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The fate of nitrogen compounds and heavy metals in studied semi-closed organic paddy fields

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ABSTRACT

Agricultural development, cultivation management, and the application of fertilizer have affected the environment to such extent that organic farming has become an adopted trend to reduce the negative impact of all these factors. For a paddy field system, implemented activities in cultivation management are the essential factors that build up man-made materials such as nitrogen compounds and heavy metals. In this paper, we studied a non-polluted, low population density farming area, which is located within a semi-closed like valley where dry/wet deposition is the only natural source of nitrogen compounds and heavy metals. However this source can be ignored if it is compared to an applied organic fertilizer used in farming activities at the studied site. Cultivation management and field sampling in three organic paddy fields were conducted to investigate the outcome of organic farming. During the three-year study, concentrations of nitrogen compounds and heavy metals in the paddy fields, after a certain stage of cultivation, were reported. Seasonal soil and water samples were taken from the studied site to compare the trends of nitrogen compounds and heavy metals in both organic and conventional farming. The results indicated a higher ammonium nitrogen transfer rate by using an organic fertilizer, and the detected heavy metals in the soil were matched with the constituents of the applied fertilizer.

Keywords: Organic rice farming; Fertilizer; Nitrogen compounds; Heavy metals

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