

# Collagen distribution in the tissue of the earthworm *Octodrilus complanatus*

(Oligochaeta: Lumbricidae)

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**Abstract.** *Octodrilus complanatus* (Lumbricidae) is a relatively large earthworm species widespread in the Hellenic territory and beyond. The main objective of our study was the histological description of *O. complanatus* and the determination of collagen distribution in its tissues. The histological study was carried out by means of hematoxylin-eosin staining in paraffin sections. The distribution of collagen was examined by histochemical techniques: CAB and Trichrom mason. The paraffin sections were examined by a light microscope after staining and the internal organs of the earthworm (alimentary canal, nervous, excretory, circulatory, and reproductive systems) were described. Most of the collagen was found in the cuticle, in the muscles under the epidermis and in the nervous system.

**Key words.** Lumbricidae, *Octodrilus complanatus*, collagen distribution, nervous system, digestive system.

## Introduction

According to the few studies that have been carried out on earthworm collagen, it is known that there are two types: One type is the cuticle and the other is the connective tissue of the inner organs. Both types are fibrous. The cuticle is structured in layers, and the inner organs are structured in fibrous packs. Finally, it has been shown that the collagen of earthworms is similar to the vertebrate and mammalian. The main objective of our study is to elucidate the histological description and to determine the collagen distribution in the tissues of the earthworm. Collagen is the main protein of connective tissue in animals and the most abundant protein in mammals (DiLULLO DAGGER et al. 2002).

We selected for our study the earthworm *Octodrilus complanatus* (Dugès, 1828), which is a large-sized species (Table 1 and has wide distribution in Europe and North Africa (POP 1998); it plays an important role in determining the soil structure and composition through burrowing activity and surface cast deposition, both in natural and cultivated ecosystems (LAVELLE & SPAIN 2001, LEE 1985). It is widespread in the Greek territory with large populations of this earthworm species that are abundant mostly in mineral soils under perennial tree cultivations.

## Material and methods

For the histological description, the animals were collected, then put into a formaldehyde solution of 0.2%. After they were segmented into four parts (body wall, digestive system, nervous and circulatory systems, and reproductive system) successive longitudinal paraffin sections (4 $\mu$  thick) were performed. In order to study the organs of *Octodrilus complanatus* under a light