

PROJECT REPORT ON

PRODUCTION OF BIOETHANOL FROM AGRICULTURAL LIGNOCELLULOSIC RESIDUES USING *Pichia* SPECIES

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ABSTRACT

The use of non-edible agricultural residues is the excellent means for the production of biofuel. Taking this as the objective, the efficacy of bio-ethanol was analyzed using *Pichia pastoris* and *Pichia fermentis*. Eight different dried raw materials were used such as coconutleaves (CL), coconut fibers (CF), areca nut leaves (AL), areca nut fibers (AF), Erianthus stem(ES), Erianthus leaves(EL), cocoa pod shell(CS) and cocoa mucilage liquid(CM)by subjecting the biomass for 2.5% acid hydrolysis to convert cellulose and lignocellulose into simple sugars and further subjecting it for fermentation by *Pichia pastoris* and *Pichia fermentis*, to convert the cellulosic sugar into ethanol. The ethanol yield per kg of the lignocellulosic biomass with respect to *Pichia pastoris* were – CL (27.92 g/kg), CF (16.2g/kg), AL (48.63 g/kg), AF (36.92 g/kg), ES (60.33 g/kg), EL (41.42 g/kg), CS (72.95 g/kg), CML (87.8 g/kg), respectively and with respect to *Pichia fermentis* CL (40.51 g/kg), CF (11.701g/kg), AL (42.32 g/kg), AF (34.22g/kg), ES (63.94 g/kg), EL (27.91g/kg), CS (68.44 g/kg), CML (90.51 g/kg) respectively. Efficiency of ethanol yield on the basis of reducing sugar content with respect to *Pichia pastoris* were-CL (56.39%), CF (53.37%), AL (78.48%), AF (83.23%), ES (23.41%), EL (28.30%), CS (90.31%), CML (97.95%) respectively and with respect to *Pichia fermentis* were- CL (80.84%), CF (58.42%), AL (79.606%), AF (87.98%), ES (24.503%), EL (18.68%), CS (81.28%), CML (89.76%) respectively. This process involves material utilization of dumped agricultural residues. Hence, effective utilization of these resources would help to overcome the energy crisis.
