Introduction

This special issue of Acta veterinaria Brno is a follow-up of the Supplement No. 6, volume 62, 1993 in which papers presented at the 1st International Symposium on Avian Microgravity were published. They were devoted to results of studies of a highly productive heterotrophic organism - Japanese quail as a part of the cosmic ecosystem.

The 2nd International Symposium on Avian Microgravity held on October 10-14, 1994 reached further in that its goal was to form a basis for international meetings aimed at more complex evaluations of the Biological Life Support System (BLSS) under cosmic conditions. BLSS is a closed autonomous cosmic ecosystem that is able to function due to multiple trophic relationships among autotrophic and heterotrophic organisms, including man and biological destructors such as bacteria and worms. The principle of BLSS lies in that it is a self-sustained system capable of long-term existence based on recycling of biogenic substances.

The core of this issue is formed by papers presented at the Symposium. For the first time, papers dealing with morphology and physiology of higher plants kept on the Orbital Station MIR and the complex MIR-SHUTTLE are included. The majority of papers is devoted to experiments using Japanese quail under cosmic flight conditions and in model experiments in the laboratory. The effect of microgravity upon quail embryonic development, on the content of mineral substances in their bones at various stages of development and in adult birds, morphology of bone tissue and behaviour of Japanese quail during repeated parabolic flights. From model laboratory experiments, the effects of hypodynamy on reproductive functions and haematological changes are included.

Such data serve as a baseline for further experimentation aimed at the closed reproductive cycle in microgravity and raising a cosmic population of these birds.

Joint evaluation of these results obtained both in autotrophic and heterotrophic organisms will yield new information concerning the influence of the heterotrophic link in the cosmic ecosystem upon its optimalized closedness. This knowledge will contribute to a gradual creation of an efficient biological system of life sustenance during long-term orbital flights but also during settlement of planetary stations.

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