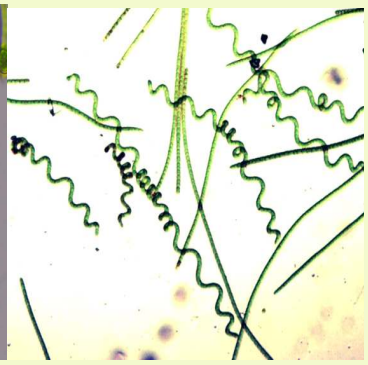
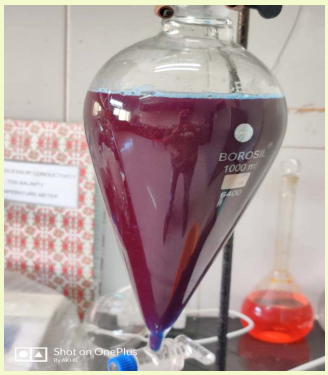
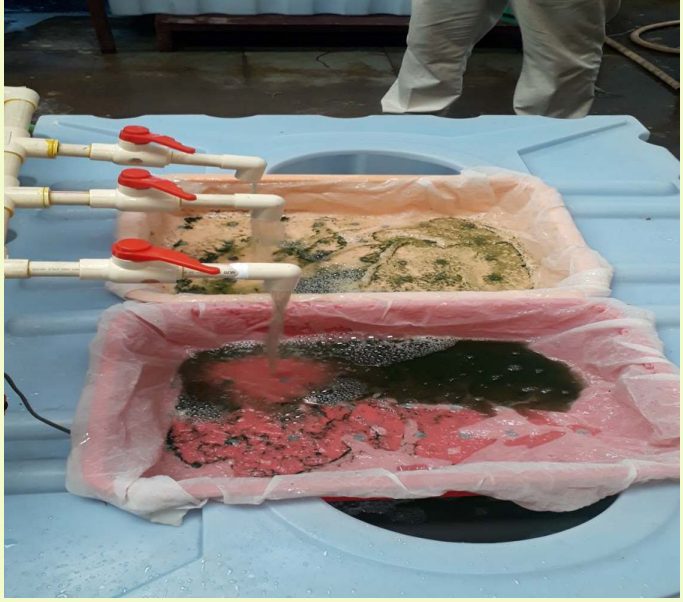
Short-Term Training Programme on Technical Know-how for *Spirulina* Biomass Production and Utilization





First Batch : **04-09 December, 2023**
Second Batch : **18-23 December, 2023**
Third Batch : **15-20 January, 2024**
Fourth Batch : **05-10 February, 2024**

भा.कृ.अनु.प. - केन्द्रीय मात्स्यिकी शिक्षा संस्थान
ICAR - Central Institute of Fisheries Education
Mumbai
www.cife.edu.in



Background

Spirulina (*Arthrospira*) *platensis* is a commercially important cyanobacterium which can grow in water with high salt concentration and high pH (9.0-9.5). It is considered as a superfood of 21st century due to its high protein content (50-70%) and adequate quantities of vitamins, minerals and poly-unsaturated fatty acids (PUFA, eg. γ-linolenic acid). *Spirulina* is rich source of pigment like phycocyanin known as a nutraceutical that is also an effective anti-carcinogenic compound. The pigment β-carotene is a powerful antioxidant and precursor of Vitamin-a. Spirulina is high in amino acid content and contains all the essential fatty acids required for good human health. Although there are numerous benefits of *Spirulina* and its pigments, the outdoor mass culture to extended periods and pigments extraction with good purity from the culture is cumbersome process that requires adequate technical skills to achieve the desired goals. Therefore, this training aims to impart the important practical knowledge and skills to the participants for their capacity building for Spirulina biomass production and utilization of the biomass for various value added compounds and products.

Benefits of Spirulina

- Spirulina intake improves immune response towards HIV.
- Spirulina intake increases the production of antibodies that help in fighting cancer cells.
- Phycocyanin- a pigment found in Spirulina showed antihypertensive effects.
- Spirulina is a rich source of tetra-pyrrole compounds which are potent anti-oxidant and anti-proliferative agent.
- Spirulina intake mitigates the effects of Arsenic toxicity. Spirulina extract (250 mg + 2 mg Zinc in 100 mL) given to 24 patients twice a day showed that Spirulina-zinc combination resulted in a decrease of 47% in the Arsenic level in the bodies of the patients.
- An addition of *Spirulina* to high cholesterol diet showed a decrease in Low Density Lipids (LDL) and increase in High Density Lipids (HDL).
- Children consumed *Spirulina* showed better cognitive skills, reversal of anaemia and overall malnutrition effects.
- Spirulina protects aged population from Alzheimer, Parkinson and other neuro-degenerative diseases.
- The biomass of Spirulina (powder or slurry) can be used as an ingredient for the development of value added products such as health drinks, yoghurt, candies, bakery items, natural colorant for liquor and medicines and also for fish and poultry products.
- Spirulina biomass and its value added products can be used in cosmetic industries.

Objective:

- To provide hands-on experience/training for *Spirulina* biomass production and its utilization

Contents/topics

- Overview of morphology, taxonomy and various applications of *Spirulina* and its commercial value
- Media preparation, microscopic study of Spirulina
- Mother culture production and maintenance in airlift units and FRP tanks
- Overview and demonstration of methods for growth measurement and harvesting of biomass
- Mass cultivation techniques and processes in outdoor tanks
- Demonstration and training for harvesting and drying of biomass
- Estimation of quality of biomass on the basis of protein and pigment contents
- Extraction of high value pigment phycocyanin and its purity evaluation
- Demonstration of product development using Spirulina and phycocyanin

Eligibility

Students, Entrepreneurs, officials of Government Departments, NGOs and other stakeholders . The government employees/students should send a scanned copy of their applications duly forwarded by the Head of the Institution (not required for private candidates) to spshukla@cife.edu.in.

Application:

Interested candidates are encouraged to contact Dr. S.P. Shukla / Course Director by email (spshukla@cife.edu.in) or phone (M 9821654291) during the office hours (9.0 am to 5.30 pm) on working days (Monday to Friday).

Intake capacity

A maximum 10 participants (in one batch) will be selected after screening.

Schedule

Six days- Four Batches

First Batch : **04-09 December, 2023**

Second Batch : **18-23 December, 2023**

Third Batch : **15-20 January, 2024**

Fourth Batch : **05-10 February, 2024**

Course Fee:

Course Fee Rs.7080/- per participant (for students Rs. 4720/-) and Rs.1770/- per 250 mL *Spirulina* mother culture (18% GST included). Fee to be paid at the time of registration or as DD drawn in favour of "ICAR Unit, CIFE" payable at Mumbai.

Other charges:

Travel/boarding and lodging (TA, DA) will not be paid. Facilities for paid boarding and lodging may be provided in the campus as per availability.

Venue

Aquatic Environment & Health Management Division, ICAR-Central Institute of Fisheries Education, Old campus, Fisheries University Road, Seven Bungalows, Opposite Versova Welfare School, Versova, Andheri (West) Mumbai-40061

Note: Duration of training: 6 days

About ICAR-CIFE

ICAR-Central Institute of Fisheries Education (CIFE), in over 50 years of existence, has emerged as a Centre of Excellence in Higher Education in Fisheries and allied disciplines. The Institute was established on 6th June 1961, under the Ministry of Agriculture, Govt. of India with assistance from FAO/UNDP. It came under the administrative control of Indian Council of Agricultural Research (ICAR) in 1979. Considering the wide mandate involving education, research and extension, and recognizing the pivotal role played by CIFE in human resources development in fisheries, the institute was conferred the status of Deemed to be University in 1989. The institute with its core strength in quality teaching, research and training has become a brand name in fisheries higher education. ICAR-CIFE is placed in a new campus also with state-of-the-art facilities and located in Andheri west, about 8 km from the domestic and international airports and 20 km from Dadar railway station, a major rail terminus in Mumbai. The Versova metro station (Versova-Ghatkopar route) and seven bungalows bus station are at walking distance from both the campuses.

Programme Director
Dr. C. N. Ravishankar
Director/ Vice-chancellor

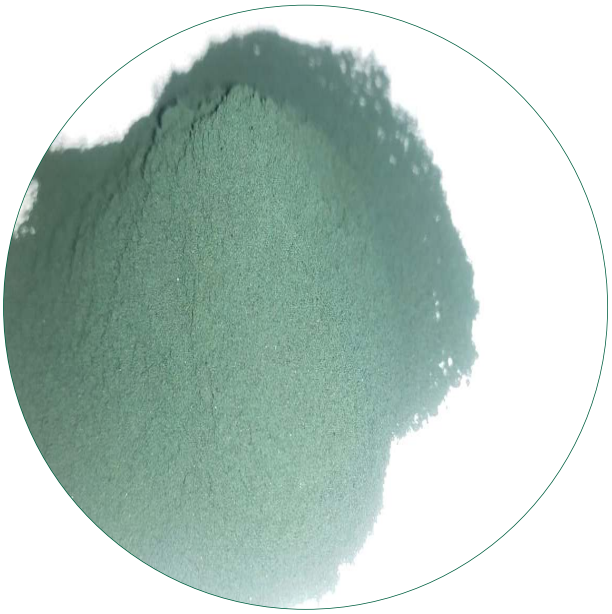
Programme Co-Director
Dr. Megha K. Bedekar
Head, AEHMD

Course Director
Dr. S.P. Shukla
Principal Scientist, AEHMD

Course Coordinators
Dr. Kundan Kumar
Senior Scientist, AEHMD
Dr. Saurav Kumar
Scientist, AEHMD

Duly filled applications on given format may be submitted to:

Dr. S.P. Shukla
Principal Scientist,
Aquatic Environment & Health Management Division,
ICAR-Central Institute of Fisheries Education,
Mumbai
Email: spshukla@cife.edu.in
Office: 022-26361446-48 (Ext. 580)
Mob: +91 9821654291



Application form

"Technical Know-how for *Spirulina* Biomass Production and Utilization"

Organized by

Aquatic Environment and Health Management Division,

ICAR-Central Institute of Fisheries Education

Versova, Mumbai 400061

Name of the applicant:

Gender (Male/Female/Transgender):

Address and contact number:

Email Id:

Profession:

Designation (only for govt. employees):

Date of Birth:

Id proof (Driving license, Student Id card, Aadhar, PAN card) number with a copy Reason for attending the training programme:

I have gone through the training brochure and accept the payment of prescribed fee before the commencement of training programme.

(Signature with date)