

Enhancement of efficiency of ethanol production from Jerusalem artichoke
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Jerusalem artichoke (JA) is a perennial plant and can be cultivated in such soil unsuitable for cultivation of food crops such as wheat, rice, potato. Moreover, this plant has high production yield (20-80 t/ha) mainly in inulin (70-80 % of d.m.), thus it can be used as a raw material for bioethanol fermentation. The main drawback should be low efficiency of bioconversion. Meanwhile, the efficiency of starch-based ethanol production can reach 93-97%, it is very poor (65-70 %) in the case of JA. In this study, improvement of the efficiency of fermentation using mixed cultures is focused. Different fermentation techniques (SSF, batch and semi-continuous fermentation with mixed cultures) were investigated. In the cases of batch fermentation with mono and mixed cultures, about 55-62 % and 74-86 % of conversion were calculated, respectively. Higher value (about 90 %) was determined when fermentation medium was inoculated using mixed cultures in two parts: 2/3 amount for initiation and 1/3 after 1 day of fermentation. A semi-continuous fermentation technology was modelled by harvesting a portion of the ferment broth and supplementing fresh substrate on two days period. The fermentation has operated for more than 40 days proved that the yeast cells were capable to hydrolyse inulin and convert to alcohol for a long time. The ethanol concentrations varied between 4,1 and 6,5 % in the mash. In conclusion, *S. cerevisiae* with high ethanol tolerance was beneficially combined with *Kl. marxianus* with high inulinase activity for production of bioethanol. The application of the mixed cultures combination with semi-continuous fermentation technology for inulin-based production of ethanol seems to be very promising due to increased efficiency significantly, thus it has potential in white biotechnology.