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EVALUATION IN SOIL OF THE ACTIVITY OF PROMISING WEEDICIDE SOURCES

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ABSTRACT

In a previous screening of a number of Mediterranean shrubs and trees *Cistus ladanifer* and *Lavandula stoechas* were selected as promising weedicide sources. As a second step, water extracts of fresh leaves of the selected species were again evaluated, but now in soil, for their activity on germination and early growth of *Triticum aestivum* and *Phalaris minor*. Shoot length, number of leaves, shoot and root biomass were examined. In general, both donors reduced the growth of the receiver species, and stimulated the germination of the crop. Unlike before, *C. ladanifer* also stimulated the germination of the weed and in some cases increased the relative advantage of the weed. With *L. stoechas* whenever the same characteristic was reduced, *P. minor* was always more reduced than *T. aestivum*. In addition, *L. stoechas* always decreased the relative advantage of the weed. Therefore, *L. stoechas* may continue to be viewed as a promising source of weedicides while *C. ladanifer* should be abandoned.

INTRODUCTION

Allelochemicals with inhibitory specificity for weeds may present a number of advantages over current synthetic herbicides by direct use as weedicides or as models for more active and safer agrochemicals (Rizvi *et al.* 1992; Zimdhal 1993).

Because of the need of alternative weed control practices if actual trends of agricultural policy are to be continued, a systematic screening for weedicide activity of secondary compounds was initiated, and 19 species of common and ecologically or economically relevant shrubs and trees of Southern Portugal were chosen as potential weedicide sources. Receivers previously selected for laboratory studies were *Triticum aestivum* L., the most important crop in the predominant dryland agriculture of Southern Portugal, *Phalaris minor* L. for its importance as a weed in wheat cropping areas and *Lactuca sativa* L. for its known sensitivity to exogenous growth regulators (Mayer and Poljakoff-Mayber 1975). The rationale and details of these studies can be found elsewhere (Dias *et al.* 1995).

To be retained as a promising weedicide source, a species should inhibit the germination of the weed without inhibiting the crop. According to these criteria *C. ladanifer* and *L. stoechas* were the most promising weedicide sources, because they reduced the germination of *P. minor* by more than 90% without reducing the germination of the crop.

However promising these results might appear, further research in more natural conditions had to be carried on, before a decision could be made on the interest of detailed chemical study of extracts. Therefore, the activity in soil of water extracts of fresh leaves of *C. ladanifer* and *L. stoechas* on wheat and *P. minor* was investigated, in order to assess their weedicide potential in soil. Extract

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