



## Effects of municipal solid waste compost and sewage sludge on chemical and spectroscopic properties of humic acids from a sandy Haplic Podzol and a clay loam Calcic Vertisol in Portugal

Filipe Pedra <sup>a,\*</sup>, César Plaza <sup>b</sup>, José M. Fernández <sup>b</sup>, Juan C. García-Gil <sup>b</sup>, Alfredo Polo <sup>b</sup>

<sup>a</sup> *Laboratório Químico Agrícola Rebelo da Silva, Apartado 3226, 1301-903 Lisbon, Portugal*

<sup>b</sup> *Centro de Ciencias Medioambientales, Consejo Superior de Investigaciones Científicas, Serrano 115 dpdo., 28006 Madrid, Spain*

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### Abstract

The effects of amendment with municipal solid waste compost (MSWC) and anaerobically digested sewage sludge (SS) on the compositional and structural features of soil humic acids (HAs) were investigated. For this purpose, HAs were isolated from MSWC, SS, and two different Portuguese soils, a sandy Haplic Podzol and a clay loam Calcic Vertisol, which were either unamended or amended with MSWC or SS at a rate of 60 t ha<sup>-1</sup>. The isolated HAs were analyzed for elemental and acidic functional group composition, and by ultraviolet/visible, Fourier transform infrared (FT IR), and fluorescence spectroscopies. The application of MSWC and especially SS to soils determined an increase of C, N, H, and S contents and  $E_4/E_6$  ratios (i.e., ratios of absorbances at 465 and 665 nm), and a decrease of O, COOH, and phenolic OH contents and C/N, C/H, and O/C ratios of soil HAs. The FT IR and fluorescence results showed that the organic amendments, especially SS, caused an increase of the aliphatic character and a decrease of the degrees of aromatic polycondensation, polymerization, and humification of amended soil HAs. Both MSWC and SS affected more markedly the clayey soil HAs than the sandy soil HAs, possibly due to less extended mineralization processes and the protective action of clay minerals on amended soil HAs. © 2007 Elsevier Ltd. All rights reserved.

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\* Corresponding author. Tel.: +351 21 3617740; fax: +351 21 3636460.  
E-mail address: [filipepedra@netcabo.pt](mailto:filipepedra@netcabo.pt) (F. Pedra).