# Phylogenetic relationships within and among Brassica species from RAPD loci associated with blackleg resistance

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## Abstract

The genus Brassica comprises economically important oilseed and vegetable crops. Their susceptibility to fungal diseases such as blackleg causes yield loss. In this study, thirty accessions from USDA germplasm collection representing two diploid Brassica species (Brassica rapa and Brassica oleracea var. virids) and fifteen tetraploid cultivars (Brassica napus) from the national winter canola variety trials (NWCVT) were evaluated using 13 sets of random amplified polymorphic DNA (RAPD) associated with blackleg resistance in Brassica nigra. 126 highly polymorphic bands with an average of 10 per primer were detected. A UPGMA dendrogram showed B. rapa as highly diverse and was supported from three different basal branches, while B. napus accessions were generally monophyletic. Similarly, all of B. oleraceae accessions were supported from the same basal node. Generally, the three species were reciprocally paraphyletic, suggesting that the RAPD markers showed both functional relationships as well as homology, possibly due to selection at the RAPD loci associated with blackleg resistance. Consequently, two potentially susceptible B. napus accessions were identified. The high polymorphic information content (PIC) and number of phylogenetically informative bands established RAPD as a useful tool for phylogenetic reconstruction, quantification of genetic diversity for conservation, cultivar classification and molecular breeding in Brassica.