Utilization of Water Hyacinth in Energy Production

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Water Hyacinth (Sp. Eichhornia crassipes) originated in the state of Amazonas is listed along with the worst five weeds in the world. This waterweed blocks waterways, affecting both navigation and drainage.Water hyacinth has a high rate of evapotranspiration leading to water loss; and it displaces indigenous flora and fauna by modifying the habitat. It is also a health hazard as it provides suitable breeding sites for vectors of animal and human diseases such as schistosomiasis (bilharzia) and Malaria. Some countries have even placed this species in their quarantine list and banned their sale or movement within their countries. Water hyacinth has invaded Africa, Asia, North America and present in 62 countries and causes extremely serious ecological, economic and social problems such as reducing native species diversity, and changing the physical and chemical aquatic environment, thus altering ecosystem structure and function by disrupting food chains and nutrient cycling. The world started to get rid of this plant by manual, chemical, and biological means, then started to get a benefit of it by using it in many industries such as furniture, fertilizers and lately in biofuel production. In a brief, our idea is to use an efficient way to extract this harmful aquatic plant and expose it to different processes until it is completely utilized, by introducing a new technique, which is using its dye in DSSC (dye-sensitized solar cell), afterward using it as a biomass for bio-ethanol production due to its composition. The cell was tested and proved that the idea of exploiting water hyacinth modified dye in DSSC is convenient for energy production, since the dye extracted from water hyacinth has shown more efficiency than other organic dyes.

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