Growth of streptomycetes in soil and their impact on bioremediation.

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Abstract

The impact of the extremely heavy metal resistant actinomycete Streptomyces mirabilis P16B-1 on heavy metal mobilization/stabilization, phytoremediation and stress level of plants was analyzed in the presence and absence of Sorghum bicolor in sterile microcosms containing highly metal contaminated or control soil. For control, a metal sensitive S. lividans TK24 was used. The metal contents with respect to the mobile and specifically adsorbed fractions of the contaminated soil were considerably decreased by addition of both, living and dead biomass of the strains, with the heavy metal resistant S. mirabilis P16B-1 showing considerably higher impact. Both strains could grow in control soil, while only S. mirabilis P16B-1 formed new tip growth in the metal contaminated soil. A plant growth promoting effect was visible for S. mirabilis P16B-1 in contaminated soil enhancing the dry weight of inoculated Sorghum plants. Thus, metal resistant strains like S. mirabilis P16B-1 are able to enhance phytoremediation of heavy metal contaminated soils.

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