



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA



S.I.Pa.V.  
Società Italiana di  
Patologia Vegetale



FACOLTÀ DI AGRARIA  
ALMA MATER STUDIORUM  
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# **XVII CONVEGNO NAZIONALE SIPAV**

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#### **S4-10 USE OF PLANT-DERIVED COMPOUNDS TO INHIBIT CAUSAL AGENTS OF BEAN ANTHRACNOSE AND CHICKPEA ASCOCHYTA BLIGHT**

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*Colletotrichum lindemuthianum* (Sacc. & Magnus) Lams.-Scrib. and *Ascochyta rabiei* (Pass.) Labr. are the causal agents of anthracnose of common bean (*Phaseolus vulgaris* L.) and leaf blight of chickpea (*Cicer arietinum* L.), respectively. Management of these seed-borne pathogens requires an integrated approach, which often includes the use of certified disease-free seed, fungicide seed treatments, cultivar resistance and timely application of foliar fungicides. Protectants that provide a barrier against pathogens propagules could be useful since foliar fungicide applications are not cost effective when disease severity is low and are incompatible with organic farming protocols. Moreover, bean and chickpea resistance against these pathogens is very erratic. In this work, we have tested several phytochemicals, such as essential oils, vegetable colorants, raw saponins and meals from *Brassica carinata* containing glucosinolates, for *in-vitro* antifungal activity against *C. lindemuthianum* and *A. rabiei*. Results indicate that hyssop and oregano-derived essential oils inhibit the two pathogens at 1% vol. of concentration. Moreover, oils distilled from basil, caraway, sage and thyme, block mycelial growth of *C. lindemuthianum*, while essential oils from lemon balm and verbena block mycelial growth of *A. rabiei*. No effects were observed with rosemary and marjoram oils. Among over thirteen plant-extracted colorants tested, only chestnut cortex colorant show partially inhibition of the radial growth of these fungi. In plate assays, *Solanum chilense* (Dunal) Reiche and *Aster sedifolius* L. tissue-meals, containing raw saponins, exhibited no fungitoxic effect. Finally, volatic compounds released by *B. carinata* L. seed-meals were effective in *in-vitro* control of both pathogens.

#### **S4-11 CONTROL OF EARLY BLIGHT OF CARROT CAUSED BY ALTERNARIA DAUCI AND A. RADICINA USING PHYTOCHEMICALS**

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*Alternaria dauci* (J.G. Kühn) J.W. Groves & Skolko and *Alternaria radicina* Meier, Drechsler & E.D. Eddy, are related pathogens causing severe blights on leaves, petioles and stems of carrot (*Daucus carota* Blotter). *A. radicina* can cause a further distinctive black rot symptom, consisting in damping-off and rotting of roots, crowns and seedlings of carrots that become unmarketable. Control of these pathogens was currently entrusted to chemical fungicides, but the preference of the consumers for safe agricultural products has stimulated the research of sustainable alternatives. The goal of this present study was to investigate *in-vitro* antifungal activity of plant-derived compounds against *Alternaria* diseases agents of carrot. *In-vitro* assays indicate that *A. radicina* was more sensible to essential oils and raw saponins than *A. dauci*. In fact, a large spectra of plant essential oils were able to suppress black rot agent (hyssop, oregano, basil, caraway, sage, marjoram and lemon balm) whereas *A. dauci* was inhibited only by oregano and thyme oils. No effects were observed with rosemary and verbena oils in both cases. In agree, *A. radicina* showed increased sensitivity by treatments with saponins enriched tissue-meals derived from *Solanum chilense* (Dunal) Reiche and *Aster sedifolius* L., and by treatments with *Brassica carinata* L. seed-meal containing glucosynolates.