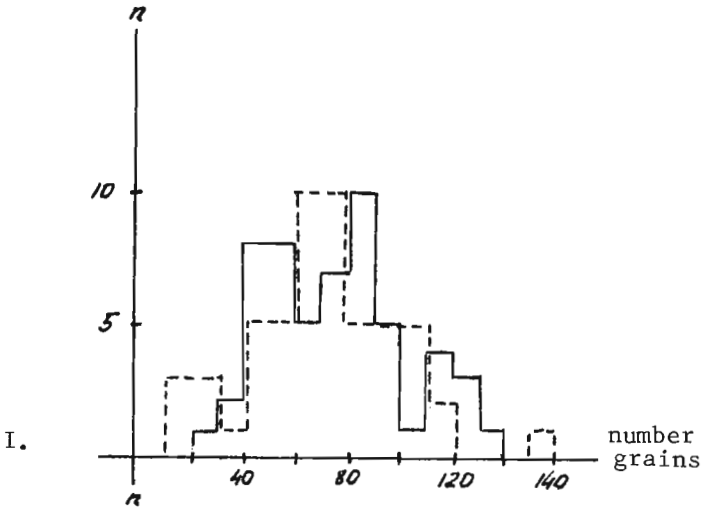
Litchev, V. A. Institute of Medical Radiology, Obninsk, USSR. The effect of radiation on the nuclear RNA synthesis in the cells of the gastric caeca of D. melanogaster.

It was shown that RNA synthesis in polytene chromosomes of the salivary glands in Diptera is not a radiosensitive process (C. Pavan and R. Basile: Int. Symp. Contr. of Cell Div. and Ind. of Cancer, Maryland, USA, 1964). The cells of the gastric caeca could be, however, the most suitable for the study of RNA synthesis by isotope methods in vitro because the gastric caeca has only few layers of cells, the possibility of equal diffusion of label during short-time incubation.

The male of inbred line (79 generations) of D. melanogaster from Batumi was used. The embryos were irradiated during the most radiosensitive stage (90-120 min. after hatching; Packard C., Radiology, 25: 223, 1935) by X-rays (dose 200 r., 20 mA, 180 Kv with filtration of 3.5 mm Al + 0.5 mm Cu, dose rate = 6.6 r. per minute). The hatching after irradiation were ranged from 15.8% to 18.0%. The temperature shock (5 min., 37°C) by the treatment in vitro of Gastric caeca in Ringer solution just before the incubation was used. After the incubation with H^3-uridine (5 min., specific activity 6000 mC/mM, concentration 200 mC/ml at a volume of 0.1 ml. per organ) the microautoradiographs were prepared (exposed 10 days) and grains over nuclei were counted. The graphs of the grain-counting given on the figures I and II. The histograms show the the dose used in the experiment had no effect on the RNA synthesis, but joint action (irradiation and temperature shock) inhibited the synthesis of RNA.



I.

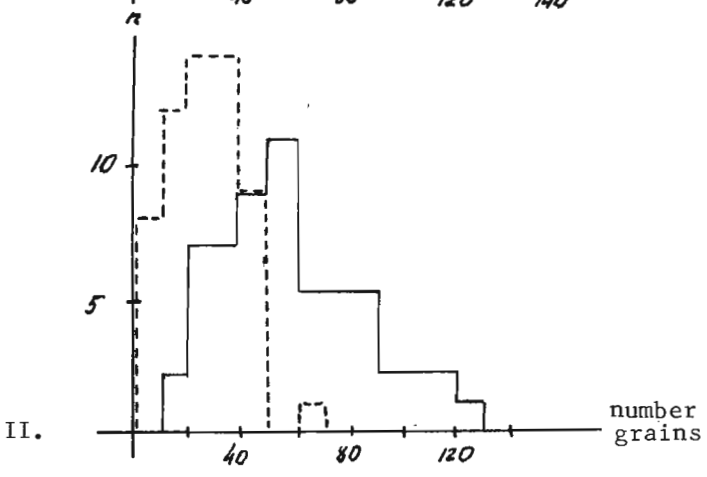
Fig. I: The effect of radiation on the nuclear RNA synthesis in Gastric caeca.

$n_{irradiated} = n_{control} = 55$

$\bar{X}_{irradiated} = 70 \pm 7$ grains

$\bar{X}_{control} = 75 \pm 7$ grains

The probability of the distinction is absent



II.

Fig. II. The effect of radiation and temperature shock on the nuclear RNA synthesis in Gastric caeca.

$n_{irradiated} = n_{control} = 58$

$\bar{X}_{irradiated\ with\ temperature\ shock} = 26 \pm 4$ grains

$\bar{X}_{control\ with\ temperature\ shock} = 57 \pm 7$ grains

The probability of the distinction is more than 0.999.