**Biogeosciences
Discussions**

Interactive comment on "Characterization on the rhizoremediation of petroleum contaminated soil as affected by different influencing factors" *by* J. Tang et al.

Anonymous Referee #1

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General comments Rhizoremediation of organic pollutants such as petroleum and PAHs in soil is of great interests and importance for soil remediation. In general, rhizoremediation is a very complex process because it can be affected by both plant growth and microbial community change. Until now, the mechanism of the rhizoremediatio is still not clear enough. However, as one of remediation techniques, it is widely applied for soil reclamation such as in Super Fund site in USA. This paper characterized several important influencing factors during rhizoremediation of petroleum hydrocarbons, which is meaningful and might be connected directly with the field remediation process. Due to little information on how different factors influence rhizoremediation process, the main results of this paper is useful for improvement of understanding in

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this research area and are publishable. However, the study design should be introduced in detail and mechanism of the rhizoremediation should be further discussed.

Specific comments

1. Page 5, please give detailed introduction on experimental design and analysis method. For example, P5, line 16-17, please detail the management of plant growth.

2. The effect of different plant species is determined by not only the plant species, but also the growth condition of the plant. The results of different plant species should be compared to literature research to determine the ability of different plant on degrading TPH.

3. Many fertilizers can be used during bioremediation process. Why the author choose urea to check the effect of fertilizer on the remediation process. How about soil P content on the plant growth and rhizoremediation process?

4. P11, line22-24. "TPH concentration was the major determinant of total bacterial abundance and had positive effects on abundances of hydrocarbon degraders (Nie et al., 2009)." Is this sentence means that higher TPH content resulted in higher bacteria and thus higher degradation rate? Please clarify it. In my opinion, at low concentration of THP, the addition of petroleum can stimulate the microbial growth. However, at high TPH concentration the microbial number will decrease with higher THP concentration as the toxicity of TPH on bacteria.

5. Why the authors choose cotton to study the effect of EMA and PGPR on the rhizoremediation but not ryegrass or tall fescue? In DGGE analysis result, the bands should be marked in Fig 5a and change of different bands during rhizoremediation process should be analyzed.

6. In Fig 6, it seemed that the effect of EMA and phytoremediation on TPH degradation is not so clear at initial period before 30d, please explain the reason.

Technical corrections

1. Table 1, there is 2 "Total N", one should be changed to "Total P" 2. P5, line19, 50 g/m2 should be changed to 30 g/m2? 3. P12, line3, delete "that" 4. Table 1, please give a foot note to "-"

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