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A Way to Recognize Origin of Soil Conditioners

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Abstract : The meaning of the word 'Nature' (literally 'that which is about to be born') has accompanied researchers throughout their study of the environment and has led to the design of technical means to improve the properties of the soil, modifying its structure and/or consistency, thus favouring the emergence and growth of plants. These include soil improvers, i.e. any substance, natural or synthetic, mineral or organic, capable of modifying and improving the chemical, physical, biological and mechanical properties and characteristics of the soil. In particular, GCSCs (Green Composted Soil Conditioners) are soil conditioners produced through a controlled process of transforming selected organic green waste materials, such as clippings from the maintenance of ornamental greenery, crop residues and other plant waste. The use of GCSC in horticulture, fruit growing, industrial cultivation and nursery gardening is an active way to return organic carbon to the soil, thus limiting CO2 emissions and the production of greenhouse gases, and also to limit the environmental impact of peat extraction, which is normally used in these areas of application. With a view to distinguish between GCSC and peats and to assess what further contributions GCSC can provide to the soil and growing plants, we studied the behaviour of the two substrates by chromatographic techniques. After treating the individual soil improvers with different solvents, used individually or by applying a polarity gradient, the extracts obtained were analysed by HPLC and LCMS in order to assess their composition mainly from a qualitative point of view. Data obtained show in GCSC the presence of polyphenolic derivatives attributable to the degradation of plant material and potentially useful for the development and growth of young plants, while commercial peat-based products only sporadically showed the presence of recognisable molecules, confirming the lower complexity of the matrix under analysis. These results allowed us to distinguish the two different types of soil conditioner based on their chromatographic profiles.

Keywords : chromatographic profile, HPLC, polyphenols, soil conditioners
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