THE USE OF THIN-LAYER CHROMATOGRAPHY IN ANALYSIS OF XANTHONES OF PLANT OBJECTS

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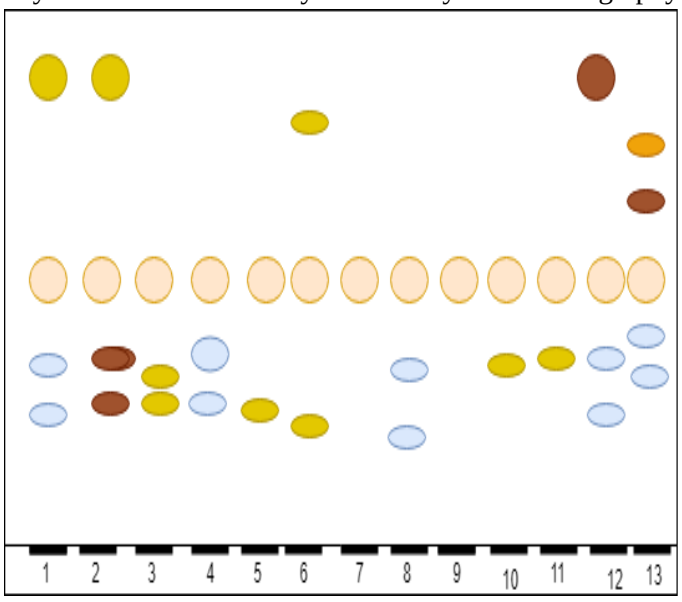
Introduction. The thin-layer chromatography (TLC) is one of the fastest and simplest methods for identifying the chemical composition of plant material used by scientists for almost a century. As is known, the TLC method is based on the process of sorption – desorption of the test substance on the sorbent layer. TLC has a number of advantages along with other well-known identification methods: the low threshold of quantitative determination, the possibility of parallel separation of several substances on one plate, the possibility of selective detection of zones, storage of the plate with separated components for a long time, simplicity of execution. So, TLC is an integral part of modern phytochemistry.

Representatives of the genus *Iris* L. (Iridaceae) are prospective raw materials for modern phytochemistry. Iris are widespread on the territory of Ukraine in the wild and widely cultivated as a decorative – park plant, therefore they have a large raw material base. Iris are natural sources of phenolic substances, including xanthones. They have long been used in folk medicine and they are also part of drugs.

Aim. Analysis of iris raw material for the content of xanthones by thin-layer chromatography.

Materials and methods. The objects of the study were leaves and rhizomes of *Iris hungarica* and 5 varieties of hybrid bearded iris (SDB) harvested in the vegetative phase at the National Botanical Gardens named. N.N. Gryshko NAS of Ukraine (Kyiv) and «Olexandria» Dendrology Park (Bila Tserkva) in 2017. The raw material was collected, washed, dried to air-dry condition. To obtain an extract, the raw material was ground to a particle size of 2-3 mm, about 2.0 g was placed in a flask, 10 ml of methanol was added and extracted in an ultrasonic bath for 30 minutes. After that, extracts were filtered through a paper folded filter. 5 µl of each extracts were applied on a chromatographic plate 60 F254 Merk (Germany) with the manhiferin standard. A solvent system of ethyl acetate – acetic acid – formic acid – water (10: 0.5: 0.5: 1.5) was used as a mobile phase. The plate was dried and viewed in visible and UV light after chromatography.

Results and discussion. The extracts of leaves and rhizomes of *Iris hungarica* and hybrid iris had several separation zones on a chromatographic plate, which were amplified during view in UV light. A zone of bright yellow color, which coincided with the standard manhiferin (Rf = 0,56) was noted. The fluorescence and band size of the samples were different, indicating a various concentration of mangiferin. Thus, the presence of mangiferin in the leaves and rhizomes of *Iris hungarica* and 5 varieties of hybrid iris determined by the thin-layer chromatography method (Picture 1).



1-leaves *I.hungarica*
2-rhizomes *I.hungarica*
3- leaves *I.hybrida* 'Galleon Gold'
4- rhizomes *I.hybrida* 'Galleon Gold'
5- leaves *I. hybrida* 'Little Dream'
6- rhizomes *I. hybrida* 'Little Dream'
7-mangiferin
8- leaves *I. hybrida* 'Bright white'
9- rhizomes *I. hybrida* 'Bright white'
10- leaves *I. Hybrida* 'Mini Dynamo'
11- rhizomes *I. hybrida* 'Mini Dynamo'
12- leaves *I. hybrida* 'Indian Pow Waw'
13- rhizomes *I. hybrida* 'Indian Pow Waw'

Picture 1. Scheme of TLC of iris extracts.

Conclusions. The method of thin-layer chromatography found that leaves and rhizomes of *Iris hungarica* and 5 varieties of hybrid iris contain xanthonic glycoside – mangiferin. Iris raw material can be used as a source of xanthones, so the study of iris is perspective.

THE COMPARISON OF SOLVENT SYSTEMS FOR QUALITIVE ANALYSIS LIME FLORES OF TILIA CORDATA USING TLC

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Introduction. Family *Tiliaceae* is widespread tall deciduous. *Tilia cordata* is the most known species. Generally linden is used for treating influenza, cough, migraine, nervous tension and various types of spasm as it has a variety of properties such as a diuretic, diaphoretic, antispasmodic, expectorant, sedatives. Today linden is widely used in folk and officinal medicine. The officinal raw material is flowers (inflorescences) with flower bunds (*Tiliae flos*), which are introduced into many pharmacopoeis of the world. The raw material contains essential oils, vitamins, mucilage and flavonoids. Nowadays there are only packed raw material and collections as medicines on the pharmaceutical market of Ukraine.

Aim. Development a method of TLC analysis of raw materials is expedient for identification and determination of its quality because of large variety of genus species. Therefore the major aim of study was selection a mobile phase for TLC analysis, which gives better resolution of linarin, routine and keampferol 3-O-glucosid-7-rhamnozide in extracts from the flowers of *Tilia cordata* as these compounds have quite close Rf.

Materials and methods. *Tilia flos* was used as a plant material for analysis, collected in Warsaw, Poland, in 2014, 2015, 2016. For determining the mobile phase of TLC analysis of extracts from *Tiliae flos* were used: tetrahydrofuran (POCH basis), isopropanol (POCH basis), dichloromethane (POCH basis), formic acid (Merck), acetic acid (Merck) and distilled water in different ratios.

The analysis was carried out at the Department of Pharmacognosy and Molecular Basis of Phytotheraphy of Medical University of Warsaw. For analysis used: CAMAG Linomat 5, CAMAG ADC 2 Automatic Developing Chamber 2, CAMAG TLC plate heater III, CAMAG derivatizer, CAMAG TLC Visualizer 2; HPTLC plates, silica gel 60 F254, Merck. Standard samples of which were used for comparison: routine, keampferol 3-O-glucosid-7-rhamnozide, linarin.

Results and discussion. The analysis showed that Rf routine=0.29, Rf linarin=0.39, Rf keampferol 3-O-glucosid-7-rhamnozide=0.45 in mobile phase tetrahydrofuran – dichloromethane – formic acid – acetic acid – water P in a ratio of 9:9:4:4:2, accordingly. Using another solvent system isopropanol – dichloromethane – formic acid – acetic acid – water P in a ratio of 9:9:4:4:4, accordingly, Rf routine=0.73, Rf linarin=0.74, Rf keampferol 3-O-glucosid-7-rhamnozide=0.8.

More visible resolution of these compounds was provided by a mobile phase which contains tetrahydrofuran – dichloromethane – formic acid – acetic acid – water P in a ratio of 9:9:4:4:2, accordingly.

Conclusions. The identified solvent system will be used in the development of normative documentation for raw materials and extracts on its basis.