

Variation of Soil Microbial Biomass and Enzyme Activities at Different Growth Stages of Rice (*Oryza sativa*) [PDF]

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摘要: A pot experiment was conducted under submerged conditions with hybrid rice Zhenong 7 to study the variation in the soil microbial biomass carbon (Cmic), soil microbial biomass nitrogen (Nmic), soil respiration rate, soil microbial metabolic quotient, soil enzyme activities, chlorophyll content, proline content and peroxidase activity (POD) in rice leaf at different growth stages. The soil Cmic, Nmic and soil respiration rate significantly increased at the early stage and then declined during rice growth, but ascended slightly at maturity. However, soil metabolic quotient declined at all the stages. Soil urease activity increased at first and then decreased, while acid phosphatase and dehydrogenase activities descended before ascended and then descended again. Soil urease activity and acid phosphatase activity showed a peak value at the tillering stage about 30 days after rice transplanting, but the peak value of dehydrogenase activity emerged at about 50 days after rice transplanting and the three soil enzymatic activities were significantly different at the different developmental stages. As rice growing, chlorophyll content in rice leaf descended at the early stage then ascended and a peak value appeared at about the 70th after rice transplanting, after that declined drastically, while POD activity increased gradually, but proline content declined gradually. There was a slight relation between rice physiological indices and soil biochemical indices, which indicated that soil biochemical characteristics were affected significantly by rice growth in the interaction system of the rice, soil and microorganisms.

关键词: rice; soil microbial biomass; soil metabolic quotient; soil enzyme activity; chlorophyll; proline; *Rice Science*. 2005, 12(4): 283-288

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