FERMENTATION STRATEGY FOR ENHANCING PHYTASE PRODUCTION UNDER D-MANNITOL CO-INDUCTION IN *PICHIA PASTORIS*

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ABSTRACT

The addition of D-mannitol with methanol as a co-substrate at the induction phase during fermentation by *Pichia pastoris* (Mut+) is a new beneficial technology for recombinant protein production.

The major challenges as heat generation and high oxygen demand are increasing during induction phases with methanol at large scale and this causes high oxygen demand during cultivation.

One possible way to reduce the oxygen demand for getting more protein productivity is the addition of D-mannitol along with methanol during induction time. The promoter of alcohol oxidase I (*AOX1*) gene in *P. pastoris* is exclusively matched for the controlled expression of foreign genes and the high levels of foreign proteins can be expressed, even if they are lethal to the cell. The co-feeding strategy was optimized to produce phytase activity of 10280 U/ml compare to methanol fed alone and which it could be used as food additives for non ruminant animals.

A deep understanding of the regulation of *AOX1* promoter, the physiology of the cells and which are being used to govern protein production during methanol/D-mannitol strategy is still not developed at large.

Key words: Phytase, *Pichia pastoris*, D-Mannitol, Methanol, Fermentation

IMAGE

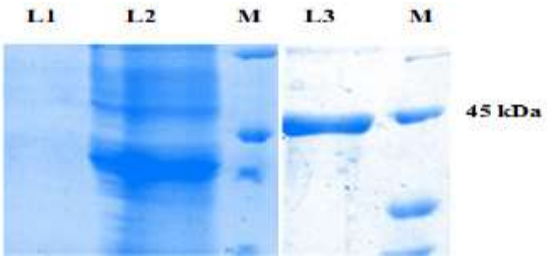


Fig. SDS-PAGE analysis of recombinant phytase expressed under D-Mannitol/Methanol co-feeding strategy, L1: Negative control with *pPICZαA*-GS115, L2: Phytase before deglycosylation, M: Unstained protein Ladder Marker, L3: Phytase protein after deglycosylation with GlycosidaseF

Publications

1.Co-feeding strategy to enhance phytaseproduction in *Pichia pastoris*,

2.Gene cloning, expression and optimization of phytase production in *Pichia pastoris*

3. Identification of corn maize borne pathogen and aflatoxins quantification

Ongoing papers writing for submission

a) Antibacterial activities of Datura stramonium and Phytolacca dodecandra on pests and diseases affecting tomatoes crop in Rwanda

b) Comparison study of bioethanol produced from sugarcane and rice straw biomasses using saccharomyces cerevisiae

Ongoing research

a) Field and Laboratory studies for supporting the development of tomatoes as a candidate biological control agent in Rwanda

b) Quantification and accumulation analysis of KIVU Methane Gas

c) Methane gas to Ethylene production under catalytical and sluria process method

d) Purification and conversion natural methane gas directly to liquid

e) Microbe based methane to diesel conversion

f) Green house promotion by converting CO2 into methane using biological agents

Bibliography



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