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SIGNIFICANT EFFECT OF ARBUSCULAR MYCORRHIZAL FUNGI INOCULATION ON MONOTERPENES BIOSYNTHESIS IN RED CLOVER

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ABSTRACT: Red Clover (*Trifolium pratense* L.) is a legume with important economic value in seed industry and animal production. This short-lived perennial species is one of the most important legume crops in Chile used primarily in short-rotation pastures, grazing and cutting. However, *T. pratense* yields decline quickly after two years, because several factors including root rot and infestation by the root borer *Hylastinus obscurus* (Marsham) (Coleoptera: Curculionidae). This curculionid is the most important insect pest attacking this foraging crop. Both larvae and adults feed into the roots when they construct galleries causing a significant reduction in levels of production and persistence of red clover. Arbuscular mycorrhizal fungi (AMF), are symbiotic organisms found on 80% of vascular plants, these biotic factors modify the primary and secondary metabolism being able to improve the bioproduction of secondary metabolites. Currently, the role of semiochemical in the interaction between *H. obscurus* and red clover plants has been widely studied for our group. Previously, (*S*)-limonene identified from the aerial part elicit a repellent effect from this curculionid. With the purpose of producing new cultivar with the ability of releasing more amount of this repellent, the study of their biosynthesis in red clover result a key step, besides the effect of biotic factors on this enzymatic production. We evaluated the enzymatic production of monoterpenes in Superqueli-INIA cultivar supplemented with two commercial AMF inoculums and using geranyl pyrophosphate (GPP) as precursor. The enzymatic monoterpene production was recorded by head-space-gas chromatograph. Our results showed the presence of β-pinene, myrcene, (*S*)-limonene, linalool, (-)-isopiperitenone, perillyl alcohol among others. (*S*)-Limonene production in enzymatic extracts was significantly increased in plants inoculated with AMF, suggesting a significant role of AMF in red clover secondary metabolism.