**Potentially toxic plastic particles: Microplastics as a vector of microcystins**

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Water quality is of continuing global environmental concern. A bloom of cyanobacteria is an indicator of poor water quality. These hepatotoxic group of cyanotoxins, called microcystins, is the most common cyanotoxin reported in freshwater bodies. There are over 200 microcystin variants, often detected as a mixture in the environment. Other pollutants, such as microplastics, are also commonly detected in freshwater. There is an emerging concern that microplastics can act as a vector for micropollutants when they co-exist in the same environment.

This study evaluated a mixture of eight microcystin (MC) variants (initial concentration 5 µg mL-1 each) mixed with two sizes (average particle sizes 5-45 µm and 90-140 µm) of polypropylene (PP) and polyethylene terephthalate (PET). Additionally, MC-LR and -LF were also placed individually in contact with the smaller particles of PP or PET to evaluate possible competition between MC variants for the adsorption sites on microplastic particles. The smaller size of PP showed the greatest adsorption potential, adsorbing from 83% (MC-RR) to 100% (MC-LW, -LF) of the MC variants after 48 hours contact. The larger size of PP and both sizes of PET only showed adsorption with the two most hydrophobic variants, MC-LW and MC-LF. In a mixture, lower amounts of either MC-LR or -LF adsorbed on small PET particles compared to when they were individually placed in the solution. MC-LF and -LW appeared to be absorbed preferentially when competing for binding places on microplastics.

The conclusion is that microplastics can act as a vector for microcystins in the aquatic environment, potentially entering the food chain.