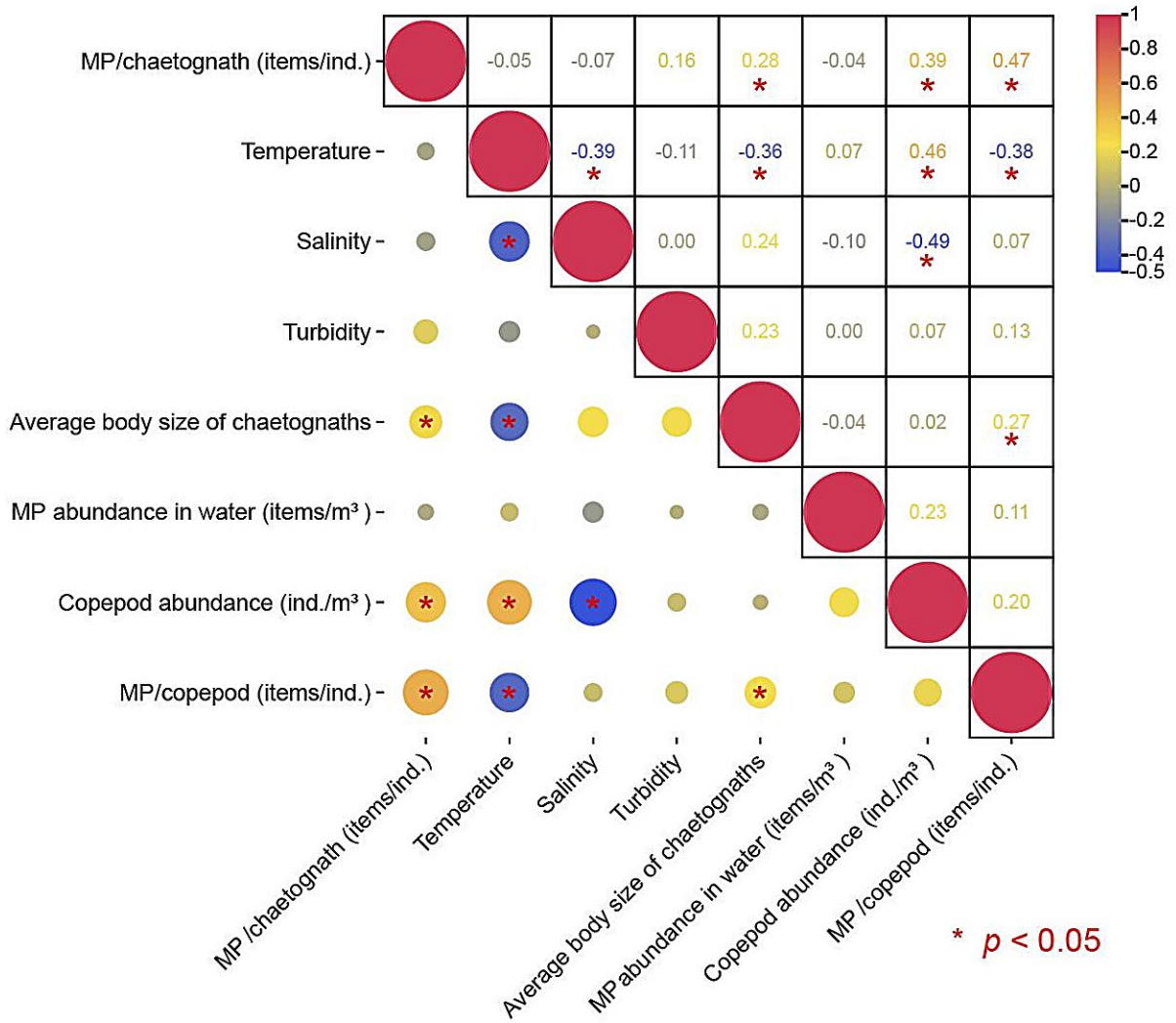
Recently, a research team led by Prof. Sun Xiaoxia from the Jiaozhou Bay Station at the Institute of Oceanology of the Chinese Academy of Sciences (IOCAS) conducted a pioneering study on the seasonal characteristics and risks of [microplastic](#) ingestion by chaetognaths in Jiaozhou Bay based on field observation data.

The study is [published](#) in the *Journal of Hazardous Materials*.

Researchers assessed the impact of copepods on chaetognaths' microplastic ingestion. Copepods are the primary prey of chaetognaths.

Results indicated that there was no [seasonal variation](#) in microplastic ingestion by chaetognaths. The Pollution Load Index (PLI) of microplastics in chaetognaths was relatively low, whereas both the Polymeric Hazard Index (PHI) and Potential Ecological Risk Index (PERI) were relatively high.

This study is among the first to provide field evidence of microplastic transfer along marine planktonic food chains.



Correlation analysis of the number of microplastics in chaetognaths with marine environmental factors, copepod abundance and the number of microplastics in copepods. Credit: Sun Xiaoxia's group

Further comparison between chaetognaths and copepods demonstrated that the number of microplastics in chaetognaths was positively correlated with copepod abundance and the number of microplastics in copepods.

"The microplastics ingested by chaetognaths were found to be highly similar to those in copepods, predominantly fibrous in shape, 101-400 µm in size and polyester in polymer type," said Meng Liujiang, first author of the study and a researcher from Sun's team.

Long-term exposure and ingestion of microplastics by higher trophic level organisms may lead to continuous accumulation of microplastics within their bodies. Calculation of the biomagnification factor showed that chaetognaths have a much higher individual-level accumulation of microplastics in the copepod–chaetognath [food chain](#), suggesting a potential risk of biomagnification.

"Our work provides critical field evidence for the transfer of microplastics through marine planktonic food chains, laying an important foundation for future research on the fate of microplastics in the ocean and their potential ecological risks," said Prof. Sun, the corresponding author.

More information: Liujiang Meng et al, Seasonal microplastic ingestion by carnivorous chaetognaths in Jiaozhou Bay, China: Field evidence revealing microplastic trophic transfer, *Journal of Hazardous Materials* (2024). [DOI: 10.1016/j.jhazmat.2024.135532](https://doi.org/10.1016/j.jhazmat.2024.135532)

Provided by Chinese Academy of Sciences

Citation: Field observations reveal microplastic transfer in marine planktonic food chains (2024, August 28) retrieved 28 August 2024 from <https://phys.org/news/2024-08-field-reveal-microplastic-marine-planktonic.html>

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