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Microplastics in fruits and vegetable as consequence of sewage sludge uses in agricultural practices. An unmanaged issue

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Abstract

While effects on aquatic systems were demonstrated, there is not much information about the consequences of use of sewage sludge from wastewaters treatment plants in agricultural soils. Especially, very few data are available about microplastics (MPs) contributions from sewage sludge due to their use as fertilizers for agricultural fields and their effects on soil. A systematic review showed that MPs observed in soils treated with sludge samples range by 3,819 particles/gr (p/g) of soil to 30 million p/g after three treatments. Through an innovative methodology (PCT/IB2019/051838 of March 7, 2019, coupled with the accepted Italian patent number 102018000003337 of March 07, 2018) we assessed the content of MPs in common agricultural products including fruits and vegetables. The MP presence in fruits and vegetable have moved into focus. In fact, we found a higher median (IQR) level of MPs in fruit and vegetable samples were 223,000 (52,600 –307,750) in apple and, 97,800 (72,175– 130,500) in carrot, respectively. About the diameter sizes of MP, these ranged by a min of 1.51 µm to a max of 2.52µm for carrot and lettuce, respectively. In this way we have calculated the Estimated Daily Intakes (EDIs) for adults and children by fruit and vegetables consume. Therefore, having already suggested by many Authors a possible risk by MPs ingestion for humans and, above all, for children, we need to further study the absorption and bioaccumulation of this emerging pollutant in various foods of agricultural origin, for a better management of the circular economy it is necessary to support applied research on the presence of MPs in agricultural byproducts, also to protect the health of consumers.

Biography

Ferrante M is Medical Doctor, Specialized in Hygiene and Preventive Medicine. She is Full Professor, the Director of Environmental and Food Hygiene Laboratories near Catania University, Italy, the Director of Hygiene Complex Unit at University Hospital of Catania and the Responsible of the Integrated Cancer Registry of CT-ME-EN in Sicily. She has over 220 publications that have been cited over 4761 times, and her publication H-index is 39 and has been serving as an editorial board member of many indexed Journals. She has many awards among which the Marquis Who's for contribute the field of medicine 2012 and the Merli Award 2019 for the environment.

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