Which Packages Leach the Most Microplastics While Brewing Hot Coffee and Tea?

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Microplastics found throughout our environment have caused increased health concerns. Recent research showed that plastic, pyramid-shaped tea bags were a significant source of microplastics. This study investigates which packages leach the most microplastics while brewing hot beverages. The hypothesis was that single-use, plastic disc packaging for brewing hot beverages leach equal amounts of microplastics as plastic, pyramid-shaped teabags, and more microplastics than traditional, paper tea bags and paper coffee filters. The independent variables were three brands each of coffee discs; tea discs; plastic, pyramid tea bags; traditional, paper teabags; and coffee filters. Heated and unheated treatments were included to help understand if heat contributed to leaching. Two heated treatments were included: a ‘usual method’ where packages were used as designed in their usual brewing environments (like a coffee maker or disc brewer), and a ‘consistent heat method’ where packages were placed in glass cups and steeped similarly. This answered whether microplastics were released from the coffee maker or disc brewer versus the packages. A control experiment used filtered water without packaging. The fluids were filtered after brewing, and the filters were examined under a microscope with UV light. Filtered microplastics, which fluoresce in UV light, were photographed and compared using a digital tool that counted fluorescing pixels in photos. The hypothesis was partially accepted and partially rejected. Disc packaging leached significantly more microplastics than all of the other packages. Neither heat method nor brewing method contributed to leaching. The microplastic contamination was from the packaging and not the brewing or heating environment it was exposed to.

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