

Abstract

Bark beetles (Coleoptera; Scolytinae) are usually considered as pests, because they attack trees in the protected and recreational forests and in the forests with economic importance. Their larvae develop under the bark, where it disturb the conductive tissues and affect the nutrient transport. *Ips typographus* attack Norway spruce (*Picea abies*). *P. abies* is an economic important woody plant. The life cycle of bark beetle is affected by its microbial symbionts in both positive and negative manner. Most of these organisms are facultative symbionts and they aren't completely depend on bark beetles. However, bark beetles are completely depend on its microbial symbionts. Symbiotic bacteria and fungus can be disseminated without bark beetles, but they are often spread by beetles. Microbial symbionts help overcome the defence mechanism of attacked trees, later they help with food digestion. Some fungi species can accumulate nitrogen in areas near the feeding chambers and improve ratio between carbon and nitrogen in plant tissue. Some bacteria are able to fix atmospheric nitrogen or use uric acid, helping with nitrogen recycling. Number of intestinal symbiont diversity increase in the course of host development. This symbionts are probably gained during feeding. The presence and prevalence of the intracellular symbionts is not known in bark beetles. A lot of studies use culture-dependent methods to examine microbial symbiont, but now days are this methods supplemented by culture-independent methods.

Key words: bark beetles, *Ips typographus*, holobiont, symbiosis, bacteria, fungi