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A Preliminary Report on the use of Parasitic Nematodes of the Earthworm for Class Study and Cytological Research

Norman M. Sulkin
State University of Iowa

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A'PRELIMINARY REPORT ON THE USE OF PARASITIC NEMATODES OF THE EARTHWORM FOR CLASS STUDY AND CYTOLOGICAL RESEARCH

NORMAN M. SULKIN

(Introduced by H. W. Beams)

A preliminary investigation shows the nematode parasites of the earthworm to be excellent material for cytological and embryological research, in addition to being useful as material for classroom study.

Their neglected study has probably been due to lack of suitable culture methods. It has been found that the nematodes will live on a 2% agar plate upon which small bits of red beef are placed. For optimum prolificity, the temperature should be kept constant at 15° C. With the use of this method, the author has kept a rapid growing culture alive for the past six months.

The ova of these nematodes have certain advantages over those of *Ascaris*, being less impervious. Several cleavages may occur during a two-hour class period. In addition, the Golgi material can be easily demonstrated and can be displaced by means of the ultracentrifuge. The eggs will cleave in the centrifuge at a force of 30,000 times gravity and the adult worms, embryos, and eggs will remain alive for at least 15 hours at that force.

Upon centrifuging, the eggs are stratified into the following layers: (1) oil globules at the centripetal pole, (2) transparent cytoplasm, (3) granules at the centrifugal pole.

Immediate examination of the eggs upon removal from the centrifuge often reveals many pseudopodia-like processes flowing out near the centripetal pole; and these, in many cases, are completely cut off.

A study is being undertaken to determine whether or not chromosome diminution occurs in these parasites.

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

OBJECTIVE STUDIES OF ELECTRIFICATION
IN MICROTECHNIQUE

KARL A. STILES AND DOUGLAS W. EASTWOOD

Tests have been made on the amount of electrification that is present when tissues are sectioned with a rotary microtome. An aluminum foil electroscope with carefully controlled conditions gave the following results. Radium, ultra-violet radiation, and spark discharges lowered the electrification to a negligible amount. Grounding the microtome, or draping it with Christmas tree tinsel had no measureable effect. Humidification of the surrounding air in several tests lowered the amount of electrification, but was too inconvenient to be practical. The best results were obtained by modification of the imbedding medium. Of eighteen different imbedding mediums, diglycol stearate, sold by the Glyco Products Company, proved to be the best. No measureable amount of electrification could be obtained with this material though other common imbedding materials used as a control showed high electrification and difficulty was encountered in obtaining ribbons from them. Since diglycol stearate is dispersible in water, attempts were made to infiltrate directly from the lower alcohols and fixatives with good results. Tissue can be infiltrated by it in a paraffin oven in one to three days using several changes. Imbedding is more successful in a fifty-fifty mixture of paraffin and diglycol stearate, and the electrification is not greatly increased.

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CEDAR RAPIDS, IOWA.

HEREDITY AND THE ETIOLOGY OF TUBERCULOSIS

KARL A. STILES AND THOMAS N. STEWART

This study traces tuberculosis of the throat through five generations of a family very susceptible to this disease.

The disease varies little throughout the family, in place of infection and in virulence.

This investigation includes one hundred and eight individuals; twenty-two having had tuberculosis of the throat; three, tuberculosis of the lung; two, tuberculosis of the bone, and three, other

throat ailments. The data suggest very strongly that there is a hereditary diathesis for tuberculosis in this family.

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COE COLLEGE,
CEDAR RAPIDS, IOWA.

EFFECTS OF ULTRACENTRIFUGING OXYTRICHA

HAROLD W. KIRSHENBLIT
(Introduced by H. W. Beams)

Oxytricha, a hypotrich having two macronuclei, was ultracentrifuged at a force of about 50,000 times gravity for five to ten minutes. It was found that the macronuclei and micronuclei are of different relative densities, the macronuclei being drawn to the centrifugal pole by high-speed centrifuging, while the micronuclei appear to be only slightly affected by the forces used. Oxytricha may be stratified and torn in two, and the fragments are able to move about independently of each other. Fragments without macronuclei are capable of normal activity, the external body form being regained in from fifteen minutes to an hour or more, depending upon the amount of distortion of the fragments. The micronuclei are able to divide while undergoing ultra-centrifugation. Small fragments containing both macronuclei and only a slight amount of cytoplasm are unable to recover, and soon die.

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