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Effects of Roentgen Rays on Development and Respiration of Grasshopper Embryos

Titus C. Evans
State University of Iowa

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EFFECTS OF ROENTGEN RAYS ON DEVELOPMENT
AND RESPIRATION OF GRASSHOP-
PER EMBRYOS

TITUS C. EVANS

Roentgen rays have been found to have many and varied effects on the development of the grasshopper, *Melanoplus differentialis*. Development may be completely inhibited, partly injured, or only temporarily retarded by proper dosages of Roentgen rays. Irradiation at a certain stage (5 to 6 days, 25° C) results in the formation of aberrant growths and the occasional duplication of formed parts. The most rapidly growing parts, and embryos developing rapidly, are more quickly affected by irradiation. The appearance of injury may be prolonged by stopping development either by cold (5° C) or by means of the natural block (diapause). When development is stopped by irradiation, the rate of respiration fails to increase with time as does that of the controls. If the nuclear end of the one day egg is protected with lead and the yolk thus irradiated with more than enough to kill the nuclei had they been exposed, the rate of oxygen consumption is not retarded at all and in some cases it is even increased. During diapause the respiration does not respond quantitatively to irradiation. It appears that the retardation of oxygen consumption rate noted when developing eggs are irradiated is due to the decrease in embryonic material rather than to a direct effect on the respiratory mechanism.

DEPARTMENT OF ZOOLOGY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

THE EFFECT OF ULTRACENTRIFUGING ON THE
RESPIRATORY ACTIVITY OF DEVELOPING
AND BLOCKED EMBRYONIC CELLS

JOSEPH HALL BODINE AND EDGAR J. BOELL

The effects of high rotational speeds as obtained through the use of the ultracentrifuge have been studied on the oxygen uptake of the eggs of the grasshopper, *Melanoplus differentialis*. The