Pentoses in Production of Fuel Ethanol

THE PROBLEM
Fuel ethanol is produced worldwide from a variety of raw materials. There is a large biomass fraction that is not convertible through conventional fermentation processes. The high pentose content of hardwood (up to 60%) is the basis for the fuel ethanol industry’s interest in the conversion of biomass residues as a potentially very low-cost feedstock. So far, however, conventional fermentation has shown to be limited in its ability to ferment the pentose fraction of lignocellulose substrates.

THE TECHNOLOGY
VTT has developed a new technology that addresses exactly this bottleneck of lignocellulose-based fuel ethanol production: the difficult fermentation of the large pentose fraction contained in biomass residues. The technology is protected by four international patents or patent applications:

- Transformed microorganisms with improved properties
- Fungal microorganism having an increased ability to carry out biotechnological processes
- Engineering fungi for the utilisation of L-arabinose
- New enzyme for an in vivo and in vitro utilisation of carbohydrates

THE OPPORTUNITY
When biomass is converted to fuel ethanol the pentose fraction comprising of the sugars D-xylose and L-arabinose, is not utilized. The technology enables the utilization of this pentose fraction. The utilization of raw materials is more effective and profitability of the production process is improved.

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