What is litter quality and how does it influence decomposition. (S03-preston161253-Oral)

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Abstract:

The litter quality attributes that influence decomposition still elude precise definition, partly because of the short duration of many studies, and the limited chemical information in traditional parameters such as C/N ratio and fractions from proximate analysis. We examine results from field studies in British Columbia, the Canadian Intersite Decomposition study with 11 litter types across Canada, a German study with four litter types, and a laboratory incubation of forest floor from boreal forest sites in Quebec. Some general trends are that initial high decomposition rates decline in long-term studies, and the acid-insoluble residue, commonly called Klason lignin, includes structures from tannins, and cutin or suberin. Solid-state C-13 CPMAS NMR generally shows a decrease in O-alkyl C and increase in alkyl C, rather than selective accumulation of lignin. Quantitative MAS NMR shows that, due to molecular mobility, alkyl C is often underestimated, especially in the early stages. C-13 isotope abundances and tannin analysis also reveal limitations of lignin-based models and the need for chemically meaningful information and a variety of field approaches.

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