

EARTHWORMS AS A SOURCE OF BIOACTIVE MOLECULES: ANTITUMOR PROPERTIES OF THE EARTHWORM PROTEINS

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Summary

Earthworms have strong and very efficient cellular and humoral immune mechanisms adapting them to survive in their natural environment which is rich in pathogens. Numerous studies showed that earthworm proteins exhibit bacteriostatic, cytolytic, antioxidant and anticancer properties. Cytotoxic components of coelomic fluid (including cytolytic factor or coelomic cytolytic factor – eiseniapore), cause lysis of vertebrate fibroblasts and erythrocytes. Moreover, proteins from coelomic fluid may also increase expression of growth factors and assist in wound healing by stimulating proliferation and differentiation of fibroblasts and epithelial cells. In addition, the coelomic fluid contains serine peptidases (eg. peptidase PI and PII) with very strong fibrinolytic and anticoagulant properties. Recently, numerous studies reported that earthworm proteins, in a concentration dependent manner, stimulate apoptosis of tumor cell lines *in vitro* and therefore are a potential source of anticancer agents.

Issues discussed in this paper indicate healing potential of biologically active molecules derived from earthworms. However, it should be noted that although the idea of their application in anti-cancer therapies is alluring, certainly more analyses and experiments, both *in vitro* and in animal models, are required before any clinical testing can be performed.