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## Evaluation of alkaline peroxide pretreatment of rice husk and its potential for bioethanol production

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**R** ice husk was selected as a model lignocellulosic biomass since it serves as a low cost raw material available in surplus globally and is generally not used as fodder due to low digestibility and high silica content. However, its recalcitrance and high quantities of lignin and ash make the use of rice husk difficult in its bioconversion to bioethanol. This makes pretreatment an indispensable step in bioconversion of rice husk to bioethanol. Thus, in the present study, alkaline peroxide assisted wet air oxidation was investigated as a pretreatment for rice husk and its potential for bioethanol production was also studied. 185°C, 5 bar, 15 minutes was found to be the optimized condition for alkaline peroxide assisted wet air oxidation of rice husk wherein the glucan content enhanced from an initial 36.77% to 55.52% while lignin was reduced from 15.06% to 4.52% post pretreatment. The subsequent enzymatic hydrolysis using cellulase (25 FPU/g dry matter) and  $\beta$ -glucosidase (12.5 IU/ g dry matter) yielded 21.4g glucose/ 100 g untreated rice husk. The hydrolysed sugars were consequently fermented using *Saccharomyces cerevisea* to produce bioethanol using different fermentation configurations. The ethanol concentrations of upto 28.74g/L were obtained with an overall volumetric ethanol productivity of 0.19g/L.h.

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