



“HDIR-6: Targeting Cancer”

**The 6th Meeting of the Croatian Association for Cancer
Research with International Participation**

November 10-12, 2022

Hotel International, Zagreb, Croatia

BOOK OF ABSTRACTS

**Hrvatsko društvo za istraživanje raka (HDIR)
Croatian Association for Cancer Research (CACR)**

“HDIR-6: Targeting Cancer” The 6th Meeting of the Croatian Association for Cancer Research with International Participation – Book of Abstracts

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Hotel International, Miramarska cesta 24, HR-10000 Zagreb, Croatia

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November 10-12, 2022

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P10: Cytotoxic Effects of *Lavandula angustifolia* Mill. and *Laurus nobilis* L. Essential Oils on Human Cervical Adenocarcinoma Cells

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Lavandula angustifolia Mill. (lavender) is an aromatic and medicinal herb whose flower essential oils (EO) are widely used for the treatment of gastrointestinal, nervous, and rheumatic disorders, and in the perfume industry. *Laurus nobilis* L. (laurel bay) is an evergreen tree whose EOs have antimicrobial and anti-inflammatory effects. Lavender and bay were collected from Sarajevo and Mostar in Bosnia and Herzegovina. The extraction was performed by hydrodistillation in Clevenger-type apparatus. Phytochemical composition was analyzed by gas chromatography coupled with mass spectrometry. Cytotoxic activities of lavender EO and bay leaf, fruit and seed EOs were investigated against human cervical adenocarcinoma HeLa cells and non-transformed human lung fibroblasts MRC-5 by MTT cell survival assay. Cell cycle phase distribution was examined by flow cytometry. In bay EOs the most abundant component was 1,8-cineole, followed by linalool, bicyclic monoterpenes sabinene, α -pinene, and β -pinene. Components identified in the fruit and seed, but not in the leaf were (E)- β -ocymene, camphene, β -elemene, bornyl acetate and trans-caryophyllene. The major component of lavender extract was linalool accompanied by linalyl acetate, lavandulyl acetate, camphor, 1,8-cineole, borneol, α -terpineol, and terpinene-4-ol. The four tested EOs showed concentration-dependent cytotoxic effects on HeLa and MRC-5 cells. Among examined EOs, lavender EO exerted the strongest cytotoxic activity on HeLa cells with IC₅₀ value of 0.11 μ L/mL. Bay seed and fruit EOs exerted stronger cytotoxicity on HeLa cells than bay leaf EO (IC₅₀ values: 0.17, 0.21, and 3.35 μ L/mL, respectively). When compared with sensitivity of HeLa cells, normal MRC-5 cells showed similar sensitivity to the cytotoxic activity of the four tested EOs. Lavender EO applied at IC₅₀ concentration, during 24 h caused remarkable increase in the percentage of HeLa cells within the subG1 cell cycle phase, in comparison with control cells (64.69% vs 2.47%). Pretreatment with caspase-3, caspase-8 or caspase-9 inhibitor before 24 h treatment with lavender EO did not cause changes in the percentage of cells in the subG1 phase in comparison with HeLa cells exposed only to lavender oil. Our results showed that lavender and bay EOs exerted potent cytotoxic activity against HeLa cells. Additional investigations are necessary to explore cytotoxic effects of these EOs against various cancer cell lines and mechanisms underlying anticancer effects.