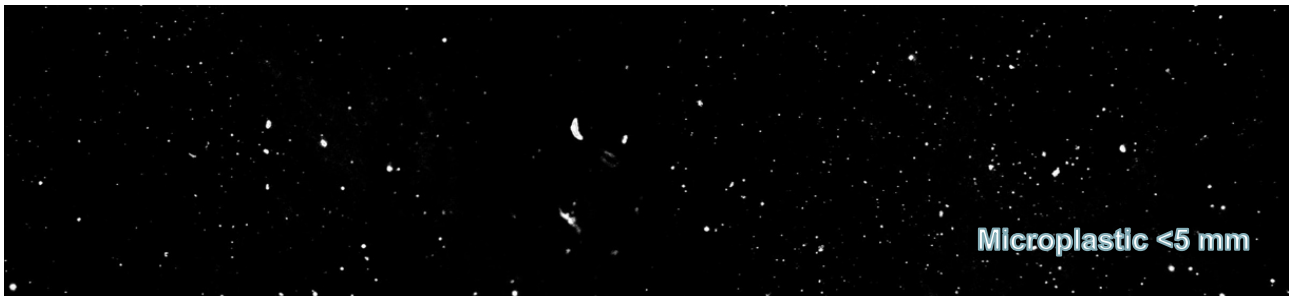
MICROPLASTIC AND HUMAN HEALTH



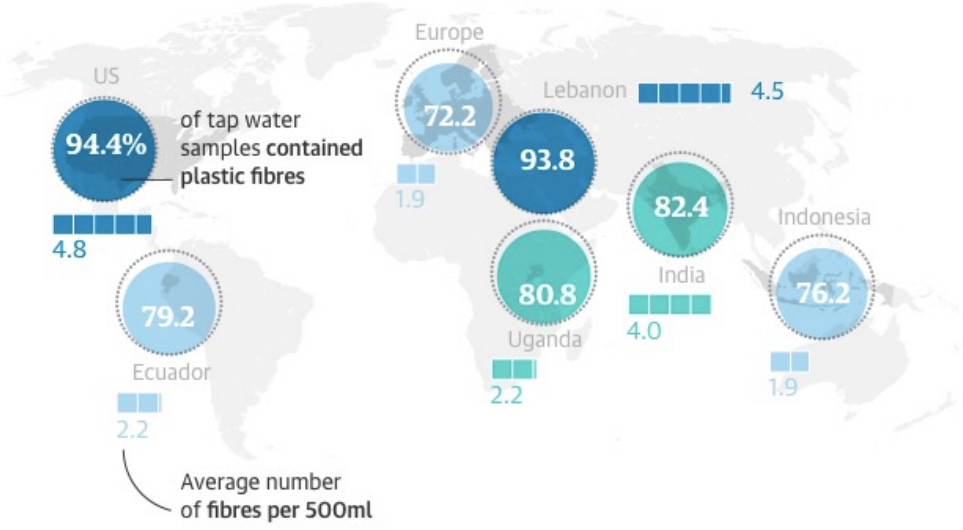
MICROPLASTIC IN BOTTLED WATER

Plastic is widely used in different aspects of our life. As of 2015, experts estimated that people have produced around 6300 metric tons of plastic, among which 79% was neither recycled nor burned (1). For it is hard to decompose in the environment, the plastic accumulates. Considered as where the vast amount of plastic might end up (2), microplastic, a kind of plastic which is less than 5mm in diameter (3), has been receiving more and more attention.

There is no doubt the tiny particles have been widespread across the world. So far, microplastic has been found in different waters from the Great Lakes (5) to the East China Sea (6). Researchers have also found it in most bottled water across the world (7). In Paris (8) and Tehran (9), it has been detected in the atmospheric fallout. In China, it has been also identified in table salt (10). All the results may indicate the worrying fact that microplastic is invading our daily life.

WHY WE SHOULD BE WORRIED

We should be worried about the tiny plastic or else we may repeat the history. Bisphenol A (BPA), a kind of plastic component, is known as the first plastic material believed to be



MICROPLASTIC FOUND IN TAP WATER ACROSS THE WORLD (4)

harmful. It was once found so widespread in the environment that it was detected in most adult Americans' urine. However, after controlled animal tests proved BPA harmful to animals, it was banned in the US several years ago. (11) History shows that people may fail to realize the harm of plastic material before it has spread to all corners of the environment. This is why we should be careful about microplastic.

Anne Marie Mahon, a professional in microplastic pollution research, made a very good answer to why we should still be careful about microplastic, even though we know little about microplastic (4),

"We should follow the precautionary principle and put enough effort into it now, immediately, so we can find out what the real risks are."

HUMAN EXPOSURE TO MICROPLASTIC AND THE POTENTIAL HARM

People are exposed to microplastic and the related potential dangers in various ways.

First of all, microplastic can directly affect functions of organisms. Controlled tests on worms using PVC microplastic have found microplastic undermined worms' functions related to health and biodiversity (12). Humans may also be affected in this way.

MICROPLASTIC FILLED UP A LARVAL PERCH FISH'S STOMACH

Second, microplastic can accumulate hydrophobic organic contaminants and heavy metal like nickel, which is very likely to cause adverse effects on health. Third, some of the toxic additives in microplastic could be released to the environment with time, affecting the biota in its surroundings.

Moreover, it is predicted that the toxins could be biomagnified, which means that the food chain could multiply the concentration of the toxins, making the final predators which are very likely to be humankind, exposed to higher degree of toxicity (3).It is widely reported that microplastic can be ingested by marine animals. Eating the polluted food could expose people to the toxins. (13)

Besides, it was also found that microplastic could serve as a vector to carry diseases (3).

PROBLEMS FACING RESEARCHERS

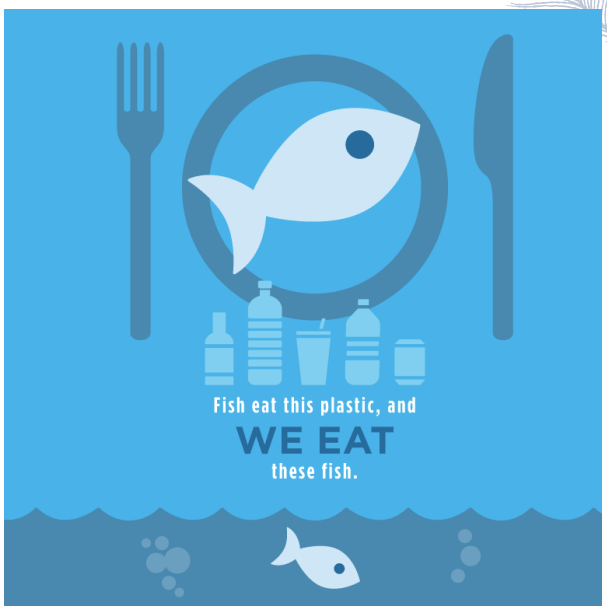
Nevertheless, to further confirm microplastic's harm to humankind, we still need more research.

Although we assume that microplastic and the associated chemicals can be transferred to humans through diets, we have not yet found any direct evidence (13). Although microplastic can carry diseases, no evidence has shown they actually do so in the environment (3). Although smaller plastic named nanoplastic (<1 mm) might be able to reach all organs of human body, no technology has been available to confirm this (14).

Besides, misconduct also troubles research in this field. Last year, a controversial *Science* article, which claimed that fish tended to eat microplastic, was retracted by the authors under investigation of alleged academic misconduct (15).

CONCLUSION

In conclusion, it is undeniable that microplastic is widespread in the environment, but its impact on human health is still not clear now. We should follow a precautious principle and take measures accordingly to avoid the potential risks at our best. So far, a lot of reasonable predictions have been made to show the potential dangers, yet more research is needed for us to better understand the potential harm of the material.



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