



**Research Doctorate (Ph.D.) in Chemical Sciences**  
**32<sup>nd</sup> Cycle – Academic Year 2016/2017**

**Tutor:**

Antonio Evidente

**Project Information**

**1 - Title**

Isolation and chemical and biological characterization of phytotoxins produced by phytopathogenic fungi of agrarian crops

**2 - Key words**

Crop diseases, Phytopathogenic fungi, Phytotoxins, Structure-Activity, Biopesticides.

**3 - Abstract**

Phytotoxic metabolites produced by *Ascochyta* and *Colletotrichum* spp. causal agents of serious diseases of important crops as legumes and cereals, will be isolated to understand their roles in the development of disease symptoms and to evaluate their potential practical application in agriculture. The metabolites structure will be determined by spectroscopic methods (1D and 2D 1H and 13C NMR, HR ESIMS), while the relative and absolute configuration will be assigned by X-ray diffractometric analyses, spectroscopic and chiroptical methods (ECD, VCD, ORD) combined with computational analysis. Bioassays will be carried out on host and non host plants and microorganisms. Derivatives of the selected phytotoxins will be hemisynthesized to carry out structure-activity correlation and mode of action studies. Phytotoxins will be used in sensitivity assays to select plant genotypes resistant to the pathogens and to evaluate their antagonistic activity against other phytopathogen agents.