



NATURAL AGROCHEMICALS FROM FUNGAL CULTURES

G.L. Gallardo¹, M.A. Rodriguez², A. Godeas², G.M. Cabrera¹

1 - Universidad de Buenos Aires, departamento de quimica organica, Buenos Aires, Argentina

2 - Universidad de Buenos Aires, Departamento de Biodiversidad y ecologia experimental, Buenos Aires, Argentina

Most of the commercially available agrochemicals used at present are of synthetic origin; they are very toxic compounds which introduce a risk to the human health from direct exposure, consumption or long-term ecological effects. In the other way the products from natural sources, like fungi, are always biodegradable and have more specific modes of action.

Developed nations turned their efforts in the development of fungal biological control agents (BCAs), but for these products the identity and, most importantly, the potential hazard of the active principle or their co-products are not always known.

This project involves the search for novel, non hazardous, bioactive fungal natural products with potential use as agrochemicals.

The biological activity of different fungal strains, isolated from pollen, soil or marine sediments, against phytopathogenic bacteria and fungi was evaluated. The active strains were cultured in 4-15 L batches and the active components were isolated by chromatographic methods and identified by means of spectroscopic (1D, 2DNMR and MS) and chemical methods.

Previously we presented the results from *Alternaria raphani* and *Alternaria brassicicola*, which produced tetramic acids with important activity against *Paenibacillus larvae*, a pathogenic bacterium to the larvae and pupae of honey bees. Another strain isolated from pollen, *Trichoderma koningii*, yielded a pirazine derivative with important antimicrobial activity against *P. larvae* and the phytopathogenic fungi, *Fusarium virguliforme* and *Botrytis cynerea*.

Amides of D-allo- and L-isoleucine derivatives were isolated from the organic extract of the culture media of a marine strain, *Acremonium furcatum*. These compounds showed moderate antimicrobial activity against clinical bacteria.

A culture media from an endophytic fungus isolated from soil, showed a highly oxygenated cyclohexanoid compound with powerful activity against different strains of phytopathogenic fungi, *Fusarium virguliforme*, *Fusarium lateritium* and *Macrophomina phaseolina*.

It is worthwhile to mention that also the production of the bioactive compounds is environmentally friendly, since it can be produced in an aqueous medium, with no toxic ingredients in the culture media. This fact is an advantage over the current synthesis of most of the used agrochemicals.