

Supplementary Table 1. The relative intensity of the main band and associated functional groups of infrared spectra of the extract of humic substances (EHS) ¹.

Wave number, cm ⁻¹	Functional groups
3500-3250	OH extension of alcoholic and phenolic-OH, small contributions of NH ₂ , -CO-NH, S-H, and P-H
3000-2800	CH ₃ and -CH ₂ aliphatic groups (symmetric and asymmetric extension of -OH groups)
1800-1600	C=O extension in lactones and NH ₂ in amides - contribution of nitrates (R-O-NO ₂), nitrites [R-O-NO)
1569	Pyridine derivatives - an extension of double rings
1408	CH ₂ and CH ₃ in aliphatic compounds, the vibration of bending CH ₂ , asymmetric deformation of CH ₃
1210	C-O and OH of COOH, C-O of aryl-ethers and phenols
1118	C-O-C in aliphatic ethers, asymmetric extension
1025	Si-O-Si - asymmetric extension, C-O in polysaccharides and S=O in alkyl sulfoxides
848	Trisubstituted benzene, deformation of CH out of the plane, balancing of Si-CH ₃
774	Multisubstituted benzene, C-Cl extension

¹ All spectra were collected in a range of 4000-400 cm⁻¹, with a resolution of 4 cm⁻¹, using 32 scans per sample