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PLANT BY-PRODUCTS AS POTENTIAL SOURCES OF VALUABLE BIOLOGICALLY ACTIVE COMPOUNDS

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Keywords: plant by-products, polysaccharides, biologically active substances.

Background: The annual accumulation of significant amounts of plant residues in the agricultural and pharmaceutical sectors creates a significant environmental burden, but in the context of the global transition to a closed-loop economy, these by-products should be considered as promising natural raw materials. Plant polysaccharides are particularly valuable, as together with phenolic compounds and organic acids, they form the basis for obtaining products with high added value and can serve as a basis for creating innovative biopolymers and dietary supplements.
Aim: The aim of the study is to investigate the quantitative content of polysaccharides in alternative plant sources.
Methods: The quantitative determination of polysaccharides in leaves, herbs, fruits, seeds, and pericarps of various species was established by the gravimetric method to the monograph State Pharmacopoeia of Ukraine (SPhU) 2.1 "Plantaginis majoris foliumN"[1].
Results: Plant samples were selected for the study, the raw materials of which are not a direct source of polysaccharides, but are used as a raw material base for the extraction of essential oils, anthocyanins, saponins, and glycosides. The concept of the study was to use raw materials after extracting the main biological substances from them: instead of disposal, further extraction was envisaged. The results of the study are presented in Table 1.
Table 1. Medicinal plant raw materials that can potentially be used as an additional source of polysaccharides
The species name Type of raw material Polysaccharide content %
Acanthus mollis L. [2] leaves 15,8
Artemisia absintium L. herbs 1,3
Artemisia argyi H. Lév. & Vaniot herbs 1,9
Cucurbita pepo var. melopepo fruits 3,7
Elettaria cardamomum (L.) Maton. [4] fruits 2,8
Elettaria cardamomum (L.) Maton. [4] seeds 2,2
Elettaria cardamomum (L.) Maton. [4] pericarps 4,7
Ocimum basilicum L. leaves 1,8
Ocimum basilicum L. seeds 0,67
Parthenocissus quinquefolia Planch. [3] leaves 4,9
Tanacetum balsamita L. leaves 1,2

During the preparation of aqueous extracts of certain types of raw materials, in particular the fruits of C. pepo var. melopepo and the seeds of O. basilicum, significant water absorption by the raw materials was observed. Therefore, our further research will be focused on analyzing this mucilage, in particular, determining the swelling index in these and other species, determining the swelling index in these and other species, as well as searching for additional sources of polysaccharides.
Conclusion: It has been established that plant residues of certain types of raw materials can serve as an additional source of polysaccharides and at the same time reduce the impact of plant waste on the environment.

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