

**DETERMINATION OF PESTICIDE RESIDUE ANALYSIS IN
WATER COLLECTED FROM THE KALPITIYA AREA
USING LC (MS/MS)**



By

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Project Report
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2025

ABSTRACT

Contaminated water resources by pesticides represent a severe issue affecting agricultural regions, especially the Kalpitiya area, which practices intensive crop farming. The analysis uses liquid chromatography – Tandem Mass Spectrometry (LC-MS/MS) to study pesticide contamination present in water samples obtained from the Sri Lankan agricultural Hub of Kalpitiya. The investigation included 20 water samples taken from various locations of Kalpitiya from Tube wells alongside different water points and surface water bodies obtained from Kandakkuliya, Mampuri, and Norochcholle to determine Acephate, Pymetrozine, Thiamethoxam, Carbendazim, and Imidacloprid levels, which were compared to the Maximum Residue Limit of 10 ppb. The analysis compared testing results were compared with the maximum residue limit established as 10 ppb as an International Regulation Body. Most water samples carried pesticide contaminants below the Maximum Residue Level, except in these isolated situations. A test sample of Acephate reached 2.824 ppb as its peak concentration, but other pesticides showed much lower levels. The pesticide Carbendazim exhibited the maximum average level of 0.181 ppb in comparison to the lowest concentration recorded from Pymetrozine, which was 0.051 ppb. According to the one-way ANOVA results, the differences in pesticide levels between areas were not significant during statistical comparison (p -values > 0.05) for all pesticides. The assessed pesticide concentrations in Kalpitiya water systems remain under the permissible level allowing agricultural irrigation. This research verifies that water sources in Kalpitiya meet safety regulations because pesticides remain at trace levels. Periodic water quality inspections need to be performed to find water contamination risks before water quality can be protected.

Keywords: Pesticide Residue, Pesticide Contamination, Permissible level, International Regulation Bodies, Agricultural Irrigation, Surface water pollution, Environmental Monitoring. Water safety Regulation

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