

REUSE OF WASTEWATER: CONCERNS ABOUT THE EFFECTS OF MIXTURES OF CHEMICAL SUBSTANCES ON HUMAN HEALTH

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Due to global warming, future practices should be adopted in the use of wastewater in agriculture, industry, and the urban sector. In the European context, the countries of the Southern Mediterranean are those that present the greatest vulnerabilities, and whose costs due to inaction are significant.

The regulation approved on May 13, 2020 by the European Parliament establishes minimum requirements for the reuse of treated urban wastewater, aiming to guarantee an alternative water supply.

Although chemical contaminants may be present in low concentrations in the environment, their effects can be exacerbated by the presence of other chemical substances, acting as chemical mixture. In the specific case of wastewater, studies have reported the presence of biocides, pesticides, dermocosmetic products, including UV filters; pharmaceuticals, detergents, among many others, which constitute a mixture of micropollutants with concentrations ranging between ng/L and µg/L. As individual components, all of these substances' present toxicity to humans. Since there is a gap between the risk assessment of chemical mixtures, an interesting proposal would be the implementation of a combined method of chemical analysis of water and study of potential effects, through *in vitro* exposure to extracts isolated from different wastewaters in culture. Through this study, potential genetic damage, effects on immunomodulation, inflammation and several other biomarkers can be studied at the chemical mixture level.

Even though these practices are not commonly adopted in Portugal and maximum values of chemical substances are determined, the effects of a mixture are expected to exceed the effects of individual substances, through toxicological reactions such as addition, potentiation and synergy. Furthermore, through the phenomenon of globalization, the supply of these foodstuffs in national markets will be a reality, making food a route of exposure to these substances throughout the food chain.