

PHARMACOACTIVE NUTRIENT FROM MARINE ALGAE

BRIEF DESCRIPTION:

Chlorella sp. finds wide application as a food supplement owing to its high nutritive value and medicinal properties. The present invention relates to the process for the production of “Pharmacoactive Growth Promoter” from live (wet) biomass of marine microalgae *Chlorella vulgaris* by modified hot water extraction method. Beneficial properties of “Pharmacoactive Growth Promoter” include anti inflammatory activity and wound healing property, detoxification, constipation relief and growth stimulation. The process involves isolating a fast growing, high biomass and lipid producing microalgal strain, *C. vulgaris*, optimized the culture media, culture methodology, harvesting technique and the production of “Pharmacoactive Growth Promoter” from *Chlorella vulgaris* of marine origin.

SALIENT FEATURES AND APPLICATIONS:

- A nutritionally and pharmaceutically valuable hot water extract “Pharmacoactive Growth Promoter (PGP)” from the live biomass of *C. vulgaris* cultured in seawater, where in the extract has been prepared by gradual heating.
- The marine *C. vulgaris*, wet biomass hot water extract “PGP” contains 27.45 % of protein, 39.21 % of carbohydrate and 0.75 % of crude fat.
- Mineral such as calcium, phosphorous, potassium, sodium, magnesium and iron were observed.
- Significantly higher level of vitamins such as vitamin B3 (Niacin-0.29 mg/100 g), vitamin B5 (Pantothenic acid- 2.26 mg/100 g) and vitamin B12 (Cobalamin- 34.42 µg/kg) were recorded.
- Pharmaceutically vital proteins such as thioredoxin, S-adenosylmethionine synthase 1, putative pleiotrophic drug resistance protein 3, dihydrolipoyl dehydrogenase, Brix-domain containing protein, Inositol monophosphatase 2, bearing significant activities such as cell growth, cell cycle regulation, defense, antioxidant, anti-cancer and proteins that are widely used in the treatment of depression, dementia, vacuolar myelopathy, liver injury, migraine, osteoarthritis, bipolar disorder, etc. were recorded in the protein fractions of PGP.
- PGP also documented various biologically important enzymes and proteins. Apart from the aforementioned proteins about 32 uncharacterized proteins were also observed.

Scale of Development: Technology demonstrated and commercialized.

Bio-pharmacological analysis of PGP from the live biomass of marine microalgae, <i>C. vulgaris</i>		
Parameters	Standard	CGF
Anti-diabetic	Acarbose	IC ₅₀ -2.4 mg/mL
α-glucosidase	IC ₅₀ -1.8 mg/mL	IC ₅₀ -6.1 mg/mL
α-amylase	IC ₅₀ -1.1 mg/mL	
Anti-inflammatory	Methotrexate	IC ₅₀ -0.65 mg/mL
Caspase-3 apoptotic-inflammatory assay	IC ₅₀ -0.9mg/mL	
Wound healing	Nitrofurazone	IC ₅₀ -4 mg/mL
In vitro scratch assay	IC ₅₀ -0.13 mg/mL	
Neuropharmacological effect- Role of CGF on central nervous system depression	Chlorpromazine (5 mg/kg)	25 mg/kg 50 mg/kg
1. Sleeping test	29% increase in sleep	11% increase in sleep
2. Locomotor activity	53.91 % reduction	67.61 % reduction
3. Muscle relaxant activity	37.33 % reduction	26.36 % reduction
4. Body weight	3.73 % decrease	10.83 % increase

