Increased Hydrocarbon Production in Algal Cell for Biofuels

BACKGROUND

Biofuels are important to energy security and in fight against climate change. Botryococenes, belongs to the class of triterpene molecules, isolated from algae and other natural sources, generate hydrocarbon precursor molecule that are suitable for biofuels. There is a need to improve the production of botryococcene molecules from natural sources.

INVENTION

This invention relates to a method to increase the production level of a botryococcene hydrocarbon molecule in an algal cell. This invention also relates to the genetic engineering of a polynucleotide sequence in an algal cell, to express a higher level of botryococcene synthase, which led to the production in increased level of a botryococcene hydrocarbon molecule than a corresponding wild type algal cell. In this invention, also disclosed is a method for identifying novel nucleotide molecules and amino acid molecules that include at least a portion of botryococcene synthase protein in various species of algal cells.

APPLICATIONS

The invention can be used for increased production of biofuels:
- Biofuels are currently being used in transportation, power generation, and heat.
- The use of biofuels helps in oil price moderation.
- It plays an important role in economic security, energy security and to restrict climate change.

ADVANTAGES

Demonstrates the utility of genetic engineering a polynucleotide sequence in an algal cell to produce increased levels of botryococcene hydrocarbon molecules, which are also found in other algal species.

MARKET

This invention adds incremental value to biofuel/renewable energy market, one estimate puts the oil production cost as $240/barrel (based on 2010 $ values) by the algae, and it is expected to have a competitive share in the oil market, by the middle of the century.

The biofuels production in top and emerging countries is now expected to grow from 24,326.7 million gallons to reach 50,921.4 million gallons by 2019 at a CAGR of 9.6% from 2013 to 2019.

TEAM (as during the research)

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