toxicity and efficacy of the products manufactured by them.

Keywords: Cosmeceuticals, cosmetics, pharmaceuticals, antioxidant, regulatory aspects

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ALGAE – BIOFUEL PRODUCTION

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The world has been confronted with an energy crisis due to depletion of finite non-renewable fossil fuel resources. The use of fossil fuels like coal petroleum is now considered unsustainable due to depleting resources and accumulation of greenhouse gases in the atmosphere. Whereas a biofuel is produced through contemporary biological processes, such as homeostasis, growth etc. rather than a fuel produced by geological processes such as those involved in the formation of fossil fuel, from prehistoric biological matter. Renewable biofuels generally involve contemporary carbon fixation through the process of photosynthesis. Algal species grow in a wide range of aquatic environments, from freshwater through saturated saline. They can grow almost anywhere even on sewage or salt water. More than 40% of the global carbon fixation is done by algae. Large amounts of lipids, proteins and carbohydrates are produced by microalgae over short period of time. *Cladophorafracta* and *Chlorellaprotothecoid* were studied for biofuel production. About 60-70% of their total biomass can produce biofuel thus reducing the environment pollution. It was found recently that the only source of renewable biodiesel that is capable of meeting the global demand for transport fuel comes majorly from microalgae. Microalgae have additional advantages over terrestrial plants. Since they are single-celled organisms that duplicate by division, high-throughput technologies can be used to rapidly evolve strains. This can reduce processes that take years in crop plants, down to a few months in algae. Algae will reduce the burden from the terrestrial plants which are currently used for biofuels and will increase the biofuel production. They can be grown on land that would not be used for traditional agricultural, and are very efficient at removing nutrients from water. Thus, not only would production of algae biofuels minimize land use compared with biofuels produced from terrestrial plants but, in the process of culturing these microalgae, waste streams can be remediated. Algae production strains also have the potential to be bioengineered, allowing improvement of specific traits and production of valuable co-products, which may allow algal biofuels to compete economically with petroleum. These characteristics make algae a platform with a high potential to produce cost-competitive biofuels.

Keywords: Fossil Fuel, Microalgae, Biofuel, Pollution, Oil, *Cladophorafracta* and *Chlorellaprotothecoid*

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OPTIMIZATION STRATEGIES FOR MAXIMAL BACTERIOCIN PRODUCTION FROM LACTIC ACID BACTERIA

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The capability of bacteria to produce anti-bacterial peptides has captured the curiosity of scientists around the globe. These peptides, commonly regarded as bacteriocins, hold diverse applications in food and health industry. Especially, Lactic acid producing bacteria have garnered special interest because of their GRAS status and their bacteriocins being stable in wide temperature; and pH range, colorless, odorless and tasteless, non-toxic, and active in even nanomolar concentrations. For instance, Nisin, a widely studied bacteriocin of *L. lactis* is now approved as a food preservative to prevent food spoilage from *Listeria monocytogenes* and *Clostridium botulinum*. Interventions are also taking place to assess their significance in combating multi-drug resistance and possible anti-cancer properties. Since, they offer multitude of potential applications its essential to maximize their production and activity. Optimization of media composition and environmental conditions entail a collective group of effective strategies aimed at maximizing bacteriocin production and activity. Optimization of media encompasses careful selection of a set potential carbon sources, nitrogen sources, and other additives in varying concentrations. Then, through exhaustive experiments, these sets are narrowed down to one choice, which delivers the maximum bacteriocin production and activity. As evident by the media optimization for *Lactobacillus*