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Analysis of wood bark use opportunities

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Abstract

The bark is very promising technological raw material and classic biorefinery object because of its unique barks biomass chemical composition and possibility to get many different products with the added value of individual or group of compounds of the synergistic biological activity, raw materials to produce various materials. Bark product market is poorly developed because bark treatment to produce product with high added value requires high investment, large amount of time. However, this market segment is currently growing in Latvia and in Europe due to the restrictions on the use of synthetic products, "green" thinking and growth of renewable material use. That is why authors did research about wood bark use opportunities, by analyzing different wood bark products which are currently at the research stage or already being manufactured. Using multi-criteria analyze (MCA) determining the main products which can be introduced in the Latvian market. Results showed that the best two products which potentially should be implemented are tannin and betulin, currently these products are not industrial produced in Latvia.

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Keywords: wood bark; products; multi-criteria analysis; bioeconomy

1. Introduction

Per European Commission report on "Innovating for sustainable growth: a bioeconomy for Europe (2012/2295(INI))" [1] European Union has set the mail goals for solving societal challenges (food safety, sustainable management of natural resources, dependence reduction of on non-renewable resources, climate change mitigation

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and adaptation, job creation and Europe's competitiveness preservation) and coordinated development of the bio-economy. Based on this report in 2013 Latvia adopted "The smart specialization strategy", which provides higher added- value product manufacturing and the creation of new materials and technologies for the creation of the traditional sectors of the economy) [2].

Bio-economy opens opportunities for Latvian economic development, based on the strongest sectors - agriculture and forestry. Wood and other biological products have potential for increasing the added value of products, replacing fossil fuels in energy production, the development of biological products and to reduce greenhouse gas emissions. Although high added value product production from wood is growing, are unused other wood components [3], like bark, what consists of various substances (example, cellulose, lignin, etc.) [4, 5] what could be used from high added value production. From the perspective of woodworking companies bark is not separated from wood because it serves as packaging for exported timber and the acquisition is time-consuming and expensive, even though they do not realize the economic benefits what could be obtained from bark production. That is why authors did analyze of production which could be produced from wood bark.

2. Overview of wood bark products

Bark is composed of different kind of substances which can be used as well for medicine, water pollution removal, building materials etc. [6]. But it is not possible to manufacture all these products from every tree species because for every tree, for example, lignin or suberin content is different and it is depending on where tree is growing, what are the climatic conditions [7]. For coniferous and deciduous trees these substances content will be different, that is why some fight volume products are better to manufacture just from one specific tree species. But sometimes it is hard for woodworking companies to separate the bark from specific tree species and that is why all tree bark are put together and later one produced to manufacture products for which are necessary some components which are in all types of bark. Although some bark has suffered in removing process from timber, it still can be used to produce different products [8–11].

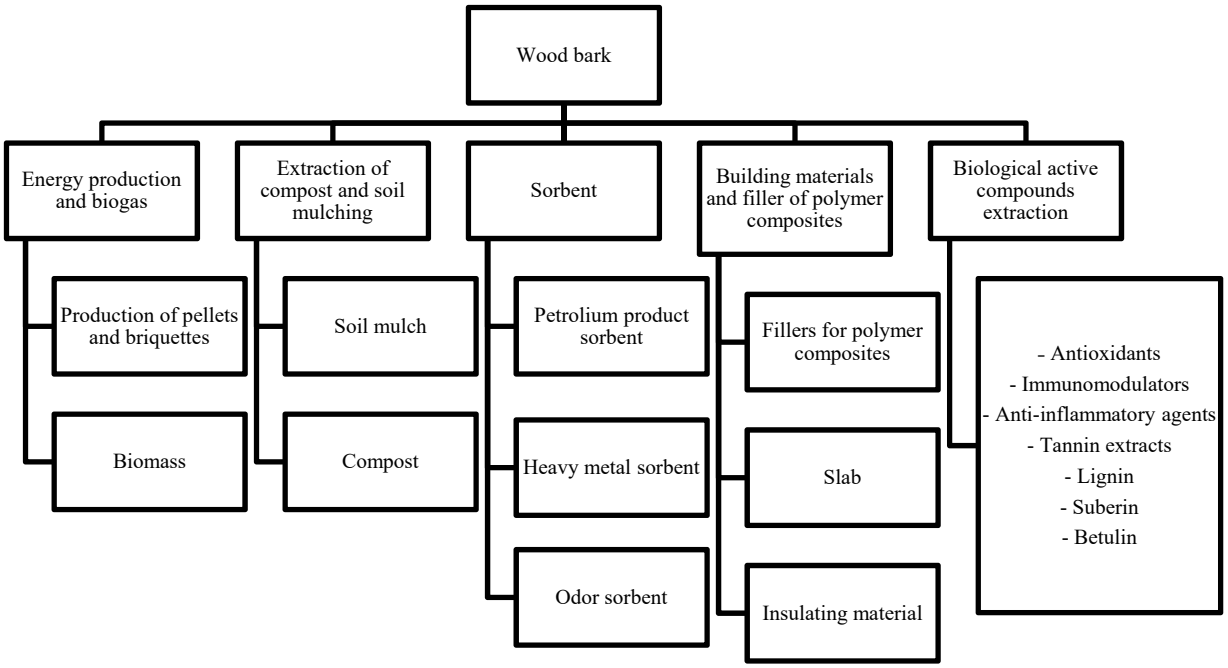

Fig. 1. Realization opportunities of wood bark.