Embryogenesis is an important stage during animal development, because during this stage the embryo's body undergoes significant transformation which can prepare the entire organism for proper functioning during adult stages. Despite the fact, that research studies on embryogenesis and postembryonic development are very interesting, they are very difficult to conduct in practical terms due to relatively small specimen sizes and great sensitivity of the material. Therefore, a carefully chosen set of non-destructive microscopy techniques has to be implemented in such studies in order to maximize the imaging results without the need for complex sample preparation procedures. Up to now, mainly the light and fluorescence microscopes have been used in order to present the anatomy of embryos, while scanning electron microscopy (SEM) has been used for preparing pictures of embryos morphology. However, these methods are very long-lasting, and invasive – the embryos must be cut and completely destroyed. One such non-destructive technique is Microtomography technique which has only recently begun to be used for studying this kind of material. X-ray Microtomography has great potential for rapid acquisition of high-resolution morphological and anatomical data of small biological samples in three dimensions at resolutions close to the diffraction limit of light. Moreover, the datasets produced allows for preparation of detailed 3D reconstructions which can be subjected to interactive manipulation and precise analysis.

N. heteropoda is the great example for comparative developmental study for other crustaceans. Investigated species is easy to breed, easy to possess and large (adult specimens are about 3 cm large). The most important is the fact, that this species is one of the most preferring bred freshwater invertebrate all over the world. Therefore, with the use of the light microscope embryos may be easily isolated from the egg capsules and scanned with X-ray equipment. Furthermore our result can be easily related to other crustacean species.

The project as the basic one is connected with the anatomy and morphology development and differentiation in freshwater shrimp *Neocaridina heteropoda* (Crustacea, Malacostraca). Primary studies will enable to obtain the new knowledge about processes which undergo during embryonic development. In literature, the information about Crustacea development is rather fragmentary and this project can show new data related to this important processes Furthermore, the visualization techniques we intend to employ will help to obtain three dimensional (3D) datasets on those samples which is not possible using either traditional light or electron microscopy. The new information can give us much more precise understanding of body plan development and the processes of morphological development over time. Up to now, studies of the crustaceans embryo development using X-ray Microtomography have not been conducted.