Molecular properties of a fermented manure preparation used as field spray in biodynamic agriculture. - GreenMedInfo Summary

Abstract Title:

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Abstract:

Manure products fermented underground in cow horns and commonly used as field spray (preparation 500) in the biodynamic farming system, were characterized for molecular composition by solid-state nuclear magnetic resonance [(13) C cross-polarization magic-angle-spinning NMR ((13) C-CPMAS-NMR)] spectroscopy and offline tetramethylammonium hydroxide thermochemolysis gas chromatography-mass spectrometry. Both thermochemolysis and NMR spectroscopy revealed a complex molecular structure, with lignin aromatic derivatives, polysaccharides, and alkyl compounds as the predominant components. CPMAS-NMR spectra of biodynamic preparations showed a carbon distribution with an overall low hydrophobic character and significant contribution of lignocellulosic derivatives. The results of thermochemolysis confirmed the characteristic highlighted by NMR spectroscopy, revealing a molecular composition based on alkyl components of plant and microbial origin and the stable incorporation of lignin derivatives. The presence of biolabile components and of undecomposed lignin compounds in the preparation 500 should be accounted to its particularly slow maturation process, as compared to common composting procedures. Our results provide, for the first time, a scientific characterization of an essential product in biodynamic agriculture, and show that biodynamic products appear to be enriched of biolabile components and, therefore, potentially conducive to plant growth stimulation.

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Additional Links

Therapeutic Actions : Biodynamic Farming : CK(1) : AC(1)