

Termites and *wood-eating cockroaches* are *worldwide* successful especially because of their ability to digest lignocellulose efficiently. After a long period of coevolution a complex ecosystem of diverse microorganisms was established in their hindgut. A lot of lineages of flagellates live solely within this unique environment and it is impossible to cultivate them *in vitro*. As termites are unable to survive without their eukaryotic endosymbionts, also protists are strongly linked to prokaryotes colonizing their cytoplasm and cytoplasmic membrane. Numerous phyla of bacteria participate in nitrogen fixation and efficient nitrogen utilization, synthesis of amino acids, cofactors and vitamins. Some of them take part in the degradation of lignocellulose. Representatives of another domain of prokaryotes, Archaea, are important in the final stages of lignocellulose fermentation, because they utilize the produced hydrogen gas in a process of methanogenesis. Large part of our knowledge about the composition and function of the termite gut biota was acquired thanks to metagenomic studies.