

## **ABSTRACT**

With the depletion of oil resources as well as the negative environmental impact associated with the use of fossil fuels, there is a renewed interest in seeking alternate energy sources. The present study was conducted to determine the microalgae biodiversity in Kenyan aquatic environment and their potential in bio-fuel production. Microalgae species were collected from 3 lakes in Kenya (Lake Turkana, Baringo and Magadi) and identified morphologically. The abundant species in the three lakes were cultured in BBM and BG-11 media to obtain pure clones. Microalgae biomass was harvested by centrifugation and lipids (oil) extracted by the Bligh and Dyer method. Three demonstration-scale microalgal culture ponds of high oil yielding species were established. The results showed that the blue-green algae were widespread and dominated the algal community in all the 3 lakes. However, Lake Turkana exhibited the highest species biodiversity compared to the other two lakes. Screening for lipid/oil content identified high oil yielding algae species abundantly distributed naturally in the Kenyan aquatic environment. The peak lipid content ranged from 1.5 – 10.5% of algal biomass. *Chlorella* species showed the highest yields, followed by *Euglena* and *Nitzschia*. These species can therefore be cultivated for biofuel production.