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长期有机无机肥配合施用土壤中添加不同肥料养分后土壤微生物短期变化

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Short-Term Effects of Addition of Different Nutrient Elements on Soil Microbe in Soil Under Long-Term Combined Application of Organic Manure and Inorganic Fertilizer

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摘要 为了阐明改变肥料养分投入后土壤微生物特性的短期变化，采集长期定位有机无机肥配施的红壤水稻土，通过室内培育试验，观测添加不同肥料养分后土壤微生物生物量碳及BIOLOG群落功能多样性的变化。结果表明，长期有机无机肥配施土壤中添加无机肥料养分短期内 (185 d)降低了 15%～22%的微生物生物量碳含量; 55.6%的微生物群落平均光密度；添加有机肥料养分短期内提高了8%～42%的微生物生物量碳含量和992% 微生物群落平均光密度；而不添加肥料养分短期内提高了501%的微生物群落平均光密度，降低了微生物群落均一性，但对微生物生物量碳含量影响不大。此外，添加不同肥料养分均改变了土壤微生物群落碳源代谢模式。长期配施有机无机肥土壤中添加不同肥料养分后土壤微生物生态特征发生明显变化，其差异体现在微生物生物量碳与微生物碳源利用特性的变化上。

关键词： 添加不同肥料养分 微生物生物量碳 微生物碳源利用特性

Abstract： To illustrate the short-term changes in soil microbe alteration of fertilizer nutrient input might bring about,samples of red paddy soil were collected from a paddy field under long-term combined application of organic manure and inorganic fertilizer.They were used in an indoor incubation experiment to observe effects of addition of different nutrient elements on soil microbial biomass carbon and functional diversity of BIOLOG communities.Results show that addition of inorganic nutrients lowered microbial biomass carbon by 15%-22% within a short period of time (185 days) and average well color development(D_{av})by 55.6%,while addition of organic nutrients raised microbial biomass carbon by 8%-42% and D_{av} by 992%.In Z(no addition of nutrients)D_{av} was increased by 501% within a short period of time,and evenness of microbial community was somewhat lowered,but microbial biomass carbon was not much affected.Besides,addition of different nutrient elements also altered the carbon metabolism pattern of the soil microbial community.Amendment of different nutrient elements into the soil under long-term combined application of organic manure and chemical fertilizer changed significantly ecological features of the soil microbe,which may be embodied in changes in microbial biomass carbon and microbial carbon utilization pattern.

Keywords： addition of different nutrient element soil microbial biomass carbon microbial carbon utilization pattern

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