

Interaction between water soluble and volatile compounds of *Cistus ladanifer* L.

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Summary. Phytotoxic activity of single and combined application of water soluble and volatile compounds of *Cistus ladanifer* on germination and early root growth of subterranean clover was investigated. Total germination, lag and speed of germination were both inhibited and stimulated, with the activity of volatiles on total germination depending upon the presence of water solubles. Antagonism between water solubles and volatiles was always found, resulting in a reduction of inhibition or a shift from inhibition to stimulation. It is suggested that the simultaneous presence of water solubles and volatiles might result in changes of the chemical nature of metabolites released by *C. ladanifer*. Early root growth was always inhibited but only by water solubles, and no interaction was found. The ecological implications of these results are discussed in terms of the exhaustion of competitors seedbanks by a two-step process in which germination is less inhibited or even stimulated by water solubles and volatiles, followed by a stronger and volatiles-independent inhibition of early root growth.

Key words. Allelopathy – antagonism – *Cistus ladanifer* – germination – root growth – synergism – *Trifolium subterraneum*

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