

EXTRACTIVE SUBSTANCES OF THE BARK OF *Picea obovata*

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The present communication gives the results of an investigation of a petroleum ether extract of the bark of the Siberian spruce *Picea obovata* L. growing in Novosibirsk Oblast.* We have previously studied the extractive substances of the bark of this species growing in other regions [1, 2].

It was found that at the same degree of grinding and extraction (petroleum ether, 70-100°C, Soxhlet apparatus) the weight of extractive substances in the sample under investigation was almost twice as great (3.45%, compared with 1.8%) as in the bark of a spruce growing in the Altai [1]. The component compositions of the two extracts were close, but there were some qualitative and considerable quantitative differences.

The extract under study contained more isocembrol (12% of the weight of the neutral fraction of the extract) and esters of β -sitosterol and unsaturated fatty acids (11.7%), and we found polyprenols and dolichols (0.22%, ratio 2.6:1), dehydroabietinal, isopimarinal, and methyl dehydroabietate. There was a considerable amount of dehydroabietic acid derivatives — 7-oxo- and 15-hydroxydehydroabietates, 10 and 20%, respectively, of the sum of the "strong" acids; 5% on the extract.

The common components of bark extracts from different growth sites were: *cis*-abienol, triterpene alcohols of the serratenene type, β -sitosterol, campesterol, resin acids (abietic, dehydroabietic, isopimaric), and saturated (16:0-24:0) and unsaturated (18:1, 18:2, 18:3) fatty acids. The yield of acids from the extract investigated amounted to 65%.

A feature of this extract was the almost complete absence from it of phenolic acids and their derivatives and of triterpene ketones and diols, and also the low level of fatty alcohols with a predominance of the 18:0 alcohol (28.8%) rather than the 22:0-24:0 species in [1]. At the same time, about 20% of the neutral fraction of the extract consisted of di- and monoacylglycerols.

Among the minor compounds of the extract we found 18-nordehydroabietinol and 11*S*,12*S*-epoxyisocembrol (trocheliophorol), which has been isolated previously from the oleoresin of the Siberian stone pine [3], although this is the first time that it has been found in spruce bark extracts. However, the compounds mentioned above may be artefacts formed as a result of the autoxidation the dehydroabietinol and isocembrol present in the extracts [3, 4].

REFERENCES

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*Maslyanskii region, village of Elban', gathered in July 1993.