

Vilniaus universitetas
Medicinos fakultetas



STUDENTŲ MOKSLINĖS VEIKLOS TINKLO LXXVII KONFERENCIJA



Vilnius, 2025 m. gegužės 16 d.

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Leidinį sudarė VU MF Mokslo ir inovacijų
skyriaus Studentų mokslinės veiklos
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VILNIAUS
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LEIDYKLA

2025

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ISSN 2783-7831 (skaitmeninis PDF)

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THE IMPACT OF LITHUANIAN GARLIC ESSENTIAL OIL ON OXIDATIVE STRESS AND CELL GROWTH IN SK-MEL-28 MELANOMA CELLS

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Aim. To evaluate the effect of Lithuanian garlic essential oil extract on oxidative stress and cell growth

Methods. SK-MEL-28 melanoma cells were cultured in DMEM supplemented with 10% FBS and 1% penicillin-streptomycin at 37 °C with 5% CO₂. Cell viability and growth were evaluated using the CCK-8 assay. Cells were seeded in 96-well plates and treated with various concentrations of Lithuanian garlic essential oil. After incubation, CCK-8 reagent was added, and absorbance was measured at 490–525 nm. Oxidative stress levels were assessed using a fluorometric intracellular ROS detection kit following the manufacturer's protocol. ROS generation was quantified using a microplate reader. Cell migration was evaluated with a wound healing assay by measuring the closure of a scratch made on a confluent monolayer. Statistical significance was determined using Student's t-test, with results considered significant at $p < 0.05$.

Results. Based on the results of the CCK-8 and ROS assays, Lithuanian garlic essential oil has a statistically significant effect on melanoma cell growth and oxidative stress. The CCK-8 assay results showed that the oil concentration reduced the viability of SK-MEL-28 cells: 1 lt (lt 1) – 4.2%, 2 lt (lt 2) – 20.1%, and 3 lt (lt 3) – 4.0% ($p < 0.05$). This suggests that the oil inhibits melanoma cell growth, potentially inducing cell death. Furthermore, Lithuanian garlic reduced oxidative stress in melanoma cells: 1 lt (lt 1) – 5.9%, 2 lt (lt 2) – 3.98%, and 3 lt (lt 3) – 2.1% ($p < 0.05$). This may promote cell survival and growth, as decreased oxidative stress protects cells from damage. However, further studies are required to definitively determine whether this effect is anticancer or growth-promoting.

Conclusion. Based on the results, Lithuanian garlic essential oil shows potential to inhibit melanoma cell growth and reduce oxidative stress, but further research is needed.

Key words. Lithuanian garlic, essential oil, oxidative stress, SK-MEL-28, CCK-8 test, ROS test.