

The basic idea of the project is to broaden the knowledge about symbiotic organisms present in the insect body. The study will provide information on the distribution and morphotypes of symbionts in the body of species belonging to the subfamily Deltocephalinae. Since classification and phylogeny of the Deltocephalinae are still under discussion, studies on symbionts living in its representatives, can help us to understand the course of evolution of this group of hemipterans. Examined leafhoppers are insects feeding on sap from plants. They are common species and many of them are pests of plants. Their diet is deficient in essential amino acids that are synthesized and provided by the symbiotic bacteria, living in their bodies. For this reason, bacteria play a huge role in the life of these insects. Symbionts inhabit specialized cells of its host, termed bacteriocytes. These cells form huge organs called bacteriomes that are localized near ovaries. Bacteria, living in the body of insects have reduced genome. Therefore, they cannot live outside their hosts. They are transovarially transmitted from one generation to next. The above-described symbionts are necessary for insect life and reproduction and are called primary symbionts (obligatory). Apart from them, in insects also secondary symbionts (additional, facultative symbionts) may be present. The latter are observed both in the host cells and extracellularly (eg. in the hemolymph, gut lumen). The secondary symbionts may be passed between individuals vertically or horizontally, between populations. The presence of primary symbionts is a result of long time ago, single infection, whereas the presence of secondary symbionts is an effect of the relatively close time and many infections. A comparison of symbiotic systems from different species will provide the answer to the question – how big is the diversity of endosymbionts and whether bacterial infection has occurred many times independently in each species, whether there has been only once in the common ancestor.