

# **FORTHEM international conference: Democratic & Responsible Bio Innovation**

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ONLINE

## **Book of Abstracts**

**Results.** The obtained results indicate that the content of polyphenolic compounds in the waste of *R. canina* fruits was  $110.01 \pm 2.10$  mgEGC/g; the content of carotenoids was  $2547.10$   $\mu$ g/g; the content of procyanidins was  $0.05 \pm 0.01\%$ .

For the petals of *R.  $\times$  damascena*, the quantitative content of water-soluble polysaccharides was  $8.04 \pm 0.15\%$  and of pectin substances was  $6.25 \pm 0.12\%$ .

**Conclusions.** Products of processing raw materials of plants of the genus *Rosa*, collected in Ukraine, are rich in various groups of biologically active substances and can be a promising source for the development and creation of medicines and dietary supplements.

## Bioconvergence & Resilient Innovation Ecosystems / 10

### Measuring export competitiveness of wood products: Latvia vs other European countries

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Wood is an important natural resource in several Northern and Central European countries. This study aims to assess the export competitiveness of wood products in the European Union (EU), with a particular focus on Latvia.

**Methodology and data.** This research is based on data from the Atlas of Economic Complexity. Wood product groups are defined according to the HS92 product classification at the 4-digit level of disaggregation. For each wood product group, we calculate the revealed comparative advantage (RCA) index and compute the average export complexity of wood products for each EU country. In addition, we analyse the share of wood products in total exports and examine developments in global market shares.

**Empirical results.** Latvia ranks first among EU countries in terms of export competitiveness in wood products. The volume of Latvia's wood product exports even exceeds the level that would be expected given the country's forest area. However, despite notable improvements, the average complexity of Latvian wood product exports remains relatively low. This suggests that wood resources could be utilised more efficiently to enhance national welfare. Latvia demonstrates strong export capacity in primary wood processing products (e.g., fuel wood, packing boxes, particle board), but comparatively weaker performance in secondary processing industries (e.g., pulp, paper, furniture, musical instruments). Further expansion limited to primary wood processing is unlikely to raise the complexity of Latvia's wood exports to the level observed in Scandinavian countries. The development of secondary wood processing industries is therefore crucial for increasing the export complexity of wood products in Latvia.

## Bioconvergence & Resilient Innovation Ecosystems / 11

### 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 %
<i>Acanthus mollis</i> L.	[2] leaves	15,8
<i>Artemisia absintium</i> L.	herbs	1,3
<i>Artemisia argyi</i> H. Lévl. & Vaniot	herbs	1,9
<i>Cucurbita pepo</i> var. <i>meloepo</i>	fruits	3,7
<i>Elettaria cardamomum</i> (L.) Maton.	[4] fruits	2,8
<i>Elettaria cardamomum</i> (L.) Maton.	[4] seeds	2,2
<i>Elettaria cardamomum</i> (L.) Maton.	[4] pericarps	4,7
<i>Ocimum basilicum</i> L.	leaves	1,8
<i>Ocimum basilicum</i> L.	seeds	0,67
<i>Parthenocissus quinquefolia</i> Planch.	[3] leaves	4,9
<i>Tanacetum balsamita</i> L.	leaves	1,2

During the preparation of aqueous extracts of certain types of raw materials, in particular the fruits of *C. pepo* var. *meloepo* 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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