ABSTRACTS (MASTER THESIS)

Production of antiviral compounds from sugarcane bagasse by microwave solvolysis

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Due to depletion of fossil resources and global warming, it has become an urgent issue to establish a biorefinery system which converts biomass to fuels, chemicals, materials and other value-added products. In particular, conversion of lignocellulosic biomass has gathered increasing interest due to its abundance and non-competitiveness with food supply. Humanities are now facing a thread of pathogenic viruses. Warming of average temperatures of the atmosphere and globalization of transportation have been causing widespread infection of pathogenic viruses harmful to humans and livestock. Therefore, development of antiviral agents suppressing spread of pathogenic viruses is rapidly becoming important.

In the present study, we studied production of antiviral compounds from sugarcane bagasse using microwave reactions by combining the needs for biorefinery and antiviral agents. Sugarcane bagasse, a major by-product of sugarcane industry is a lignocellulosic agricultural residue. Sugarcane bagasse was decomposed by microwave acidic solvolysis. The reaction solution was neutralized, and the decomposition products were extracted with ethyl acetate and methanol. The extracted products were subjected to plaque assay against influenza A virus and enterovirus 71 (EV71). Influenza A virus is an enveloped single strand RNA virus classified as the family *Orthomyxoviridae*. EV71 is a nonenveloped single strand RNA virus classified as the family Picornaviridae. As results of the screening, we found that acidolysis of sugarcane bagasse produced lignin fractions having strong antiviral activity against influenza virus A virus and EV71. Thus, reactions producing antiviral compounds against enveloped and nonenveloped viruses from sugarcane bagasse were found.