

## STUDIES ON THE FATTY ACID COMPOSITION OF HOP EXTRACT

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**Studies on fatty acids composition of hop extract obtained from Vurtenberg hop by extraction with a threecomponent mixture was carried out.**

**It has been established that the content of fatty acids in hop extract is 0.3% ±5%. Fatty acids composition was determined by Gas-chromatographic analysis. The presence of the following unsaturated fatty acids has been proven: C<sub>18:1</sub>; C<sub>18:1</sub>; C<sub>18:2</sub>; C<sub>18:3</sub>; C<sub>20:1</sub> which represent about 40% of the general content of fatty acids in the extract.**

**Key Words:** Hop extract, fatty acids, fatty acids composition.

### INTRODUCTION

It is known that the lipids of the hop plant are located in the seeds<sup>1</sup>. The quantity to be found in hop extract depends on the seed content and breaching of seed cover during extraction. The presence of glyceride oil in the extract can adversely affect beer quality since after oxidation undesirable aromatic products appear and the fatty acids have a negative influence on beer foam. Literature indicates that glyceride removal from the extract can be accomplished by additional treatment with dilute alcohol<sup>1</sup>. The quantity of glyceride oil and its action in the extract will depend on the hop extraction technique.

The purpose of this study is to examine the fatty acids composition of hop extract.

### MATERIALS AND METHODS

Hop extract from the Vurtenberg variety of hop was prepared using a threecomponent mixture, consisting of methyl alcohol 0.5 parts, petroleum ether 0.25 parts and dichloroethane 0.25 parts, at 1.2 · 10<sup>-2</sup> m<sup>3</sup>/kg hydromodule, at 30°C temperature for 120 minutes for first extraction, 15 minutes for the second and 15 minutes for the third extraction. To determine fatty acids composition, first methyl esters of fatty acids contained in hop extract were obtained. For this purpose the extract is methylated with methylation mixture<sup>2</sup>.

Purification was by thin layer chromatography using the system PE:EE = 97:3 (Figure 1).

The pure methyl esters were analysed by a Gas-chromatograph type GC 6000 Vega Series Carlo Erba, flame ionization detector, integrator, FFAP immovable phase, 25 m capillary column, 230°C column temperature, 0.8 cm<sup>3</sup>/min gas-carrier velocity, Argon, sample: 0.1 µl in tetrachloromethane.

### RESULTS AND DISCUSSION

It has been shown that the content of fatty acids in studied hop extract is 0.3%.

The fatty acid composition is displayed in Table I.

The unsaturated fatty acids are 44.2% of the general contents of fatty acids in the studied hop extract. Linolic—18.8% and linoleic acids—17.7% predominated. The highest content is palmitic acid, which is 27.6% and the general content of unsaturated fatty acids is 42.3%. These results show balanced contents of saturated and unsaturated fatty acids in hop extract, obtained with threecomponent solvent from the Vurtenberg hop.

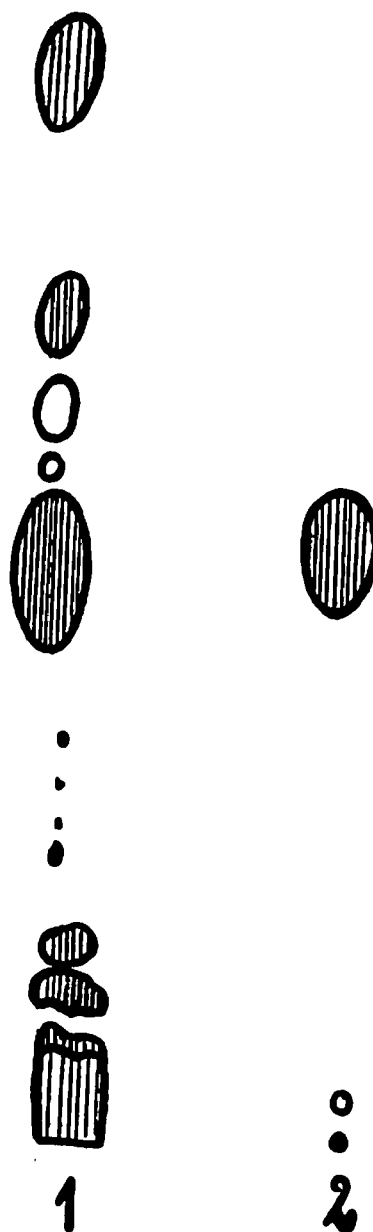


FIG. 1. 1. Hop extract. 2. Methyl esters of higher fatty acids.

TABLE I. Fatty acids composition of hop extract obtained from Vurtenberg hop

No.	Name of fatty acids	Contents, %
1.	Lauric acid	0.3
2.	Myristic acid	6.4
3.	Palmitic acid	27.6
4.	Palmitoleic acid	1.2
5.	Stearic acid	3.4
6.	Oleic acid	6.5
7.	Linolic acid	18.8
8.	Linoleic acid	17.7
9.	Arachic acid	4.0
10.	Gadolinic acid	0.6
11.	Others	13.0

## REFERENCES

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