ABSTRACT

Rapid depletion of fossil fuel reserves coupled with recent global economic meltdown has put tremendous pressure to search for the alternative renewable energy sources. Enormous concern has been shown for the development of biofuel from non-food feedstock. Algae being the prime candidate were looked into due to their remarkable attributes of high energy value and overall productivity. The potential of some native algal species was evaluated taking into account their growth rate and the lipid yield as measure of productivity. Following the sampling from some native habitats two algal species were chosen based on the presence of oil and identified as: *Pithophora sp.* (Chlorophyte) and *Botrydiopsis arhiza* Borzi (Xanthophyte). Subsequently maximum specific growth rate was estimated after optimization of some growth factors which came out to be 0.49 ± 0.022 doubling / day of *Pithophora sp.* at light intensity; 25 µmole/m^2/s, temperature; 25±1 °C, pH; 8 while 1.97 ± 0.036 doubling / day of *Botrydiopsis arhiza* at light intensity; 200 µmole/m^2/s, temperature; 30±1 °C, pH; 6.

Extraction of oil from both algal species was carried out using different organic solvents and it was noted that the amount of oil extracted using various solvents was significantly different ($P<0.001$). The total lipid content derived using Folch's method was found to be maximum i.e. 27.99 % ± 1.09 in *Pithophora sp.* while 47.99 % ± 0.722 in *Botrydiopsis arhiza* on the basis of dry mass. The qualitative analysis of the oil after derivitization revealed that *Botrydiopsis arhiza* contains 10- Nonadecenoic acid methyl ester ($C_{20}H_{38}O_2$), 9-Octadecenoic acid methyl ester ($C_{19}H_{36}O_2$), 11-Eicosenoic acid methyl ester ($C_{21}H_{40}O_2$), 9, 14- Octadecenoic acid methyl ester ($C_{19}H_{34}O_2$). Likewise, *Pithophora sp* contains 9-Octadecenoic acid methyl ester ($C_{19}H_{36}O_2$), 10- Nonadecenoic acid methyl ester ($C_{20}H_{38}O_2$), Eicosenoic acid methyl ester ($C_{21}H_{42}O_2$), 11-Eicosenoic acid methyl ester ($C_{21}H_{40}O_2$).