

## 水分状况与供氮水平对土壤可溶性氮素形态变化的影响

1浙江大学环境资源学院, 教育部环境修复与生态健康重点实验室, 浙江杭州 310029; 2浙江大学环境资源学院, 浙江省亚热带土壤与植物营养重点实验室, 浙江杭州 310029

## Effects of water condition and nitrogen level on soil dissolved nitrogen compounds

1 Ministry of Education Key Lab of Environment Remediation and Ecological Health/College of Environmental and Natural Resources Science, Zhejiang University, Hangzhou 310029, China; 2 Zhejiang Key Laboratory of Subtropical Soil Science and Plant Nutrition/College of Environmental and Natural Resources Science, Zhejiang University, Hangzhou 310029, China

[摘要](#)[参考文献](#)[相关文章](#)Download: [PDF \(1011KB\)](#) [HTML 1KB](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

**摘要** 采用通气培养试验, 研究比较了两种水稻土在不同水分和供氮水平下的矿质氮(TMN)和可溶性有机氮(SON)的变化特征。结果表明, 加氮处理及淹水培养均显著提高青紫泥的 $\text{NH}_4^+\text{-N}$ 含量; 除加氮处理淹水培养第7 d外, 潮土 $\text{NH}_4^+\text{-N}$ 含量并未因加氮处理或淹水培养而明显升高。无论加氮与否, 控水处理显著提高两种土壤的 $\text{NO}_3^-\text{-N}$ 含量, 其中潮土始见于培养第7 d, 青紫泥则始于培养后21 d; 加氮处理可显著提高淹水培养潮土 $\text{NO}_3^-\text{-N}$ 含量, 却未能提高淹水培养青紫泥 $\text{NO}_3^-\text{-N}$ 含量。两种土壤的SON含量从开始培养即逐步升高, 至培养2135 d达高峰期, 随后急剧下降并回落至基础土样的水平; SON含量高峰期, 潮土SON/TSN最高达80%以上, 青紫泥也达60%。综上所述, 潮土不仅在控水条件下具有很强硝化作用, 在淹水条件下的硝化作用也不容忽视, 因此氮肥在潮土中以硝态氮的形式流失的风险比青紫泥更值得关注; 在SON含量高峰期, 两种土壤的可溶性有机氮的流失风险也应以重视。

**关键词:** 水分状况 供氮水平 土壤矿质氮 土壤可溶性有机氮 硝态氮 铵态氮

**Abstract:** A ventilated incubation experiment was conducted to investigate the dynamic trends of the soil  $\text{NH}_4^+\text{-N}$ ,  $\text{NO}_3^-\text{-N}$  and soluble organic nitrogen(SON) contents under different water conditions and nitrogen levels in two paddy soils, Alluvial soil and Purplish clayey soil. During incubating period, the content of  $\text{NH}_4^+\text{-N}$  in the Purplish clayey soil is significantly higher under the water logged incubation than that under the water controlled incubation, whether nitrogen fertilizer is added or not. However, the content of  $\text{NH}_4^+\text{-N}$  in the Alluvial soil is not obviously enhanced under the water logged incubation or nitrogen fertilization, except for being distinctly elevated at the 7th day of the water logged incubation with nitrogen fertilizer addition. The  $\text{NO}_3^-\text{-N}$  contents of the two soils are significantly increased under the water controlled incubation with or without nitrogen fertilization. Whereas, aforesaid phenomena exhibits during whole incubation period in the alluvial soil but starts from the 21st day of incubation in the Purplish clayey soil. The  $\text{NO}_3^-\text{-N}$  content is significantly increased in the Alluvial soil with nitrogen fertilization under both the water controlled condition and water logged condition. While, the  $\text{NO}_3^-\text{-N}$  content of the Purplish clayey soil with nitrogen addition is not noticeably increased under the water logged condition. The contents of SON in the two soils are gradually increased and reach the highest level during the period of 21th day to 35th day of incubation, and then are rapidly declined to their original levels. On the peak period, the ratio of SON to TSN can reach to 80% in the Alluvial soil and 60% in the Purplish clayey soil, respectively. These results indicate that the nitrification activity in the Alluvial soil is very strong not only under the water controlled condition but also under the water logged condition. It is, therefore, important to pay much more attention to the  $\text{NO}_3^-\text{-N}$  leaching loss in the Alluvial soil, and the risk of soluble organic nitrogen losses in the two paddy soils during its peak period could not be neglected either.

**Keywords:** water condition nitrogen level soil mineral nitrogen soluble organic nitrogen  $\text{NH}_4^+\text{-N}$   $\text{NO}_3^-\text{-N}$

Received 2009-08-19; published 2009-11-27

Fund: 国家重点基础研究发展计划项目(编号: 2007CB109305)资助

## 引用本文:

李亚娟1, 杨俞娟2, 张友润2, 滕一波1, 方萍1\*, 林咸永2. 水分状况与供氮水平对土壤可溶性氮素形态变化的影响[J] 植物营养与肥料学报, 2010, V16(5): 1153-1160

LI Ya-Juan-1, YANG Yu-Juan-2, ZHANG You-Run-2, TENG Yi-Bo-1, FANG Ping-1\*, L IN Xian-Yong-2. Effects of water condition and nitrogen level on soil dissolved nitrogen compounds[J] Acta Metallurgica Sinica, 2010, V16(5): 1153-1160

## Service

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [Email Alert](#)
- ▶ [RSS](#)

## 作者相关文章

- ▶ [李亚娟1](#)
- ▶ [杨俞娟2](#)
- ▶ [张友润2](#)
- ▶ [滕一波1](#)
- ▶ [方萍1\\*](#)
- ▶ [林咸永2](#)