

ovule formation, micro- and macrosporogenesis, male and female gametophyte development, processes of pollination and fertilization, embryo- and endospermogenesis, the peculiarities of reserve substance accumulation during seed formation);

— to try to obtain the second generation of higher plants in microgravity. The methods of light microscopy, transmission and scanning electron micro-

scopy, cytochemistry, and morphometric analysis will be used.

The obtained data will be important for understanding the role of gravity in plant seed reproduction system formation and for revealing the stages in plant generative development, which are the most sensitive to the influence of microgravity.

«Orchids» Experiment

INFLUENCE OF MICROGRAVITY ON GROWTH AND DEVELOPMENT OF ORCHID PLANTS

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The purpose of the experiment is to define a sensitivity of different orchid species to the microgravity effect, depending on their anatomical and morphological features and development phases to devise methods of plant cultivation in a space flight.

The main objectives are as follows:

— to study the effect of clinostating and microgravity on physiological and biological processes in plants;

— to make a comparative analysis of the anatomical structure of the leaf surface in epiphyte and terrestrial orchid species in microgravity.

— to work out the technology of plant growing in the artificial soil substitutes using the mineral nutrition balance system.

Epiphyte and terrestrial orchid species with monopodial and sympodial types of shoot system broaching and various photosynthetic types of metabolism were chosen as the experimental samples. Use of

the callus cultures in the solid nutrient medium is also planned.

The integral parameters of morphological, anatomical and physiological changes in orchid species will be studied, to define the functional state of plants under clinostating and microgravity. The amino acid analyser will determine the content and composition of free aminoacids. Photosynthetic pigment content and activity of oxidising, as well as respiration enzymes will be evaluated by the methods of spectrophotometry. Biogenous element level in plant organs will be assessed by the atomic-absorptive gas analyser. Phytohormone compounds will be evaluated by the chromatography method and biotests.

Results obtained will promote development of the cultivation technology of plants with different morphological and ecological types in microgravity. The structural model for the microgravity conditions will be elaborated.