Valorization of Italian OLive products through INnovative analytical tools- VIOLIN

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Aree / Gruppi di ricerca

* Analytical Chemistry
* Pharmaceutical Biology and Food Chemistry
Group "Food Chemistry (FOODCHEM)"

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Descrizione del progetto

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Università degli Studi di Bari Aldo Moro

Università degli Studi di Verona

Sponsors:

Fondazioni in Rete per la Ricerca Agroalimentare - Ager - **http://www.progettoager.it/**

Description:

VIOLIN aims to develop and test the performances of rapid screening methods based both on chromatographic devices and portable biosensors for quality and authenticity evaluation of Italian PDO and monovarietal olive oils. The systems will be able to discriminate these olive oils with different geographical and cultivar origins from equivalents with not certified geographical origin. To set up the methods, different innovative chemical analytical protocols and biological activity tests will be employed to obtain a complete chemical, sensorial and biological fingerprint profile of the selected Italian PDO and monovarietal olive oils.

Very powerful techniques and last-generation instruments will be employed for fingerprint profiles definition, such as LC and GC coupled to different mass spectrometry detectors (using low and high mass resolution mass spectrometers) and LC-Orbitrap-MS; multidimensional comprehensive chromatographic techniques with different interfaces; fingerprinting techniques, such as IR, NMR, MALDI-ToF, PTR-MS, and DNA-based technologies. All the data will be elaborated through advanced chemometric tools to extrapolate information. The instruments and

methods finally developed will represent the effective deliveries to OO producers and Control institution. As well the results of this proposal will feed the **VIOLIN Data-Base**, which will be a comprehensive data-base including different level of information extrapolated from the huge set of samples analyzed. Rapid and highly informative analyses validated under the Commission Decision 657/2002 guidelines, implemented in routine controls of EVO oils, in a short term perspective will help to define a peculiar and distinctive blueprint of high-quality Italian products and, within a medium-to-long term perspective, will enable a productive fingerprinting aimed at clearly distinguish high-quality oils from massive productions. The application of novel and fingerprint analytical techniques, in combination with new rapid screening methods, both in the field of analytical chemistry, biological and genomic analysis will provide powerful tools to control the quality of oils along all the production and distribution chain.

The main goals that VIOLIN aim to achieve are:

1-Comprehensive approach to improve and support oil classification along with valorization of Italian production:

- Determination of chemical fingerprints and blueprints to support sensory profiles of different PDOs and monovarietal oils, with the aim to valorise specific product, but also to support the oil classification in a more objective way

- Creation of “hedonistic” and chemical profiles to discriminate among different PDOs

- Study of the consumer acceptance of different oil-food combinations

- Characterization of antioxidant and bioactive properties in relation to EVOO origin

2- Simple and reliable methods to improve consumer and stakeholders confidence:

- Development of portable biosensors to support high quality oil production

- Development and validation of rapid chromatographic methods to be used by Control Institutions

- Development of untargeted and fingerprinting methods to assess quality and authenticity

- Highly innovative and informative results of VIOLIN will be presented to the scientific community by organization of dedicated Workshop and presentation to national and international Conferences in the field. The strong scientific value of the information will be the main pillar to guarantee an effective and successful dissemination to stakeholders and civil community.

3- A comprehensive database on Italian PDOs and monovarietal oils

4- Transform Oil Production Waste Products in new usable, high-value products:

- provide methodologies to transform OPWP in a source of:

a) substantial volumes of detoxified water that can be recovered and reused in olive milling productive process or in agriculture;

b) enriched bioactive compounds that could be employed for their antimicrobial and antiparassite, anti-cancer and anti-inflammatory potential, as well as food supplements (functional food), feed additives or in cosmetic commercial products.

Keywords:

Extra-Virgin Olive oil, fingerprinting, advanced analytical techniques, PDOs Olive Oils, Oil Production Waste Products

Links:

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