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ABSTRACT

The aims of this study were to evaluate the elimination of oxytetracycline, chlortetracycline, sulfadiazine and sulfamethoxazole from soil, and to investigate the influence of pH and the rainfall on elimination of the antibiotics. To detect antibiotic concentrations, leachate samples were collected from soil columns. The antibiotics were extracted by solid phase extraction and analysed by high performance liquid chromatography system. To determine elimination half-life of the antibiotics from soil and relationship between measured parameters, first-order kinetics and statistical analyses were applied to all collected data. Half-life of sulfadiazine and sulfamethoxazole in leachate waters 19 days after treatment was 0.24 hour and this was increased up to 2.25 hours sulfamethoxazole and 3.57 hours sulfadiazine 33 days after treatment. A half-life for tetracyclines was not detected, since there was not consistent trend for the transport of tetracyclines between soil and water compartments. The results of regression analyses showed that the concentrations of antibiotics in the same group changed at the same rate. The pH of leachate samples was positively influenced by increases in rainfall and days after treatment. A significant relationship was not found between the antibiotic concentrations and both pH and rainfall.