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P5: DETERMINATION OF PHTHALATES IN PURIFIED DRINKING WATER BY SPME-GC/MS

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Endocrine disruptors (EDCs) are exogenous substances or mixtures that can interfere with the normal function of the endocrine system, resulting in potentially adverse health effects in exposed organisms. The European Union has identified more than 400 compounds as potential endocrine disruptors, of which phthalates (PAEs) are among the most widespread. These synthetic organic compounds are mainly used as plasticizers, and because they are not covalently bound to polymers, they can easily migrate into air, water and food, becoming a significant source of human exposure.

Italy is a particularly relevant context, with the highest per capita consumption of bottled water in Europe. However, growing environmental concerns and the need to reduce plastic waste have increasingly pushed consumers to adopt home water purification systems. These devices are now commonly used not only in private homes but also in public facilities. This study aimed to identify and quantify phthalates in drinking water treated with different water purifiers that use reverse osmosis systems.

Five target compounds: Diethyl phthalate (DEP), Diisobutyl phthalate (DiBP), Butyl octyl phthalate (BOP), Dibutyl phthalate (DBP) and bis(2-ethylhexyl) phthalate (DEHP) were identified and quantified in the samples using the solid-phase microextraction gas chromatography-mass spectrometry (SPME-GC/MS) method.

The results showed a significant reduction in total phthalate concentrations in most purified samples compared to untreated inlet water, thus confirming the effectiveness of reverse osmosis systems. Furthermore, the estimated daily intake (DI) values for both adults and young children remained well below the safety thresholds established by the European Food Safety Authority (EFSA).

References

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