

SKŁADNIKI LIPIDOWE *RHIZOBIACEAE*

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Lipid components in *Rhizobiaceae*

Abstract: The cells of bacteria belonging to the *Rhizobiaceae* family are composed (like the other Gram-negative bacteria) of two layers: the outer and cytoplasmic membranes. The latter are separated by the peptidoglycan sacculus. These membranes are formed mainly by phospholipids, except for the outer part of OM — which is formed by lipopolysaccharide (LPS).

Lipid A — the hydrophobic region of LPS, is very diversified in the *Rhizobiaceae*. Three types of those molecules were distinguished depending on the structure of sugar backbone, the presence of phosphate group and the diversity of the fatty acid residues.

The main phospholipids of rhizobial membranes are: phosphatidylcholine (PC), phosphatidylglycerol (PG), cardiolipin (CL), phosphatidylethanolamine (PE) and its methylated derivatives: N-monomethylphosphatidylethanolamine (MMPE) and N,N'-dimethylphosphatidylethanolamine (DMPE). Other phospholipids i.e.: phosphatidylserine (PS) and phosphatidylinositol (PI) are found rarely. There are often found neutral lipids, such as polyhydroxybutyrate (PHB), free fatty acids, acylglycerols, fatty acid methyl esters and hydrocarbons, in preparations of rhizobial lipids.

In phosphate-limiting conditions rhizobia replace their membrane phospholipids by phosphorus less lipids. Glycolipids, sulfolipids, amino-acids containing ornithine and lysine lipids belong to this subclass of lipids.

Among fatty acids, which are components responsible for hydrofobicity of a large group of lipids, numerous diversities are observed. The presence of both saturated and nonsaturated fatty acids, with one or two double bonds, 2- and 3-hydroxy fatty acids, long (w-1)-hydroxy fatty acids and 4-oxo fatty acids were described.

The transformation of rhizobia from the free-living to the symbiotic form, results in changes both in the membrane phospholipids and in their fatty acid composition.

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