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Cellulasic Activity in the Gut of *Eisenia foetida*

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ABSTRACT

The evaluation of the free cellulasic activity in the gut of *Eisenia foetida* under different conditions of breeding (earthworms on manure, on treated municipal wastes, in sterile conditions) has been done by testing the production of reducing sugars (RS) from the carboxymethylcellulose (CMC) and filter paper (FP).

Whatever the breeding conditions are, a cellulasic activity can be observed even for disinfected worms kept in almost sterile conditions.

The alimentary canal contains the complete enzyme system as reducing sugars are produced from CMC and FP.

Localization: The different regions (crop, gizzard, fore, mid, hind gut) contain cellulases except the pharynx. The greatest activities have been found in the fore and mid gut. Even after five washings of the gut wall of holoxenic and disinfected worms with sterile water, a cellulasic activity is still measurable. As anaerobic cellulolytic bacteria are still present on the gut wall, even after disinfection, we cannot presume upon the origin of the enzymes.

Origin: Enzymes produced by the worm rather than by microorganisms? The screening of the cellulolytic ability of 100 bacteria isolated from the gut contents on cellulose azur, shows that many species are cellulolytic and can lead the production of reducing sugars in 3 h. On the other hand, the cellulolysis has been evaluated in two groups of Eisenia foetida worms with or without astomatous ciliates enfeoffed to the gut. The results expressed in μg RS/mg gut show no difference between the two groups.

Only really axenic worms will resolve the problem of the origin of the cellulase. This research is actually in progress.

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