B-58: Effect of heavy metals contaminated sewage sludge on growth of fungi in forest soils

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Sewage sludge when added to land, improved nutrient concentrations in addition to other improvements (e.g. physical and biological properties) of soils.

To assess the effect of heavy metals in sewage sludge on the soil fungi, *Penicillium notatum* and *Aspergillus flavus* were isolated from the soil and spore suspensions prepared. The solution of sewage sludge:soil mixture 1:6.9 corresponded to high rate of sewage sludge (1,000 kg N ha^{-1}) and 1:13.8 corresponded to low rate of sewage sludge application (500 kg N ha^{-1}) to the forest soils. Only soil solution and only water were also considered as 2 treatments. A set of solutions were sterilized using an autoclave while another set was used as non-sterile solutions. Then sterilized and non-sterilized solutions were introduced to wells made in the centre of spore suspension in the agar plates of both fungi spore suspensions.

Solutions of individual metals coresponding to the concentrations of sewage sludge (Cd, 3, Cu 25, Mn 50 Pb and Zn 60 μg/ml) and as cocktail mixture of above metal solutions were applied to the spore suspensions also as non sterile and sterile solutions.

The inhibition areas (diameter) of the germination of agar spore suspension) of *Penicillium notatus* and *Aspergillus flavus* in the non sterile solutions of all treatments were not shown. The significant ($P < 0.001$) diameter of the germination of *Penicillium notatus* was 1 and 3 cm with autoclaved sludge : soil mixture of low and high rates respectively. These diameters were 2 and 4 cm in autoclaved sludge : soil mixture of low and high rates respectively in *Aspergillus flavus* agar plates. Spore germination of *Penicillium notatus* and *Aspergillus flavus* was not affected by individual metal solutions and the cocktail combination. The greater fungitoxicity of the autoclaved sludge : soil extracts may have been due to an increased mobilization of fungitoxic substances in the extracts as a result of steam sterilization. The low concentrations of heavy metals present in sewage sludge/soil extracts did not cause inhibitory effects on the spore germination of *Penicillium notatum* and *Aspergillus flavus*.