

New yeast strains for production of fuels and chemicals

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Lignocellulosic biomass, which is rich in pentose and hexose sugars, and crude-glycerol waste of biodiesel industry, are two inexpensive and abundant substrates that can be used for production of fuels and chemicals. Several microbial strains able to convert these substrates to added-value chemicals have been obtained by prospecting biodiversity and/or genetic engineering strategies. In this context, we isolated and prospected yeasts from oil palm (*Elaeis guineensis*), sugarcane (*Saccharum officinarum* L.), and soil around these crops to select strains able to produce fuels and chemicals from pentose sugars and crude-glycerol from biodiesel industry. Initially, approximately 400 yeast strains, both endophytic and epiphytic, and from soil, were isolated on YPD medium. Afterwards, these strains were screened for growth in micro-titer plates containing either xylose or glycerol as unique carbon source. To evaluate the tolerance of the strains towards contaminants of the substrates they were also evaluated for growth in sugarcane bagasse hydrolysate and crude-glycerol from a biodiesel industry. Based on these results, we were able to isolate 10 new yeast strains for evaluation under fermentative conditions. Comparison of xylose fermentation capability demonstrated that some of the strains can consume xylose more efficiently than *Scheffersomyces stipitis* NRRL Y7124 and *Pachysolen thannophilus* NRRL Y2460. These two yeast species are known for the ability to grow on xylose. Similar results were found for glycerol conversion. Analysis of substrate consumption and product formation demonstrated that these strains can efficiently convert xylose and/or glycerol to a variety of chemicals, for example, ethanol. Taxonomical identification of the top 10 strains demonstrated that they belong to different genera, including some *Scheffersomyces*. Our results clearly demonstrated the potential of bioprospection in the obtainment of new yeast strains for biotechnological applications. Furthermore, it provides new resources for projects in genetic engineering either by providing new genes or new host strains.