

## LA RICERCA FARMACOGNOSTICA: FERRUCCIO POLI

### A) INFORMAZIONI PERSONALI

NOME	<i>Ferruccio</i>	E-mail	<i>ferruccio.poli@unibo.it</i>
COGNOME	<i>Poli</i>		
POSIZIONE	<i>Prof. Ordinario</i>		

### B) AFFILIAZIONE

ISTITUZIONE	<i>Dipartimento di Biologia Evoluzionistica Sperimentale</i>	Web: <a href="http://www.dipartimentobiologia.it/research/ruferrucciopoli.asp">http://www.dipartimentobiologia.it/research/ruferrucciopoli.asp</a>
LABORATORIO	<i>Pharmaceutical botany and plant stress physiology</i>	Web: <a href="http://">http://</a>
INDIRIZZO	<i>Via Irnerio,42</i>	
TELEFONO	<i>051 2091317</i>	
FAX	<i>051 242576</i>	

### C) COMPONENTI DEL GRUPPO DI RICERCA

#### Team leader

1	<i>Ferruccio</i>	<i>Poli</i>
---	------------------	-------------

#### Others

2	<i>Stefania</i>	<i>Biondi</i>
3	<i>Fabiana</i>	<i>Antognoni</i>
3	<i>Paolo</i>	<i>Scartezzini</i>
4	<i>Pascal</i>	<i>Nadembega</i>

### D) LINEE DI RICERCA

#### 1. Ethnobotanical studies on traditional medicinal plants.

Ethnopharmacological investigations represent one of the main sources of new plants of interest for pharmaceuticals and food. The prolonged use by local populations of a certain plant, either for medicinal purposes or food, suggests that it may contain bioactive molecules, without being toxic to humans. Such investigations require the identification of plant populations living in floristically diversified regions. Our research is focused on geographical areas where it is well known that there is a strong biodiversity, including several endemisms, namely the Mediterranean area (in particular Sardinia, Italy), India, and the Amazon forest (Ecuador).

The research of our group deals with ethnopharmacological investigations carried out, using innovative qualitative and quantitative methods, in different areas having diverse ethnical, social and economical features. It is based on the acquisition of information regarding the use of plants for medicinal purposes by local populations, and on the assessment of the traditional knowledge of these plants.

This research is performed through the following steps:

- identification of the correct nomenclature (local name, e.g., traditional Sanskrit name vs Latin name);
- identification of the plant and of the drug;
- direct collection of wild plants or seeds;
- histological analyses to check for possible adulteration;
- phytochemical analyses (HPLC, GC-MS, NMR) aimed at identifying titration markers;
- evaluation of biological activities, such as in vitro antioxidant tests (DPPH, ABTS,  $\beta$ -carotene bleaching test, cytochrome C test, FRAP), antibacterial and antifungal assays, etc..

## 2. Production of bioactive compounds by plants and in vitro cell cultures.

This research area deals with the analysis of bioactive compounds produced by medicinal and food plants previously screened by ethnopharmacological studies. Research activities focus on the separation of secondary metabolites after bioassay-oriented fractionation of extracts obtained from different plants. The bioassays utilized are principally in vitro antioxidant, antibacterial and antifungal tests.

Research is also aimed at the establishment of in vitro cultures from plants producing pharmacologically or toxicologically interesting compounds in order to study their metabolic pathways. Recent work has dealt with the production of alkaloids, flavonoids, and tocopherols from in vitro cultures of *Hyoscyamus muticus*, *Passiflora quadrangularis* and *Amaranthus caudatus*, respectively. In order to enhance the production of these compounds, elicitation of cultures by abiotic factors (e.g., UV light and jasmonates) is performed.

## E) TECNOLOGIE

- identification of the plants and of the drugs;
- histological analyses to check for possible adulteration of plants and drugs;
- phytochemical analyses (HPLC, GC-MS, NMR) aimed at identifying titration markers;
- evaluation of biological activities, such as in vitro antioxidant tests (DPPH, ABTS,  $\beta$ -carotene bleaching test, cytochrome C test, FRAP), antibacterial and antifungal assays, etc..
- *In vitro* plants cell cultures;
- elicitation of cultures by abiotic factors (e.g., UV light and jasmonates) .