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Identification of DNA markers associated with cadmium accumulation in oat

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Cadmium is a risk factor in cereal crops due to its high toxicity and accumulation in the body, particularly to liver and kidneys, with associated osteoporosis and cancer. Crop plants uptake Cd from soil as a trace of fertilizers. Oat (*Avena sativa* L.) is widely used in baby foods and also adult consumption is increasing due to reduction of the risk of heart disease caused by β-glucan. The Cd level in plants is directly correlated with that in the soil, but is also affected by genetic factors. Mapping population was made between oat cultivars Aslak (low Cd accumulator) and Salo (high Cd accumulator). Cadmium accumulation of their F_2 progeny (150 individuals) was analysed from the grain yield of the Cd feeding pot test. DNA markers associated with Cd accumulation were searched by bulked segregant analysis. As a result, four DNA markers associated with Cd uptake were identified. In future, we intend to identify candidate genes for Cd accumulation by using bioinformatics, genetics, and genomics tools. Our practical goal is to produce molecular markers tightly linked to the gene to enable the marker-assisted selection of low-accumulating cultivars in breeding programmes for healthy oat cultivars.