

## VALORISATION OF WALNUT SEPTUM POLYPHENOLS

Iuliana SANDU<sup>1</sup>, ORCID ID: 0000-0003-1266-3154  
Alexei BAERLE<sup>2</sup>, ORCID ID: 0000-0001-6392-9579  
Pavel TATAROV<sup>1</sup>, ORCID ID: 0000-0001-9923-8200  
Iurie SCUTARU<sup>2</sup>, ORCID ID: 0000-0002-9199-5183  
Artur MACARI<sup>1</sup>, ORCID ID: 0000-0003-4163-3771

<sup>1</sup>Technical University of Moldova, Department of Food Technology, Chişinău, Moldova

<sup>2</sup>Technical University of Moldova, Department of Oenology and Chemistry, Chişinău, Moldova

\*Corresponding author: Iuliana Sandu, iuliana.sandu@tpa.utm.md

**Introduction.** Republic of Moldova and Romania, in tandem, produce more than 50000-60000 tons of walnuts annually. The walnut external shell and its internal septum make up 40-50% and 3-5% of fruit's mass. Correspondingly, at least 25000-32000 tons of a "wastes" of organic material are formed annually. Preponderantly lignified shells can be successfully transformed into briquetted fuel. Little quantities of septum are used for preparation of the traditional home-made brown-colored alcoholic drinks. But great amounts of septum (at least 2000 tons annually) are not used in industrial scale. The processing of a septum for solid briquette fuel should not be named hardly "intelligent", because walnut septum contains significant amounts of polyphenols [1].

**Materials and methods.** Walnuts of "Kogălniceanu" variety, harvested in 2020, were crushed, and septum was separated from kernels thoroughly. Septum was extracted at ultrasonic bath (room temperature, 37kHz, 10min.) by water-ethanol extracts, containing 0.02% polygalacturonase. HPLC analysis of walnut septum extracts were performed by "Shimadzu LC-2030 3D-Plus", integrated with PDA-detector, using reversed-phased C<sub>18</sub> "Phenomenex" column (150mm\*4.6mm\*5µm\*80nm), gradient elution with *Water: Acetic Acid 0.1%* (phase A) and *Acetonitrile : Acetic Acid 0.1%* (phase B), flow 0.5mL/min, from 5% to 90% of phase B in the extremes of the gradient curve, column temperature of 25°C and detection at 30°C.

**Results.** The presence of several important Biologically Active Compounds in septum was confirmed: Gallic Acid ( $\lambda_{max.} = 271\text{nm}$ ,  $R_T \sim 10\text{min.}$ ), Catechin, Epicatechin ( $\lambda_{max.} = 278\text{nm}$ ,  $R_T \sim 15\text{min.}$ ,  $\sim 16\text{min.}$ ), Ellagic Acid ( $\lambda_{max.} = 366\text{nm}$ ,  $R_T \sim 20\text{min.}$ ), also their derivatives. Our calculations demonstrate, that possible production of only one of these compounds, Ellagic Acid, can to reach 5 tons annually, if all walnut septum will be intelligently treated.

**Conclusions.** Walnut septum was confirmed as veritable source of Biologically Active Compounds (Gallic and Ellagic Acids, flavanols and their derivatives). Intelligent valorization of septum can to provide tons of individual BACs or its compositions, some of them possessing antioxidant properties, vasoregulatory and cardio-protection activity [2]. We consider (but additional market research is necessary), that these quantities will be very sufficient for internal needs and for possible exports.

**Keywords:** *Catechin and Epicatechin, Ellagic Acid, Gallic Acid, HPLC, PDA, UV-Vis  $\lambda_{max.}$*

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