

Light measurement enables estimation of the chemical attributes of spice extracts

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Spices and other plant-derived products contain many active components, such as polyphenols and flavonoids. However, even the slightest variations in conditions can considerably affect the extraction

efficiency of these active components, posing challenges in determining the exact quantity of active components in the extract solution.

In a new [study](#) published in *Food Chemistry*, researchers comprehensively measured the [fluorescence](#) emitted by polyphenols and flavonoids and analyzed the acquired data using [machine learning](#) methods. This approach yielded a highly accurate, simple, and rapid method of estimating the total polyphenol and flavonoid contents and antioxidant capacity.

The crucial factor in achieving accuracy was to integrate measurements acquired at multiple concentrations. While the conventional practice during measuring fluorescence involves diluting the sample to a single concentration, the wide variation in component amounts in plant extracts renders determining a universally suitable dilution concentration.

Consequently, the researchers conducted exhaustive fluorescence measurements at four different dilution levels and integrated this data into the machine learning process.

Therefore, machine learning was able to accurately estimate important indices for evaluating spice extracts, including the total polyphenol content, total flavonoid content, antioxidant capacity, and reducing capacity. Notably, the optical measurement's estimation of total flavonoid content, in particular, represents a groundbreaking achievement, marking the effectiveness of this method where such estimations have not been conducted optically in the past.

More information: Thi Bao Chau Bui et al, Utilization of multiple-dilution fluorescence fingerprint facilitates prediction of chemical attributes in spice extracts, *Food Chemistry* (2023). [DOI: 10.1016/j.foodchem.2023.138028](https://doi.org/10.1016/j.foodchem.2023.138028)

Provided by University of Tsukuba

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