

Plant-microbe interactions in the rhizosphere of exotic thermophilic plants

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Temperature is expected to increase due to climate change, especially at higher latitudes. Therefore, thermophilic (warmth-loving) plant species are expected to extend their ranges from southern Europe towards the pole. Some such thermophilic exotic plants might become more abundant and even invasive in their new range, especially when they are released from natural enemies. Quite recently, the release from soil pathogens has been named as explanation for the invasion of exotic plants. However, an increased efficiency in nutrient acquisition might be another explanation for the increased abundance of exotic plants. In this study we examined how exotic thermophilic plant species acquire nutrients for growth and biomass production in comparison to their north-western European native congeneric plants. A greenhouse study was conducted comparing the effects of exotic thermophilic plants and native congeneric plants on soil processes related to nitrogen and phosphorus cycling. We observed that exotic plants altered nitrogen cycling, but that the direction of this alteration was different among congeneric plant couples. On the other hand exotic plants inhibited phosphorus cycle less than the native congeneric plants. We propose that the effects of exotic thermophilic plants on soil microbial communities in their new range depend on the plant species investigated. Altered nutrient cycling may play a role in enhanced plant performance, but certainly not in all cases.