

THE SUPERCRITICAL CO₂ EXTRACTION OF *JUNIPERUS OBLONGA L.*

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INTRODUCTION

In spite of wide spread occurrence of *Juniperus oblonga L.* in the Caucasus there are very few works studying its chemical composition and of CO₂ extraction. Generally *Juniperus oblonga L.* is applied in medicine and food industry. For maximum exposure of biologic potential of the plant is needed a complete study of its chemical composition.

A composition of the extract depends on soil-climatic conditions. In this connection there are observed some discrepancies in yield percentage of extractive substances of the same species of plant. This question is very important at gathering of herbal raw material for certain objectives of pharmaceutical, food, cosmetic, etc. industries, and so a problem of phytotechnological investigations and an application of new technologies in extract and separation processes remain very urgent today.

MATERIALS AND METHODS

Juniperus oblonga L. was gathered in the second half of November at a height of 1750 m and 2000 m above sea level and dried in the shade aerating place at temperatures 35-37°C. The juniper was grinded to the sizes of 0.3-05 mm.

The extraction was carried out in the experimental device, which consists of extractor with capacity of one liter. Grinded plant was loaded into the extractor. Next CO₂ was supplied in to extractor at necessary supercritical parameters and infused during 20 min. After that CO₂ with dissolved extract was moved up into the separator, where the temperature 25°C and pressure 0,5 MPa were sustained, at which CO₂ transferred into the gaseous state and the extract precipitated in separator.

To determine the extraction dynamics of different compound classes were chosen three supercritical CO₂ – extracts of juniper, obtained in isothermal regime (t=31.5°C) at pressures 10, 20, and 30 MPa. They differed by mass, appearance, density and consistency.

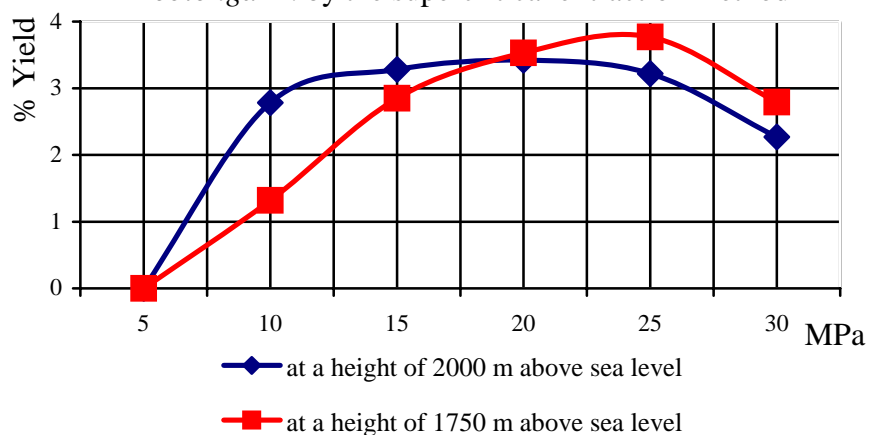
The chemical analysis for obtained fractions was carried out by a gas chromatography method of mass-spectral and UV detection in the device (Saturn 2000 (Varian)) in column Stabilwax with 30 m of length, 0.32 mm of inside diameter, 0.5 mc of fixed phase thickness.

RESULTS

The experiments show a noticeable difference in yield of extractive substances from a change of the extraction parameters. The accumulation of biologically active substances in the plant is different in the dependence of its growing place. For *Juniperus oblonga L.* gathered at a height of 1750 m above sea level reveals the maximum biological active substance yield at 25 MPa. And temperature 31.5°C, for the specimen gathered at a height of 2000 m above sea level the BAS yield occur at 20 MPa., but insignificantly changes in interval from 10 to 25 MPa. Such temperature 31.5°C for process is chosen in order to save the thermolabile compounds in extracts.

The obtained data show a noticeable change in biologically active components relation of CO₂ – extracts of *Juniperus oblonga L.* in the dependence of stage and parameters of the extraction process.

Figure 1. Yield of extractive substances from *Juniperus oblonga L.* by the supercritical extraction method



Isotherms of extractive substances yield are given (Figure 1). Our results make it possible choose more effective parameters for extraction of biologically active substances from *Juniperus oblonga L.* The obtained extractions differ by density, color, smell and freezing temperature. Hence, it preliminarily can be concluded that extracted components strongly depend on the extraction parameters.