

# INFLUENCE OF LOW AND MEDIUM MOLECULAR PROTEIN AND PEPTIDE FRACTIONS IN EXTRACTS SEEDS OF *CHENOPODIUM ALBUM L.* ON COMPONENTS OF PAIN IN RATS

*Cheretaev I. V.<sup>1</sup>, Chaika A. V.<sup>1</sup>, Pertsov S. S.<sup>2</sup>, Kozlov A. Yu.<sup>2</sup>, Rogozhin E. A.<sup>3</sup>*

<sup>1</sup>*V. I. Vernadsky Crimean Federal University, Simferopol, Russian Federation*

<sup>2</sup>*Federal State Scientific Institution "Research Institute of Normal Physiology P.K. Anohina", Moscow, Russia*

<sup>3</sup>*Federal State Budgetary Educational Institution of the Higher Education "A.I. Yevdokimov Moscow State University of Medicine and Dentistry" of the Ministry of Healthcare of the Russian Federation*

<sup>4</sup>*Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry of the Russian Academy of Sciences, Moscow, Russia*

*E-mail: cheretaev86@yandex.ru*

The work studied the analgesic activity different doses of extracts *Chenopodium album L.*, containing small and medium molecular protein-peptide fractions and evaluated their impact on perceptual, emotional, and immune pain components in rats in normal conditions and 1 hour after intraperitoneal administration to laboratory rats. The experiments were performed on 60 male rats Wistar weighing 220–260 g, which were divided into 6 groups. The effect of the tested extracts on the perceptual component of pain was assessed in the test "tail-flick" and emotional – on the verge of vocalizing animals in response to electrocutaneous stimulation of the tail in the test "electrocutaneous stimulation of the tail." Part of the immune component of pain in the physiological effect of the investigated extracts was determined against the background of the injection of lipopolysaccharide, with immunomodulatory properties, using the test "tail-flick" and "electrocutaneous stimulation of the tail".

Before performing the experiments animals of each group in the initial state measured their baseline nociceptive thresholds in the test "tail-flick" and "electrocutaneous stimulation of the tail." Then the animals using disposable plastic syringes were introduced specific the test substance. 1 hour after injection of the test's substances were again determined nociceptive thresholds in the test "tail-flick" and "electrocutaneous stimulation of the tail".

Rats in the control group (n=10) was administered once intraperitoneally 0.5 ml of physiological solution (0.9-% NaCl). Animals of groups I (n=10) and II (n=10) received

intraperitoneal injections once the seed extract *Chenopodium album* L., containing protein-peptide components with molecular weight from 1500 to 5000 Da in doses of 85 and 850 µg/kg respectively. Animals of group III (n=10) received intraperitoneal injections the seed extract *Chenopodium album* L. containing low molecular weight components with a weight up to 1500 Da (85 µg/kg). The investigated extracts obtained in the Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry of the Russian Academy of Sciences (Moscow, Russia). Animals of groups IV (n=10) and V (n=10) were given once intraperitoneally injection of lipopolysaccharide pyrogenalum in a dose of 30 µg/kg dissolved in 0.5 ml of saline. On the 4th day after the injection of pyrogenalum the animals were measured nociceptive thresholds in the test "tail-flick" and "electrocutaneous stimulation of the tail". Then the rats of group IV carried out by intraperitoneal injection of seed extract *Chenopodium album* L., containing protein-peptide components with molecular weight from 1500 to 6000 Da at a dose of 850 µg/kg. Animals of group V of an extract containing protein and peptide components with molecular weight up to 1500 Da in a dose of 85 µg/kg, 1 hour after injection was measured again nociceptive thresholds of the animals in the test "tail-flick" and "electrocutaneous stimulation of the tail."

The experimental results were processed using statistical software package STATISTICA 12. The significance of differences between groups of rats was determined using the nonparametric Wilcoxon test. The adopted level of significance of intergroup differences was 5 %.

In the test "tail-flick" it was discovered, that the seed extract *Chenopodium album* L. (850 µg/kg) containing mainly protein-peptide components with molecular weight from 1500 to 6000 Da, 1 hour after injection suppresses the perceptual component of nociception in rats, significantly increasing ( $p < 0.01$ ) latent period of diversion of the tail compared to the initial state by 20.51 %.

In the test, "electrocutaneous stimulation of the tail" it is shown that compared to baseline 1 hour after injection of the seed extract *Chenopodium album* L. at a dose of 85 µg/kg, containing primarily peptide components with molecular weight up to 1500 Da, suppresses the emotional component of nociception, significantly increasing the threshold vocalizations by 28.36 % ( $p < 0.05$ ).

On the background of injection of lipopolysaccharide pyrogenalum shown that the seed extract *Chenopodium album* L. at a dose of 850 µg/kg containing mainly protein-peptide components with a molecular weight of from 1500 to 6000 Da, weakens algesic effect of pyrogenalum, by acting on the immune component of nociception.

All studies was performed on equipment laboratory of emotional stress Federal State Scientific Institution "Research Institute of Normal Physiology P.K. Anohina" (Moscow, Russian Federation) in the framework of the draft Programme of Development of V. I. Vernadsky Crimean Federal University in 2015–2024 years.

**Keywords:** perceptual, emotional, and immune components of pain, *Chenopodium album* L., protein-peptide extracts, lab rats, the test "tail-flick", test "electrocutaneous stimulation of the tail", pyrogenalum.

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