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CHARACTERIZATION OF NON- EXCHANGEABLE AMMONIUM NITROGEN IN RICE GROWING SOILS OF SRI LANKA

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Ammonium nitrogen (NH_4^+-N) trapped in interlayer spaces of clay minerals frequently termed as non-exchangeable or fixed NH_4^+-N form of soil nitrogen. Amount of fixed or non-exchangeable NH_4^+-N varies from soil to soil and depends on soil type, clay content and other soil environmental conditions. Quantification of non-exchangeable form of nitrogen in our soils has not been done adequately. Therefore, the objectives of the present study are,1). To characterize non-exchangeable NH_4^+-N in rice growing soils and 11).To Examine release and fixation pattern of nitrogen in soil under rice cultivation in green house Condition.

Thirteen soils were collected from different agriculturally important areas of Sri Lanka. Rice plants (BG-300) were established in pots filled with soils and maintained in flooded conditions in greenhouse. Recommended fertilizers were applied except nitrogen. Soil sampling was done before and after the rice establishment. All soil samples were analyzed for non-exchangeable NH_4^+-N using method described by Silva and Brenner (1966).

Results showed that fixed or non-exchangeable NH_4^+-N in studied soils varied from 12 to 28% of total nitrogen. The average amount of fixed nitrogen in our soils is around 20%. The amount of non-exchangeable NH_4^+-N was highly correlated with the clay contents of the soils. Therefore, it can be deduced that the amount of non-exchangeable NH_4^+-N in a given soils depends on the clay content. Release and fixation of non-exchangeable NH_4^+-N during the rice growing period were also monitored. No significant difference of the amounts of non-exchangeable NH_4^+-N extracted before and after rice cultivation was observed. This relatively unchanged pattern of non-exchangeable NH_4^+-N during the growing period could be attributed to the experimental conditions such as short time period of experiment and no nitrogen fertilizer practice.