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Enzyme discovery for tuber processing pulps

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The full potential of agro-industrial side streams has not yet been unlocked of the massive production of tuber crops in China. The starch is extracted; however the remaining processing pulp hold potential unexploited value as animal feed among other applications. Due to too low dietary fiber nutritional content the pulp is undesired as a source of animal feed. To make the pulp more attractive for the farmer's, it is necessary to upgrade it. Increasing the protein content could make it more attractive; alternatively the complex polysaccharides could be converted into health promoting oligosaccharides by enzymatic hydrolysis of selected enzymes, but *where to look for such enzymes?*

The relevant enzymes are likely to be found in invasive microbes of the tuber crops in the field or in storage. If the candidates are reported as dangerous a closely related non-pathogenic and less dangerous species was selected.

China is the World's largest cultivator of sweet potato with in annual production of 72 million tons according to Food and Agriculture Organization of the United Nations, 2008. The accumulation of processing pulp is growing proportional to the production of starch from tuber crops involving increasing environmental stress and pollution. The starch to pulp ratio depends on the processing techniques but a general example of a local (low efficient) processing unity takes 30 tons of sweet potato pr. day to generate about 25 tons of processing pulp and a starch yield of about 5 tons (Figure 1).

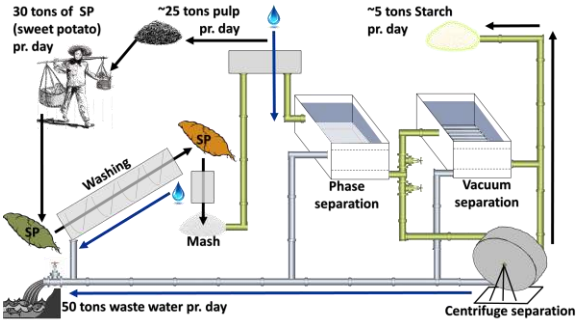

Figure 1 - *Sweet potato processing - The farmer comes to the factory with harvested crops where the starch is extracted and the pulp is left for rotting or in some cases for animal feed with relatively low nutritional gain and contribution to growth.*

To get an overview of which enzyme functions are present in different fungi, selected genome assemblies were screened for enzymes with carbohydrate acting activities upon genome, transcriptome and proteome sequencing. The selected fungi were investigated for interesting extracellular enzymes likely to cause degradation of tuber crops. Broth of the fungi indicated activities of several enzyme activities after growth of the fungi on media containing tuber processing pulp.

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