Decomposition of 14C-labeled lignins, model humic acid polymers, and fungal melanins in allophanic soils

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During 1 yr, CO2-C losses from 7 agricultural soils containing 0.5-1.5% organic C ranged from 70 to 243 mg 100 g - 1 while losses from three allophanic soils containing 4.9-8.9% organic C varied from 92 to 191 mg. Losses as 14CO2 from ring-labeled model and cornstalk lignins averaged about 30% from the agricultural soils compared to about 11% for the allophanic soils. Losses of 2-side chain lignin carbons were about the same as for the ring carbons. Carbon losses from 1-side chain and methoxyl C varied from 42 to 59% in the normal soils while losses from the allophanic soils were a third to a half these values. From 6 to 9% of protein, cysteine, lysine, and glucosamine carbons linked into model humic acid polymers were lost during 1 yr in the allophanic soils compared with 13-24% from the normal soils. Comparable losses from two fungal melanins were 7-15% for the normal soils and 2-4% for the allophanic soils.