

## **Geobotanical Prospecting around the Navan Zn-Pb Deposit, Ireland: Developing geochemical vectors for mineral exploration**

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Recent studies have shown great potential for using plants in mineral exploration, for example grass root geochemistry, which led to a discovery of a new Australian metallogenic province [1]. In this research, the trace-element geochemistry of native and common plant species in Ireland such as ash, beech, blackberry, hawthorn, oak, poplar and sycamore was systematically determined above the Navan Zn-Pb deposit (Ireland), currently mined by Boliden Tara Mines Limited. The study area represents a sub-outcropping carbonate-hosted base-metal ore body characterised by a large shallow soil Zn-Pb anomaly. The new results show that Zn contents in leaf materials across all species vary from 18 ppm to 700 ppm (dry weight). The highest concentrations of Zn are observed in poplar trees growing above subcropping mineralization. Levels of Pb and Cd are anomalously high in all investigated tree species grown in soil with metal anomalies, compared to the background values from control sites. In this study, focus was also placed on hawthorn and oak as a representative plant species used for spatial and temporal vectoring. Using trace-element analysis, anomalies can be detected, but uncertainties remain concerning their sources. In order to better understand anomaly source several models of Cu and Zn isotope data will illustrate the typical ranges of metal stable isotopes one might expect in diverse geological, and botanical setting. This orientation study will lead to a better understanding of biogeochemical metal cycling in natural systems and for development of geobotanical tools for Zn-Pb exploration.

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[1] Collerson, K.D. et al. (2015), Grassroots exploration under cover. The AusIMM Bulletin, online article (source: <https://tinyurl.com/k9n7j7q>)