PA-78

Effect of *Solidago altissima* L. Extract on Forage Crop Germination

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[Abstract]
There are 28 families and 166 species of exotic weeds on agricultural land and among these, 23 families and 80 species of exotic weeds occur on pastures. Among them, the *Solidago altissima* is a perennial weed belonging to the asteraceae family and it is an exotic weed that spreads to the surrounding area using methods such as high seed production, vegetative propagation using underground rhizomes and allelochemical. Accordingly, in 2009, the Ministry of Environment designated it as an ecosystem-disrupting species. This study was conducted to obtain basic data about the effects of *S.altissima* derived allelochemicals on forage crops. The root of *S.altissima* was separated, dried in the shade and then pulverized to prepare an root powder. Powder was repeatedly extracted with methanol for 3 days and concentrated under reduced pressure to obtain an root methanol extract. Dissolve the extract in distilled water, dispense it in a separate-funnel and proceed with liquid-liquid extraction by adding equal amounts of n-haxane (Hex), chloroform ($CHCl_3$), ethyl acetate (EtoAC), and butanol (BuOH) in order of increasing polarity. A seed-bioassay was performed using fractions for each solvent, followed by separation and purification by silica gel column chromatography. As a result of the fraction germination test for each solvent, the IC_{50} values using the fresh weight of each fraction were 898.3 mg L^{-1}, 676.3 mg L^{-1}, 1160 mg L^{-1} and 1360 mg L^{-1}. CA, CB, and CC fractions were obtained through primary silica gel column chromatography that used $CHCl_3$ fraction. As a result of seed-bioassay using each fraction, the IC_{50} values for the fresh weight of each fraction was 537.3 mg L^{-1}, 1280 mg L^{-1} and 1947 mg L^{-1}. Based on this, 5 fractions were obtained as a result of secondary silica gel column chromatography using the CA fraction. A seed-bioassay was performed, as a result, the lowest IC_{50} value was calculated as 226.7 mg L^{-1} in the CAE fraction. Based on this, the fraction was analyzed by GC-MS. The results of this study can be used as basic research data on the effects of weeds on forage crops and allelochemicals secreted from *S.altissima.*

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