



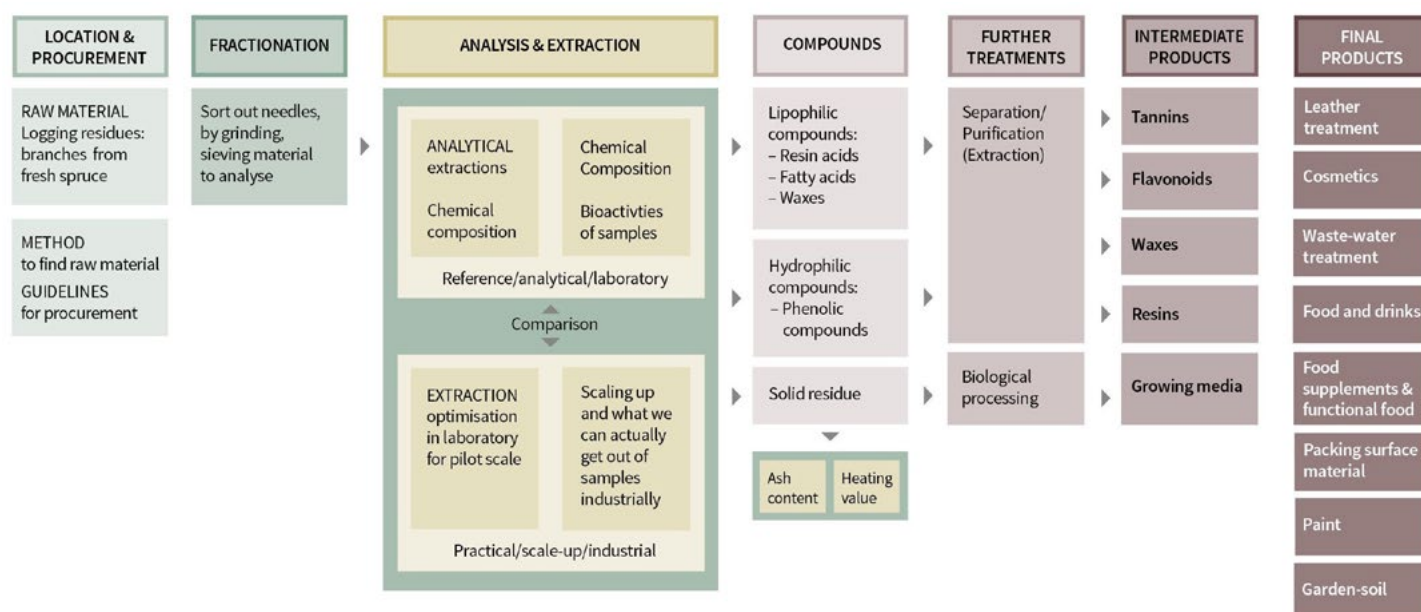
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Added value from logging residues

Added value can demonstrate innovative methods to produce valuable biochemicals and ingredients from the currently under-utilized logging residues. The first step is to identify the most suitable areas for logging residue procurement and then to test new processes to mechanically separate needles. All to find out what kind of useful substances and chemicals and in what proportions you can find them in logging residues. The aim is to develop chemicals for use in local industries. The project is based on long-term cross-border cooperation between Sweden and Finland and between forest and chemical researchers.

PROCESS PICTURE

The joint work in this project is here presented in the picture below and it shows the work performed in this project. After that follows a description of the work.



LOGGING RESIDUES

We are using spruce needles, bark, and branch wood.



LOCATION & PROCUREMENT

The aim is to identify the most suitable areas for logging residue procurement in the Botnia-Atlantica (BA) region. Interviews have been conducted in both countries to learn more about the procurement of logging residues today and the possibilities to procure fresh logging residues in the future. A “multi-criteria area selection support model” will be developed and tested in a case study area (located in Sweden) but it will be possible to adjust and employ in the whole BA area.

FRACTIONATION

The logging residues are harvested in Umeå. As reference material, hand-picked needles are used. The aim is to look for a new innovative process for mechanically separating needles. Fractionation aims to find methods that enable logging residues in quantities used in industry.



ANALYSIS AND EXTRACTION

Chemical characterization and chemical processing of logging residues and needles are made both with the hand-picked material and with the results from fractionation. Three different analyses are carried out and four different solvents (hexane, SFE, hot water and ethanol) are used. The extractions are done on a lab-scale, semi-pilot scale (5 L), and pilot-scale (300 L). They are evaluated by a techno-economic analysis.

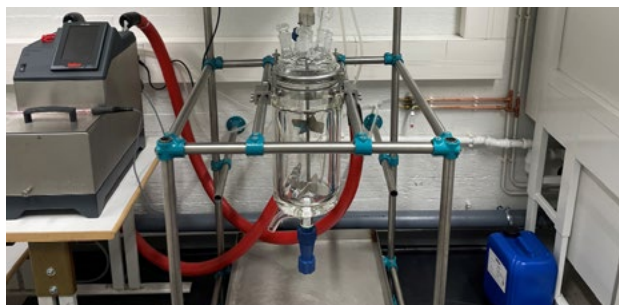
COMPOUNDS

The found and analysed compounds are

1. Lipophilic compounds: Resin acids, Fatty acids, Waxes
2. Hydrophilic compounds: Phenolic compounds
3. Solid residue

FURTHER TREATMENTS

The next step is separation and/or purification to sort out the compounds. The solid residue remaining after the extraction is tested regarding ash content and heat value. The main part of the solid residue is biological processed and can be used as growing media.



INTERMEDIATE PRODUCTS

An intermediate product is either ready to use by end-users or used to produce a final good or finished product. In this project, the following products can be pinpointed:

1. Tannins, 2. Flavonoids 3. Waxes, 4. Resins, 5. Growing media

FINAL PRODUCTS

The end-users described here are examples of how logging residues can give added value to our bioeconomy. 1. Leather treatment, 2. Cosmetics, 3. waste-water treatment, 4. Food and drinks, 5. Food supplements and functional food, 6. Packing surface material, 7. Paint, 8. Garden-soil.

COMMUNICATION AND TARGET GROUP DIALOGUES

The results will be disseminated in September and October 2022.

ABOUT THE PROJECT

The project is ongoing during the years 2021 and 2022. The total budget is 0.63 M Euro financed by Interreg Botnia-Atlantica, Regional Council of Ostrobothnia and Region Västerbotten. Project partners are the Natural Resources Institute Finland (LUKE), University of Applied Sciences (Centria), Forest Centre (Metsäkeskus), Swedish University of Agricultural Sciences (SLU) and BioFuel Region (Project leader)

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