Four radical scavenging activity-HPTLC assays in combination with chemometrics for the assessment of antioxidant activity of *Sempervivum tectorum* L. leaf extracts

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The houseleek (*Sempervivum tectorum* L.) has a wide application in traditional medicine for skin changes treatment, ear, throat and bladder infections, stomach ulcers. Recently, several studies confirmed antioxidative, antimicrobial and anti-inflammatory effects of houseleek [1,2]. Several spectroscopic techniques have been proposed to measure the free radical scavenging capacity (RSC), regardless of the individual compounds which contribute to the total free RSC. On the other hand, high-performance thin-layer chromatography (HPTLC) hyphenated with biochemical detection allows identification of single compounds responsible for radical scavenging activity (RSA). The main aim of current study is to identify single radical scavengers using four HPTLC-based assays such as 2,2-Diphenyl-1-picrylhydrazyl assay (DPPH), 2,2'-Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) assay (ABTS), potassium hexacyanoferrate(III) total reducing power assay (TRP) and total antioxidant capacity by phosphomolybdenum assay (TAC) in combination with principal component analysis (PCA). The best of our knowledge, HPTLC-TRP and HPTLC-TAC were developed for the first time. PCA was used for the classification of samples with similar RSA and the identification of radical scavengers responsible for classification. HPTLC-DPPH, HPTLC-ABTS and HPTLC-TRP chromatograms showed similar bioactive profiles. Further, HPTLC-TAC fingerprint differs from the others with observed numerous new zones with hR_F at 73, 83, 89, and 98 values. Based on PCA, HPTLC-ABTS and HPTLC-TRP assays showed similar grouping of samples. Phenolic compounds such as gallic acid (hR_F = 48), kaempferol (hR_F = 69) and unknown compound at hR_F = 18 are recognized as markers responsible for the separation between samples.

References

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