

## A study of microplastics present in edible salts in Sri Lanka

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Microplastics (MP) are defined as plastics with a size less than 5 mm. Plastic debris, the origin of MP, has become a significant environmental pollutant. MP can cause more severe diseases in the respiratory, digestive and circulatory systems. The objective of this study was to investigate the presence of MP in commercially available crystalline and table salt in Sri Lanka. One brand of crystalline salt and six brands of table salt were selected with manufacturing date ranging from 2023 November to 2024 April. Precautionary measures were taken to minimize possible contamination with plastics from external sources. Blank experiments were carried out. A known quantity of salt samples was oxidized using H<sub>2</sub>O<sub>2</sub> to eliminate any organic matter present. MP were isolated by filtering and stained by acid red-1 dye. Color, shape and abundance were studied using a light microscope. Polymer types were identified by ATR-FTIR spectroscopy and Open Specy software. Morphology was studied using Scanning Electron Microscope. All the analyzed salt samples were contaminated with MP with an average concentration of 314 particles/kg. Average concentrations of MP in crystalline and table salt were 222 particles/kg

and 335 particles/kg, respectively. The morphologies determined for isolated MP included fibers (49 %), fragments (17 %), pellets (23 %), and spherical particles (12 %). When considering the color, transparent (199 particles/kg) was the predominant type of MP followed by black, brown, blue, red and green. Nine types of polymers were observed. Polyethylene was the most abundant (23%) polymer. Other polymers found were polypropylene, polyvinyl chloride, polyethylene terephthalate, acrylonitrile, cellulose nitrate, nylon, chlorinated polyethylene and acrylonitrile styrene. The findings underscore the urgent issue of MP contamination in salt, which poses significant health risks and threatens ecosystem conservation. Immediate measures such as sustainable development practices incorporating green chemistry are necessary to mitigate MP contamination, emphasizing that economic growth should not compromise sensitive ecosystems.

### Keywords:

Microplastics; table salt; crystalline salt; polymer; Sri Lanka