

# Schwertmannite in acid sulfate subsoils and associated groundwater geochemistry

L.A. SULLIVAN<sup>1</sup>, Y. CABOT<sup>2</sup>, R.T. BUSH<sup>1</sup> AND E.D. BURTON<sup>1</sup>

<sup>1</sup> Centre for Acid Sulfate Soil Research, Southern Cross University, Australia; [leigh.sullivan@scu.edu.au](mailto:leigh.sullivan@scu.edu.au)

<sup>2</sup> Richmond River County Council, Lismore, Australia;

Schwertmannite [ $\text{Fe}_8\text{O}_8(\text{OH})_6\text{SO}_4$ ] has recently been found to be the dominant mineral of iron precipitate accumulations from surface environments surrounding waterways (e.g. the sides of drains, and soil surface horizons) in acid sulfate soil landscapes in eastern Australia [1]. In this study the yellowish-brown, orange-brown, and reddish-brown coatings on macropores (such as channels and planar pores) in 21 subsoil layers all located within severely-acidified acid sulfate soil landscapes in eastern Australia, were isolated and examined by both XRD and SEM-EDS to determine if schwertmannite was present.

Schwertmannite was detected in these coatings in 14 of these 21 subsoil layers. This finding that schwertmannite is common in the acid sulfate subsoils within severely-acidified acid sulfate soil landscapes has implications for the behavior of these soil materials and in particular the properties of groundwater in these soil layers.

The results presented here indicates that the presence of macropore coatings of schwertmannite in the acid sulfate subsoil layers within these landscapes is likely to exert a strong influence on the geochemistry of groundwaters within severely-acidified acid sulfate soil landscapes.

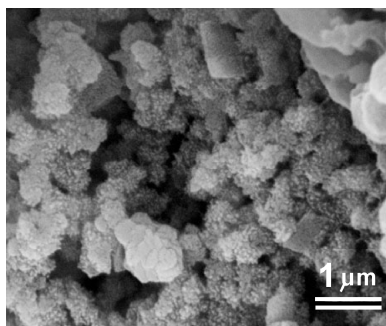


Figure 1. SEM image of schwertmannite with a fibrous spheroidal morphology coating a macropore in the 45 – 60 cm depth soil layer at the Edwards Creek site.

## References

- [1] Sullivan, L.A., Bush, R.T. (2004). *Marine Freshwater Res.* **55**, 727-736.