Ultrasound for the extraction of EVOO

The Studies University of Bari "Aldo Moro" and the Polytechnic of Bari, in collaboration with several companies of Puglia (MBL Solutions S.R.L., Auriga S.P.A.; DE.OL. S.R.L.; Olearia Pazienza S.R.L.; y Promis Biotech S.R.L), organized the past December the first demonstration workshop of the innovative ultrasonic system for the extraction of extra virgin olive oil in oil-mill, a result of the project Perform Tech, financed by the Puglia region, thanks to the support of the Regional Technological Cluster for Innovation.

"This is a great technological step for one of the main agri-food sectors in Puglia. The use of ultrasound is the new great revolution after the introduction of the continuous system, which took place more than 30 years ago. This innovation offers two main advantages: the increase of yields and the sustainability of the process," said Professor Riccardo Amirante, of the Polytechnic of Bari.

Maria Lisa Clodoveo, professor of the Studies University of Bari "Aldo Moro" stressed that "the advantages of ultrasound in the extraction process also affect the quality of the product; the extracted oil has a significant content of molecules and a healthier activity than the traditional product, retaining all the organoleptic qualities of a high-quality food."

According to the researchers, the application of ultrasound to the olive paste -a form of mechanical energy generated by sound mechanical waves characterized through frequencies above 20,000 Hz .- determines the phenomenon of cavitation, which is manifested by thermal and mechanical effects capable of modulating the physicochemical and biochemical reactions within the pulp of the crushed olive. The thermal effect derives from the ultrasonic waves, which penetrate through the tissues of the plant, yielding part of its kinetic energy in the form of heat. The mechanical action is obtained thanks to the phenomenon of cavitation, that is to say, to the creation of microscopic bubbles of steam in the mass of the olive paste that, when growing and reaching a critical diameter, implode violently, releasing energy and causing the rupture of the cell membrane and the plant's wall, thus releasing the fat and minority compounds contained in the cell.

According to Clodoveo's view, the application of ultrasound in the olive paste shows positive effects and represents a potential solution for the development of new systems capable of converting the kneading phase in a continuous process.

In addition, according to the researchers, the insertion of the prototype in the line of transformation has allowed to reduce the processing times and to increase the yield (from 14.5 to 16.5%), improving the physical-chemical, nutraceutical and organoleptic profiles of the oil produced.

In order to meet the changing needs of the market, producers need high energy and working efficiency, which can limit investment and management costs, reduce processing times and optimize the working capacity of machines. Which also contributes "to ensuring satisfactory income for entrepreneurs."

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