

PUBLICATIONS

ISOLATION OF TOTAL EXTRACTIVE SUBSTANCES FROM *Vitis vinifera* LEAVES BY EMULSION EXTRACTION

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The present study is aimed at developing highly efficient approaches for processing renewable plant raw materials for the isolation of extractive substances. Emulsion extraction enables the rapid extraction and separation of complex mixtures of compounds. The advantages of emulsion extraction methods include the possibility of simultaneous recovery of entire groups of substances, a large interfacial contact area between phases, and single-stage extraction.

This methodology was developed by researchers of the Komi Scientific Center of the Russian Academy of Sciences [1]. Continuing our investigations on the polyphenols (PPs) of grape leaves, we applied this method as an alternative to the previously described two-stage procedure involving extraction followed by saponification [2]. For this purpose, leaves of wine grape (WG) varieties and the table grape cultivar ‘Damskiy Palchik’ (DP) were ground to a particle size of 2–3 mm. To the plant material, 100 mL of 5% and 10% aqueous potassium hydroxide (KOH) solutions and 30 mL of petroleum ether were added. The mixture was stirred on a magnetic stirrer at 120 rpm for 10 h. Extraction was performed three times (10, 8, and 8 h, respectively). The resulting extracts were combined and transferred to a separatory funnel. The ether extracts were combined and washed with water until a neutral pH (pH 7) was reached, yielding the total extractive substances, yields are presented in Table 1

Table 1. Yields of Extractive Substances (g and % of Air-Dried Biomass)

№	Plant Material					
	DP (5% KOH)	DPr (10% KOH)	WG (5% KOH)	WG (10% KOH)	DP (infusion)	WG (infusion)
1						
2	Yield, %					
	1.6	1.80	1.01	1.20	1.61.	2.80

* **method** stirring; **extraction** 10–8–8h

Thus, a comparison between classical infusion extraction and emulsion extraction of grape leaves was performed. Although the highest yield obtained by emulsion extraction (1.80%) was lower than that achieved by infusion followed by saponification (2.80%), the emulsion extraction technique proved to be an efficient and rapid method for the recovery of biologically active compounds.

References

1. N.N. Nikonova, T.V. Khurshkainen, and A.V. Kuchin. *Technology for the Isolation of Low-Molecular-Weight Components from Pine and Larch Green Biomass by Emulsion Extraction*. Proceedings of the Saint Petersburg Forestry Academy, 2022, Issue 239, P. 220–234.
2. Zokirova UT, Khidyrova NK, Tursunova NV, Syrov VN, Shakhidoyatov KhM (2015) Polyphenols From *Vitis vinifera* Leaves and Their Hepatoprotective Activity, Chem. Nat. Compds, 51(3):423-426.