QUALITY CONTROL OF UKRAINIAN HOME-GROWN HERBAL RAW MATERIALS AND ITS HERBAL DRUGS BY HPTLC

Khokhlova K. O., Zdoryk O. A.
National University of Pharmacy, Kharkiv, Ukraine

Introduction. Quality control of herbal raw materials and herbal drugs is always an analytical challenge. Due to the complexities in a proper authentification of herbal raw materials, its natural variability, possibility of usage a big number of different species, it is always difficult to choose a technique, which gives possibility to develop and validate a method with specific and reproducible result. The answer for this question can be usage of High-performance thin-layer chromatography (HPTLC) procedure in a field of quality control of herbal raw materials and its products.

Planar chromatography is a synonym for HPTLC, which is a modern instrumental TLC. This is a technique of choice for separation of complex matrices like plant materials, lipids, samples with high sugar content, etc. The HPTLC is a simple, rapid, cost-effective, flexible and documented. Unlike any other chromatographic technique the features of modern HPTLC is the unique ability to very rapidly present the result in form of an image. The parallel analysis for reference standards and samples under identical conditions gives possibility to evaluate results easy and properly. Since August 2015, HPTLC is included in USP Compendiums as an official chapters <203> 'High-performance thin-layer chromatography procedure for identification of articles of botanical origin' and <1064> 'Identification of articles of botanical origin by high-performance thin-layer chromatography procedure'.

The **aim** of our work was evaluation of the HPTLC strength for quality control of herbal drugs and determination of its application fields (identification, detection of adulteration/falsification, assay of marker compounds, stability study, etc.). For such tasks different objects were chosen and analyzed. These were different species of rhizomata et radices Rhodiolae (3 spp.); fructus Crataegi (20 spp.); flores et folia Crataegi (15 spp.) and its herbal drugs, which were produced by different manufactures; compounding preparation for oral usage with herbals.

Materials and methods. The samples of herbal raw materials were collected throughout Ukraine and Russia in different years. Wild-crafted and commercial samples from different sources were analyzed. Samples of herbal drugs and dietary supplements were acquired from different manufactures from Ukraine and Russia (different years, different batches). All samples of herbal raw materials were properly authentificated with a help of botanists. The research was carried out on the base of CAMAG laboratory, Switzerland in compliance with standardized procedure. As HPTLC instrument the Advanced Herbal System (CAMAG, Switzerland) was used.

Results and discussion. Specific HPTLC method for identification of Rhodiola rosea was developed. This method allows to distinguish related species of Rhodiola rosea and detect the falsification of Rhodiola finished products. Specific HPTLC methods for identification of Crataegi species were developed. These allow to distinguish Crataegi species, which are typical for Europe, Asia and North America and can be used for identification of Crataegi drugs. Usage of HPTLC fingerprints for stability study of compounding preparation with herbals was proved.

Conclusion. During research it was shown, that HPTLC procedure can be widely used for quality control of Ukrainian home-grown herbal raw materials and its herbal drugs. Properly developed and validated methods allow to identify herbal raw material with a chemical/botanical reference standards and distinguish different species of plant on the one plate. The images of HPTLC fingerprints make chromatographic process visual and documented and allow to detect adulteration/falsification of herbal drugs.