

THE SCIENTIFIC REPORT OF PROJECT PN-III-P1-1.1-PD-2016-0892 – STAGE I

Project title: *The valorisation opportunities of natural products, separated from secondary resources through biorefining process*

Project code: PN-III-P1-1.1-PD-2016-0892

Acronym: BIOPHENOL

Project lead: Corneliu Tanase

Stage 1 - Characterization of polyphenolic extracts obtained from beech (*Fagus sylvatica* L.) bark

The degree of achievement of the indicators: all stage I indicators have been met.

The aim of this stage (2018) included the following activity:

Act 1.1 - Obtaining beech bark polyphenolic

To obtain the global polyphenolic extracts, two extraction methods were used, according to the plan: ultrasonic extraction and microwave extraction.

Results: 6 global extracts were obtained through the two extractions types.

Act 1.2 - Characterization of beech bark polyphenolic extracts

Results: The extracts were characterized in terms of total content in tannins and polyphenols. Some of the results are included in the article "Spruce and beech bark aqueous extracts: source of polyphenols, tannins and antioxidants correlated to *in vitro* antitumor potential on two different cell lines", accepted for publication in the journal Wood Science and Technology, FI: 1,706 of red zone.

Act. 1.3. Determination of the antioxidant activity of beech bark polyphenolic extracts

Results: The total polyphenol content of the extracts obtained indicates the antioxidant effect. This result was also confirmed by the DPPH method resulting in the antioxidant effect of the aqueous extracts, tested compared to ascorbic acid. The DPPH reagent is reduced extremely rapidly in the first 50 seconds. Also, the AOA values at baseline are lower than the AOA values at the end of the reaction. This is due to the fact that the aqueous extracts do not immediately reduce DPPH, but throughout the reaction.

The results are included in the article "Spruce and beech bark aqueous extracts: source of polyphenols, tannins and antioxidants correlated to *in vitro* antitumor potential on two different cell lines", accepted for publication in the journal Wood Science and Technology, FI: 1,706 in the red zone

Act 1.4 – The identification of phenolic compounds from beech bark polyphenolic extract.

Results: Analyzing the chromatograms obtained for the tested extracts, bioactive compounds were identified (quantitatively and qualitatively or only qualitatively). The results were presented at the Third International Symposium on Phytochemicals in Medicine and Food (3-ISPMF), held in Kunming, China, August 25-30, 2018.

The dissemination of the results obtained within the project, in 2018 was achieved by:

1. Participation in the prestigious International Conference - Third International Symposium on Phytochemicals in Medicine and Food (3-ISPMF), organized in Kunming, China, August 25-30, 2018, with the paper “Study of the microwave assisted extraction of polyphenols from beech (*Fagus sylvatica* L.) bark ”, authors: Corneliu Tanase, Andrei Mocan, Sanda Coșarcă, Alexandru Gâvan, Daniela-Lucia Muntean,
2. **Acceptance for publication of the article**”Spruce and beech bark aqueous extracts: source of polyphenols, tannins and antioxidants correlated to *in vitro* antitumor potential on two different cell lines”, Coșarcă Sanda-Liliana, Moacă Elena-Alina, **Tanase Corneliu**, Muntean Daniela Lucia, Pavel Ioana Zinuca, Dehelean Cristina Adriana, *Wood Science and Technology*, FI: 1,706, **red zone**.

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