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The 65th international conference for students of Physics and Natural sciences Open Readings 2022 brings together young researchers from all over the world. Open Readings 2022 is a virtual event where the conference attendees can share their work and ideas on an extensive range of topics and connect with one another. We hope that the conference participants will enjoy memorable lectures from world-class speakers and presentations from eager young scientists.

We wish you good luck in your scientific journey. Stay curious and creative.

Yours sincerely,

Open Readings 2022 Organizing Team



ARTEMISIA TILESII LEDEB EXTRACT INHIBITS 15-LIPOXYGENASE ENZYME

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Inflammation is the cause of many chronic diseases of various human body systems. According to the modern understanding, inflammation on the one hand is a necessary protective and adaptive reaction of the organism to the influence of pathogenic factors, on the other hand - a pathological process that in chronic course leads to atherosclerosis, cancer, neurodegenerative diseases, etc. [1, 2].

Neurodegenerative disorders, including Alzheimer's disease, which directly linked to inflammation, are one of the leading causes of disability in Europe [1, 2].

Enzymatic and non-enzymatic ways of formation of lipid peroxidation metabolites play a significant role in the formation and progress of inflammatory processes, initiating oxidative stress and provoking secondary alteration as a mediator of inflammation. One of the key enzymes of lipid metabolism is lipoxygenase. Thus, the search for compounds capable of inhibiting 15-lipoxygenase activity and the development of a drug with anti-inflammatory action using inhibitors of this enzyme is relevant [3].

There is information in the literature on the use of plants that contain substances that inhibit enzymes that play a role in the progress of inflammatory processes, such as 15-lipoxygenase. Such plants include *Artemisia tilesii* Ledeb [3].

Artemisia tilesii Ledeb is a little-known plant with a very narrow range that grows in Japan and North America. This plant belongs to the class *Magnoliopsida*, a division of the *Magnoliophyta* family *Asteraceae* [4]. There are practically no publications on the biological activity of these plants. We only know that the indigenous population uses them to treat various diseases [4].

An extract from *Artemisia tilesii* Ledeb, which contains a large amount of flavonoids, selected for the study. It is promising and expedient to conduct research on the use of *Artemisia tilesii* extract as an inhibitor of the enzyme 15-lipoxygenase, which will allow us to evaluate the possibility of its use as a potential active pharmaceutical ingredient for development an effective anti-inflammatory drug for the treatment of neurodegenerative diseases.

The study of the extract from *Artemisia tilesii* Ledeb using FTIR spectroscopy revealed that the main part of the extract substances has an aromatic nature, a small amount of substances contains aliphatic groups with a branched structure. In comparison with rutin, this water-ethanol extract (30:70%) *Artemisia tilesii* Ledeb, contains about 34% flavonoids. It was also proved that this extract effectively inhibits the enzyme 15-lipoxygenase (IC₅₀ = 17.94 ± 1.20 μm), because this effect is manifested in the studied concentration range for rutin 25-100 μm. Probable mechanism of inhibition of 15-lipoxygenase extract from *Artemisia tilesii* Ledeb – mixed (partial). Mixed (partial) inhibition occurs when the inhibitor binds both in the active site of the enzyme and externally, and the enzyme substrate complex retains partial activity compared to the native enzyme. The mechanism of inhibition established in this study fully accord to the essence of the extract composition as a mixture of different biologically active and inert substances. Thus, it can be argued about the potential anti-inflammatory properties of the extract of *Artemisia tilesii* Ledeb in vitro.

The results indicate that the extract of *Artemisia tilesii* Ledeb can be used in the development of new anti-inflammatory drugs for the treatment of neurodegenerative diseases.

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