

# EFFECT OF THE PREPARATION MUMIE ON LYMPHOPOIESIS IN ACUTE RADIATION SICKNESS

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The preparation mumie stimulates lymphopoiesis in irradiated rats (investigations of peripheral blood, bone marrow, and spleen). Some stimulation of erythropoiesis, with a smaller fall and rapid recovery of the reticulocyte and platelet counts in the peripheral blood were also observed.

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In our previous investigations [1-4] the therapeutic effect of the preparation mumie in acute radiation sickness was demonstrated.

The object of the present investigation was to study the action of the preparation mumie on lymphopoiesis in acute radiation sickness.

## EXPERIMENTAL METHOD

Experiments were carried out on 130 noninbred rats of both sexes weighing 180-220 g. The animals were divided into two groups: experimental and control, and were exposed to a single dose of whole-body irradiation from a type ÉGO-2 x-ray apparatus at the rate of 180-220 R/min, with a total dose of 600 R ( $LD_{65}$ ). The period of observation was 30 days after irradiation.

The rate and duration of survival of the animals, the peripheral blood morphology, and the number of hemopoietic cells in the bone marrow and spleen were studied, and the myelogram and lienocytogram were calculated from impression films.

The animals of the experimental group received the preparation mumie in doses of 0.5 g/kg from the first to the 20th days after irradiation.

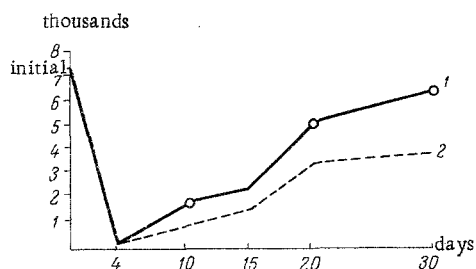


Fig. 1. Changes in lymphocyte count in peripheral blood of treated and control animals. 1) Treated rats; 2) control rats; ○) differences statistically significant.

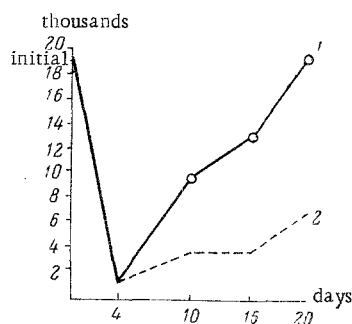


Fig. 2. Absolute number of lymphocytes in bone marrow. Legend as in Fig. 1.

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## EXPERIMENTAL RESULTS

The experiments showed that this preparation caused rapid recovery of the lymphocyte count in the peripheral blood of the treated animals (Fig. 1).

By the 10th day after irradiation the absolute and relative numbers of lymphocytes in bone marrow impression films from the treated animals were significantly higher ( $P < 0.01$ ) than in the controls (Fig. 2). Significant differences ( $P < 0.01$ ) between the control and treated animals were also found when mitotic index and absolute number of nucleated femoral marrow cells were determined on the 10th-15th and 20th days after irradiation. Recovery of the weight of the spleen and of its total cell content was more rapid in the treated animals than in the controls (Fig. 3).

The investigations showed that many disintegrating cells appeared in the impressions of the spleen from the control animals after irradiation, together with cells with pycnosis and rhexis of the nuclei, and reticular cells. All these changes were less marked in the treated animals. For example, on the 10th, 15th, and 20th days after irradiation the number of reticular cells in the control animals was  $51 \pm 7$  million,  $30 \pm 6$  million, and  $19 \pm 4$  million, compared with  $12 \pm 2.6$  million,  $21 \pm 6$  million, and  $13 \pm 2$  million in the treated animals ( $P < 0.05$ ).

The study of the lenocytogram showed that the absolute number of lymphoid cells on the 10th, 15th, and 20th days after irradiation was on the average twice or three times greater in the treated animals ( $P < 0.01$ ) than in the controls (Fig. 3). Significant differences between the treated and control animals were also found in the number of mitoses in the lymphoid cells of the spleen.

It was also shown that the preparation mumie had some stimulant action on erythropoiesis, mainly in the recovery period of acute radiation sickness. For example, by the 20th day the erythrocyte count in the peripheral blood of the treated animals was  $7.3 \pm 0.4$  million, compared with  $6.0 \pm 0.3$  million in the control ( $P < 0.02$ ). Maturation of the erythroblastic series in the bone marrow was also accelerated.

The reticulocyte and platelet counts in the peripheral blood of the treated animals fell to a lesser degree and recovered more rapidly in the treated animals.

Administration of the preparation mumie in doses of 50.5 g/kg from the 1st until the 20th day after irradiation ( $LD_{65}$ ) thus stimulated lymphopoiesis in acute radiation sickness. This was manifested by the more rapid recovery of the lymphocyte count in the peripheral blood, bone marrow, and spleen of the treated animals. The preparation mumie also had some stimulant action on erythropoiesis, mainly in the recovery period from acute radiation sickness.

## LITERATURE CITED

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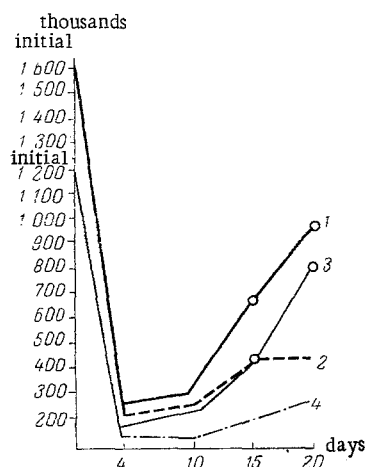


Fig. 3. Changes in total number of cells [1) experiment, 2) control] and lymphoid cells [3) experiment, 4) control] in spleen of treated and control animals. ○) differences statistically significant.