Title Rapid evaluation of quality parameters in plant products applying ATR-IR and Raman spectroscopy

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Abstract

For the last two decades near-infrared spectroscopy (NIRS) has been applied as a useful tool for rapid and reliable analyses of numerous valuable substances in fruit, vegetables as well as medicinal and spice plants. Recently, also various applications of ATR/IR spectroscopy in combination with sophisticated chemometric algorithms were successfully introduced for qualitative and quantitative evaluation of several horticultural plants. Mostly the obtained spectra present significant and well-resolved key bands of the individual components. As an alternative analytical option, also several Raman spectroscopy methods have been developed during the last years to predict simultaneously the amount of different valuable substances occurring in various plant extracts. Using Nd:YAG laser excitation at 1064 nm it is possible to observe non-destructively characteristic “key Raman bands” of valuable substances also directly in the plant tissue. Furthermore Raman microspectroscopy can be applied for detailed investigation of plant tissue on the cellular level. Based on Raman mapping, obtained from sections of different plant constituents, it is principally possible to determine the distribution of certain components in situ.