

**ABSTRACT**

Algae are an attractive biofuel feedstock because of their fast growth rates and improved land use efficiency when compared with terrestrial crops. Bio-fuels from algae has the potential to replace all the deterioration brought by fossil fuels. Present study was undertaken to investigate bioethanol and biogas potential of some local algal species. Altogether two microalgae species *Cladophora fracta* (Dillw.) Kützing and *Euglena Polymorpha* Dangeard were collected from various freshwater ponds, channels and tanks of Sheikhpura. Collected species were analyzed for bioethanol production capacity *Cladophora fracta* (Dillw.) Kützing treated (Table 16) showed high quantity of bioethanol (0.29gm) whereas *Euglena polymorpha* Dangeard untreated (Table 16) became the least efficient (0.10gm). *Cladophora fracta* (Dillw.) Kützing treated (Table 17) showed high quantity of biogas (0.56dm³) whereas *Euglena polymorpha* Dangeard untreated (Table 17) became the least efficient (0.00dm³). *Euglena polymorpha* Dangeard untreated (Table 18) left 99% biomass after bioethanol and *Euglena polymorpha* Dangeard untreated and *Euglena polymorpha* Dangeard treated (Table 19) left 99.9% biomass after biogas production. pH of bioethanol of all experimental algal species fall in the range of 5.8-6. The Fourier transform infrared spectroscopy (FTIR) analysis was performed to prove the bond representation events including purified fatty acid ethyl esters of biomass. A dominant peak at 3342.67 cm⁻¹ corresponds to OH bending in cellulose and hemicellulose. This band was expanded to 1641.70cm⁻¹ in treated sample of *Cladophora fracta* (Dillw.) Kützing which is showing the separation in some parts of cellulose. The band was expanded to 1415.10cm⁻¹ in treated sample of *Euglena polymorpha* Dangeard which is showing the separation in some parts of cellulose. Gas Chromatography-Mass Spectrometer (GC-MS) analysis has shown ions composition in the bioethanol and biogas of sample species. The ethanol and methane contents in the bioethanol and biogas production was measured by gas chromatography. The major ions were present in *Cladophora fracta* (Dillw.) Kützing. Untreated and treated 1, 2-benzenedicarboxylic acid, diisooctyl ester and Naphthalene, 2-methyl respectively. The major ions Decane, 5-methyl was present in untreated *Euglenapolymorpha*Dangeard.