Characterisation and Evaluation of a Novel Feedstock, Manihot Glaziovii, Muell. Arg, For Production of Bioenergy Carriers: Bioethanol and Biogas

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Abstract

The objective of this study was to characterise and evaluate a wild inedible cassava species, *Manihot glaziovii* as feedstock for bioenergy production. Tubers obtained from 3 different areas in Tanzania were characterised and evaluated for bioethanol and biogas production. These bioenergy carriers were produced both separately and sequentially and their energy values evaluated based on these two approaches. Composition analysis demonstrated that *M. glaziovii* is a suitable feedstock for both bioethanol and biogas production. Starch content ranged from 77% to 81%, structural carbohydrates 3–16%, total crude protein ranged from 2% to 8%. Yeast fermentation achieved ethanol concentration of up to 85 g/L at a fermentation efficiency of 89%. The fuel energy of the bioethanol and methane from flour-peels mix ranged from 5 to 13 and 11 to 14 MJ/kg VS, respectively. Co-production of bioethanol and biogas in which the peels were added to the fermentation residue prior to anaerobic digestion produced maximum fuel energy yield of (15–23 MJ/kg VS).

Keywords

Manihot glaziovii;
Bioethanol;
Methane;
Bioenergy;
Cassava