
INITIAL STUDY ON THE RELEASE OF WATER – SOLUBLE PHOSPHORUS FROM FOREST SOILS UNDER THE EFFECTS OF DRYING - REWETTING CYCLE IN LABORATORY CONDITIONS

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SUMMARY

Drying-rewetting cycles (D/W) occur more frequently in topsoils and release water-soluble phosphorus. The study was conducted to determine the effects of prolonged drought and rewetting on the release of water-soluble phosphorus from forest soils. Samples were collected at a depth of 0 - 20 cm in Acacia mangium forest soil (forest plantation) and the natural forest soil at PuMat National Park. DW samples were experienced drying period at 7 days, 14 days (water holding capacity about from 2 to 5%), while the controls (dc) were kept permanently at 50% water holding capacity. Soil samples were collected at a depth of 0 - 20 cm of the Acacia mangium forest soil and the natural forest soil at Pu Mat National Park. The soil samples were subjected to a dry drought of 7 days, 14 days (relative humidity in the soil of 2 to 5%) (DW), while control soil samples were kept at 50% water holding capacity during the experiment. In the beginning, after 7 days, 14 days of drying period following rewetting, water-soluble phosphorus was extracted from soils in water. The net release of total water-soluble phosphorus was largest from plantation forest soil at 7 days after drying following rewetting, about 0.86 mgkg⁻¹; smallest from natural forest soil at 14 days after drying following rewetting, about 0.36 mgkg⁻¹. The net release of total water-soluble phosphorus from natural forest fluctuated from 0.6 to 0.7 mgkg⁻¹. The net release of the water-soluble phosphorus decreased with time of duration period following rewetting in plantation forest soil. Water-soluble organic phosphorus was the main part of total water-soluble phosphorus releasing from forest soil after drying rewetting cycle (more than 80%). There was no significant difference in response to DW between samples from forest plantation and natural forest. Our results suggest that DW release water - soluble phosphorus contributing in the source of the soluble nutrient.

Keywords: Drying - rewetting, forest plantation, natural forest, total water soluble phosphorus, water soluble organic phosphorus.

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