Isolation of Microflora and Changes of Carbohydrates of Certain Water Weeds through Senescence

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Water weeds have become an ecological and social problem in irrigation tanks, reducing the flow of water in irrigation and drainage channels, blocking sluice gates and points of water intake in power generating stations. Producing biofuels via biomass conversion to use them as renewable sources of energy alternative to fossil fuels would be an economical solution to control these weeds. "Microbial energy conversions" can be used to convert biomass into biofuel at low cost. This study aimed to isolate and identify the microflora that can be used in microbial energy conversions and to examine the changes of carbohydrates of certain water weeds through senescence. Three floating aquatic weeds; Eichhornia crassipes (water hyacinth), Salvinia molesta (water moss) and Pistia stratiotes (water lettuce) abundant in different climatic zones of Sri Lanka were utilized.

Enrichment culture techniques were used to isolate the microorganisms. Bacterial isolates were identified to the genus level using biochemical tests and for fungi morphological characters were observed. Finally pure cultures were transfered to agar slants of suitable media for short term storage, and for long term maintenance they were presereved in cryo tubes and stored under -20 OC. Bacterial genera identified consisted Clostridium, Pseudomonas, Bacillus, Staphylococcus and Klebsiella while the fungal genera consisted Paecilomyces, Trichoderma, Acremonium and Cylindrocarpon.

To analyse the carbohydrate composition (mainly cellulose and lignin), Fourier Transform Infrared Spectrometer (FTIR) was used. Cellulose and lignin were identified using FTIR absorbance peaks for bonds that are specific for these compounds. According to the FTIR absorbance peaks there were no qualitatative changes among the three species **of water** weeds or within the different stages of their growth. The statistical analysis of the different absorptivities of the water weeds showed that there is no significant different in Cellulose or Lignin among the three water weeds. When comparing Cellulose and Lignin mature Eichhornia crassipes had a significantly higher amount of lignin than cellulose at the 5% probability level.The Cellulose content is high in mature stage of Salvinia molesta than in young and senescence stages. This study was a prelude for the development of microbial energy conversions to produce bio-fuels from cellulosic biomass.