

## ***Surface enhanced Raman scattering on aqueous pollen extracts***

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Identification, classification, and characterization of pollen are currently a time-consuming task. One possibility to save time and to increase accuracy in pollen detection is to use methods of vibrational spectroscopy in combination with multivariate statistics. It has been shown that Raman<sup>1</sup> and also infrared-spectroscopies<sup>2</sup> can be used for pollen spectra classification.

Here we show that classification can also be achieved by SERS on the aqueous extracts of pollen. This method provides a lot of advantages, in particular short acquisition times, low fluorescence background in the spectra, small amounts of sample and the possibility to low excitation intensities.

We have optimized the parameters for SERS experiments on the water-soluble fraction of pollen samples, in particular regarding amount of sample, SERS substrate, sample preparation, and excitation wavelength. We show that using immobilized nanoparticles for the SERS experiment results in a good reproducibility of the spectra of pollen. The high reproducibility of our data enables classification of pollen spectra by multivariate statistics. The new approach was applied to the successful classification of commercially available and fresh pollens collected in the field.

### References

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