

Thesis Title Determination of Carbaryl in Treated Vegetables by High
Performance Liquid Chromatography

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M.S. Environmental Risk Assessment for Tropical Ecosystems

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Abstract

Determination of carbaryl in vegetables in this study was carried out using a high performance liquid chromatographic (HPLC) method. Prior to HPLC analysis, 40 g of each vegetable sample were sonicated for 2 minutes in 100 ml of methanol in order to remove the pesticide. A 5 ml aliquot was combined with 245 ml water and passed through a disposable solid phase extraction cartridge, packed with 1g of C₁₈-bonded silica (40 µm. particle size), which selectively retained slightly non polar compounds. The reversed phase HPLC separation was accomplished with µBondapak C₁₈ column and 50% (v/v) acetonitrile-water as the eluent. Detection was performed at 220 nm. The detection limit and the lower limit of determination were found to be 0.8 ppb and 1.4 ppb, respectively. The detector linearity range was found to be in the range from 0.8 ng to 2.4 µg of carbaryl injected. Average recoveries for 2 kinds of the analysed vegetables were 93.6% with coefficient of variation of 1.8% at 1 µg/g concentration and 84.2% with coefficient of variation of 2.5% at 5 µg/g concentration.

The amounts of carbaryl found on different day intervals were found to have varied with time. No carbaryl was detected on the day before spraying and 25 days after spraying while the average highest amount of carbaryl found amounting to 35.0 mg/kg was taken from vegetables collected on the day directly after spraying. Compared to the maximum residue limit values imposed in Germany and Thailand as 3.0 mg/kg and 10.0 mg/kg, respectively, the highest amount of carbaryl found in this study was a rather high figure. However, in terms of the WHO acceptable daily

intake value in a hypothetical situation, the consumers of these carbaryl-treated vegetables would face no potential health risk if the crops were harvested 12 days or more after spraying and proper pre-treatment of the crops was taken before eating.



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