ALGAL APPLICATIONS

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CARRAGEENAN

COMPOSED OF ALTERNATE UNITS OF α-1-3 AND β-1-4 D-GALACTOSE WITH SULPHATE

CARRAGEENAN-SOURCE

CHONDRUS
EUCHEUMA
FURCELLARIA FASTIGIATA
HYPNEA SPP.
SARCONEMA FILIFORMIS
GRATELUPIA SPP.
KAPPAPHYCUS

CARRAGEENAN-SOURCE

HYPNEA

SARCONEMA FILIFORME

KAPPAPHYCUS ALVAREZII

GRATELOUPIA

EUCHEUMA

CARRAGEENAN-PROPERTIES

FORMS HIGHLY VISCOUS AQUEOUS SOLUTION

FORMS GELS ON COOLING OF HOT SOLUTIONS IN THE PRESCENCE OF CATIONS SUCH AS K/Ca.

FORMS GELS BY COOLING A SOLUTION OF CARRAGEENAN IN HOT MILK

CARRAGEENAN-EXTRACTION

CLEANING – TO REMOVE SAND & CALCAREOUS STONES

EXTRACTION – IN ALKALINE WATER (BY USING 2% SODIUM CARBONATE SOLUTION) MAINTAIN A TEMPERATURE OF 95 DEGREE C FOR 2 HRS.

FILTRATION – COOL AND FILTER THROUGH FINE CLOTH

CONCENTRATION – EVAPORATE *IN VACUO* TO REDUCE THE VOLUME TO HALF THE ORIGINAL VOLUME

PRECIPITATION – PRECIPITATED WITH ISOPROPANOL

DRYING – REMOVE THE PRECIPITATE AND DRY IN AN OVEN

GRINDING

PACKING

CARRAGEENAN-USES

IT IS USED FOR ITS PHYSICAL FUNCTIONS IN GELATION, VISCOUS BEHAVIOURS, STABILIZATION OF EMULSIONS, CONTROL OF CRYSTAL GROWTH, BINDING, DISPERSION AND SYNERESIS CONTROL.

USED AS A GELLING AGENT

USED AS A STABILIZING AGENT IN ICE CREAM, EVAPORATED MILK, INFANT FOOD FORMULAE AND IN SALAD DRESSINGS

CARRAGEENAN-USES

IT STABILIZES AND THICKENS THE STERILIZED/ PASTEURIZED MILK DRINKS, YOGHURT, BAKER'S JELLIES, ETC.

USED TO SUSPEND COCOA IN MILK AND WHIPPED CREAM

USED TO MAKE ANTIBIOTIC ICE USED FOR FISH PRESERVATION

USED IN PROCESSING MEAT, FISH AND POULTRY

CARRAGEENAN-USES

USED AS A STIFFENING AND BINDING MATERIAL IN TEXTILE INDUSTRY

USED IN THE PRODUCTION OF AIR FRESHNER JELS

USED FOR PRODUCING GLOSS AND STIFFNESS IN LEATHER

IN PHARMACEUTICALS IT IS USED AS AN ANTICOAGULANT OF BLOOD IN VERY GREAT DILUTIONS.

USEFUL AS A BINDER IN TOOTH PASTE

ALSO USED AS A COMPONENT IN SHAVING SOAPS, HAND LOTIONS AND HAIR CREAMS

LIQUID SEAWEED FERTILIZER

IT IS EXTRACTED FROM SEAWEEDS

IT CONTAINS UNIQUE COMBINATION OF N, P, K, TRACE ELEMENTS, ALGINATES AND SIMPLE SUGARS IN DISSOLVED FORM

THESE ARE EASILY ABSORBED THROUGH ROOTS AND LEAVES BESIDES RELEASING TRACE ELEMENTS BOUND TO THE SOIL

USED AS GROWTH STIMULANTS, DEFICIENCY CORRECTORS AND ANTI-STRESS AGENTS

BIOZYME GRANULES: CYTOKININ AND AUXIN PRECURSORS ENZYMES & HYDROLYSED PROTEIN COMPLEXES

LIQUID SEAWEED FERTILIZER

COMMERCIALLY AVAILABLE LSFS.

MAXICROP

ALGIFERT

GOEMAR GA 14

SEASPRAY

SEASOL

S.M.3.

CYTEX

SEA CROP 16

LIQUID SEAWEED FERTILIZER

RESPONSE OF PLANTS TO **LSF**

INCREASE IN YIELD, FRESH WEIGHT, DRY WEIGHT, SHOOT LENGTH, ROOT LENGTH, SEED YIELD, SEED MASS AND FRUIT MASS. SEED GERMINATION & MINERAL UPTAKE

IT'S USAGE WILL RESULT IN DISEASE RESISTANCE, FROST RESISTANCE. LONGER SHELF-LIFE OF FRUITS AND EARLY FLOWERING.

LIQUID SEAWEED FERTILIZER

EXTRACTION OF LSF

WASHING – IN WATER TO REMOVE ALL SUSPENDED IMPURITIES

DRYING – FIRST IN SUNLLIGHT AND THEN IN HOT AIR OVEN AT 65 °C

GRINDING – PULVERISED IN A GRINDER TO OBTAIN A COARSE POWDER

SOAKING – IN WATER FOR A FEW MINUTES BEFORE EXTRACTION

EXTRACTION – COOK THE SEAWEED IN AUTOCLAVE OR PRESSURE COOKER FOR 2 HRS. IN WATER (10 TIMES OF THE MATERIAL

FILTRATION

CENTRIFUGATION – AT 5000-10,000 RPM TO REMOVE SUSPENDED IMPURITIES

DRYING – IN A HOT AIR OVEN AT 65°C. THICK VISCOUS FLUID GOT AT THE END IS STORED IN A SEALED BOTTLE WITH A PRESERVATIVE

OR

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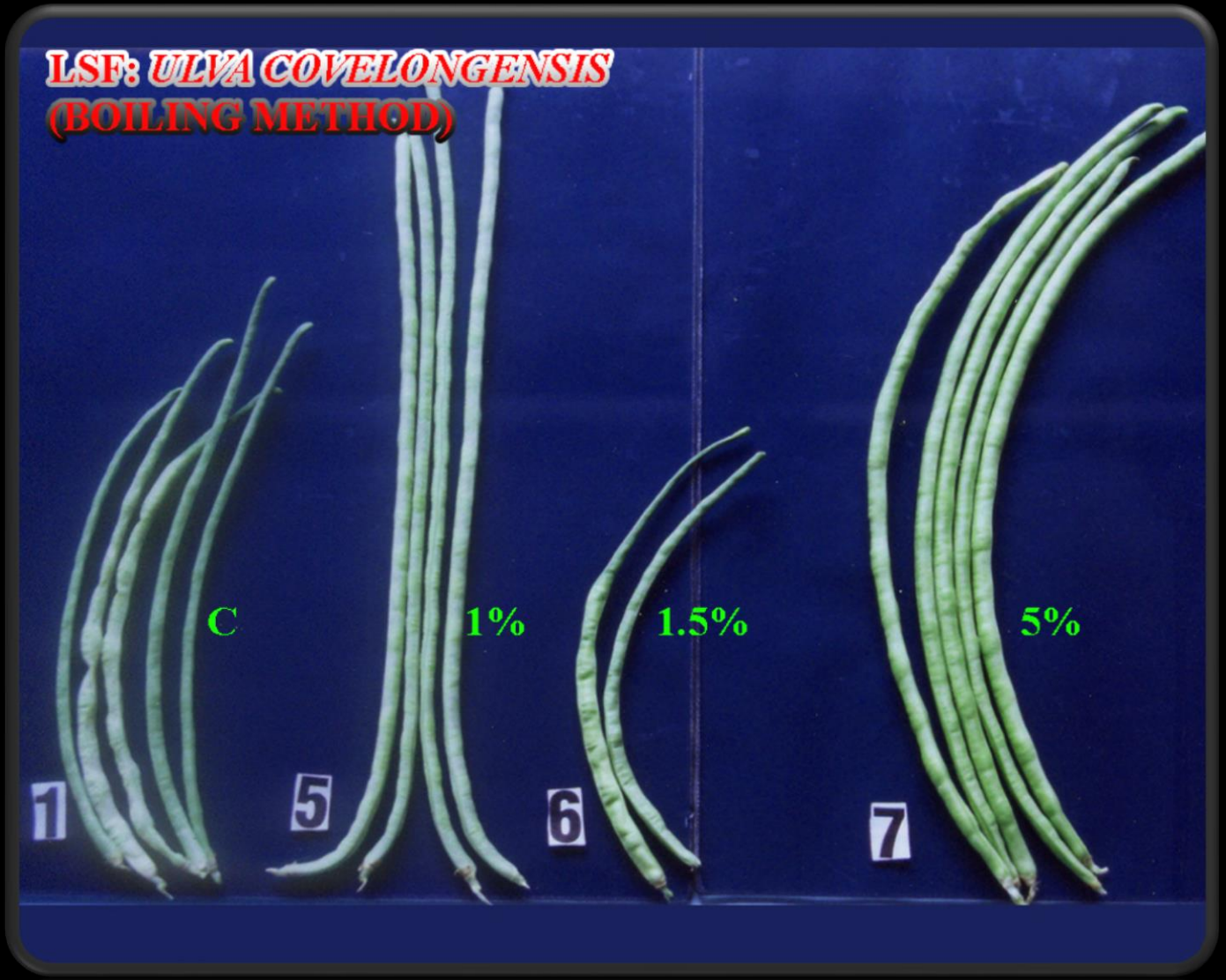
OR

DRY THE FILTRATE COMPLETELY AT 65˚C , POWDER AND PACK IN AIR-TIGHT BOTTLES

USAGE – 0.5 TO 1.0% SOLUTION IS PREPARED AND USED AS LSF

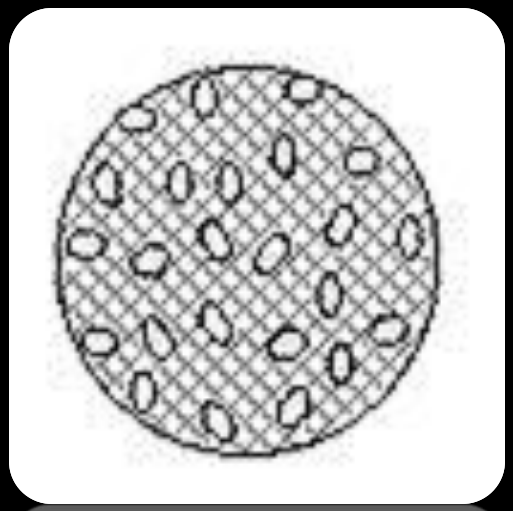
Effect of LSF from *Ulva covelongensis* on cow pea

Effect of LSF from *Ulva covelongensis* on cow pea



CELL IMMOBILIZATION

PHYSICAL CONFINEMENT OR LOCALIZATION OF INTACT CELLS TO A CERTAIN DEFINED REGION OF SPACE WITH PRESERVATION OF SOME DESIRED CATALYTIC ACTIVITY



Entrapment of cells within a matrix

CELL IMMOBILIZATION

Immobilization offers many potential advantages over free cell systems, such as:

- Higher cell densities and cell loads
- Increased volumetric productivity
- Shorter overall reaction times
- Smaller fermentor sizes which may lower capital costs
- The reuse of the same biocatalysts for prolonged period of time due to constant cell regeneration
- A continuous process which may be performed beyond the nominal washout rate
- Improved substrate utilization
- Reduced risk for microbial contamination
- Constant product quality
- Improved tolerance or protection of cells from substrate and end-product Inhibition.

Above all, immobilized cell technology gives much faster processing times compared to the existing free cell fermentation.

CELL IMMOBILIZATION

The procedure consists of mixing of cell suspension with Na-alginate solution and dripping of it into a solution containing divalent cations.

This is causing instantaneous gel spheres formation and cell entrapment into a three dimensional lattice structure of ionically cross-linked alginate.

Since the conditions for the cells during this procedure are very mild, cells are remaining viable and catalytic active for a long period of time.

THANK YOU ALL

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