Khokhlova K. O., Zdoryk O. A., Vyshnevska L. I.
QUALITY ASSESSMENT OF *RHODIOLA ROSEA*, *RHODIOLA QUADRIFIDA* AND ITS HERBAL PRODUCTS FROM UKRAINE MARKET BY HIGH-PERFORMANCE THIN-LAYER CHROMATOGRAPHY
Scientific consultant prof. Vyshnevska L. I.
Drug Technology Department
National University of Pharmacy, Kharkiv, Ukraine

Introduction. There are mainly three products from *Rhodiola* species are present in the Ukrainian market. They are *R.rosea* and *R.quadrifida* crude drugs and *Rhodiola rosea* liquid extract (RRLE). *R.rosea* is used traditionally for the temporary relief of symptoms associated with stress, such as fatigue, exhaustion and mild anxiety. RRLE is used as a tonic remedy and has stimulating and adaptogen activities. *R. quadrifida* is traditionally used as a tonic, adaptogen, antidepressant and anti-inflammatory drugs and for the treatment of gynaecological diseases. The pharmacopoeial monographs for these herbals are absent in the State Pharmacopoeia of Ukraine and need to be developed. Among other pharmacopoeial tests, the high-performance thin-layer chromatography (HPTLC) identification method is a powerful tool for authentification of herbal products and detection of adulteration. This method is very important for quality control of the processed drugs when macro- and microscopy cannot be useful. The HPTLC method for *R. rosea* is described in USP HMC monograph and the TLC method for *R. rosea* is described in the USSR monograph, the State Russian pharmacopoeia. There were some publications of TLC/HPTLC analysis of *R.quadrifida,* but this species was represented with only a small number of samples, and chromatographic fingerprints of these samples were not consistent. Thus, further investigation to accurately define the HPTLC chemical markers for *Rhodiola quadrifida* is required.

Therefore, the **aim** of this study was to compare and improve the existing TLC/HPTLC methods for identification of *R. rosea,* to develop of the HPTLC identification method for RRLE and *R. quadrifida,* implementation of these methods in the State Pharmacopoeia of Ukraine and prevention of adulteration in the Ukrainian market.

Materials and methods. Multiple samples of *Rhodiola rosea*, *Rhodiola quadrifida* and RRLE were compared under different chromatographic conditions. The CAMAG HPTLC system (Muttenz, Switzerland) controlled by visionCATS software was used for analysis.

Results. The multiple samples of *R.rosea*, *R.quadrifida* and RRLE were compared; the optimal chromatographic conditions for identification of *R.rosea* and RRLE based on the presence of rosavins and salidroside as well as for identification of *R.quadrifida* based on the presence of salidroside were proposed; the specific HPTLC fingerprints were obtained; the acceptance criteria for each product were set. The adulteration cases for *R.rosea* and RRLE samples were established. The dependence on handling *R.rosea* and presence of rosavins was determined. It was assumed that low-quality raw materials or inefficient technology process were used for RRLE. The consistency of HPTLC fingerprints for *R.quadrifida* samples was established.

Conclusion. The proposed specific HPTLC identification methods could aid to detect adulteration or falsification of *Rhodiola* products in the market.