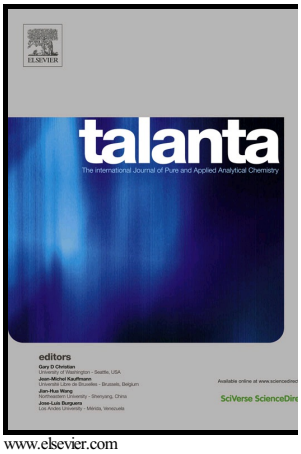

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Highly sensitive on-site detection of drugs adulterated in botanical dietary supplements using thin layer chromatography combined with dynamic surface enhanced Raman spectroscopy

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Abstract

The phenomenon of botanical dietary supplements (BDS) doped with illegal adulterants has become a serious problem all over the world, which could cause great threat to human's health. Therefore, it is of great value to identify BDS. Herein, we put forward a highly sensitive method for on-site detection of antitussive and antiasthmatic drugs adulterated in BDS using thin layer chromatography (TLC) combined with dynamic surface enhanced Raman spectroscopy (DSERS). Adulterants in BDS were separated on a TLC plate and located under UV illumination. Then DSERS detection was performed using a portable Raman spectrometer with 50% glycerol silver colloid serving as DSERS active substrate. Here, the effects of different solvents on detection efficacy were evaluated using phenformin hydrochloride (PHE) as a probe. It was shown that 50% glycerol resulted in higher SERS enhancement and relatively higher stability. Moreover, practical