

عنوان مقاله:

Root establishment of maize (*Zea mays* L.) in an autoclaved petroleum-contaminated soil

محل انتشار:

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خلاصه مقاله:

Sterilized soil is often used as a control to distinguish between biotic and abiotic reactions and in petroleum-contaminated soils it is used to verify bioremediation experiments. In the present study we performed a laboratory and a greenhouse experiment to evaluate the effect of steam sterilization, e.g. autoclaving, on some of the chemical properties of a petroleum-contaminated soil as well the effects on shoot and root growth of maize (*Zea mays* L.). The results showed that the autoclaving significantly decreased pH and increased the amounts of electrical conductivity and available phosphorus in both contaminated and uncontaminated soils. Almost all poly-cyclic aromatic hydrocarbons (PAHs) in contaminated soil were strongly increased by autoclaving. The total concentration of PAHs increased around 250% as affected by sterilization treatment, while the content of total petroleum hydrocarbon (TPH) remained constant. Growing parameters of maize such as root and shoot biomass, shoot height, total root length, number of root tips and root depth were strongly decreased in the contaminated soil. Furthermore sterilization of uncontaminated soil had a positive effect on shoot biomass, while it was slightly negative for the contaminated soil. Therefore it is important to consider both the changes of soil properties and petroleum compounds and effects of these alterations on the plant growth when studying autoclaving sterilized soils.

کلمات کلیدی:

PAHs, autoclaving, petroleum contaminated soil, rhizotron, sterilization

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