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Enzymes in Ontogenesis (orthoptera): I. Tyrosinase

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AN AMEBA-LIKE PARASITE OF GRASSHOPPERS

R. L. KING AND A. B. TAYLOR

A description of a new species of parasitic ameba which lives in the Malpighian tubules of the grasshopper, *Melanoplus differentialis*, with a discussion of its effects on the host.

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ENZYMES IN ONTOGENESIS (ORTHOPTERA)
I. TYROSINASE

J. H. BODINE AND E. J. BOELL

Variations in concentration of tyrosinase throughout the entire embryonic development of the grasshopper, *Melanoplus differentialis*, have been determined by measuring the oxygen uptake of the tyrosinase-tyrosine reaction with the Barcroft-Warburg apparatus. Tyrosinase activity of eggs at different developmental stages has thus been expressed as the amount of O₂ consumed per 100 minute interval at 25° C. in the oxidation of a given amount of tyrosine by the enzyme extracted (in phosphate buffer pH 8.0) from 20 eggs.

The growth curve for tyrosinase in the whole egg is sigmoid during the first three weeks. Maximum enzyme concentration is reached on the 20th day and is maintained at this level throughout a period of suspended embryonic development (diapause) which occurs then. The post-diapause developmental period, during which the embryo pigments and hatches, is characterized by a decrease in concentration of tyrosinase during the first 10 to 12 days. However, the maximal value is again reached two or three days prior to hatching.

The largest part of the tyrosinase content of the egg is found in the yolk and in the serosa cells and fluids surrounding the embryo. The amount of tyrosinase in the embryo alone is low but increases during growth. During post-diapause development the embryo engulfs yolk and serosa cells so that it eventually contains most of the enzyme rich egg components. Apparently a gradual transfer of enzyme from yolk to embryo then occurs. The amount

of tyrosinase in the egg membranes is low and remains practically static during the whole of development.

Attempts to obtain the enzyme from nymphs (after the 3rd instar) and from adults have been unsuccessful.

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