J Bioproces Biotechniq 2014, 4:6
http://dx.doi.org/10.4172/2155-9821.C1.007

OMICS International
conferenceseries.com

3rd International conference on
Bioprocess and Biosystems Engineering
September 14-15, 2015 Baltimore, USA

## Process development for lab scale xylitol production and design of pilot scale stirred tank reactor

**R Balakrishnaraja**
Bannari Amman Institute of Technology, India

Combating the complex disorders such as Diabetes, Cardiac malfunctions and tumors will be possible by suitable regulatory pathways. Xylitol is a polyalcohol having relative sweetness equivalent to fructose and doesn't involve in insulin metabolic pathway. It also acts against dental cavities as anticariogenic compound in pharmaceutical ingredients. The present study deals about the production of xylitol in a two liter stirred tank bioreactor and estimation of its oxygen mass transfer coefficient with corn hydrolysate medium. Then organism employed here was isolated & identified from cane processing industry through standard biotechnological techniques. Corncob was milled, pretreated, hydrolyzed and used as supplementary medium with 49% initial xylose content (w/v). Physiological conditions such as pH, temperature, inoculum volume and agitation speed was optimized using response surface methodology and adopted in bioreactor. The oxygen side mass transfer coefficient was also measured using dynamic gassing method. The stirred tank reactor was designed according to the standard procedures and all materials used for fabrication were stainless steel. The vessel has 17 liters working volume with aspect ratio for H:D as 4:1.

balakrishnarajar@bitsathy.ac.in

## Influence of controlled drying conditions on the effective moisture diffusivity, energy consumption and picroside content of *Picrorrhiza kurroa* rhizomes

**Vasudha Agnihotri, Rajesh Joshi, Arvind Jantwal, S K Nandi** and **Kireet Kumar**
GB Pant Institute of Himalayan Environment & Development, India

The extracts of runners and roots of *Picrorhiza kurroa* Royle ex Benth. (family: Scrophulariaceae, local/ trade name: 'Kutki'), an important endangered medicinal herb endemic to alpine Himalaya, is traditionally being used to treat disorder of liver and upper respiratory tract, reduce fevers, dyspepsia, chronic diarrhea, scorpion sting and also as antipyretic. Besides the presence of other active constituents, it contains two iridoid glycosides, picroside-I and II, as major bioactive compounds. Drying of rhizome under controlled conditions can preserve the plant material without affecting the concentration of important active ingredients. Hence a study has been undertaken to investigate the influence of temperature and relative humidity, maintained in climate chamber, on effective moisture diffusivity, specific energy requirement and % picroside I & II content. Two well defined falling rate periods at all the drying conditions were obtained. In first falling rate period, values of $D_{eff}$ varied from $2.2E^{-10}$ to $1.21E^{-09}$ $m^2 s^{-1}$ and in the second falling rate period, values of $D_{eff}$ varied from $3.34E^{-10}$ to $4.03E^{-09}$ at all drying conditions. Specific energy requirement for thin layer drying of *P. kurroa* rhizomes were found to be in the range of 444.93- 1785.54 kWh/ kg at 30°C to 60°C temperature with relative humidity of 30% to 80%. Picroside I and II contents were analyzed using RP-HPLC and the concentration of picroside-I was found varied from 1.88 to 10.69% and concentration of picroside-II varied from 8.31 to 34.07% in the dried extracts of the plant under different drying conditions. Temperature has shown significant effect ($p<0.05$) on picroside II content while both the relative humidity and temperature have shown significant effect ($p<0.05$) on picroside I and II content.

vasudha@gbpihed.nic.in