

## ABSTRACT

Microplastics are most abundant category of pollutant found in environment and are considered to be an important environmental concern. Laundry wastewater from domestic and industrial washing is a substantial source of microplastics that ultimately discharged into the rivers and to the ocean through drainage systems. The current study aimed to assess the concentration of microplastics in domestic laundry wastewater from Lahore city and environmental risk associated with microplastics. The laundry wastewater samples were collected in twelve households in two sampling periods i.e: a) December to January and b) April to June, to consider the variation in microplastics contents due to variable fabric types influenced by seasons in the study area. The commercial detergents used were also sampled to assess their effects on microplastics contents in wastewater. The concentration of microplastics determined was 130000/kg – 1088400/kg in winter sampling season, while the 132000/kg – 1080400/kg microfibers were recorded in summer sampling season. The most abundant type of microplastics was transparent 93% fibers, followed by 3% sheets, and 2% fragments and less than 1% beads. Microscopic quantification of detergents revealed the presence of microplastics in detergents. Polymer identification was done with the help of Fourier Transform Infrared (FTIR-ATR), the most commonly found microfibers was Cellulose 33% (cotton), polyester 16% (PES), polyethylene 11% (PET), polystyrene 5% (PS), polyphenylene 11% (PP) polyvinyl alcohol 11% polyvinyl alcohol (PVA). Linear regression value 0.6 confirmed significant correlation between concentration of released microplastics and weight of washed clothes. Microplastic polymers from domestic laundry wastewater and detergents are significant risk to environmental matrices. This study identified the contribution of domestic washing in microplastics pollution that needs to be mitigated through technological advancements to control this significant point source of microplastics in environment.