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Association of AFLP and SCAR markers with common leafspot resistance in autotetraploid alfalfa (*Medicago sativa*)

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ABSTRACT. To identify amplified fragment length polymorphism (AFLP) markers associated with resistance or susceptibility of alfalfa to common leafspot (CLS) caused by the fungus *Pseudopeziza medicaginis* (Dermateaceae), bulked segregant analysis was conducted based on an $F_{1(M \times M)}$ population of 93 plants and a BC_1S population of 91 plants. Three AFLP markers, $ACTCAA_{R206}$, $TAGCAC_{R185}$, and $GGACTA_{S264}$, were found to be associated with CLS resistance or susceptibility. All three markers were found at significantly different frequencies (71.9, 80.3 and 91.8%) compared to resistant or susceptible plants in the original population. Subsequently, these three AFLP markers were converted into three SCAR markers, $ACTCAA_{R136}$, $TAGCAC_{R128}$ and $GGACTA_{S254}$, which are easier to employ in breeding programs. The three SCAR markers were used in a randomly selected population with 50% resistance; the probability of finding one resistant plant was increased to 67.3, 66.7 and 90.0% with markers $ACTCAA_{R136}$, $TAGCAC_{R128}$ and $GGACTA_{S254}$, independently. If two of the SCAR markers were used simultaneously, the probability would be higher

than 89%. The three SCAR markers identified in this study would be applicable for selection for CLS resistance in alfalfa breeding programs. Moreover, the genetic analysis indicated that CLS resistance in alfalfa is conferred by a single dominant gene.

Key words: Alfalfa; Common leafspot; Resistance; AFLP; SCAR

