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The Alga Spirulina as a Source of -Linolenic Acid and Other Valuable Chemicals

Interim Report No. 1

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Collaboration

Ms. B. Bunnag and Ms. M. Reungjitchachawaly have visited the Algal Biotechnology Lab at Sede-Boker for 3 and 8 weeks respectively for methodology and technology transfer.

During her stay, Ms. Bunnag was trained in the common procedures necessary for the physiological studies which will be carried in the project, primarily growth measurement of algae by determination of turbidity, absorbance, chlorophyll and protein. The rational for using the different parameters, way of calculation and problems to be expected were discussed throughout the period of training. The usage of portable equipment for field measurements procedure for strain isolation and measurement of photosynthesis by using of simple oxygen electrode were especially emphasized.

Ms. Reungjitchachawaly was trained in the areas of algal cultivation, the use of inhibitors, lipid extraction, fatty acid transmethylation and gas chromatography .

A photosynthetic measurement unit was built for the KMIT group by the Electronic workshop of the Ben-Gurion Univ. and the Algal Biotechnology Lab. This unit will be installed at KMIT by the Israeli investigators in the coming month .

Prof. A. Richmond is currently visiting the Thai laboratory in order to assure continuation and to solve on-site problems.

Materials and Methods

Strains:

The following strains of *Spirulina* are already available at the Algal Biotechnology Lab. at Sede-Boker: SB, Mad, Cat, Art. B, 1928, L1, AR, B4, B2, G, PC, B3, Art. A, Eth, L2, Minor, 2342, 2340, Subsalsa.

Cultures will be grown on Zarrouk's medium [Vonshak et al., Biomass 2, 175 (1982)]. Fatty acid extraction and transmethylation will be performed according to Lepage and Roy [J. Lipid Res., 25, 1391 (1984)].

Materials:

Various inhibitors were already obtained (Sandoz 9785, 9774, 9789, 6706, MDL 14,514 nuarimol and fenarimol).

Results

The effects of temperature, light intensity, growth phase and salinity is currently extensively studied. Full data will be published in the annual report.

The main findings so far are: All but one of the tested *Spirulina* strains contained GLA. At 35 ^{o}C the content of GLA varied between 0.3% to 1.4% GLA (% of ash free dry weight), and 8-31% GLA of the total fatty acids. *S. subsalsa* does not contain GLA and it is doubtful whether it is a strain of *Spirulina* at all. It appears that maximal GLA content is occurring in most strains at 30-35 ^{o}C which coincides with the optimal growth temperature .

Spirulina cultures were sonicated to yield isolated cells. These cells were successfully cultivated on agar plates.