

Rapid authentication of salep in commercial products using VIS-NIR spectroscopy coupled with statistical methods

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Introduction & Aim

Salep powder is a high-value food ingredient that has been claimed to offer a number of health benefits. However, commercial salep mixtures are **frequently adulterated with cheaper sugars and starches**, yet methods for verifying their authenticity remain scarce. This work demonstrates that VIS–NIR spectroscopy with principal component analysis (PCA) following standard normal variate (SNV) correction can be utilized for this purpose.

Experimental

- Theoretical model built on a variety of different commercially available food–grade salep mixtures, each one spiked with pure salep powder from 0 % up to 50 % addition
- Portable and rapid NIR spectrometer, ASD FieldSpec4 Hi-Res NG (Malvern Instruments, UK) using Muglight accessory

Conclusions

- NIR band centered near 1850–1900 nm corresponding to the O–H stretching + bending combination band
- Flagged three commercial products as containing low levels or no detectable genuine salep
- Model provided successful discrimination of salep-specific spectral features rather than the features arising from starches and other components in **real, ready-to-use, salep mixtures**

Results and discussion

