

**DEVELOPMENTAL BIOLOGY IN MICROGRAVITY  
(«Greenhouse», «Biolaboratory» Projects)**

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**Introduction.** The currently available experimental evidence concerning the generative development of higher plants in microgravity does not provide an answer to the problem of obtaining the second and next generations of fertile plants in orbit. This issue is of paramount importance, because higher plants are an indispensable component of CELSS. The attempts to obtain the second generation of fertile higher plants in orbit, i. e., fruiting and forming viable seeds, were futile. The causes of failure could be the following: 1) disturbance of hormonal balance in plants in space flight, especially at the stage of transition to generative development; 2) lack of the optimal conditions for plant growth, first of all, aeration and water regime for the root system growth.

Therefore, development and creation of a space

green-house of a new generation is absolutely necessary for growing higher plants and selection of other species of dicotyledons and monocotyledons for long-term space flight experiments. All this will enable studying the peculiarities of seed reproduction of higher plants in microgravity. The higher plants (wild and cultivates) have a different ecology and diverse types of the root system. They differ by the peculiarities of generative development, in particular, by the types of embryo- and endospermogenesis. Due to these features, the various species of higher plants will adapt to microgravity in different ways. The chief objective of experiments proposed below is to realize all the stages of generative development (budding, flowering and fruiting) for formation of viable seeds of the second and next generations in orbit.

**«Seed» Experiment**

**INFLUENCE OF MICROGRAVITY ON VEGETATIVE AND GENERATIVE  
STAGES OF ONTOGENESIS AND PLANT SEED REPRODUCTION**

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The purposes of this experiment are to study the reproductive development of annual higher plants in microgravity and to obtain a full plant cycle from seed to seed as the basis for working out the tech-

nologies of space planting for CELLS. The main objectives are as follows:

— to obtain an «embryological diagram» of annual plants in microgravity (characteristics of anther and