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## Agricultural and Food Science - abstract



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Sources of acidity and metals in a stream draining acid sulphate soil, till and peat, western Finland, revealed by a hydrochemical and sulphur isotope study

Keywords acid sulphate soil, alkali metals, alkaline earth metals, sulphur, ditching, sulphur isotopes, land use, catchment area,

### Abstract

The main aim of this study was to determine, during extreme hydrological conditions, the source(s) of acids, sulphate and metals (alkali and alkaline earths) in the Munsala stream (western Finland) draining mainly acid sulphate soil, peat and till. Samples were collected at 6 sites along the main stem on 3 high-flow and 3 low-flow events, and were analysed for the required chemical and isotopic variables. The acid sulphate soils (located under farmland) had a large impact on the stream as indicated by pH values occasionally down to 4.0, moderately to strongly increased concentrations of inorganic solutes, and a high acid SO<sub>4</sub><sup>2-</sup> load characterised by negative δ<sup>34</sup>S(sulphate) values. In addition, the forested areas underlain mainly with till and peat released low SO<sub>4</sub><sup>2-</sup> but low pH waters (down to at least 4.6) during high flows, indicating the importance of humic acids in controlling the pH. These humic acids flocculated abundantly in the middle/ lower reaches as a result of interaction with acid sulphate water. Therefore, not only the farmland acid sulphate soils but also the organic-rich soils/horizons in the forested areas contribute to water-quality deterioration.

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