UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Molecole Bioattive Naturali

2223-1-F0601Q110-F0601Q114M

Aims

The current course provides both theoretical and practical basic knowledge of the main techniques used to obtain biologically active substances from various plant and food sources (leaves, fruits, seeds, etc.) collected in the field during the previous laboratory's activities. At the end of the course, the students will acquire knowledge about the main green extraction techniques (conventional and non-conventional) and isolation strategies to obtain biologically active phytoextracts of nutraceutical interest. The student will be able to evaluate the environmental impact of the developed process and choose the most appropriate strategy relating to the classes of molecules occurring in the matrices in order to avoid degradation phenomena and increase the yield of the process.

Contents

The current laboratory is focused on the extraction and purification of the bioactive components from plant matrices sampled in different ecosystems, in order to develop analytical protocols to obtain phytocomplexes with potential applications in nutraceutical and food industry.

Detailed program

This part of the "One Health Laboratory" will lead the student to understand the resources that can be found in biodiversity both in terms of bioactive metabolites capable of promoting wellness and preventing diseases and in terms of direct mitigation effects (biodiversity to reduce pollution, temperatures, for psychophysical well-being). However, risk factors such as anti-nutrients, natural and process chemical pollutants, which can negatively affect human health, will also be analyzed.
From a technical point of view, the laboratory practice will provide students with the theoretical and practical knowledge to:

1. To apply the main extraction techniques declined from a green perspective (maceration, decoction, sonication, extraction with pressurized liquids, extraction with supercritical fluids)
2. To develop analytical strategies for pre-concentration, purification and isolation (evaporation, lyophilization, solid phase extraction (SPE), low-pressure chromatography) of bioactive compounds of natural origin.
3. To provide the quantitative determination of the main compounds occurring in the extracts by using analytical techniques
4. The evaluation of some biological properties such as radical scavenging activity evaluated by spectrophotometric assays (DPPH; ABTS)

Prerequisites

Knowledge of chemistry and organic chemistry is useful both for the full learning of the theoretical lessons, but also to be able to carry out practical laboratory activities safely

Teaching form

Oral lessons and laboratory activities.

Textbook and teaching resource

The slides used in class will be uploaded on the e-learning .

Semester

Assessment method

The knowledge acquired during the course will be assessed through an oral exam which has the aim of verifying the acquisition of the expected knowledge according to what is detailed in the course objectives and its ability to discuss the program using the appropriate terminology. The final valuation will be carried out by analyzing the written report on the activities carried out during the laboratory and some oral questions, aimed at ascertaining the understanding of the theoretical topics and experiments carried out in the laboratory practice.

Office hours

On appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING