

THE KOSMOS-1129 BIOSATELLITE

S. A. Nikitin

(NASA-TM-76344) THE KOSMOS-1129
BIOSATELLITE (National Aeronautics and Space
Administration) 4 p HC A02/MF A01. CSCL 22A

N81-15011

Unclas
G5/12 13015

Translation of "Biosputnik 'Kosmos-1129'," Priroda, No. 2, Feb. 1980,
p. 103.



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546
AUGUST 1980

STANDARD TITLE PAGE

1. Report No. NASA TM-76344	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle THE KOSMOS-1129 BIOSATELLITE		5. Report Date August 1980	6. Performing Organization Code
7. Author(s) S. A. Nikitin Moscow		8. Performing Organization Report No.	10. Work Unit No.
9. Performing Organization Name and Address Leo Kanner Associates Redwood City, California 94063		11. Contract or Grant No. NASW - 3199	13. Type of Report and Period Covered Translation
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration, Washington, D.C. 20546		14. Sponsoring Agency Code	
15. Supplementary Notes Translation of "Biosputnik 'Kosmos-1129'," Priroda, No. 2, Feb. 1980. p. 103.			
16. Abstract <p>A number of experiments were designed by participating specialists from a number of countries and placed aboard the "Kosmos-1129" biosatellite, launched from the Soviet Union in September, 1979. The experiments included those entitled "Biorhythm", "Stress", "Body Parts", "Behavior", "Ontogenesis", and "Gravitational Preference", which are briefly described in the article. The biological subjects of the experiments conducted aboard "Kosmos-1129" were retrieved immediately after the landing of the satellite and examined in a field laboratory, whence they were sent to laboratories in the countries participating in the designing of the experiments.</p>			
17. Key Words (Selected by Author(s))		18. Distribution Statement This copyrighted Soviet work is reproduced and sold by NTIS under license from VAAP, the Soviet copyright agency. No further copying is permitted without permission from VAAP.	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages	22.

THE KOSMOS-1129 BIOSATELLITE

S. A. Nikitin

Moscow

The "Kosmos-1129" biosatellite, earmarked for the continuation of research on the effects of space flight factors on living organisms, was successfully launched from the Soviet Union on 25 September 1979. Aboard the satellite were experimental systems and their biological subjects (mammals, insects, plants, and cell cultures) as well as scientific apparatus developed in the USSR, Czechoslovakia, the USA, and France. Specialists from Bulgaria, Hungary, the GDR, Poland, and Romania participated in the preparation of biological material for the experiments.

Some of the more than a dozen experiments conducted on "Kosmos-1129" were further developments of previous ones, while others were new. 38 white rats bred under "unusually pure" conditions by specialists at the Slovakian Academy of Sciences Institute of Endocrinology served as the mammalian subjects of the "Stress", "Biorhythm", "Body Parts", and "Behavior" experiments.

The "Ontogenesis" experiment, during which attempts were made for the first time to determine the possibility of fertilization and fetal development in mammals under weightless conditions, was set up to use seven rats (five females and two males). The experiment begins with the encounter of the rats which had been placed in a special cage. It was the "Ontogenesis" experiment that basically determined the duration of the "Kosmos-1129" flight: the satellite should land 2 to 3 days before the intended births. In the opinion of specialists, the pregnant rats and the developing fetuses should be more sensitive to the effects of space flight factors, particularly weightlessness.

Research on 60 Japanese quail eggs, conducted by specialists from the USSR and Czechoslovakia, with the participation of US specialists,

was also devoted to the study of the course of embryonal development in weightlessness. The necessary conditions are automatically provided within the on-board incubator, which was built in Czechoslovakia.

A study of heat-exchange processes in weightlessness was performed using a device designed in Czechoslovakia.

The goal of the "Gravitational Preference" experiment is to ascertain the gravitational force preferred by animals for the life and development of their offspring. Varying gravitational forces are created in a small centrifuge with four tunnels made of a transparent material. Fruit flies (*Drosophila*) are placed at the center of the device, where during rotation acceleration remains zero. Newly-emerged *Drosophila*, flying along the tunnels, use their own preference to choose any of three feeding areas and places for egg-laying where the gravitational forces correspond to 0.2, 0.6, and 1.0 of the terrestrial. The experiment makes it possible not only to evaluate the effects of gravitation on living organisms, but also to determine its evolutionary importance.

Specialists from the USSR and the USA did experiments on plant cell cultures in order to confirm data from previous space flights regarding the capability of isolated somatic plant cells to develop normally from embryo to adult organism during weightlessness, as well as to study the intensity of metabolism in plant tumor cells.

The Soviet-French radiobiological experiment "Bioblock" continued research begun on previous biosatellite flights involving the dangers of cosmic ray heavy nuclei for organisms.¹ Study of electrostatic shielding against charged particles of cosmic origin was continued in radiation-physics experiments.

"Kosmos-1129" returned to Earth on 14 October 1979, after a 19-day flight. The first studies on the biological subjects which had been on board were performed at the landing site in an operationally developed field laboratory. Following preliminary evaluation of the obtained results, portions of the material were sent to scientific laboratories in the nations participating in the experiments.

REFERENCES

1. Akoyev, I. G., "Problems of Space Biophysics," Priroda, 12 (1977).

COPYRIGHT: IZDATEL'STVO "NAUKA," "PRIRODA" 1980