

Monitoring of Insecticide Levels in Sediment Cores from Lake Abaya using Solvent Extraction and GC/MS

Thorsten Schmeck¹ and Bernd W. Wenclawiak²

1 Siegen University, Department of Chemistry – Biology, Analytical Chemistry, Adolf Reichwein Str., 57068 Siegen, Germany, ThorstenSchmeck@gmx.de

2 Siegen University, Department of Chemistry – Biology, Analytical Chemistry, Adolf Reichwein Str., 57068 Siegen, Germany, wenclawiak@chemie.uni.siegen.de

The application of large amounts of organochlorine insecticides, pyrethroids and malathion are known in the Lake Abaya watershed. The region is also known as a malaria area and it therefore is common to spray in-house areas with large amounts of technical DDT (approx. 2 g m⁻² every 6 months).

The aim of this study was to determine the amount of insecticides stored at different depths in the sediment of Lake Abaya. Sediment cores were sampled from river estuaries and the lake centre. In order to facilitate the monitoring of many samples a simple, timesaving analysis method that does not require too many preparation steps was developed. The aim was to achieve good recoveries of the employed analytes and to minimize the amount of organic matter co-extracted from the sediment by appropriate choice of extraction method and solvent. Ultrasonic extraction, Soxhlet extraction and pressurized solvent extraction (PSE) using Hexane, Dichloromethane, Ethylacetate/Methyl-tert-butylether (1/3, v/v) and Hexane/Acetone (1/1, v/v) as solvents have been compared. Additionally, cleanup methods like solid phase extraction (SPE) were checked for their effectiveness.

Method validation data as well as results from sample measurements are presented.