Commentary about: Pinto et al., (2022) Influence of UV degradation of bioplastics on the amplification of mercury bioavailability in aquatic environments. Marine Pollution Bulletin 180, 113806 https://doi.org/10.1016/j.marpolbul.2022.113806

Mercury is a contaminant found in many environments. Its affinity to biological materials (such as algae, banana peels, rice husks, walnut shells, from which it is absorbed) is very high.

In this article the authors study mercury uptake by conventional plastic films and a starch-based biodegradable plastic, before and after UV treatment (used to simulate littering in the environment and a possible abiotic degradation step).

The authors accurately characterized the films before and after UV treatment. The conventional film does not seem to be degraded much by UV (most likely due to the presence of anti-UV additives) while the biodegradable film shows a clear degradation. The researchers then measured the absorption of mercury from water (distilled and saline) by the films under study. The conclusion they come to is that both films (conventional and bio) absorb mercury. The biodegradable film absorbs mercury to a greater extent than conventional films. The biodegradable product, especially after UV degradation, shows a mercury absorption level very similar to that shown by algae. Therefore, particles of plastic materials both conventional and biodegradable can give rise to a phenomenon of bio-magnification along the food chain just as algae and other natural products present in water such as organic debris etc. The authors arrive at the conclusion that it is not appropriate to dump bioplastics into the sea: "*As such, although bioplastics present numerous advantages over petroleum-based plastics in most scenarios, their disposal in the marine environment should still be avoided and regulated, as bioplastics can become a potential hazard by concentrating toxic metals and potentially act as a vector for their biomagnification along the food chain*."

These conclusions are inconsequential because the idea of using the sea as a rubbish dumb for biodegradable materials, taking advantage of biodegradability, is totally unacceptable and not proposed by anyone. This applies to any biodegradable material, not just plastics. Nobody approves of a newspaper being littered after reading it "because it is biodegradable". Moreover, even a newspaper (considering the chemical characteristics of cellulose) would behave as a carrier of mercury giving rise to bio-magnification. It is clear that nothing should be littered and that everything should be collected and recovered.

If, on the other hand, the researchers were interested in quantifying the ecological risk in the event of littering, then it would have been necessary to determine not only the absorption capacity but also the residence time in the environment of the various carriers. Persistent particles can perform the function of carrier for longer times and therefore represent a greater environmental risk over particle with shorter lifespan. However, this aspect is not covered by the article, which is a well done characterization study of the absorption properties of different particles. It does not address environmental risk issues. From this point of view, the title of the article is misleading because strictly speaking it does not deal with the "bioavailability of mercury in the environment". It only considers the absorption potential and completely neglects biodegradation and persistence in the environment, a very important parameter in assessing the risk of biomagnification caused by microparticles.