Study of Composition of Volatile Compounds of Siberian and Far East Conifers by Gas Chromatography - Mass-Spectrometry

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Compositions of volatile compounds were studies by GC-MS using quadruple MS (Hewlett-Packard MSD 5971) coupled to a HP 5890/II GC fitted with an HP-5 (30 m × 0.25 mm I.D., film thickness 0.25 μm) fused silica column. The percentage composition of the essential oils was computed from GC peak areas without using correction factor. Qualitative analysis was based on comparison of the retention indexes and full mass spectra of the components with the data for standards prepared by separation of reference oils and identified by NMR spectroscopy. Using the column mentioned above, one can face the problem of determination of content of limonene and β-phellandrene if they occur together because they have identical retention indexes. We studied composition of hydrocarbons from oleoresins of *Abies alba* Mill., *Abies gracilis* Kom., *Abies mayranana* Miyable et Kudo, *Larix decidua* Mill, *Pinus funebris* Kom. and *Picea excelsa* Link (P. abies Kor), as well as essential oils (prepared by the standard hydrodistillation technique) from shoots of *Abies sibirica* Ledb., *Pinus sibirica* R. Mayr. and *Picea obovata* L. of the population from Altai Mountains (Choiskii region).

The data obtained allowed us to define more exactly composition of extracts and oils of conifers which are of great importance as industrial source of wood and turpentine. The main constituents of hydrocarbon fraction of *Abies gracilis* are α-pinene (27.1%), β-pinene (26.2%), β-phellandrene (29.7%). We failed to observe γ-terpinene, terpinolene, fenchene, β-farnesene, α-muurolene, γ- muurolene, β-elemene and caryophyllene which had been mentioned before as constituents of the fraction. The main constituents of hydrocarbon fraction of *Abies mayranana* are α-pinene (16.3%), β-pinene (26.4%), β-phellandrene (53.3%). We did not find β-farnesene, ar-curcumene, α-muurolene, γ-muurolene and γ-cadinene whose presence had been reported in previous works. Hydrocarbon fraction of *Abies alba* contains α-pinene (49.7%), β-pinene (13.4%) and limonene (20.1%) as the main constituents. Hydrocarbon fraction of oleoresin of *Larix decidua* contains the following main components: α-pinene (69.7%), β-pinene (6.5%), limonene (5.5). Hydrocarbon fraction of oleoresin of *Pinus funebris*: α-pinene (34.6%), β-pinene (12.7%), longifolene(19.8%). Hydrocarbon fraction of oleoresin of *Picea excelsa*: α-pinene (31.6%), β-pinene (23.9%).

The main constituents of essential oil of *Picea obovata* are α-pinene (9.0%), camphene (17.0%), 3-carene (6.9%), limonene (12.0%) and bornyl acetate (31.8%). We did not find α-ylangene and γ-cadinene whose presence had been reported in previous works. The main constituents of essential oil of *Pinus sibirica* are α-pinene (82.9%), camphene (1.3%), β-pinene (3.3%) and β-phellandrene (11.9%). We did not find α-ylangene and β-bisabolene whose presence had been reported in previous works. The main constituents of essential oil of *Abies sibirica* are tricyclene (3.1%), α-pinene (13.7%), camphene (28.4%), 3-carene (6.2%), β-phellandrene (6.3%) and bornyl acetate (37.6%). We did not find β-bisabolene, ar-curcumene and β-farnesene whose presence had been reported in previous works. The details of separation and identification procedure as well as composition of the hydrocarbon fractions are discussed.

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