

INSECT-BACTERIA SYMBIOSIS

Summary

Insects are among the most successful animals on Earth both with regard to their biomass and biodiversity. In 1965, Paul Buchner first described the symbiotic, intracellular specific microorganisms. It is estimated that up to 20% of all insects are associated with microorganisms. This relationship has greatly contributed to insects' evolutionary success.

Symbiotic bacteria live in specialized cells called the bacteriocytes (mycetocytes), fat body or insects gut. These bacteria may have a role in nutritional upgrading of their hosts' diets. For example, all aphids require a primary endosymbiont, the bacterium *Buchnera* sp., to synthesize the nutrients missing in their xylem food source. The improvement of

health condition of the host resistance to pathogens and high temperature is associated with the presence of specific microflora.

Extremely stable interactions between insects and bacteria are the result of specific genetic mechanisms. Analysis of 16S rRNA gene sequence allowed the identification of these microorganisms because their culture is not possible on traditional microbiological media. The genome sequence analysis enabled the discovery of their metabolic functions.

Researches on insect-symbiotic bacteria interactions allowed for the application of new strategies to pest control. New methods are less toxic to the environment.