



Submarine technology inspires science to detect fake olive oil

Submarine technology has inspired scientists in the US to develop a method of determining whether there have been changes in the physical properties of liquids, which could soon be used to quickly and cheaply detect fraudulent extra virgin olive oil.

Known as laser-induced sound pinging (LISP), the quality of tiny drops of sea water, dairy milk and molten salt were analyzed using the photoacoustic effect, or the generation of sound waves after light is absorbed in a material, which is like sonar used by submarines. The team at the University of Missouri (MU) believe that this might be the first use of this technology to analyze such small liquid samples.

Using cymbals as an analogy, Gary A. Baker, associate professor of chemistry in the MU College of Arts and Science, explains that sunlight heats the cymbals and creates a constant ringing sound. "Here, on a much smaller scale, we create the same effect by sending flashes of laser light at our tiny homemade cymbal, which is the tape, and measure the speed of the sound that is generated."

The method uses a tattoo removal laser machine to emit a series of flashes lasting about 10 nanoseconds along a fiber optic cable. One end of the cable, which is submerged in the liquid, is wrapped with paint-on liquid electrical tape that converts the laser light into sound. The sound is recorded by a microphone and the data is analyzed in real time by computer.

The MU team began by analyzing whether the technique would be a practical analytical tool for answering a broad range of liquid forensic questions, such as its potential application in drinking water quality evaluation, as well as food safety and authentication.

"If the water isn't drinkable, then our method will tell you that something is wrong with the water," said Luis Polo-Parada, an associate professor of pharmacology and physiology in the MU School of Medicine and investigator at the MU Dalton Cardiovascular Research Center.

"For instance, if a facility removes salt from sea water in order for water to be safe for drinking, our method can help alert the facility to potential changes such as an issue with the desalination process," the professor told the MU News Bureau in July.

According to MU News Bureau, the team's next step is to refine the recording methods and equipment so commercial industries can utilize it to monitor a variety of liquids, ranging from the percentage of alcohol in alcoholic beverages and the amount of sugar or sugar substitutes in soft drinks to the amount of poorer quality oil in adulterated olive oils.

In recent years, the reputation of extra virgin olive oil has suffered from a growing fraudulent global market that has involved low quality and falsely labelled olive oils, as well as some being mixed with other lower-grade oils disguised with coloring and aroma.

The international TAICHI project is spreading information about the health benefits of using extra virgin olive oil for cooking to Mainland China and Taiwan.

Co-funded by the EU and promoted by the two main consortia of Italian olive growers, Italia Olivicola and UNAPOL, the TAICHI project offers consumers all the information they need to understand olive oil through its website, various social media platforms and OurOliveOil APP – available in the [App Store](#) and [Google Play](#).

Sources:

<https://munews.missouri.edu/news-releases/2019/0708-liquid-forensics-could-lead-to-safer-drinking-water-mu-study-finds>



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