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Lipid profile of spontaneously hypertensive rats after application of rhythmic extreme cryoeffect and conditioned medium of mesenchymal stromal cells

I.V. Kandybko [1], L.A. Syrotenko [1, 2]
[1] Institute for Problems of Cryobiology and Cryomedicine of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine
[2] State Institution "V.Ya. Danilevsky Institute of Endocrine Pathology of the National Academy of Medical Sciences of Ukraine", Kharkiv, Ukraine

Arterial hypertension (AH) and its complications remain the most common problem of modern medicine. The presence of a large arsenal of pharmaceutical agents intended to reduce blood pressure and atherogenic chan-ges in the cardiovascular system is not always able to achieve the expected therapeutic effect. Therefore, the search for new methods of therapeutic influence on the body for partial or complete restoration of disturbed homeostasis remains relevant.

The research aim was to study the combined effect of conditioned medium (CM) of mesenchymal stromal cells (MSCs) and rhythmic extreme cryotherapy on the lipid profile of spontaneously hypertensive rats (SHR) of different age groups.

The studies were performed on 9- and 24-month-old male SHR, which were selected as a classical model of hypertension. White outbred rats served as normotensive controls. The CM was obtained during cultivation of human dermal MSCs. The CM MSCs were administered intraperitoneally to experimental animals at the rate of 50 μg of protein/100 g of animal weight after 9 sessions of RECE (–120 °C). The content of total cholesterol (C), triglycerides (TG), and high-density lipoprotein cholesterol (HDL-C) was determined. The formula was used to calculate the level of low-density lipoprotein cholesterol (LDL-C), very-low-density lipoprotein cholesterol (VLDL-C) and the atherogenic index (AI). As a result of the work, it was established that spontaneously hypertensive rats of different age groups have an imbalance of the lipid profile (significantly increased levels of AI, AI and LDL-C), which indicates the development of cardiovascular disorders in these animals. The combined use of RECE and CM most effectively affected the state of cholesterol homeostasis in spontaneously hypertensive rats of both age groups during the month of post-exposure, which allowed a significantly reduction of the AI by 42.2 and 60.3% in groups of rats aged 9 and 24 months, respectively, compared with the normotensive control groups. The decrease in atherogenic fractions in the blood of SHR occurred due to the activation of cholesterol transport forms (HDL-C) in the liver.

The obtained experimental data allow us to expand the understanding of the influence of the combined action of RECE and MSC CS in the development of pathological processes, in particular arterial hypertension.

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Temperature-adapted invasive species of aquarium invertebrates as a threat to the local fauna of Kharkiv Region (Ukraine)

S.A. Sidorovskiy
V.N. Karazin Kharkiv National University, Kharkiv, Ukraine

Contemporary global biodiversity is experiencing unprecedented anthropogenic pressures, resulting in significant alterations in ecosystem structure and function. Human activities proved to be the primary drivers of biodiversity loss, leading to species extinctions at both local and global scales. Key threats include habitat degradation, fragmentation, environmental pollution, climate change, and the introduction of invasive alien species. Among these, biological invasions are recognized as a major contributor to biodiversity decline, as non-native species can outcompete native taxa, disrupt ecological interactions, and destabilize ecosystem processes (Dudgeon *et al*., 2006). To date, several representatives of non-native aquarium fauna, which are popular among aquarists, have been recorded within the Kharkiv region: *Tarebia granifera*, *Planorbella duryi*, *Neocaridina davidi*, and *Procambarus virginalis* (Sidorovsky *et al*., 2023). Also, in the near future, we can expect the invasion of *Helobdella europaea*, which is common in aquaculture conditions in Ukraine (Morhun *et al*., 2021).

Tarebia granifera in the Kharkiv region, a single specimen of the species was first recorded in February 2021 in the discharge channel of the Eskhariv Thermal Power Plant (Sidorovsky *et al*. 2023). Besides, it was also found in the cooling pond of the Zaporizka Nuclear Power Plant (Yakovenko *et al*. 2018). No records of the species have been revealed outside thermally polluted water bodies, although the species is registered in both thermally polluted rivers and ordinary ones. Individuals of the species can create large clusters. *Planorbella duryi* was first recorded in 2020 in the discharge channel of the Eskhar TPP (Sidorovsky *et al.,* 2023). Over Ukraine, the snail has been found in the Donetsk, Odesa, and Khmelnytskyi regions (Son, 2009; Silaeva *et al.* 2009). Moreover, it has been also revealed in Italy, France, Germany, and the Slovak Republic (Vimpère, 2004: Nehring, 2006). The species is common in thermally polluted water bodies and in ordinary ones. The individuals of *P. duryi* can form large aggregations consisting of many snails. *Neocaridina davidi* in the Kharkiv region, a single specimen of the species was first recorded in June 2020 and October 2021 on the thermally polluted section of the Kharkiv River. Other finds in Ukraine are unconfirmed. The species was also found in Hungary, Poland, and Germany (Jablonska *et al*., 2018; Gerhard, Arndt, 2018). The crustacean is registered in both thermally polluted rivers and ordinary ones. *Procambarus virginalis in* the Kharkiv region, a single specimen of the species was first recorded in October 2019 and October 2020 in a pond of Kharkiv. In October 2020 and February 2021 the species was revealed in the discharge channel of the Eskhar Thermal Power Plant (Son *et al*. 2020; Sidorovsky *et al*. 2023). This is one of the most common non-native species in Europe (Kouba *et al*. 2014). The crustaceans have been found both in thermally polluted water bodies and in ordinary ones.

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