HOW TO AVOID DESTABILIZATION OF MUCUS-FORMING POLYSACCHARIDES FROM *LINUM USITATISSIMUM* SEED CAKE?

Alexei Baerle*, ORCID: 0000-0001-6392-9579
Iuliana Sandu, ORCID: 0000-0003-1266-3154
Artur Macari, ORCID: 0000-0003-4163-3771

Technical University of Moldova, 168 Stefan cel Mare blvd., Chisinau, Republic of Moldova
*Email: alexei.baerle@chim.utm.md

The biological role of mucus-forming polysaccharides in flax seeds (Figure 1, left) is to protect the oily endosperm from small amounts of water, but also to retain and to dose large amounts of water during germination.

Arabinoxylan is the polymer of xylose with lateral short branches of 1-2 arabinose units. This structure is very similar with the structure of dendrimers – hedgehog-like molecules, capable for molecular entrapment of other compounds in their large cavities [1]. Unlike dendrimers, Arabinoxylan and Arabinogalactan are barbed-wire-like structure macromolecules, which also are capable to form large cavities (Figure 1, right).

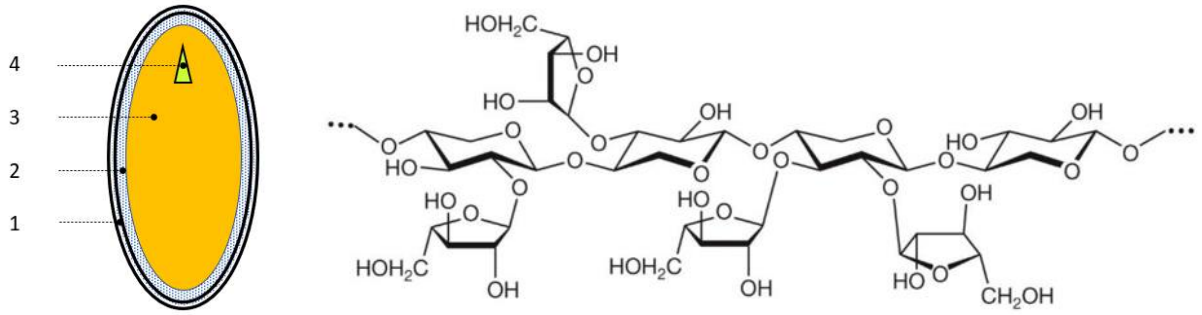

Figure 1. ***Left:*** Flax seed structure (scheme): 1 – cuticle; 2 – mucus-forming polysaccharides (arabinoxylan, arabinogalactan); 3 – oily endosperm; 4 – germ. ***Right:*** Arabinoxylan structure

Many food products technologies require additives with high water holding capacity. So, flax seed cake is very important source of these additives. Traditional oil cold pressing inevitably leads to intense contact and mixing of seed tissues, and the entrapment of different unstable compounds by biopolymers. We demonstrate, that preventive arabinoxylan / arabinogalactan extraction from a whole seed is way to obtain much pure muco-polysaccharides, without of entrapped lipids and proteins – components, which destabilize polysaccharides aspect and functionality. Flaxseed oil must be pressed only after extraction of polysaccharides.

Keywords: *Arabinogalactan, Arabinoxylan, Dendrimers, Intramolecular Entrapment*

Acknowledgments. The authors would like to thank the Project 2SOFT/1.2/83 ***Intelligent valorization of agro-food industrial wastes***, funded by the European Union, within the program Cross border cooperation Romania - Republic of Moldova 2014-2020.

Bibliography:

1. ABBASI E., AVAL S.F., AKBARZADEH A., MILANI M. et al. Dendrimers: synthesis, applications, and properties. Nanoscale research letters, 2014, 9(1), 247.