Development of dispersive liquid-liquid microextraction procedure for trace determination of pesticide malathion in urine samples

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7HKUDQ 8QLYHUVLW\ RI 0HGLFDO 6FLHQFHV ,UDQ

Background: Measurement of pesticides in biological matrices is a serious challenge for researches because of their very lo concentration in di erent matrices. e aim of this study was to develop a new sample preparation method with high accuracy, validity, simplicity as well as a short retention time for chromatographic determination of the pesticide malathion.

Methods: Dispersive liquid-liquid micro-extraction (DLLME) technique coupled with high performance liquid chromatography equipped with ultra violet detector (HPLC-UV) was developed for trace extraction and determination of pesticide malathion in human urine samples. One variable at a time (OVAT) method was used to optimize parameters a ecting the malathion extraction. Di erent parameters such as extraction solvent, disperser solvent, volume of the extraction solvent, volume of the disperser solvent, centrifugation time and speed salt addition, and sample pH were studied and optimized.

Results: Under the optimized conditions, the limit of detection and enrichment factor of the developed procedure were 0.5 µgL^{-1} and 200, respectively. e calibration curve was linear in the concentration range of 2-250 µgL^{-1}. e relative standard deviation for six replicate experiments at 200 µgL^{-1} concentration was less than 3%. e relative recoveries of spiked urine samples were 96.3%, 101.7% and 97.3% at three di erent concentration levels of 50, 200, and 1000 µgL^{-1}, respectively.

Conclusion: According to the obtained results, DLLME procedure was successfully developed for the extraction of malathion from human urine samples. Compared to other extraction techniques, the proposed procedure had some advantages such a shorter extraction time, better reproducibility, and higher enrichment factor.

Recent Publications

1. Khadem M, Faridbod F, Norouzi P, Rahimi Foroushani A, Ganjali MR, Shahtaheri SJ, Yarahmadi R (2017).Modi cation of carbon paste electrode basec on molecularly imprinted polymer for electrochemical determination of diazinon in biological and environmental samples, Electro analysis, Vol. 29, 708-715.
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3. 3. Harati B, Shahtaheri SJ, Karimi A, Azam K (2017). Evaluation of health risk assessment of occupational exposure to chemical pollutant in an automobile manufacturing industry, Journal of Health and Safety at Work, Vol. 7, No. 2, 121-131.
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