## SUMMARY

Myriapoda is one of the most numerous groups of invertebrates, which is characterized by large species diversity. The millipedes (Diplopoda) are considered the most diverse class in Myriapoda. This group is widespread all over the world.

The species selected for the experiment was *Telodeinopus aoutii*. It is a herbivorous mmillipede which can also eat detritus. The natural habitat the *T. aoutii* is the rainforests of Central Africa, in particular in the vicinity of Togo and Ghana. The research was done to verify that gluten administered with food as a stressor will affect the midgut and the fat body of *T. aoutii* at the structural and ultrastructural levels.

Two separate organs were selected to analyze the effects of gluten - the midgut and the fat body. Light microscopy, transmission electron microscopy, confocal microscopy, and flow cytometry were selected as the methods of analysis. The selected organs are largely responsible for proper homeostasis in the animal's organism.

The midgut has unique functions, such as taking part in digestive and secretory processes, and absorption, and also has the ability to activate numerous mechanisms that allow for the removal of unnecessary and toxic products from the external environment. The fat body is a kind of reservoir for all harmful products and as a results, animal's body can function properly.

Gluten was chosen as the stressor. It is a complex mixture of proteins found in wheat, rye, barley, and oats. Because of its specific and multifunctional properties, gluten has gained great recognition in many areas, such as in the pharmaceutical and cosmetic industries, but most of all in the food industry. The aspect of deliberately adding gluten to numerous food products has contributed to numerous disorders of the digestive system. Increasingly, hypersensitivity to this food additive is observed. For this reason, research is ongoing to determine exactly what effect gluten has on human and animal bodies.

However, the effects of gluten on invertebrates have not been studied in detail, bearing in mind that these animals are often bred adjacent to gluten and consequently could be its vectors and be responsible for their transfer between subsequent links in the food chain. In the selected species only and only the digestive cells of the middle intestine, while in the fat body the trophocytes were analyzed.

The results of this study showed that the addition of gluten to the food of invertebrate organisms that don’t consume it in the natural environment causes certain aberrations in the middle intestine and the fat body, which undergo regeneration over time.