

ANNUAL REPORT 2020-2021



Annual Report

2020- 2021



BCSIR, Chattogram Laboratories

P. O. - Chattogram Cantonment, Chattogram-4220, Bangladesh

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Message from the Chairman

It is my immense pleasure to know that BCSIR, Chattogram Laboratories is going to publish Annual Report on the overall R&D activities and performances for the year 2020-2021. This is an especially meaningful edition for me as I have completed more than one year as the chairman of the BCSIR. We are celebrating the birth centenary of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman and I would like to recall the memories of the architect of Bangladesh, Father of the Nation and poet of politics Bangabandhu Sheikh Mujibur Rahman with profound respect.

BCSIR, Chattogram Laboratories is one of the largest multi-disciplinary research units which was established in 1965. As per national as well as BCSIR's missions and mandates, this multi-disciplinary research unit has been aligning its focus and commitments to promote industrial development and to solve problems connected with the establishment and development of industries in Bangladesh. The Institute has expanded its research with an excellent analytical facility and remains unique in conducting basic and applied research to utilizing the indigenous resources of the biggest port city of the Bangladesh.

During the COVID-19 pandemic, the scientists have participated in different trainings, workshops, seminar and conferences at home which have evolved themselves as a better researcher and they implemented their acquired knowledge in different research works which reflects from their yearly achievements. I believe that the scientists, with all other officers and staffs of BCSIR, Chattogram Laboratories, will contribute together in the identical fashion for the continuous advancement of research activities of our country. The stories here reflect fully how the BCSIR, Chattogram Laboratories is advancing scientific and industrial research together with brief description of significant contributions made by the institute on interdisciplinary R&D activities, collaboration with universities and stakeholders, major activities and programs organized during the reporting period.

I would like to express my profound gratitude to Honorable Prime Minister of the Government of the People's Republic of Bangladesh Sheikh Hasina for the visionary leadership to the nation. I am really thankful to the Minister, Ministry of Science and Technology Architect Yeafesh Osman for his continuous support and leadership to bring BCSIR in its desirable height. I would like to thank the Secretary to the Ministry of Science and Technology for his invaluable guidance, support and assistance. I am convinced that, we will continue to work in a focused, consistent and responsible manner to develop new technologies for the benefit of humankind.

I hope this laboratories shall be successful in its future to accept the challenges of the 4th industrial revolutions. I would like to express my heartfelt gratitude to the Director of BCSIR, Chattogram Laboratories, members of the editorial committee and all the scientists of the laboratory for their excellent contribution in their relevant field of research.

(Professor Dr. Md. Aftab Ali Shaikh)
Chairman, BCSIR



Message from the Director

It is my great pleasure to inform you that the Annual Report 2020-2021 of BCSIR, Chattogram Laboratories is finally ready for publication. The report presents an overview of all the R&D activities, achievements of the scientists, list of participation in different trainings, workshops, seminar and conferences and other activities like research guidance to the MS and PhD students etc.

BCSIR, Chattogram Laboratories plays an important role in research and development activities, mainly in the field of medicinal and aromatic plant research. At present, scientist of BCSIR, Chattogram Laboratories are working on seven different fields of science and technology. In addition to R&D project works, scientists are also engaged in offering analytical services to public and private enterprises.

An impressive number of sophisticated laboratory instruments have already been installed under Central Laboratory Facility this year and more to come. Along with this, establishment of Hydrogen Energy laboratories under Annual Development Project (ADP) will boost up our research efficiency and increase our analytical problem-solving capacity in many folds.

I would like to express my deepest gratitude to the Chairman of BCSIR for his continuous encouragement and guidance for publishing this annual report. We sincerely acknowledge his keen interest in the research and development activities of this laboratory. I would also like to thank members of editorial committee, all the scientists, officers and staffs of this laboratory for their support and kind cooperation.

(Dr. Mohammad Mostafa)
Director in-charge
BCSIR, Chattogram Laboratories

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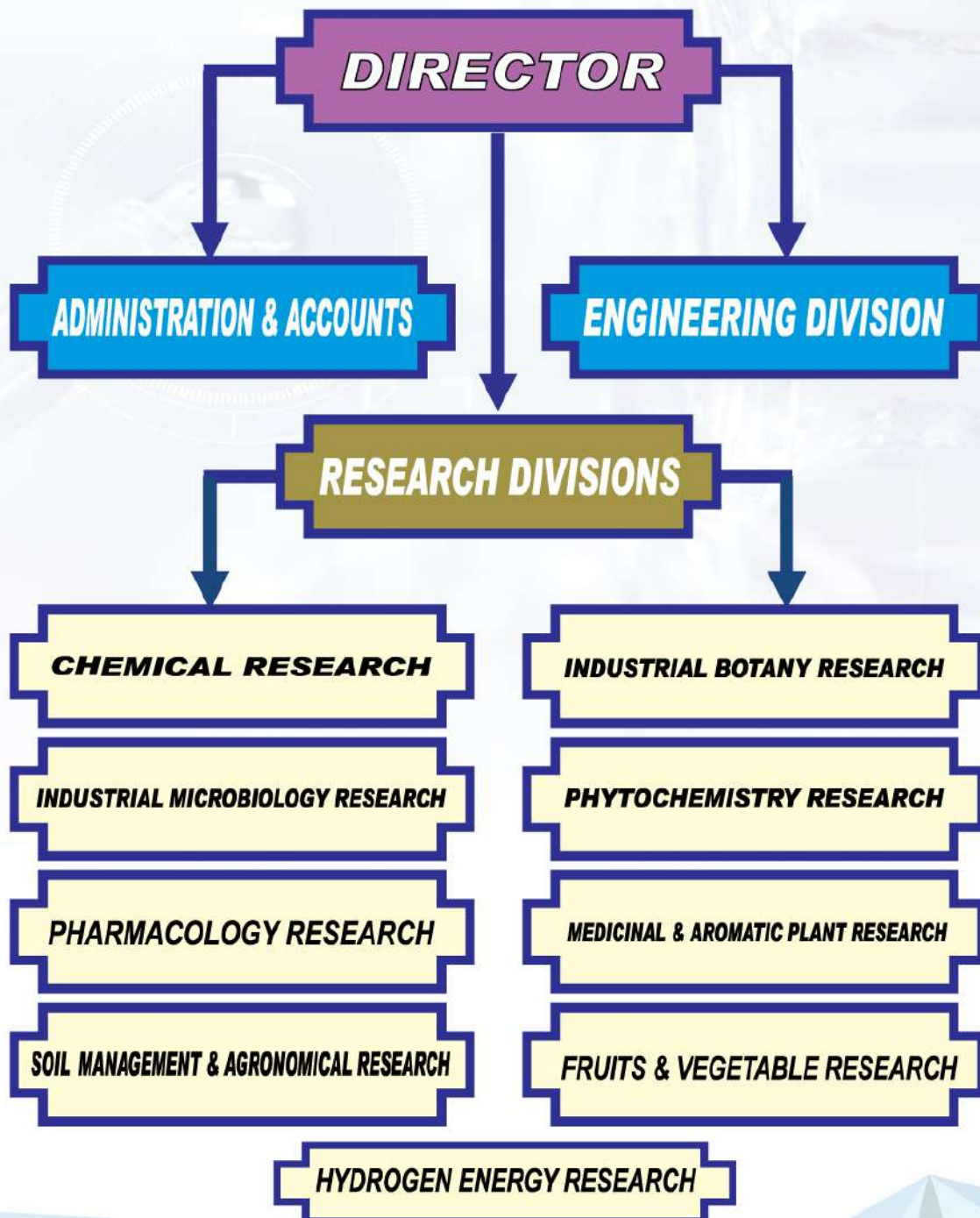
Annual Report 2020-2021 BCSIR, Chattogram Laboratories

BCSIR, Chattogram Laboratories established in 1965 under the name "Natural Drug Research and Development Institute (NDRDI)", which was later renamed as BCSIR, Chittagong Laboratories in 1973. It is a multi-disciplinary unit of Bangladesh Council of Scientific and Industrial Research (BCSIR) under the Ministry of Science and Technology, the People's Republic of Bangladesh. This research organization is headed by a Director and it consists of eight research division viz. Chemical Research Division, Medicinal and Aromatic Plant Research Division, Pharmacology Research Division, Industrial Microbiology Research Division, Phytochemistry Research Division, Soil Management and Agronomical Research Division, Fruits and Vegetables Research Division and Industrial Botany Research Division. Moreover, Hydrogen Energy Laboratory (HEL) is a research Cell of BCSIR dedicated solely to advancing hydrogen energy and fuel Cell technologies. Hydrogen Energy Laboratory (HEL) of BCSIR, Chattogram Laboratories conducts research on hydrogen production, storage, distribution and hydrogen fuel cell. The activities of the HEL are to produce hydrogen using an economic hydrogen production process, developing solid state hydrogen storage materials to store hydrogen safely and hydrogen fuel cell to produce power for stationary application.

The mission of this organization is to carry out, promote and guide scientific, industrial and technological research on various disciplines of pure and applied science that optimize the economic, environmental and social benefits for the people of Bangladesh.



STRUCTURAL ARRANGEMENT OF BCSIR, CHATTOGRAM LABORATORIES





CITIZEN CHARTER

BCSIR, Chattogram Laboratories provides the following services:

- BCSIR, Chattogram Laboratories is a multidisciplinary research organization governed by Bangladesh Council of Scientific and Industrial Research (BCSIR) according to the Act 2013 of the Government of Bangladesh.
- Scientists of various research divisions conduct their approved R & D project and submit the research progress report on quarter yearly/ half yearly/ annual basis as well as publish research outputs in national and international journals.
- This research organization provides technical support to entrepreneurs for the industrial development of the country by leasing out industrial process development by the scientists of this laboratory.
- BCSIR, Chattogram Laboratories renders analytical service through assuring quality checking of the products of various government (Custom house, BSTI etc.), autonomous (Port Authority, WASA etc.) and private companies to help the government earning revenues.
- It conducts research activities especially on medicinal & aromatic plants cultivation, conservation, documentation, research and promotion of indigenous medicinal and aromatic plants.
- It helps the government magistracy through checking status of products that is seized to protect public health and to assure safety of their lives.
- The scientists of this research organization supervise M. S., M. Phil & Ph. D students of different universities to enhance skilled human resources of the country.
- This research organization arranges training, conference, seminar, symposiums, workshops etc. regarding scientific research to create public awareness on various national issues.



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RESEARCH & DEVELOPMENT (R & D) ACTIVITIES



Research and Development (R & D) Activities:

1. Isolation and Structure Elucidation of Bioactive Constituents from Endophytic Fungi of a Local Medicinal Plant *Blumea lacera* with anti-diabetic potential.

Tania Sharmin, S. O. (PL); Dr. Mohammad Mostafa, C. S. O.; Rasheda Akter, S. S. O.; S. M. Zahid Hosen, S. S. O.; Sakia Ferdousy, S. O.

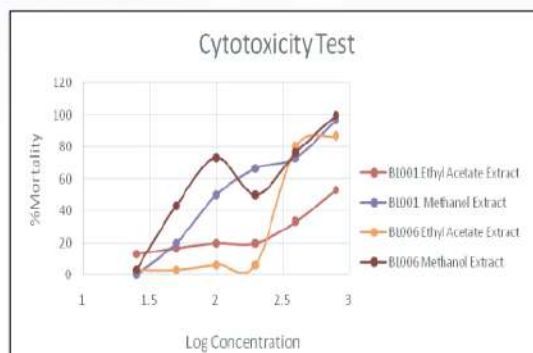
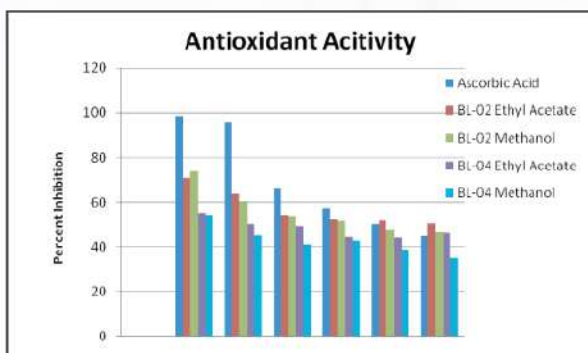
Endophytic fungi are ubiquitous organisms found in the plants, residing intercellular or intracellular, at least for a portion of their lives without causing apparent symptoms of infection. Almost all plants are known to harbor endophytes. The choice of the plant to be used for exploring endophytes for bioactivity is important. Therefore, medicinal plants which are known to be used since centuries as an alternative source of medicine are a valuable source for bio-prospecting endophytes. Nevertheless, due to many reasons there is a dire need for novel resources for novel drugs which can be an answer to many deadly diseases. Endophytic fungi from medicinal plants are a source of bioactive and chemically novel compounds. The bioactive metabolites produced by endophytic fungi originate from different biosynthetic pathways and belong to diverse structural groups such as terpenoids, steroids, quinones, phenols, coumarins etc. Endophytic fungi, therefore, represent a chemical reservoir for new compounds such as, anticancer, antidiabetic, immune modulatory, antioxidant, antiparasitic, antiviral, antitubercular, insecticidal etc. for use in the pharmaceutical and agrochemical industries. These bioactive compounds, if isolated as pure compounds, can be useful as lead compounds in new drug design in the pharmaceutical industries of our country.

Objectives

- ❖ To tap the Endophytic fungal diversity from the local plants of Bangladesh and assess their potential bioactive constituents
- ❖ Structure elucidation of bioactive compounds from endophytic fungi of local medicinal plants

Work Progress (with research related data, photographs etc.)

- ❖ 4 endophytic fungi were isolated and examined for bioactivity
- ❖ All of them showed significant anti-oxidant and cytotoxic activity
- ❖ Phytochemical screening of 4 isolated endophytic fungi has been done.



2. Database Development of Nature Derived Molecules for Rational Drug Discovery in Bangladesh.

Nusrat Jahan Mouri, S. S. O. (PL); Rasheda Akter, S. S. O.; S. M. Zahid Hosen, S. S. O.; Tania Sharmin, S. O.; Sakia Ferdousy, S. O.



Many researchers in the worldwide use in-house, commercial or non-commercial computational tools to screen existing natural products databases with a molecular target of interest. Therefore, this research project involves designing and development of web based natural compounds library for the first time in Bangladesh. This type of library will facilitate computer-aided drug design process and can be accessed worldwide, from any corner of world. From academic to government researchers and students can be benefitted by this virtual library whose research is based on natural products. Some novel and updated computational methods are also aimed to develop to screen out potent drug like targets and novel compounds for a particular disease by using computer platforms. These methods not only reduce the time needed in lab based bioassays but also more cheaply and affordably that anyone can consider it as a good starting point and a useful tool in the drug discovery process.

Objectives:

- ❖ To develop a database of whole medicinal plants derived molecules.
- ❖ To establish 3D visualization platform to upgrade molecular modeling techniques for drug discovery.

Work Progress

- ❖ Compound mining, drawing, 2D descriptor analysis, 3D descriptor analysis, target analysis and citation of 202 more plants has been completed
- ❖ Plant profiling, excel upload for duplication check of 202 plants have been completed.
- ❖ Five publications are done (MRMC, CPB journal, Bentham science publishers)

3. Enhanced biogas production from solid waste using high yielding microbial consortium

Rajib Sarkar, S. O. (PL); Dr. Saiful Islam, S. S. O.; Suman Das, S. S. O.; Sujan Kanti Das, S. O.;
Md. Habibur Rahman Bhuiyan, C. S. O.; Dr. Mohammad Mostafa, C. S. O.;
Mokarram Billa Chowdhury, P. S. O. (Retired); S. M. Asaduzzaman Sujan, S. S. O.

Bangladesh has a huge potential for biogas production. There are about 25 million cattle and 1,50,000 poultry farms. Cities are generating about 25000 tons of domestic waste per day. 75% of which are organics and suitable for biogas production. Agricultural residues and water hyacinth are also suitable for biogas production as abundantly available. According to experts, there is scope to set up 4 million biogas plants in Bangladesh. So we can assume that even Chattogram has a scope to build at least 1 million biogas plants. Biogas-based power generation has also huge potential.

Objective:

- ❖ Implementation of a sustainable and economical biogas plant using microbial consortium
- ❖ Decreasing the retention time for rapid and quality biogas production from solid waste for economic benefit
- ❖ Increasing the quantity & quality of biogas to use as fuel and power generation for economic benefit as well as green environment maintenance
- ❖ To encourage entrepreneurs for setting up more biogas plant

Work Progress:

We have set up four lab-scale digesters. A comparative study between cow dung and solid waste has been done two times. Microbiological analysis has been performed for understanding microbial dynamics. We are now screening for potential isolates that can increase biogas production.



Comparative Study of Biogas Production from Cow dung, Raw Solid Waste & Aerobic Solid Waste				
Digester Name	Gas Production (1-15 days)	Gas Production (16-30 days)	Gas Production (31-45 days)	Total Gas Production
Digester 01 (Cowdung based)	410 ml	443 ml	3370 ml	4223 ml
Digester 02 (Cowdung & Raw Solid waste based)	2785 ml	05 ml	0 ml	2790 ml
Digester 03 (Cowdung & Aerobic Digested Solid waste based)	563 ml	2885 ml	4050 ml	7498 ml
Digester 04 (Cowdung & Aerobic Digested Solid waste small pieces based)	812 ml	3005 ml	3685 ml	7502 ml

Microbiological Analysis(1 st day)							
Digester Name	Total aerobic count Cfu/ml	Yeast & mould count Cfu/ml	Total Anaerobi count Cfu/ml	Total coliform Cfu/100 ml	Thermotolerant coliform Cfu/100 ml	E coli Cfu/100 ml	Salmonella /ml
Digester 01	04*10 ⁶	9*10 ⁴	5*10 ⁴	>1100	>1100	>1100	Present
Digester 02	1.2*10 ⁶	7*10 ⁴	3*10 ⁴	>1100	>1100	>1100	Present
Digester 03	3*10 ⁷	3*10 ⁵	7*10 ⁵	>1100	>1100	>1100	Present
Digester 04	5*10 ⁶	9*10 ⁵	4*10 ⁵	>1100	>1100	>1100	Present

Microbiological Analysis(After 15 days)							
Digester Name	Total aerobic count Cfu/ml	Yeast & mould count Cfu/ml	Total Anaerobi count Cfu/ml	Total coliform Cfu/100 ml	Thermotolerant coliform Cfu/100 ml	E coli Cfu/100 ml	Salmonella /ml
Digester 01	3.5*10 ⁶	5*10 ⁶	7*10 ⁶	>1100	>1100	>1100	Present
Digester 02	2*10 ⁶	2*10 ⁶	1.8*10 ⁷	>1100	>1100	>1100	Present
Digester 03	3.2*10 ⁷	4.5*10 ⁷	5*10 ⁷	>1100	>1100	>1100	Present
Digester 04	5*10 ⁶	9*10 ⁷	10*10 ⁶	>1100	>1100	>1100	Present

Microbiological Analysis(At 45 days)							
Digester Name	Total aerobic count Cfu/ml	Yeast & mould count Cfu/ml	Total Anaerobi count Cfu/ml	Total coliform Cfu/100 ml	Thermotolerant coliform Cfu/100 ml	E coli Cfu/100 ml	Salmonella /ml
Digester 01	06*10 ⁶	10*10 ⁶	1.5*10 ⁶	>1100	>1100	>1100	Present
Digester 02	04*10 ⁶	02*10 ⁶	10*10 ⁶	>1100	>1100	>1100	Present
Digester 03	2*10 ⁶	6*10 ⁶	2*10 ⁶	>1100	>1100	>1100	Present
Digester 04	7*10 ⁶	10*10 ⁶	10*10 ⁶	>1100	>1100	>1100	Present

4. Development of herbal products from *Gynura procumbens* and *Coccinia cordifolia* for diabetes management.

A. J. M. Morshed, S. S. O. (PL); Muhammad Abu Bakar, S. S. O.; Sujan Kanti Das, S. O.; Rasheda Akter, S. S. O.; Dr. Mohammad Mostafa, C. S. O.

Medicinal plants have been discovered and utilized to develop different types of herbal products since prehistoric period. A large number of compounds are obtained from these herbal plants which are played an important role for defending against various diseases as herbal remedies or dietary supplements. According to the primary record of World Health Organization (WHO), about 80 percent of population in the world depends on traditional medicine. Because, herbal products made from medicinal plants may be non-toxic and nothing or low side effects than the artificial products. Bangladesh is enriched of huge sources of medicinal plants. Traditional practitioners of the Chittagong Hill Tracts of Bangladesh have been used the medicinal plants as remedy of many diseases from time immemorial.

Objectives

- ❖ To develop value added products such as Tea, Biscuit, healthy drinks and juice.
- ❖ To isolate active compounds for using as raw materials in different industries such as pharmaceuticals, cosmetics, food industries etc.

Work Progress

Comparison between *Gynura procumbens* and *Coccinea cordifolia* regarding their antihyperglycemic properties has been completed [Table 1]. One research paper is ready for submission.

Table 1: Comparative study of hypoglycemic effects between *Gynura procumbens* and *Coccinia cordifolia*.

Group	Model	Dose g/Kg	Fasting Blood Glucose Level (mmol/L)		Changed BGL (%)
			1 st Day(Before treatment)	14 th Day(After treatment)	
I	Diabetic control	-	18.10 ± 2.14	26.60 ± 2.91	+ 46.96
II	Positive control	0.5	17.35 ± 0.78	6.60 ± 3.25	- 61.96
III	Ethanol extract – A	0.5	14.40 ± 1.56	8.10 ± 2.26	- 43.75
IV	Ethanol extract – A	1.0	12.70 ± 1.80	6.13 ± 0.35	- 51.73
V	Ethanol extract – A	2.0	15.25 ± 1.63	6.75 ± 2.47	- 55.74
VI	Ethanol extract – B	0.5	17.93 ± 1.91	10.10 ± 1.83	- 43.67
VII	Ethanol extract – B	1.0	12.60 ± 2.26	6.40 ± 1.84	- 49.21
VIII	Ethanol extract – B	2.0	14.90 ± 2.69	7.05 ± 0.21	- 52.68

(+): Increased BGL (%)

(-): Decreased BGL (%)

Diabetic control: Diabetic rats without medication.

Positive control: Diabetic rats treated with Glibenclamide

Ethanol extract – A: Crude ethanol extract of *Gynura procumbens*

Ethanol extract – B: Crude ethanol extract of *Coccinia cordifolia*

Values are given as mean ± standard deviation for groups of five animals. Values are statistically significant at * p< 0.05.

5. Investigating natural antibacterial agent from garlic (রসুন) against multidrug resistant pathogens

Md. Saddam Hossain, S. O. (PL); Dr. Saiful Islam, S. S. O.; Suman Das, S. S. O.;
Farjana Showline Chaity, S. O.; Rasheda Akter, S. S. O.

Multidrug resistance is a growing problem all over the world. Natural products having fewer side effects compared to conventional antibiotics are now being used as an alternative medicine for treatment of various diseases. They are relatively inexpensive and readily available for the people while showing better patient tolerance. Garlic (*Allium sativum*) is one of the herbs that is used by traditional practitioners for preparation of herbals medicine. Several studies have shown that garlic extract is effective against multidrug resistant pathogens. Therefore, they can also be used in Bangladesh against the multidrug resistant pathogens where most commonly used antibiotics fails. Bangladesh Agriculture Research Institute (BARI) has developed high yielding garlic species like BARI ROSHUN 1-4. They are of very good quality and their disease and pest infestation rate is low. BAU ROSHUN-1, BAU RASHUN-2 developed by Bangladesh Agriculture University is also remarkable. They are promising but their antimicrobial activity as well as other potency as a drug candidate is not yet investigated.

Objectives

- ❖ To investigate natural antibacterial agent from high yielding Bangladeshi garlic variety against multidrug resistant pathogens.
- ❖ Finally, to develop herbal preparation for the treatment of infectious diseases if promising.

Work Progress

The antimicrobial activity of the high yielding garlic has been carried out against the selected multidrug resistant *Escherichia coli* and other pathogenic bacteria by broth microdilution method. They were also compared with the other garlic found in our commercial market in terms of their antimicrobial activity. We also analysed the organosulphur compounds of the garlic by GC-MS.



Fig 1 : MIC assay of garlic powder against test organisms by microbroth dilution assay

Table-01: Antimicrobial activity of garlic varieties against multidrug resistant organisms

Bacterial species MIC value of (mg/mL) of garlic powder											
	Bari-1	Bari-2	Bari-3	Bari-4	Ban-1	Ban-2	Ban-5	Chinese	Indian	Deshi	Neg Blank
<i>E.coli</i>	10	2.5	5	2.5	2.5	2.5	2.5	10	5	2.5	0
<i>K. pneumoniae</i>	10	2.5	2.5	2.5	2.5	5	2.5	10	5	2.5	0
<i>S. aureus</i>	10	2.5	2.5	2.5	2.5	5	2.5	10	5	2.5	0
<i>S. typhi</i>	>10	2.5	5	5	5	5	5	10	5	2.5	0
<i>B. cereus</i>	>10	2.5	2.5	2.5	5	5	2.5	5	2.5	2.5	0
DTRPz0	>5	5	5	5	5	5	5	10	5	2.5	0
NCKT07	>5	5	5	5	5	5	5	10	5	2.5	0
CMC-13	>10	10	10	10	10	>10	10	10	5	2.5	0
CMC-16	>10	10	10	10	10	10	10	>10	10	2.5	0
CMC-19	>10	5	5	5	10	10	5	10	5	5	0
Pm ₁	>10	2.5	5	5	5	5	5	5	5	2.5	0
Pm ₃	>10	2.5	5	5	5	5	5	10	5	1.25	0
Pm ₄	10	1.25	2.5	2.5	2.5	2.5	2.5	5	5	1.25	0
Pm ₅	5	1.25	2.5	2.5	2.5	2.5	2.5	5	5	1.25	0
Pm ₆	5	1.25	1.25	1.25	1.25	1.25	1.25	5	2.25	5	0

GC-MS analysis

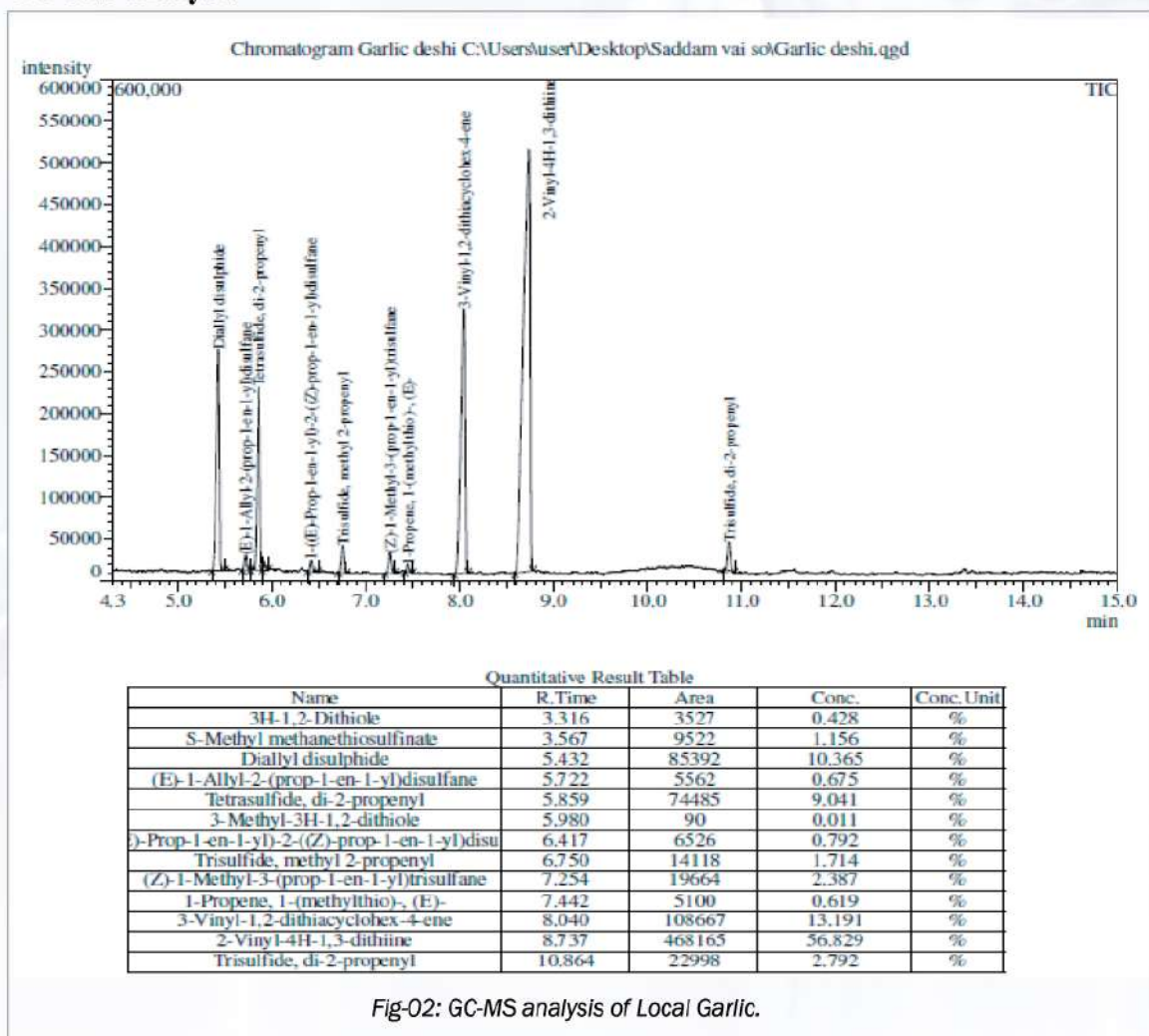


Fig-02: GC-MS analysis of Local Garlic.

6. Development of value added herbal products (skin care and medicated soap, face wash cream, petroleum jelly, lip gel etc.) from locally available indigenous plants.

Md. Saidur Rahman, S. S. O. (PL); Nemai Chandra Nandi, P. S. O.; Md. Abu Bakar, S. S. O.; Rajib Sarkar, S. O.; Amena Kibria, S. O.

The demand of herbal products likely cosmetics and foods are increasing day by day due to side effect and different hazardous activities of chemically synthesized products.

The concept of well health, beauty and cosmetics is as ancient as mankind and civilization. Women are obsessed with looking beautiful. So, they use various beauty products that have herbs to look charming and young. The skin beauty of individuals depends on the health, habits, routine job, climatic conditions and maintenance. The skin due to excessive exposure to heat will dehydrate during summer and causes wrinkle, freckles, blemishes, pigmentation and sunburns. The extreme winter cause damages to the skin in the form of cracks, cuts, maceration and infections. The skin diseases are common among all age groups and can be due to exposure towards microbes, chemical agents, biological toxin present in the environment and also to some extend due to malnutrition. With the help of this project skin care and medicated herbal cosmetics products will eliminate



mentioned affects.

On the other hand it is proved that herbal products promote vibrant health and radiant beauty, soothe everyday ailments, and ease persistent stress, natural cures for everything from dry skin and act as medicine of others different types of disease. By the project herbal food products will act as medicine and create an easy way to become a disease free person from diseases affected person.

Objectives

- ❖ To develop different value added skin care and medicated herbal products.
- ❖ To develop different herbal food such as biscuit, cake etc.
- ❖ To use of locally available indigenous plants.
- ❖ To develop technology for small scale and large scale industries.
- ❖ To create some employments opportunities.

Work progress

One process has been accepted and two processes have been developed but their shelf life are now observing.

7. Development of disease resistant variety of legumes pulses plants: Checkpea (*Cicer arietinum*), Pea (*Pisum sativum*) etc. through nanotechnology.

Md. Saidur Rahman, S. S. O. (PL); Nemai Chandra Nandi, P. S. O.

Nanotechnology is one of the most fascinating and rapidly advancing sciences and possesses potential to revolutionize many disciplines of science, technology, medicine and agriculture. It is proved that nano size particles (1-100 nm) give birth to new characteristics and the material behaves differently. In agriculture, nanotechnology has potential scope for use in the natural resource exploitation and production and protection of the crops and livestock. Because of ultra-small size, nanoparticles may hit/target specific reaction that may open a new field of controlling diseases in plants. Use of nanoparticles in plant disease management is a novel and fancy approach that may prove very effective in future with the progress of application aspect of nanotechnology. Use of nanobiotechnology, nanoparticles can be potentially used in the crop protection. Significance of nanotechnology has been realized internationally and several countries have set up especial committees/groups to support and monitor nano technological advancements and to harness its benefits for the mankind.

Since, physio-chemical properties of nanoforms from its macroform vary greatly; it becomes important to examine the effect of nanoparticles on microorganisms to harness the benefit of this technology in the plant protection especially against phytopathogens. Nanoparticles because of ultra-small size, even smaller than a virus particle and high reactivity, may affect the activity of microorganisms. The silver has been generally found non injurious to microorganisms. However, silver nanoparticles inhibited the colonization of *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Klebsiella pneumonia*. The highest antimicrobial activity of silver nanoparticles (30 nm) synthesized by *Solanum tuberosum* and *Ocimum tenuiflorum* leaf extracts was found against *S. aureus* and *E. coli*, respectively. The information so far available on this aspect has shown that the nanoparticles have definite effect on the colonization of bacteria and fungi. However, these effects are suppressive as well as stimulatory and hence cannot be generalized. Grain and forage legumes are grown on some 180 million Ha, or 12% to 15% of the Earth's arable surface. They account for 27% of the world's primary crop production, with grain legumes alone contributing 33% of the dietary protein nitrogen (N) needs of humans. But due to plant pathogen,



lost of yield is 20%-100%. For example, field observations during vegetation indicated, that often various specific disease symptoms occurring on chickpea (*Cicer arietinum*) plants were caused by the fungi infesting plant tissues. Leaf, stems and pods spots, yellowing and drying of whole plants and root rot and basal rot were dominant symptoms. The main reasons of those disease symptoms were fungi from genus: *Fusarium*, *Alternaria*, and *Ascochyta* and additionally *Botrytis cinerea* and *Rhizoctonia solani*. Nanotechnology is a promising field in biological science including agriculture. With the help of this project, it is possible to use nanotechnology in biological science particularly plant biological system, it will be easy to prevent plant disease with minimal cost and country will get disease free seeds or plants as well as some noble knowledge will generate in the scientific arena.

Objectives

- ❖ To get disease resistant legumes plants.
- ❖ To produce quality seeds of legumes.
- ❖ To reduce yield loss of legumes.
- ❖ To decrease cost of cultivation.
- ❖ To reduce harvesting time.

Work progress

Two papers have been published and one paper is ready for submission.

8. Extraction of natural colors from Asiatic penny Worst (*Centella asiatica*), Jambolana (*Syzygium cumini*), Gum Arabic tree (*Acacia nilotica*), Common bean (*Phaseolus vulgaris*) and Red Spinach (*Amaranthus dubius*) for using in food industry.

Sreebash Chandra Bhattacharjee, P. S. O. (PL); Dr. Dipankar Chakraborty, P. S. O.;
Suman Das, S. S. O.; A. J. M. Morshed, S. S. O.

Synthetic colorants have long been used for the aforementioned purposes due to their stability, diverse hue variation and vibrant color. Unfortunately, consumption of synthetic colorants has been reported to be related to many negative health effects, e.g., hyperactivity, irritability, sleep disorders and aggressiveness. Use of natural colorants as well as colorants produced from natural sources has thus gained increasing popularity, especially during the past few years. Proper utilization of these natural colors could be a resource for solving our health problem and contributing our socio-economic development. The study will be helpful for the utilization of the local plants like Asiatic penny Worst (*Centella asiatica*), Jambolan (*Syzygium cumini*), Gum Arabic tree (*Acacia nilotica*), Common bean (*Phaseolus Vulgaris*) and Red Spinach (*Amaranthus dubius*) to produce different natural color compounds and their health effects.

Objectives

- ❖ To utilize of our local plants to isolate different natural colors for using in food and beverages.
- ❖ To reduce the use of different synthetic colors toxic effect on our food and beverages.
- ❖ To save our foreign currency by reducing the import of color compounds.
- ❖ To solve health problems like diabetes, aging, cancer and free radical scavenging of using those color compounds as by product of food and beverages.
- ❖ To develop different industrial products using those color compounds which improving our food habits all over the country

Work progress

We isolate anthocyanins following water extraction method and its containing 6.67%. Again carotenoids isolation has been carried out by using different organic solvent extraction method. From the experiment, the result of percentage of isolation of carotenoids is as follows.



Solvent(organic)	Percentage of Carotenoids
Methanol	25.35%
Ethanol	18.33%
Chloroform	3.79%
Isoamylalcohol	4.85%
Isobutyl alcohol	4.26%
Pet ether	10.67%
Ethyl acetate	2.85%
N-hexane	16.73%
Cyclohexane	14.63%
Acetone	3.0%

From above extraction data, we shall carry out extraction choosing methanol and a process will be submitted suitability of the natural food colorant isolating and applying of different food product.



9. Biopesticidal product development from *Accacia nilotica* (Bengali: Babla) for agricultural use.

Dr. Dipankar Chakraborty, P. S. O. (PL); Sreebash Chandra Bhattacharjee, P. S. O.;
Suman Das, S. S. O.; Paroma Arefin, S. O.

Now-a days natural products is more popular to the people of the world because of its less side effect. Bangladesh though a small country owing to its favorable climate influences has been blessed with immense natural resource including explored and unexplored natural pesticide plants. There is a great demand of natural and bioorganic pesticides products in the pharmaceutical and agricultural industries in our country. Proper utilization of these natural plants may be a resource for our socio-economic development. The study will be helpful for the utilization of the medicinal plants like *Accacia nilotica* (Bengali: Babla) to develop different pesticides products against different types of pesticides.

Objectives

- ❖ To use of our local medicinal plants to isolate different pesticide compounds.
- ❖ To reduce the use of different synthetic pesticide and herbicidal compounds polluting our environment.
- ❖ To save our foreign currency by reducing the import of pesticide chemicals.
- ❖ To create wealth through scientific research and innovative idea from our local medicinal plants.
- ❖ To develop different industrial products which flourish through small and medium enterises (SME) all over the country.



Work progress

- ❖ The ethanolic extract and its fraction of pods identified containing compounds such as alkaloids, flavanoids, terpenoids, steroids and tannins.
- ❖ Toxicity of extract proved variable toxicity effects by screening with mortality of store grain pest *Sitophilus oryzae*, mosquito larvae and antibacterial activity with some drug resistant microorganism such *Bacillus subtilis*, *Staphylococcus aureus*, etc.
- ❖ There was larvicidal efficacy noticed for both store grain insect and mosquito larvae.
- ❖ Concerning the adult stage, ethanolic extract of the tested tree pods proved repellent effects and insecticidal toxicity properties causing knock down against both pest. The ethanolic, methanolic, water and pet ether extract shows antifungal activity against plant fungal pathogens.
- ❖ *Aspergillus flavus*, *Aspergillus niger* where the rate of mycelial growth inhibition was increasing by the increasing the extract concentration. So, the extract of *Acacia nilotica* was found to have promising effects in controlling the investigated pests.
- ❖ A process will be submitted to evaluate pesticide properties on some agricultural pest.

10. Development of Bio-Coagulant (from Jack fruits, Bean) for Waste Water Treatment.

Muhammad Abu Bakar, S. S. O (PL); Sujan Kanti Das, S. O.; Dr Saiful Islam, S. S. O.; Dr. Md. Abdus Salam, S. P. E.; Dr Dipankar Chakraborty, P. S. O.; Dr. Mohammad Mostafa, C. S. O.

Pollution of water is a major health issue in the world especially where industry is growing fast. Many techniques such as chemical or microbiological process are used to treat waste water which is not regarded as suitable due to economic or environmental considerations. Coagulation process is one of the important step for waste water treatment. Many chemicals like Alum, Ferric chloride, Ferric sulfate; PAC etc are used in most of the water treatment process which are added in environment after treatment. Most of the chemicals are environmentally hazardous due to its no degradability and its toxicity. For sustainable development, we need to develop green process to treat effluent. There are many studies on plant based coagulant (Bio-Coagulant). Though a lot of scientists reported that some plants can be effectively removed 70 to 95% turbidity/color. But bio-coagulant is not yet developed for commercial utilization. This research will be supported to develop biocoagulant that will be utilized in water purification. Moreover, this research may also be helpful to ensure environmental compliance and will play an important role in SDG.

Objectives:

- ❖ To develop Bio-Coagulant using seeds of Jackfruits and common bean for commercial utilization.
- ❖ To develop a Bio-Coagulation process for waste water treatment.
- ❖ To appreciate environment friendly, biodegradable product.

Work Progress:

Jar test apparatus and some raw materials have been collected.

11. Formulation of aroma products from available essential oils.

A. J. M. Morshed, S. S. O. (PL); Dr. Dipankar Chakraborty, P. S. O.; Sreebhash Chandra Bhattacharjee, P. S. O.; Nemai Chandra Nandi, P. S. O.; Dr. Mohammad Mostafa, C. S. O.

Essential oil is a volatile substance collected from aromatic plants by steam distillation. It is used in cosmetics, pharmaceuticals and food industries. Fragrance industries are still depending a lot on import. There is not much well reputed fragrance locally available that we can use without worry. There is a huge quantity of medicinal and aromatic plants as well as herbs in Bangladesh. We can use them not only to save foreign currency but also earn them by exporting. This will also create job opportunities for many people in our country.

Objectives

- ❖ To develop different types of aroma products by using locally available essential oil.
- ❖ To encourage use of herbal products in lieu of synthetic or artificial aroma products.

Work Progress

Some raw materials have been collected to develop perfumeries.



12. Synthesis and Characterization of low cost Photocatalyst for Hydrogen Production.

Md. Sahab Uddin, S. O. (P.L); Dr. Md. Abdus Salam, S. P. E; Md. Shehan Habib, S. O.;
Kawsar Ahamed, S. O.

Fossil fuels are most significant sources of energy for today's human society. In recent years, world has realized the importance of energy resources for its overall development. The devastating exploitation of this fuels accelerated the depletion of non-renewable resources. Meanwhile, the emissions of greenhouse gases and other toxic pollutants associated with fossil energy are environmentally non-viable. Therefore an urgent need arises for the development of clean and sustainable sources of energy. Solar energy is considered as one of the most promising alternative energy sources because of its cleanness and richness, but there is a difficulty while capture, transform, and store of this form of energy. Thus more researchers are trying to convert solar energy into a more available and viable renewable energy source. Hydrogen is considered as the most ideal alternative clean energy because of its high Calorific value, zero pollution, and storability. It is widely considered to be the future clean energy carrier in many applications, such as environmentally friendly vehicles, domestic heating, and stationary power generation. If we can transform the scattered, inexhaustible solar energy into the highly concentrated and clean hydrogen energy by photochemical, electrochemical, photo electrochemical, and Photocatalytic Water splitting methods energy shortage challenges can also be solved.

Objectives

- ❖ Synthesis of a suitable catalyst for water splitting.
- ❖ Characterization of the synthesized catalyst.

Work progress

A batch of Titanium based SrTiO₃ photocatalyst has been synthesized by Flux method and also doped with Ag, Ni, and Cu at different concentration. A reactor with 1000ml capacity mounted with 250W-Xenon lamp was set to check the performance of synthesized catalyst. A review paper entitled "Various Material Development Strategies for Suitable Catalysts of Photo Catalytic Water Splitting to Green Fuel H₂:A Critical Review" has been published.

13. Development of low cost biodegradable Polyethylene composite for Packaging Application.

Kawsar Ahmed, S. O. (PL); Dr. Md. Abdus Salam, S. P. E.; Md. Shehan Habib, S. O.;
Md. Sahab Uddin, S. O.

Ongoing use of polyethylene product is the concern of environmental specialists. By nature, polyethylene is not easily degradable and creates unwanted blockage in the flow of water/sludge. The two major applications of synthetic polymers fall in the field of food packaging (wrapping materials) and other uses (i.e. mulch films, seedling pots and binding twine). LDPE is an 'omnipresent' polymer having already found numerous applications. Their degradability was questioned on several occasions mainly because of lacking documentation either with regard to the properties of the tested polymer or in relationship to the degradation procedure employed. In this research, the extrusion production process will be used to prepare PE biocomposite with high density polyethylene (HDPE) and rice husk biochar obtained by rice husk pyrolysis. The mechanical and biodegradable properties of biodegradable PE will be done and finally performance evaluation will be reported. Successful research can be achieved sustainable development goal (SDG)- 11, 13 and 14.

Objectives

- ❖ To prepare and characterize the reinforcing or filler materials.
- ❖ To produce biodegradable polyethylene film.
- ❖ To characterize the biodegradable polyethylene and evaluate its performance for packaging application.

Work progress

- ❖ Reinforcing materials was produced by the pyrolysis of rice husk, paper mill industries and sugarcane bagasse.
- ❖ Composite preparation is going on.



14. Screening of novel bioactive compound from soil actinomycetes

Farjana Showline Chaity, S. O. (PL); Dr. Saiful Islam, S. S. O.; Rajib Sarkar, S. O.;
Md. Sahab Uddin, S. O.; Habibur Rahman Bhuiyan, C. S. O.

Multiple drug resistance in many bacterial pathogens is the main hindrance in successful treatment of infectious diseases worldwide. In Bangladesh, the problems are also severe. Natural products having fewer side effects compared to conventional antibiotics are now being popular for medicinal uses. They are relatively inexpensive and readily available for the people while showing better patient tolerance. New strains of Actinomycetes can be used as an alternative source for developing novel antimicrobial agents to combat infectious diseases. Actinomycetes can perform noteworthy biogeochemical roles in terrestrial soils and are highly valued for their unparalleled ability to produce biologically-active secondary metabolites. Novel antimicrobial agents can be produced from this strain at lower costs with fewer side effects.

Objectives

Development of new antimicrobial agents from Actinomycetes secondary metabolites.

Work Progress

Twenty strains of Actinomycetes have been isolated from soil of BCSIR, Chattogram Laboratories and Rangamati. Isolates were stored at -80°C freezer for long time preservation.

15. Development of anti-obesity herbal products

Dr. Saiful Islam, S. S. O. (PL); Rajib Sarkar, S. O.; Farjana Showline Chaity, S. O.;
Rasheda Akter, S. S. O.; Dr. Mohammad Mostafa, C. S. O.

Obesity rate in Bangladesh are increasing in a slower pace. In 1980, 7% adults were obese but in 2013 this rate has climbed to 17% for adults. MS Hossain et. al. (2019) found that 14% of schools going children were overweight in Bangladesh. Obesity may contribute to various chronic diseases such as type 2 diabetes (T2D), hyperlipidemia, cardiovascular disease (CVD), hypertension, cerebrovascular incidents, and obstructive sleep apnea etc.

Currently, multiple therapeutic options are available to treat obesity such as diet modification, exercise, behavioral changes, surgery, and pharmacotherapy. Among these, pharmacotherapy is the most common, although numerous drugs used to reduce weight have associated side effects and, specifically, fenfluramine, rimonabant, and sibutramine were withdrawn from the market because of dangerous side effects. Therefore, orlistat is the only medication approved for long-term use worldwide, although uncomfortable adverse events are associated with its use. Furthermore, lorcaserin and the fixed-dose drugs phentermine and topiramate were approved for weight loss, but their side effects were problematic. Therefore, other sources of weight loss drugs, such as natural products, are need to investigation. Development of new anti-obesity herbal medication will contribute to reduce obesity rate in Bangladesh.

Objectives

- ❖ To develop low-cost anti-obesity herbal medication.
- ❖ Introduction of new startup with newly discovered anti-obesity herbal medications.

Work Progress

- ❖ Selection of plant and purchase of required chemical has been completed.

16. Inhibitory effects of some common medicinal plant extract on dental plaque forming bacteria and the production of Herbal Toothpaste.

Nusrat Jahan Mouri, S. S. O. (PL); Rasheda Akter, S. S. O.; Tania Sharmin, S. O.; Sakia Ferdousy, S. O.

The association between oral diseases and the oral microbiota is well established. More than 750 species of bacteria that inhabit the oral cavity, a number are implicated in oral diseases. The development of dental caries involves acidogenic and aciduric Gram-positive bacteria mutans streptococci, lactobacilli and actinomycetes metabolize sucrose to organic acids (mainly lactic acid) that dissolve the calcium phosphate in teeth, causing decalcification and eventual decay. Periodontal diseases have been linked to anaerobic Gram-negative bacteria (*Porphyromonas gingivalis*, *Actinobacillus*, *Prevotella* and *Fusobacterium*). Given the incidence of oral disease, increased



resistance by bacteria to antibiotics, adverse effects of some antibacterial agents currently used in dentistry and financial considerations in developing countries, there is a need for alternative prevention and treatment options that can alter oral microbiota and have undesirable side-effects such as vomiting, diarrhea and tooth staining. Other antibacterial agents used in the prevention and treatment of oral diseases, including cetylpyridinium chloride, chlorhexidine, amine fluorides or products containing such agents, are reported to exhibit toxicity, cause staining of teeth or in the case of ethanol (commonly found in mouthwashes) have been linked to oral cancer [Hence, the search for alternative products continues and natural phytochemicals isolated from plants used as traditional medicines are considered as good alternatives.

Objectives

- ❖ To resist dental plaque formation by using natural substances like plant extract and essential oil.
- ❖ Production of such a toothpaste that inhibit oral bacteria.
- ❖ To reduce the use of synthetic chemicals containing dental products.

Work Progress

- ❖ Raw material collection
- ❖ Extraction of essential oil by solvent extraction process



Fig.: Essential Oil

17. Preparation of anti-acne face wash from herbal extracts

Dr. Dipankar Chakraborty, P. S. O. (PL); Sreebhash Chandra Bhattacharjee, P. S. O.; Suman Das, S. S. O.; Saidur Rahman, S. S. O.; Paroma Arefin, S. O.; Ferdousi Jahan, S. O.; Rajib Sarkar, S. O.; Dr Mohammed Mostafa, C. S. O.

Acne is an extremely common disorder of skin that affects virtually all individuals at least once during lifetime. The incidence of acne peaks at teenage but substantial number of men and women between 20 to 30 years of age are also affected by the disorder. The pathogenesis of acne involves multiple physiological factors like follicular hyper proliferation, increased serum production due to higher androgen levels and colonization of organisms, propionibacterium acnes and staphylococcus epidermidis etc. Number of formulations are available in the market with variety of active pharmaceutical ingredients for the treatment of acne, such as antibiotics, retinoid, salicylic acid, benzoil peroxide, laser and hormone therapy. However none of these regimens is free of side effects

Objectives

- ❖ To prepare effective and standard quality anti-acne face wash formulation with local herbal extract and control, and alleviate symptoms of acne.
- ❖ To develop the useful cleansers with the absence of harmful chemicals like silicone, paraben, paraffin, SLES, SLS, glycols, formaldehyde, PEG and soap.
- ❖ To develop technology for innovative, safe, value-added high quality products from herbal sources.

Work progress

- ❖ The raw materials for this study like, Tulsi, Nageswar seed, Anantamool, Orange peel, lemon, honey, Rose water were collected from local area of Chattogram.
- ❖ The collected raw materials were kept in hot air oven for drying purpose at 45⁰ C and grained into small pieces by Grinder.
- ❖ Desired quantity of powdered raw materials was weighed and each herb is macerated with ethanol in the conical flask for three days separately by moderate shaking.
- ❖ After three days, contents were filtered out by using simple filtration. The extracts were then concentrated to dryness under reduced pressure and controlled temperature and preserved in refrigerator.
- ❖ After microbiological study of the extracts, different formulation for face wash will be developed.



18. Development of methods for Identification of Adulterants in Honey

Suman Das, S. S. O. (PL); Dr. Saiful Islam, S. S. O.; Rasheda Akter, S. S. O.; Dr. Mohammad Mostafa, C. S. O.

Generally, honey is adulterated with other cheaper sweeteners such as sugar syrups, which could have a similar sugar composition. Since honey is a value-added food, this product is susceptible to adulteration by the addition of high fructose corn syrup (HFCS), sugar cane syrup, among other lower cost products, for illicit benefits. The most common adulteration is with rice syrups or rice molasses, used in some Asian countries, where most of the honey is exported to Europe, the USA and Japan. The honey adulteration affects not only the consumers who seeks a product of nutritional and therapeutic value but also makes the market disloyal to the producers of high-quality honey. Hence, the monitoring of honey composition is crucial to keep its quality because it has a very complex composition. Honey may contain more than 180 substances, mostly sugars (33.3-43.0 % (w/w) of fructose, 25.2-35.3 % (w/w) of glucose, 0-2 % (w/w) sucrose, and other more complex sugars) and water. At lower amounts, there are minerals (K, Mg, Ca, Na, Fe, Zn, among others), vitamins, proteins, free amino acids, enzymes, and phenolic compounds in its composition. The adulteration of honey with sugar cane or corn syrups is verified by the sugar profile determined by HPLC. However, several alternative methods for the identification and quantification of adulterants (sweetener syrups) have been successfully developed using different spectroscopic techniques, such as Fourier transform mid-infrared (FT-IR), near infrared (NIR), visible and near infrared (Vis-NIR).

Objectives

- ❖ To evaluate Sugar profile and HMF content in seventy Bangladeshi honey samples from different districts with nineteen different flowers, few unknown flowers and mixed flowers through High Performance Liquid Chromatography (HPLC) system equipped with Photo Diode Array (PDA) and refractive index detector (RID).

Work progress

- ❖ Evaluated Sugar profile and HMF content in seventy Bangladeshi honey samples collected from different districts with nineteen different flowers, few unknown flowers and mixed flowers through High-Performance Liquid Chromatography (HPLC) system equipped with Photo Diode Array (PDA) and refractive index detector (RID).
- ❖ The sugar profiles show that these honey samples are nectar honeys and may be two samples were adulterated by sucrose.
- ❖ The HMF data it was seen that recent honeys has less amount of HMF content than the older ones. So in order to widen the acquaintance of the composition of Bangladeshi honeys, others analysis (physicochemical characteristics, antioxidant activity) can be done in future.

The chromatograms for the sugar content (Fructose, Glucose and Sucrose) analysis and HMF content are shown in Figure 1 and Figure 2 respectively.

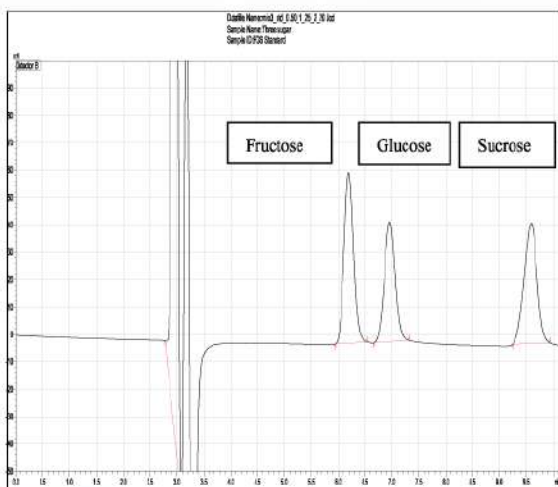


Figure 1

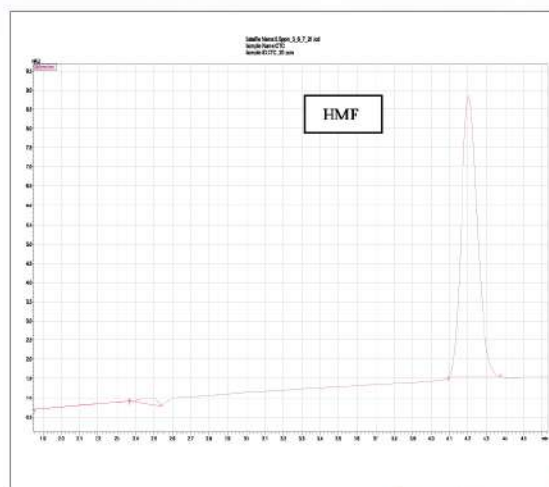


Figure 2



19. Development of vitamin enriched hair care products from medicinal Plants.

Amena Kibria, S. O. (PL); Nasima Momtaz, R.C.; Farjana Showline Chaity, S. O.; Md. Saidur Rahman, S. S. O.; Rasheda Akter, S. S. O.; Nemai Chandra Nandi, P. S. O.; Dr. Mohammad Mostafa, C. S. O.

This cannot be denied that nature has been a source for beauty solutions since the beginning of time. Herbs have been used to nourish the scalp and promote the growth of strong, healthy hair for thousands of years. There are many medicinal herbs which have different medicinal uses and values regarding to healthy hair growth in our surroundings. Commonly, Amla (*Phyllanthus emblica*) promotes hair growth, reduces hair greying, helps with dandruff and scalp condition. Shikakai (*Acacia concinna*) helps to strengthen hair, control dandruff and gently cleanse the scalp. Methi (*Trigonella foenum-graceum*) is nature's conditioner. It improves circulation in the scalp and promotes hair growth. Neem (*Azadirachta indica*) oil boosts the rate of hair growth and increases the tensile strength of the hair shafts, making them silky and adding shine. It reduces hair loss and irritation of the scalp. Hibiscus is packed full of antioxidants and vitamins that help to improve the overall health of the scalp and hair. Brahmi (*Bacopamonnieri*) is used in oil and powder form to stop hair fall and make hair thicker and healthier. Bhringaraaj (*Sphagneticola calendulaceae*) is an ancient ayurvedic remedy that has been in use for centuries. It is used to treat hair loss and to rejuvenate the scalp.

Objectives

- ❖ To develop herbal hair oil.

Work progress

- ❖ Collection of different plants parts which are required for developing the product.
- ❖ Dried the different plants and turned them in powder form, and prepared for isolation of crude extract.



Research Achievements

Publications

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Product List of BCSIR, Chattogram Laboratories

All products are ready to lease out

1. Aromatic oil from dry Turmeric leaves.
2. Herbal Mint Balm
3. Fruity Papaya
4. Japanese Mint Oil
5. Menthol Crystal from Japanese Mint Oil
6. Slow Releasing Fertilizer
7. Herbal Hair Tonic



8. Protein concentrate from Shark Meat
9. Candy from Bamboo Shoots
10. Chewing Ginger
11. Citronella Oil
12. Glucosamine hydrochloride from Lobster Shells
13. Tea Cola
14. Green Bael Powder
15. Scopolamine hydrobromide from *Datura fastuosa* leaves
16. Shark Liver Oil
17. Starch from *Musa paradisiaca* plant
18. Shark Protein
19. Lemon Grass Oil
20. Turmeric Paste
21. Lemon Pickle
22. Kalomegh Tablet
23. Herbal Antidiabetic Tea
24. Chalta Sauce
25. Patchouli Oil
26. Triffala Health Drink
27. Bergamot Mint Oil
28. Perfume Oil from Eucalyptus
29. Aromatic Oil from *Cymbopogon osmastoni*
30. Aromatic Oil from *Ocimum clocimum*
31. Stevia Product as Sweetener
32. Herbal Mosquito Repellent Cream
33. Herbal Mosquito Repellent Refill
34. Herbal Mouth Wash
35. Mosquito Repellent Body Oil
36. Lamp Oil as Mosquito Repellent
37. Herbal Turmeric Soap
38. Palmarosa Oil
39. Instant Stevia Tea
40. Skin Care Jelly with natural ingredients.

Academic Research Guidance/ Supervision

Sl. No.	Title of the Research	Research Category	Name of the students	Name of academic Institution	Name & Designation of Supervisors in BCSIR
01	Comparative analysis of cytotoxic and anti-diabetic activity of different regional piper betel extract of Bangladesh	MS thesis	Mithila Sarkar	University of Chittagong	Rasheda Akter. Senior Scientific Officer



02	Comparative Study of the Anti - oxidant and Thrombolytic Potential of three different regional piper betel cultivars of Bangladesh	MS thesis	Fabiha Nowshin	University of Chittagong	Rasheda Akter. Senior Scientific Officer
03	Comparative study of physicochemical properties of repeated heated sunflower oil and rice bran oil.	MS thesis	Joyanta Rudra	University of Chittagong	A. J. M. Morshed. Senior Scientific Officer
04	Biofuel production from waste material for maintenance of green environment.	MS Thesis	Jui Chakraborty	University of Chittagong	Dr. Dipankar Chakraborty Principal Scientific Officer
05	Compare to the physicochemical characteristics between heated soybean oil and mustard oil.	MS thesis	A. T. M. Niaz Habib	University of Chittagong	A. J. M. Morshed. Senior Scientific Officer
06	Market based production of "Anti-acne" cosmetics from natural source materials.	MS Thesis	Mehedi Hasan	University of Chittagong	Sreebash Chandra Bhattacharjee. Principal Scientific Officer
07	Organic pigment isolation from natural source for industrial purpose.	MS Thesis	Mohammed Iqbal Hossain	University of Chittagong	Sreebash Chandra Bhattacharjee. Principal Scientific Officer
08	Phytochemical screening and antidiabetic activity of crude extract of <i>Stevia rebaudiana</i> leaves available in Chattogram.	MS thesis	Sharmin Jamal	University of Chittagong	A. J. M. Morshed Senior Scientific Officer
09	Antimicrobial properties of garlic varieties available in commercial market, Bangladesh against multidrug resistant pathogens.	MS Thesis	Methun Paul	University of Chittagong	Rajib Sarkar. Scientific Officer



10	The hydro-geochemical signatures, Quality indices and health risk assessment of Kaptai Lake water in terms of drinking, irrigation and industrial purposes: A multi-dimensional approach.	MS Thesis	Dipta Das	University of Chittagong	Sujan Kanti Das. Scientific Officer
11	Water scarcity and its susceptibility to health impact: A case study on the people of Rangamati	MS Thesis	Roli Dewan	University of Chittagong	Dr. Dipankar Chakraborty. Principal Scientific Officer & Dr. Saiful Islam. Senior Scientific Officer
12	Study of arsenic accumulation in rice and vegetables cultivated in arsenic contaminated areas and evaluation of arsenic induced toxicity after consumption of these foods in wistar albino rats.	MS Thesis	Md. Mazharul Alam	University of Chittagong	Muhammad Abu Bakar. Senior Scientific Officer
13	Determination of some toxic and heavy metal concentrations in sediment dwelling molluscan fauna of the Karnaphuli River estuary and their impact on human in coastal zone of Chittagong, Bangladesh.	MS thesis	Humayra Kabir Niloy	University of Chittagong	Muhammad Abu Bakar Senior Scientific Officer
14	Evaluation of carcinogenic and non-carcinogenic effect of few selected heavy metals detected from the ground water of Feni district.	MS thesis	Md. Sohel Mahmud	University of Chittagong	Sujan Kanti Das. Scientific Officer

Scientists pursuing Ph D course in abroad

1) Name : Abu Sayeed Md. Mahmud Designation : Senior Scientific Officer Division : Industrial Microbiology Research Division University : University of Melbourne, Australia.	2) Name : S. M. Zahid Hosen Designation : Scientific Officer Division : Pharmacology Research Division University : University of New South Wales, Australia
3) Name : Jewel Das Designation : Scientific Officer Division : Chemical Research Division University : National University of Ireland Galway, Ireland.	4) Name : Sabrina Sultana Designation : Scientific Officer Division : Industrial Microbiology Research Division University : Osaka Prefecture University, Japan.
5) Name : Prabhangshu Kumar Das Designation : Scientific Officer Division : Chemical Research Division University : South Illinois University, Carbondale, USA	



TRAINING, CONFERENCE & INDUSTRIAL TOUR

PARTICIPATION OF IN HOUSE TRAINING PROGRAM

Sl.	Subject/ Instruments	Name & Designation	Duration/Period	Place/Organization
1.	Gas Chromatography-Mass Spectrometry.	A. J. M. Morshed. Senior Scientific Officer Saddam Hossain. Scientific Officer	07-11 February, 2021	INARS, BCSIR, Dhaka
2.	PCR (Polymerase chain reaction)	Rajib Sarkar Scientific Officer	31 Jan, 2021 - 04 February, 2021	BCSIR Laboratories, Dhaka
3	UV Visible Spectroscopy and Ion Chromatography	Sujan Kanti Das Scientific Officer	03 – 07 January, 2021	INARS, BCSIR, Dhaka
4	Bet Sorptometer	Kawsar Ahmed Scientific Officer	10 – 14 January, 2021	BCSIR Laboratories, Dhaka
5	Elemental Analyzer	Muhammad Abu Bakar Senior Scientific Officer	10 – 14 January, 2021	INARS, BCSIR, Dhaka

ADMINISTRATIVE TRAINING PARTICIPATED

Sl.	Subject/ Instruments	Name & Designation	Duration/Period	Place/Organization
01	Public Procurement Management	A. J. M. Morshed, Senior Scientific Officer	24 – 26 December, 2020	Bangladesh Institute of Management (BIM), Sobhanbag, Dhaka-1207
02	Public Financial Management	Dr. Dipankar Chakraborty Principal Scientific Officer	(14 – 18) February, 2021	National Academy for Planning and Development (NAPD), Dhaka

CONFERENCE

Sl.	Subject	Name & Designation	Duration/Period	Place/Organization
01	ICSTB-2021	Dr. Mohammad Mostafa, C. S. O. Sreebhash Chandra Bhattacharjee, P. S. O. Dr. Saiful Islam, S. S. O. Rasheda Akter, S. S. O. Md Saidur Rahman, S. S. O. Suman Das, S. O. Sujan Kanti Das, S. O. Tania Sharmin, S. O. Rajib Sarkar, S. O. Kawsar Ahmed, S. O. Saddam Hossain, S. O.	21 – 23 March, 2021	BCSIR, Dhaka

INDUSTRIAL TOUR PROGRAM

Sl	Industry	Name & Designation	Date
01	Sri Kondeshwari Oushadhalaya Limited, Rawzan, Chattogram	(i) Md. Habibur Rahman Bhuiyan, C. S. O. (ii) Nema Chandra Nandi, P. S. O. (iii) Dr. Dipankar Chakraborty, P. S. O. (iv) Rasheda Akter, S. S. O. (v) Sujan Kanti Das, S. O. (vi) Rajib Sarkar, S. O.	22 June, 2021
02	Ashuganj Fertilizer and Chemical Company Limited, Ashuganj, Brahammanbaria	(i) Dr. Dipankar Chakraborty, P. S. O. (ii) Kawsar Ahmed, S. O. (iii) Md. Sahab Uddin, S. O.	01 February, 2021
03	Globe Biotech Limited, Dhaka	(i) Dr. Mohammad Mostafa, C. S. O. (ii) Dr. Saiful Islam, S. S. O. (iii) Rasheda Akter, S. S. O. (iv) Tania Sharmin, S. O. (v) Sakia Ferdousi, S. O.	27-28 February, 2021

**OFFICIAL INFORMATION, FACILITIES & MEMORABLE EVENTS****Name of the Directors and duration**

Sl. No.	Name	From	To
01	Dr. Md. Kiamuddin	08.02.1965	10.02.1970
02	Dr. Md. Erfan Ali	11.10.1970	04.02.1972
03	Dr. Humayun K. M. A. Hye	05.02.1972	14.12.1973
04	Prof. N. A. Khan	15.12.1973	28.11.1978
05	Dr. Manzur-i-Khuda	29.11.1978	29.05.1986
06	Dr. Md. Nurul Alam	30.05.1986	02.07.1991
07	Dr. Shamim J. Ahmed	03.07.1991	25.05.1992
08	Dr. Md. Nurul Alam	26.05.1992	13.01.1997
09	Dr. Md. Nurul Islam	14.01.1997	12.03.1997
10	Dr. Md. Sayeedul Huq	13.03.1997	27.10.1998
11	Dr. Md. Fazlul Huq	28.10.1998	29.04.2000
12	Mr. Khandoker M. Ismail	30.04.2000	08.08.2002
13	Md. Abdul Karim	09.08.2002	30.12.2002
14	Dr. Mir Ezharul Hossain	31.12.2002	29.09.2005
15	Md. Enayetul Islam	30.09.2005	19.01.2006
16	Dr. K. M. Formuzul Haque	20.01.2006	21.11.2006
17	Mr. Kabir Ahmed	22.11.2006	15.07.2007
18	Dr. Mohammed Yusuf	16.07.2007	12.12.2007
19	Mr. Kabir Ahmed	13.12.2007	30.12.2008
20	Dr. Smarajit Kumar Biswas	31.12.2008	26.05.2009
21	Mr. Sudhangshu Kumar Roy	27.05.2009	31.01.2010
22	Dr. D. A. Nasima Chowdhury	01.02.2010	24.05.2010
23	Dr. Jaripa Begum	25.05.2010	09.01.2014
24	Md. Habibur Rahman Bhuiyan	10.01.2014	15.03.2014
25	Ferdousi Begum	16.03.2014	19.05.2014
26	Dr. Parvin Noor	20.05.2014	12.10.2014
27	Dr. Khandker Nesar Ahmed	13.10.2014	03.01.2016
28	Mahmuda Khatun	04.01.2016	10.07.2018
29	Dr. Mohammad Mostafa	11.07.2018	Continue

**Budget of BCSIR, Chattogram Laboratories
Fiscal Year 2020 - 2021**

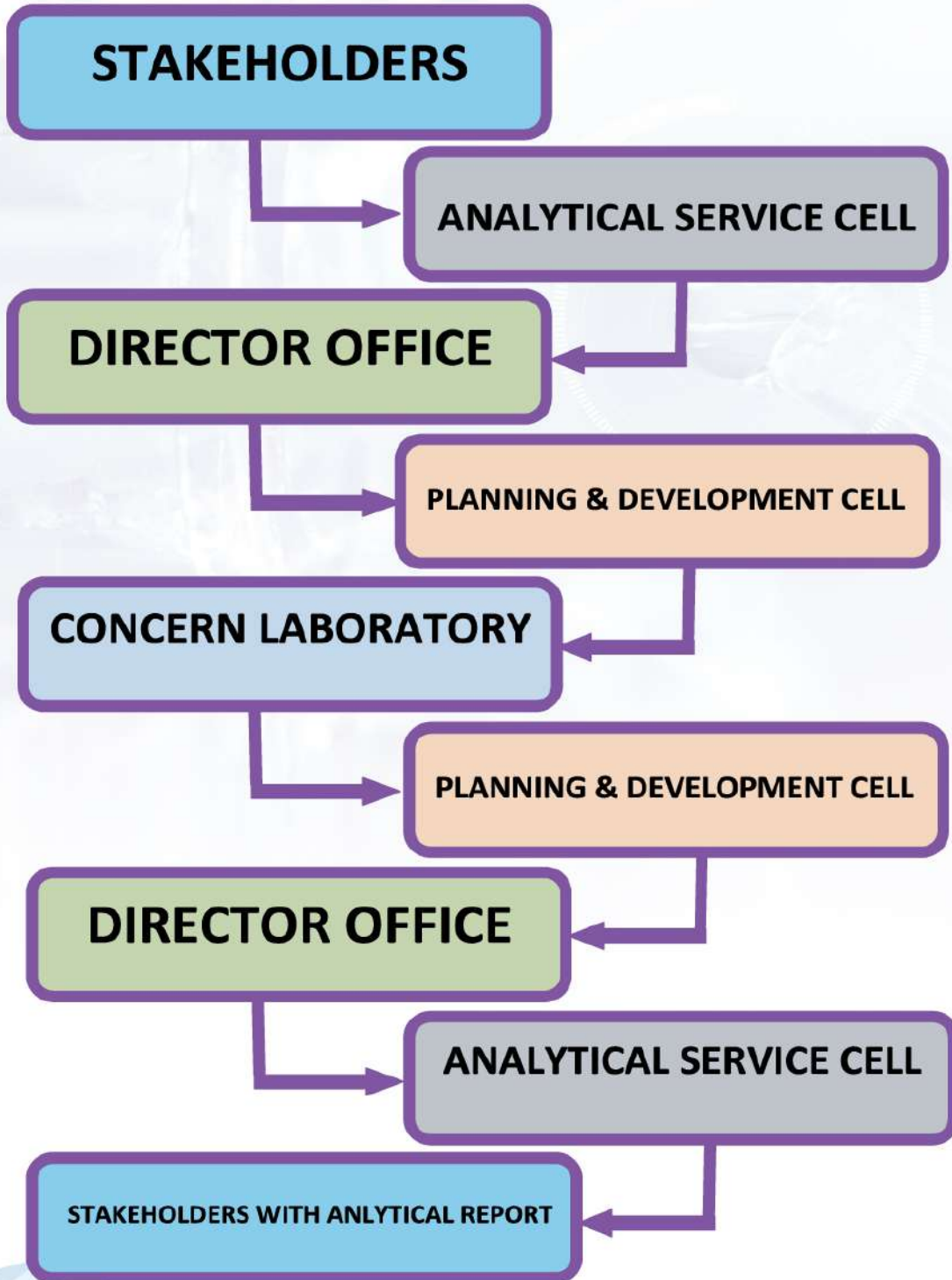
AREA	ALLOCATION (TK)	EXPENDITURE (TK)
Salary	3,22,86,800.00	2,89,32,052.00
Allowance	1,90,11,780.00	1,71,23,487.00
Research & Development	45,00,000.00	44,27,050.00
Goods and Service	5,12,15,500.00	5,04,97,636.64
Others	18,60,000.00	17,43,122.00
Total	10,88,74,080.00	10,27,23,347.64

Earning obtained from analytical service

Providing analytical service to stakeholders, BCSIR, Chattogram Laboratories has been earned 62, 25,774.02 (Sixty Two Lac Twenty Five Thousand Seven Hundred Seventy Four Taka and Two Paise) taka for fiscal year 2020 - 2021.



STAKEHOLDERS WITH ANALYTICAL REPORT





Some Stakeholders

Sl. No.	Name	Sl.No.	Name
01	Abul Khair Group	46	Legacy Fashion Ltd.
02	Apollo Seaing & Garments Limited	47	Loyaltex Ltd.
03	Azim Group	48	Loyal Apparels Ltd
04	Apparel Promoters Ltd	49	Mass Fashion Limited
05	Ark Sea Foods Limited	50	maf Footwear Limited
06	Arrow Jeans Pvt. Ltd.	51	Mark Fashion Wear (Pvt.) Ltd.
07	Asian Paints Bangladesh Ltd.	52	Masud Agro Processing Food Products Ltd.
08	Bangladesh Stadar and Testing Institute (BSTI)	53	Merim Co. Limited
09	Bangladesh Inland Water Transport Authority (BIWTA)	54	Men's Fashion Limited
10	Bangladesh Steel Re-rolling Mills (BSRM)	55	Montex Apparels Limited
11	Banoful & Co.	56	Meenhar Fisheries Limited
12	Bangladesh Spinner & Knitters	57	Moon Star Paints & Chemical Industries.
13	Belamy Textiles Ltd.	58	Nur Mohammed & Co. Ltd.
14	BM Energy (BD) Ltd.	59	Overseas Cargo Industries Ltd.
15	Brightex Washing Plant	60	Padma Wear Ltd
16	BASE Textile Limited	61	Power Development Board (PDB)
17	Bengal Sea Food	62	PHP Group
18	CPDL	63	Postlink Logistic Limited
19	Chattogram WASA	64	PRM Fashions Pvt. Ltd
20	Confidence Group	65	Premier 1888 Ltd.
21	Custom House, Chattogram	66	Priyam Garments Ltd.
22	Cargo Control BD Ltd	67	Progressive Apparels Ind. Ltd.
23	Chattogram Port Authority	68	RJM Foot Wear Limited
24	Chattogram Asian Apparels Ltd.	69	R. S. B. Industries Ltd
25	Coats Bangladesh Ltd.	70	S. A. Salt Industries Limited
26	Dah Yuan Bangladesh Ltd.	71	SAR & Co. Ltd.
27	Desh Garments Limited	72	Samdani Wash
28	Divine Design Ltd.	73	Santex Knitwears Ltd
29	Farzana Fashions World Ltd.	74	Sea Tex & Sea Blue Textile Limited
30	Farrokh Chemical Complex	75	Shah Amanat Knitting & Dyeing Industries Ltd.
31	Four H Group	76	Shodesh Chemicals
32	FAMILYTEX (BD) Ltd.	77	Shabnam Vegetable Oil Industries Ltd.
33	Fashion Watch Ltd	78	Suborna Garments Ltd
34	Fulkoli Bread & Biscuit Industries Ltd.	79	Smart Jeans Ltd
35	Finlays	80	S & S Swimwear Limited
36	GEODIS Bangladesh Limited	81	Summit Alliance Port Limited.
37	Goldmart Apparels (Pvt.) Ltd.	82	Sunman Textiles Limited
38	Glitter Fashion Ltd	83	Tadanta International Trade Organisation
39	Global Garments Ltd.	84	The Peninsula Chittagong Limited
40	Guangdong Power Engineering.	85	Toy Woods (Bd) Co. Ltd.
41	Hakkani Pulp & Paper Mills Ltd.	86	TOTAL Premier LP Gas Ltd
42	Heidelberg Cement Bangladesh Ltd	87	Unilever Bangladesh Limited
43	Intimate Apparels Limited	88	VALTEX International (BD) Ltd.
44	KDS Group	89	WHITEX Garments (BD) Pvt. Ltd.
45	Kenpark Bangladesh Apparel (Pvt.) Ltd.	90	Youngone Bangladesh Limited

BCSIR, Chattogram Laboratories is committed to provide technical assistance and analytical services to all stakeholders.



Sophisticated Instruments and their application



HPLC

Function:
Separation, identification and quantification of the component in mixture.

Sample category:
Vitamin, Protein, Antibiotics, Adulterated food etc.

Function:
Quantitative determination of different samples such as transition metal ions, organic compounds and biological macromolecules.

Sample category:
Color, water, sugar, organic compound etc.



UV-Visible Spectrophotometer

Function:
Identification and determination of volatile organic compounds in a mixture and investigation of unknown samples.

Sample category:
Volatile essential oil, Flavour, Hydrocarbons etc.



GC-MS



Sophisticated Instruments and their application



Atomic Absorption Spectrophotometer

Function:

Quantification of metallic elements.

Sample category:

Water, Soil, Metallic Bar or Sheet, Alloy, Various types of crops, foods etc.

Function:

Selective DNA isolation, Amplification and quantification of DNA, diagnosis of diseases.

Sample category:

Plants and plant product (GMO), Animal products (Halal test, Porcine), Bird flu etc.



Polymerase Chain Reaction (PCR)



LC-MS

Function:

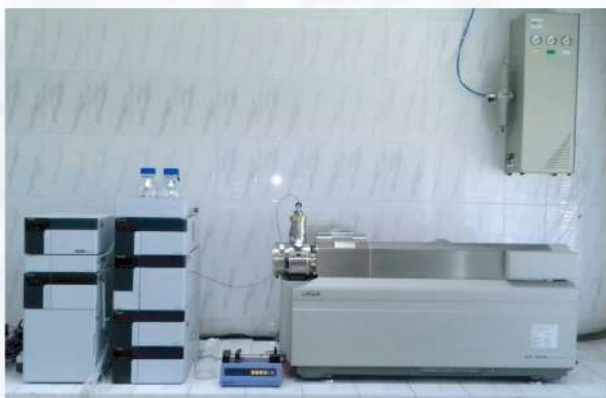
Separation, Identification and Quantification of a mixture.

Sample category:

Antibiotics, Protein, Vitamin, Adulterated food etc.



Sophisticated Instruments and their application



LC-MS-MS

Function:

Determination of masses of particles and elucidation of the chemical structures of molecules.

Sample category:

Pharmaceutical drugs (e. g. Antibiotics, Vitamins), Pesticides etc.

Function:

Imaging and documentation of nucleic acid and protein.

Sample category:

Sample related to molecular biology.



Gel Documentation System



Flame Emission Spectrometer

Function:

Quantitative determination of sodium, potassium and calcium.

Sample category:

Water, Soil, Various types of foods & crops.



Sophisticated Instruments and their application



ELISA Reader

Function:

Detection for the presence of a substance, usually an antigen in a liquid or wet sample
Detection of toxin like ochratoxins, aflatoxins etc.

Sample category:

Various types of food and crop.

Function:

Quantification of major anion (Fluoride, Chloride, Nitrite, Nitrate, Suphate etc.) and cation (Sodium, Potassium, Calcium, Magnesium etc.)

Sample category:

Water, soil, plant, salt, food and crop.



Ion Chromatography



FTIR

Function:

Detection of functional groups and identification of compounds.

Sample category:

Polymer, oil, resin and other organic substances.



Memorable events at a glance

National Mourning Day - 2020



Victory Day - 2020





INDEPENDENCE DAY - 2021



International Mother Language Day - 2021





BIRTH ANNIVERSERY - 2021



Stakeholder Meeting



BCSIR Science & Industrial Technology Fair - 2021



Tree Plantation Program on the occasion of Birth Centenary of Bangabandhu Sheikh Mujibur Rahman





Laying foundation stone of dry fish and indoor farming laboratory by Md. Anwar Hossain (Sr. Secretary, MOST)



Inauguration Ceremony of Tree Corner of BCSIR, Chattogram Labs. (Inaugurated by Prof. Dr. Md. Aftab Ali Shaikh, Chairman, BCSIR)



**COMMITTEES****House Allotment Committee**

1. Nemai Chandra Nandi	Principal Scientific Officer	- Convener
2. A. J. M. Morshed	Senior Scientific Officer	- Member
3. Md. Jahangir Khan	Assistant Accounts Officer	- Member
4. Secretary of the Union		- Member
5. Md. Azim	Executive Engineer	- Member Secretary

Technical Committee (Vehicle)

1. Nemai Chandra Nandi	Principal Scientific Officer	- Convener
2. Dr. Saiful Islam	Senior Scientific Officer	- Member
3. Md. Alimur Rahman	Sub-Assistant Engineer	- Member
4. Md. Asadur Rahman	Field Assistant	- Member
5. Sujan Kanti Das	Scientific Officer	- Member Secretary

Tender Opening Committee

1. Rasheda Akter	Senior Scientific Officer	- Convener
2. Rajib Sarkar	Scientific Officer	- Member
3. A. J. M. Morshed	Senior Scientific Officer	- Member Secretary

Work Maintenance Committee

1. Dr. Dipankar Chakraborty	Principal Scientific Officer	- Convener
2. Md Saidur Rahman	Senior Scientific Officer	- Member
3. Md. Jahangir Khan	Assistant Accounts Officer	- Member
4. Md. Asadur Rahman	Field Assistant	- Member
5. A. J. M. Morshed	Senior Scientific Officer	- Member Secretary

Integrity Committee

1. Nemai Chandra Nandi	Principal Scientific Officer	- Convener
2. Dr. Dipankar Chakraborty	Principal Scientific Officer	- Member
3. Sreebhash Chandra Bhattacharjee	Principal Scientific Officer	- Member
4. Md. Azim	Executive Engineer	- Member
5. Md. Jahangir Khan	Assistant Accounts Officer	- Member Secretary

Tender Assessment Committee

1. Md. Habibur Rahman Bhuiyan	Chief Scientific Officer	- Convener
2. A. J. M. Morshed	Senior Scientific Officer	- Member
3. Md. Mozammel Hoque	Asstt. Engineer, Cantt. Board	- Member
4. Shahazadee Khanam	Store Officer	- Member
5. Md. Omar Faruk	Inspector (vehicle), BRTA	- Member
6. Md. Alimur Rahman	Sub-Assistant Engineer	- Member
7. Md. Azim	Executive Engineer	- Member Secretary



Condemnation Committee

1. Dr. Dipankar Chakraborty	Principal Scientific Officer	- Convener
2. Suman Das	Senior Scientific Officer	- Member
3. Md. Jahangir Khan	Executive Officer (Additional Charge)	- Member Secretary

Auction Committee

1. Md. Habibur Rahman Bhuiyan	Chief Scientific Officer	- Convener
2. Nemaï Chandra Nandi	Principal Scientific Officer	- Member
3. Md. Azim	Executive Engineer	- Member
4. Md. Jahangir Khan	Executive Officer (Additional Charge)	- Member
5. Shahazadee Khanam	Store Officer	- Member Secretary

Standing Committee for Purchase

1. Nemaï Chandra Nandi	Principal Scientific Officer	- Convener
2. Sujan Kanti Das	Scientific Officer	- Member
2. Md. Jahangir Khan	Assistant Accounts Officer	- Member
3. Indenter		- Member
5. Shahazadee Khanam	Store Officer	- Member Secretary

Vigilance Team

1. Md. Azim	Executive Engineer	- Convener
2. Md. Abdul Khaleque	LDA	- Member
3. Md. Alimur Rahman	Sub- Assistant Engineer	- Member Secretary

Innovation Sub-Committee

1. Md. Habibur Rahman Bhuiyan	Principal Scientific Officer	- Convener
2. A. J. M. Morshed	Senior Scientific Officer,	- Member
3. Dr. Md. Abdus Salam	Senior Principal Engineer	- Member Secretary

Technical Sub-Committee

1. Dr. Saiful Islam	Senior Scientific Officer	- Convener
2. Suman Das	Senior Scientific Officer	- Member
3. Tania Sharmin	Scientific Officer	- Member Secretary

Inspection Committee

1. Sreebash Chandra Bhattacharjee	Principal Scientific Officer	- Convener
2. Muhammad Abu Bakar	Senior Scientific Officer	- Member
3. Indenting Officer		- Member Secretary

Environment Committee

1. Nemaï Chandra Nandi	Principal Scientific Officer	- Convener
2. Rasheda Akter	Senior Scientific Officer	- Member
3. Md. Azim	Executive Engineer	- Member
4. Kawsar Ahmed	Scientific Officer	- Member
5. Md. Abdul Khaleque	LDA	- Member
6. Md. Asadur Rahman	Field Assistant	- Member
7. Md. Suman Miah	LDA	- Member
8. Md. Shohrab Hossain	Record Keeper	- Member
9. A. J. M. Morshed	Senior Scientific Officer	- Member Secretary.



List of the employees

Sl No	Name	Designation	Date of Birth	Joining Date
01	Dr. Mohammad Mostafa	Director (in charge)	31.12.1968	04.10.1994
02	Md. Habibur Rahman Bhuiyan	Chief Scientific Officer	21.01.1968	04.10.1994
03	Dr. Md. Abdus Salam	Senior Principal Engineer	01.01.1974	25.06.2006
04	Nemai Chandra Nandi	Principal Scientific Officer	06.08.1963	31.12.1988
05	Dr. Dipankar Chakraborty	Principal Scientific Officer	21.12.1968	15.04.1999
06	Sreebash Chandra Bhattacharjee	Principal Scientific Officer	05.03.1970	06.07.2002
07	Dr. Saiful Islam	Senior Scientific Officer	01.07.1980	11.06.2006
08	Rasheda Akter	Senior Scientific Officer	29.11.1978	15.06.2006
09	Suman Das	Senior Scientific Officer	12.08.1981	20.12.2009
10	Md. Saidur Rahman	Senior Scientific Officer	12.10.1981	12.07.2010
11	Muhammad Abu Bakar	Senior Scientific Officer	10.12.1977	09.07.2006
12	Abu Jahan Mohammed Morshed	Senior Scientific Officer	01.01.1975	25.06.2006
13	Abu Sayeed Mohammad Mahmud	Senior Scientific Officer	13.08.1984	30.06.2011
14	Nusrat Jahan Mouri	Senior Scientific Officer	12.02.1987	03.02.2013
15	Jewel Das	Scientific Officer	01.10.1982	30.06.2011
16	S. M. Zahid Hossain	Scientific Officer	01.01.1986	03.02.2013
17	Prabhangshu Kumer Das	Scientific Officer	09.10.1983	03.02.2013
18	Sabrina Sultana	Scientific Officer	09.12.1990	12.07.2015
19	Paroma Arefin	Scientific Officer	16.07.1991	15.03.2016
20	Sujan Kanti Das	Scientific Officer	01.02.1989	15.03.2016
21	Tania Sharmin	Scientific Officer	23.12.1989	10.10.2016
22	Rajib Sarkar	Scientific Officer	06.08.1991	13.10.2016
23	Md. Shehan Habib	Scientific Officer	30.12.1988	15.03.2016
24	Kawsar Ahmed	Scientific Officer	15.03.1988	10.10.2016
25	Amena Kibria	Scientific Officer	09.12.1988	21.10.2018
26	Md. Saddam Hossain	Scientific Officer	25.06.1992	21.10.2018
27	Sakia Ferdousy	Scientific Officer	07.08.1989	21.10.2018
28	Md Sahab Uddin	Scientific Officer	16.09.1989	21.10.2018
29	Farjana Showline Chaity	Scientific Officer	05.03.1994	22.05.2019
30	Mohammad Azim	Executive Engineer	15.10.1978	12.07.2010
31	Shahazadee Khanam	Store Officer	20.01.1972	07.10.2001
32	Md. Jahangir Khan	Assistant Store Officer	01.01.1963	04.11.1980
33	Md. Alimur Rahman	Sub-Assistant Engineer	28.12.1980	12.11.2018
34	Sohel Ahmed	Senior Technician	28.08.1982	30.06.2010
35	Md. Golam Robbani	Head Assistant	01.01.1976	01.01.1996
36	Md. Mosharaf Hossain	UDA	04.09.1987	15.03.2016
37	Ishrat Jahan	UDA	12.01.1987	15.03.2016
38	Taslina Akter	UDA	01.01.1980	21.09.2006
39	Md. Abdul Khaleque	UDA/Computer Operator	22.02.1984	24.09.2006
40	Md. Shoaib Ullah	UDA/Computer Operator	01.05.1978	26.09.2006
41	Md. Suman Miah	LDA/Computer Operator	21.04.1989	20.01.2009



SI No	Name	Designation	Date of Birth	Joining Date
42	Md. Abdullah Al Mamun	LDA//Computer Operator	01.10.1979	20.12.2009
43	Md. Biplob Hossain	LDA//Computer Operator	01.02.1989	30.10.2017
44	Md. Hasan Ahmed	LDA/Computer Operator	22.01.1991	21.08.2017
45	Uma Das	LDA/Computer Operator	08.03.1991	24.08.2017
46	Saiful Alam	LDA//Computer Operator	16.12.1993	07.09.2017
47	Amit Shil	LDA//Computer Operator	30.12.1997	30.08.2017
48	Md. Abdul Mannan	Technician	01.01.1963	15.02.1987
49	Abdullah Al Mamun	LDA/Computer Operator	02.12.1998	23.08.2009
50	Abdul Awal Khandaker	Junior Technician	01.01.1969	29.01.1989
51	Md. Anwar Hossain	Junior Technician	01.01.1978	06.09.2001
52	Md. Hasibul Hossain	Junior Technician	02.05.1985	10.09.2006
53	Md. Asadur Rahman	Field Assistant	01.09.1973	13.09.2001
54	Ahamed Nur Roni	Telephone Operator	08.09.1997	05.02.2018
55	Rasel Miah	Telephone Operator	06.05.1992	12.11.2018
56	Shahin Ullah Shahin	Senior Lab Attendant	25.05.1978	09.11.2006
57	Bulbul Bin Shahid	Junior Technician	31.12.1981	15.10.2006
58	Parvez Mahmud	Assistant Store Keeper	28.02.1988	10.10.2016
59	Mohammad Harun	Junior Mechanic	07.03.1983	21.08.2017
60	Mohammad Ali	Senior PP Attendant	01.01.1978	09.10.2006
61	Md. Shohrab Hossain	Record Keeper	02.08.1962	05.12.1984
62	Minati Bala Sutradhar	Record Keeper	01.01.1965	05.12.1984
63	Nurul Islam	Senior Gardener	15.06.1963	15.06.1981
64	Md. Mir Hossain	Senior Gardener	01.01.1977	06.09.2001
65	Md. Ridwanul Bari	Senior Gardener	01.09.1981	06.09.2001
66	Md. Masum	Book Binder	09.10.1993	01.01.2018
67	Md. Salauddin	Driver	03.04.1990	03.04.2019
68	Devroy Chakma	Lab Attendant	12.12.1990	24.08.2017
69	Md. Sajjadul Islam	Lab Attendant	15.12.1995	24.08.2017
70	S M Omar Faruk	Lab Attendant	31.12.1996	07.09.2017
71	Khandakar Rezaul Karim	Lab Attendant	28.12.1988	30.10.2017
72	Md. Rakibul Ayub	Lab Attendant	10.11.1992	30.10.2017
73	Arfatul Islam	Lab Attendant	02.12.1995	21.08.2017
74	Sabina Khatun	Lab Attendant	22.05.1989	17.02.2019
75	Md. Hafizur Rahman	Lab Attendant	01.01.1997	17.02.2019
76	Md. Nazrul Islam	Senior Security Guard	16.09.1968	30.08.1993
77	Md. Sarwar Alam	Senior Security Guard	01.09.1967	01.09.1993
78	Asaduzzaman Talukdar	Senior Security Guard	07.12.1976	17.05.1995
79	Ashraf Miah	Senior Security Guard	01.07.1973	28.12.1995
80	Md. Nurul Islam Bhuiyan	Senior Security Guard	08.05.1972	31.01.2000
81	Md. Shah Alam	Senior Security Guard	10.10.1978	13.09.2006
82	Abdul Kader Mazumder	Senior Security Guard	10.05.1980	10.09.2000



Sl No	Name	Designation	Date of Birth	Joining Date
83	Md. Alauddin	Senior Security Guard	27.11.1983	0.09.2006
84	Md. Elias	Senior Security Guard	01.01.1978	14.09.2006
85	Md. Abul Kalam	Senior Security Guard	10.03.1986	18.09.2006
86	Md. Suman Sarkar	Senior Security Guard	06.05.1988	17.11.2009
87	Md. Hafizur Rahman	Security Guard	10.02.1980	19.11.2009
88	Md. Abdur Rahman Lal	Security Guard	08.02.1995	22.08.2017
89	Kamal Ahmed	Security Guard	19.12.1991	27.08.2017
90	Mohibur Rahman	Security Guard	15.03.1989	13.01.2019
91	Md. Hanif	Security Guard	08.12.1988	13.01.2019
92	Md. Sohel Rana	Electric Helper	01.02.1997	01.01.2018
93	Md. Nazrul Islam	Office Attendant	12.03.1968	14.01.1989
94	Sittol Muna	Office Attendant	20.12.1974	11.10.2001
95	Md. Shafiul Alam	Office Attendant	01.07.1979	23.06.2008
96	Md. Helal Uddin	Office Attendant	20.12.1990	27.08.2017
97	Md. Alamgir Miah	Office Attendant	26.05.1988	23.08.2017
98	Md. Aminur Rahman	Office Attendant	15.01.1990	12.02.2018
99	Md. Atikur Rahman	Gardener	01.06.1991	17.11.2009
100	Md. Nasher Uddin	Gardener	10.11.1980	17.11.2009
101	Md. Kamal	Gardener	01.12.1988	22.08.2017
102	Md. Abdul Mannan	Gardener	05.03.1991	13.11.2018
103	Ranjith Kumar Nath	Sweeper	03.05.1978	09.11.2006
104	Titu Das	Sweeper	15.03.1990	01.01.2018
105	Mintu Das	Sweeper	09.01.1989	01.01.2018



Central Lab Facilities



Innovation Gallery



**BCSIR SCIENCE AND INDUSTRIAL-TECHNOLOGY FAIR 2021****1. Project, Institute & Participant Details**

Sl. No	Name of the Institutes	Project No	Name of the Projects	Participants	Group
01	Chattogram Cantonment Public College	01	Blood Book	Abrar Shahid	A
		02	Futurfied Train	Misbah Uddin Inan	A
		03	জ্বালানী হিসেবে পানির ব্যবহার	Farea Sultana Fahin Miftahul Jannat	B
		04	সমুদ্রের ডেউ ব্যবহার করে বিদ্যুৎ শক্তি উৎপাদন	Md. Yasin Arafat	B
		05	আগাছা থেকে বিনামূল্যে জৈবিক কীটনাশক	Md. Fazlul Karim Sium	C
		06	Carbon Utilization Plant	Md. Ismail Hasan Jubayen Md. Mujahid Khan	C
		07	Cultivation System of Future	Abdullah Mahfuz	C
		08	Today's Farmer and Technology of Bangladesh	Amnah Khatun Shohaib Rumi Rafsan	C
		09	ভূমিকম্পের এলার্ম।	Shah Mohammad Mehedi Hasan Md. Rifat Al Islam	C
02	Saint Placid's School & College	10	Save Hill, Live Well	Miftahul Alam Khan Arnab Sikder	B
03	Bangladesh Nou-Bahini School and College, Chattogram	11	Arduino Ardroid Car	Md. Nazmus Shakib Nazib	B
		12	Storing Information in DNA	Md. Nahiduzzaman Md. Abu Sufian Khondokar	B
		13	Commercial uses of magnetic field in agriculture.	Shahin Mahmud Samiul Tasnin Jahan Arifa	C
		14	Solar magnetic electricity plant.	Shahin Mahmud Samiull Martuz Ahmed	C
04	Cantonment English School & College	15	An algorithmic approach to reduce accidents	Mibsam Rahemeen Chowdhury	A
		16	Alarm of Earthquake	Habiba Islam Sadika	A
		17	Covid-19 prevention alarm	SamiraTahseen Prapti	A
		18	Homemade Air Cooler	Wasif Nibras	A
		19	Solar irrigation system	Adiba Mubashira	A
		20	Mechanical barrier to stop unwanted entry to military or UN bases and other important installations	Zarin Tasneem Protikkha	B
		21	Automatic hand sanitizer	Rubaiyat Tahsin Orni	B
		22	Waste water treatment	Prohor Nandy	B
		23	Earthquake resistant infrastructure	Shareem Ahmed Siam Synthon Wahab	C
		24	Fire alarm system	Saiyan Nurus Samce	C
		25	Homemade alternative to Isopropyl alcohol to fight against covid-19	Montaha Rahman	C
		26	Preparation of vegetable lamp(with the help of potato)	Bijoya Dutta	C
		27	"Biodegradable plastic from potato"	A.K.M Fazlul Kawsib	C
		28	A modern multistoried apartment with disaster free protocols with self sustaining environment	Maliha Hoque	C
05	Sanowara Islam Boy's High School	29	Safe Railway.	Aowsuf Ahamed Kazi Intamul Islam Enan	A
		30	Modern Traffic System	Gopal Chandra Dey Robiul Hasan Sany	A
		31	Intelligent Cultivating Technology.	Aryan Tashfin	B
		32	Oxygen Concentrator	Ejaj Mansur Jami Ifakharul Abid	B
		33	Producing Oxygen gas through electrochemical analysis at water and how to conserve oxygen gas for adverse conditions	Hamidur Rahman Rahim	B
		34	Corona Safety Gadget Ventilation Machine.	Md Ariful Islam Nirob	B
		35	ভূমিকম্প এলার্ম।	Md Shariar Rahim Sabit Ahmad	B



06	Mohajanhat Fazlur Rahman School & College, Mirsarai, Chattogram	36	Energy From Sea-Wave (A Great Source of Renewable Energy)	Farhana Akter Sanjida Yeasmin	C
		37	Rain Water Harvesting With Pre-Activated Alarm.	Sanjida Najnin Shakil Uddin Hridoy	C
07	BCSIR Laboratory High School	38	Mobile charging by made of cycle	Prohar Singha Abdulla Al Kawser	A
		39	Popcorn Machine	Khadija Alam Salsabila Tasnim	A
		40	Air pollution controller	Mohammad Sorfuddin Sabit Abdullah	A
		41	Security Alarm	Ariful Alam (Abir) Jaber Bin Bahar	A
		42	Pollution absorber	Afrina Rahman Eshaduzjaman (Tuha)	B
		43	Application of domestically prepared O ₂ gas with a view to managing the COVID-19 patients at home.	Tahsin Akter Mahin Chowdhury	B
		44	Walking Robot	Saba Alam Jim Taslina Jahan Tania	B
		45	Use of science and technology in food security	Fariha Chowdhury Jannatul Mawa	B
		46	রিসাইকেল প্রক্রিয়ায় ইটের পরিবর্তে প্লাস্টিক বোতল ব্যবহার করে বাড়ি নির্মাণ।	Md. Rakib Mukta Akter	B
47	সহজ উপায়ে জ্বোন তৈরি।	Shotabdi Barua Naima Akther	B		
08	BAF Shaheen College, Chattogram	48	Volcanic Eruption	Nahim Ahmmed	A
		49	Wind energy conversion to electric energy	Md. Sadman Riduwan	A
		50	এ্যাকুয়ামপোনিঞ্জ এর মাধ্যমে গাছ ও সবজি চাষ।	Bony Amin Mojumder M. A. Mahmud Yeamin	C
		51	Recycle Smart Tiles	Nusrat Jahan Tuli	C
09	Government City College, Chattogram	52	Bad effects of smoking	S. B. M. S. Ali Khan Babu Biswas	C
		53	Anti Polluted Green City	Mustavi Rafid Md Kamrul Hasan	C
10	Chittagong Govt. Model School & College	54	SAP(Super Absorbent Polymer)	Misbah Uddin Saiful Hoque	C
		55	Innovative Thunderbolt (বজ্রপাত) solution and extinguish fire by sound wave system.	Mohammad Sakib Mofazzal Hossain	C

2. Final Result

Group	Position	Name of the Projects	Name of the Institutes	Participants
A	Third	Volcanic Eruption	BAF Shaheen College, Chattogram	Nahim Ahmmed
	Second	Modern Traffic System	Sanowara Islam Boy's High School	Gopal Chandra Dey Robiul Hasan Sany
	First	Covid-19 prevention alarm	Cantonment English School & College	Samira Tahseen Prapti
B	Third	Save Hill, Live Well	Saint Placid's School & College	Miftahul Alam Khan Arnab Sikder
	Second	Pollution absorber	BCSIR Laboratory High School	Afrina Rahman
	First	Storing Information in DNA	Bangladesh Nou-Bahini School and College, Chattogram	Eshaduzjaman (Tuha) Md. Nahiduzzaman Md. Abu Sufian Khondokar
C	Third	Anti Polluted Green City	Government City College, Chattogram	Mustavi Rafid Md Kamrul Hasan
	Second	Innovative Thunderbolt (বজ্রপাত) solution and extinguish fire by sound wave system.	Chittagong Govt. Model School & College	Mohammad Sakib Mofazzal Hossain
	First	Carbon Utilization Plant	Chattogram Cantonment Public College	Md. Ismail Hasan Jubayen Md. Mujahid Khan



3. Picture of the participants

Chattogram Cantonment Public College



Saint Placid's School & College



Bangladesh Now-Bahini School and College, Chattogram



Cantonment English School & College, Chattogram





Sanowara Islam Boy's High School



Mohajanhat Fazlur Rahman School & College, Mirsarai, Chattogram.





BCSIR Laboratory High School, Chattogram





BAF Shaheen College, Chattogram



Government City College, Chattogram



Chittagong Govt. Model School & College





BCSIR AT A GLANCE

**** BCSIR SECRETARIAT BUILDING**

**** LABORATORIES**

- ❖ BCSIR, Dhaka Laboratories
- ❖ BCSIR, Chattogram Laboratories
- ❖ BCSIR, Rajshahi Laboratories

**** INSTITUTES**

- ❖ Institute of Food Science and Technology (IFST), Dhaka.
- ❖ Institute of Glass & Ceramic Research & Testing (IGCRT), Dhaka.
- ❖ Institute of Fuel Research and Development (IFRD), Dhaka.
- ❖ Pilot Plant and Process Development Centre (PP & PDC), Dhaka.
- ❖ Institute of National Analytical Research and Services (INARS), Dhaka.
- ❖ Leather Research Institute (LRI), Savar, Dhaka.
- ❖ Institute of Mining, Mineralogy and Metallurgy (IMMM), Joypurhat.
- ❖ Biomedical and Toxicological Research Institute (BTRI), Dhaka.
- ❖ Institute of Technology Transfer and Innovation (ITTI), Dhaka.