

QUO VADIS Life Sciences 23-27 JUNE 2021 Opole, POLAND



ABSTRACT BOOK

CORRELATION BETWEEN HISTOCHEMICAL EXPRESS METHOD AND INSTRUMENTAL METHODS OF ANALYSIS IN PHYTOCHEMISTRY

Uliana Karpiuk, Nadiia Kovalska

*Bogomolets National Medical University, Kyiv, Ukraine
uliana.karpiuk@gmail.com*

Macrochemistry and microchemistry of plants is designed to detect an insignificant content of substances in organs, tissues, and cells and determine their distribution and localization. The use of a microscope greatly increases the sensitivity of the reaction and makes it possible to trace the reaction where it remains hidden to the naked eye. The amount of substances involved in microscopic reactions during the study is expressed in micrograms. According to Pellicciari C. (2010), a wide development of histochemical research will especially be possible in the field of plant biology [1]. The author says that the number of plant histochemical articles published has been relatively small since the '50s of the last century, but about 200 have been published in 2001-2010 years. The highest amount of articles about plant histochemistry has been published in 2011 according to the search in the National Library of Medicine. It is suggesting that the histochemical approach is becoming increasingly attractive for the plant chemistry.

As well as any other methods of studying the nature around us, microscopic chemistry has its advantages and disadvantages: sensitivity, rapidity of work, simplicity of the technique, locality of the reaction, the complexity of the composition of the cellular content, cell death, the reliability of the reaction, the effect of sample preparation [2,3].

The aim of our work was to study polysaccharides, flavonoids, hydroxycinnamic acids by histochemical methods and by instrumental methods (spectrophotometry, HPLC) in medicinal plant material of different plants.

The study of presence of polysaccharides in *Akebia quinata* leaves, *Primula veris* leaves and flowers, *Rosa damascena* buds and petals has been done under the microscope using the methylene blue reagent, phloroglucinol solution and potassium permanganate solution. For the histochemical determination of flavonoids in *Agrimonia eupatoria* and *Akebia quinata* plant material the 10% sodium hydroxide solution has been used. Hydroxycinnamic acids have been identified in plant material of *Agrimonia eupatoria*, *Akebia quinata*, and *Actinidia arguta* by complex reagent: Arnov's reagent (sodium molybdate and sodium nitrate), sodium hydroxide solution, hydrochloric acid solution [2,3]. The quantitative content of polysaccharides and mucilage has been studied by mucilage index and gravimetry. The study of the qualitative composition and quantitative content of flavonoids, hydroxycinnamic acids has been performed by spectrophotometry and HPLC methods.

The obtained results of quantitative determination confirm the assumptions about the presence of certain classes of biological active substances in the studied samples of plant materials during histochemical reactions. The color intensity in the places of localization of biological active substances in the tissues of plant raw materials correlates with the obtained results of quantitative content.

Literature:

[1] C. Pellicciari. *European Journal of Histochemistry*. 2010, 54:e51, 242-248.

[2] F. A. Badria, W. S. Aboelmaaty. *Acta scientific pharmaceutical sciences*. 2019, 3(7), 88-100.

[3] W. A. Jensen. *Botanical Histochemistry. Principles and practices*. Freeman, San Francisco, 1962. 408 pp.