

A Call for Sustainable Solutions in Qatar: Unveiling Threats from Disposable Paper Cups

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Abstract:

This study evaluated the potential health and environmental risks associated with the widespread use of disposable paper cups in Qatar. Controlled leaching experiments were conducted to measure the release of microplastics and phthalates (PAEs) into liquids when cups were exposed to hot water. Sophisticated analytical techniques, including GC-MS, FTIR, and SEM, were employed to examine the released contaminants. GC-MS analysis identified the concentration and types of PAEs leached from the cups, while FTIR and SEM analyses revealed that the plastic films were primarily composed of polystyrene and polyethylene. The breakdown process was accelerated by increased heat and exposure time, resulting in the release of microplastic particles with average sizes ranging from 75-145 μm in the plastic cover and 64-119 μm in the filter paper. These findings highlight the significant release of harmful contaminants that may pose health and environmental risks. Microplastics and phthalates have been linked to various health issues, including cytotoxic and inflammatory responses. Additionally, the environmental impact of these contaminants is concerning, as they can enter ecosystems and harm aquatic life. The study underscores the urgent need for safer material alternatives and stricter regulations to address the negative impacts of disposable paper cups in Qatar. This research provides valuable insights into the potential health and environmental risks associated with the use of these products and emphasizes the importance of sustainable and environmentally friendly alternatives.

Keywords: Disposable paper cups, Microplastics, Phthalates, Gas Chromatography-Mass Spectrometry, Fourier Transform Infrared Spectroscopy, Scanning Electron Microscopy, Environmental risk