

ANNUAL REPORT 2023-2024



Institute of National Analytical Research and Service (INARS)
(ISO/IEC 17025:2017 Accredited Laboratory)

Bangladesh Council of Scientific and Industrial Research (BCSIR)

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ANNUAL REPORT

2023-2024



Message from Chairman, BCSIR

I am delighted to know that the Institute of National Analytical Research and Service (INARS) is going to publish its 8th Annual Report for the fiscal year of 2023-2024. As the Chairman of the BCSIR, it is a great honor and a source of inspiration for me to write something for this annual report. In this report, the scientists and researchers' year-long efforts with their research and development activities are briefly highlighted.

I am very pleased to know that, from the very inception, this institute has been responsible for ensuring safe water quality in Bangladesh. INARS is committed to achieving the Sustainable Development Goal (SDG-06) of ensuring safe water for all in Bangladesh. On that ground, this institute focus its R&D work on arsenic mitigation, water purification, rainwater harvesting and environmental technology verification, identifies active ingredients in medicinal plants and carries out microbiological analyses of water. In this Institute, scientists also pursue research on renewable and green technologies, analytical, environmental and natural product chemistry. In addition, scientists render their knowledge and share experience to private entrepreneurs and industrialists to handle their challenges for the smooth industrialization and sustainable development in our country.

It is worth mentioning that INARS serves as the first ISO/IEC 17025:2017-accredited government testing laboratory in Bangladesh. Recently, It has achieved ISO/IEC 17025:2017 accreditation on hundred (100) water quality parameters to date from the Bangladesh Accreditation Board (BAB).

This report will give you a vivid picture of the year-long activities of the institute on R&D projects, publications, human resource development, capacity building and analytical services. I strongly believe that this important publication will be a great use for scientists, researchers and other relevant stakeholders, including our development partners. I genuinely urge everyone at INARS to continue your spirited efforts on advancing research, offering services and developing cutting-edge technologies for the welfare of human beings. I would also like to express my heartfelt gratitude and felicitations to the director, members of the editorial committee, scientists and staff of INARS for their sincere efforts and significant contributions to the nation through relevant areas of research and services and positive energy that each of you brings to the office every day. Our success is a direct reflection of your commitment and collaboration.

As we continue to work toward our goals, I am confident that, together, we will achieve great things. Let's keep supporting one another and maintain the positive atmosphere that makes this institute such a great place to work.

Warm regards,



Dr. Samina Ahmed
Chairman
BCSIR





Message from Director INARS

As a Director of INARS, it is a great honor for me to announce that INARS will release its 8th annual report 2023-2024 for the respective financial year. This report provides a documentary on the general development of the R&D activities in addition to other significant events, such as participation in conferences, training, seminars, testing services provided by the institute etc.

Since its establishment from 2016, INARS has been conducting research as part of an annual development project with the goal of advancing technology and achieving industrial development self-sufficiency. In addition to R & D activities, INARS provides its analytical services to different government organization, different industries, NGOs, public and private universities. INARS is dedicated to provide high-quality research and services and is equipped with some cutting-edge machinery. The performance claims of arsenic removal technologies are being verified by this institute which is crucial for Bangladesh's arsenic mitigation efforts. In this regard, INARS has successfully attained ISO/IEC 17025:2017 accreditation as the first government testing laboratory in Bangladesh and has continued to provide high-quality research and services by achieving accreditation on 100 water quality parameters from Bangladesh Accreditation Board (BAB).

Finally, I express my special thanks to all the members of the editorial committee for their tireless effort for publication of the annual report. Sincere thanks are due to all the scientists, technicians, officers and staff of these laboratories for their support in the preparation of the report.

A handwritten signature in blue ink, appearing to read 'Kamruzzaman'.

Sarker Kamruzzaman
Director (Addl.Charge), INARS, BCSIR





Message from Convener

As a convener of the 8th Annual Progress Report (2023-2024) publication committee, I offer my immense pleasure to present the annual report of INARS before you along with the overall research and development activities, achievements, analytical services, participation and offering trainings, seminars, conferences and workshops. I hope it would be very useful for the researchers, industrialist, entrepreneurs, students and other respective people.

INARS is always committed to serve the nation by doing quality research and services. This institute is renowned for its role in ensuring safe drinking water and sustainable ecosystem by maintaining quality control and quality assurance protocol for the betterment of test results as an ISO/IEC 17025:2017 certified laboratory. Keeping the spirit ahead, the team of INARS is working tirelessly to achieve the mission and vision targeted by this institute. Currently, INARS has received accreditation from the Bangladesh Accreditation Board (BAB) for 100 water quality indicators for 2024.

I express my sincere gratitude to the Director, INARS for his guidance and support for completion this report. My team member along with the scientists, technologists, officers and staffs of INARS deserve thumbs up for their cooperation to prepare this report.



Dr. Muhammad Abdullah Al-Mansur,
PSO & Convener
Annual Publication Committee
INARS, BCSIR, Dhaka



Message from Member Secretary

This year, it has been a great privilege for me to work as the member secretary of the 8th Annual Progress Report (2023-2024) publication committee of INARS. Beginning with a brief history of the institute, this report provides the details of work force, available instruments, research and development projects and analytical services of INARS. Along with that, this book highlights the publication works, participated trainings/conferences and other routine activities in sections.

This institute is well recognized for maintaining ISO standard laboratory activities for research and analytical services. In this perspective, we feel gratified to state that INARS has already received ISO/IEC 17025:2017 accreditation from Bangladesh Accreditation Board on Hundred (100) water quality parameters.

I would like to acknowledge our honorable Director of INARS, BCSIR who always supported us to conduct all activities related to research and service in this institute. I am also obliged to the convener of the publication committee for his time to time reconnaissance and to the passionate publication team members who positioned their efforts to prepare this report.

Warm regards,



Partha Paul
SO & Member Secretary
Annual Publication Committee
INARS, BCSIR, Dhaka



Publication Committee



Dr. Muhammad Abdullah Al-Mansur
PSO, INARS, BCSIR, Dhaka
Convener



AHM Shofiul Islam Molla Jamal
SSO, INARS, BCSIR, Dhaka
Member



Sharmin Ahmed Trisha
SO, INARS, BCSIR, Dhaka
Member



Pallabe Saha
SO, INARS, BCSIR, Dhaka
Member



Partha Paul,
SO, INARS, BCSIR, Dhaka
Member Secretary

Background of INARS

Institute of National Analytical Research and Service (INARS), the ISO certified laboratory of BCSIR was established in September 2016. Since then INARS has been conducting research focusing mostly on analytical, environmental and natural products chemistry. This institute has expertise in research related to water chemistry, more specifically alleviating arsenic and other heavy metals contamination from water. Moreover, the existing research trend has been extended to investigate the organic contaminants in water.



INARS has contributed significantly with arsenic elimination technology verification process since last decade and subsequently the institute has come up with the solution to ensure arsenic free drinking water for everyone in Bangladesh. More recently, a microbiology wing has been installed here to determine microbial quality of both potable and non-potable water.

With a broader view ahead, INARS is mostly obligated to conduct research maintaining a standard laboratory set up. Besides, INARS has profoundly achieved ISO 17025:2017 accreditation as a first ever govt. testing laboratory in Bangladesh. Initially, it received accreditation for thirty four (34) water quality parameters first. Then in 2019, INARS successfully achieved accreditation for forty (40) water quality parameters more (total 74) which has been expanded to eighty eight (88) parameters in 2020. Currently, INARS has received accreditation from the Bangladesh Accreditation Board (BAB) for 100 water quality indicators for 2024. The institute is always committed to provide testing services following international standard.

Mission and Vision



Dr. Muhammad Qudrat-I-Khuda

Our Mission

To carry out, promote and guide scientific, industrial and technological research maintaining ISO/IEC 17025:2017 standardization that optimizes the economic, environment and social benefits for the people of Bangladesh.

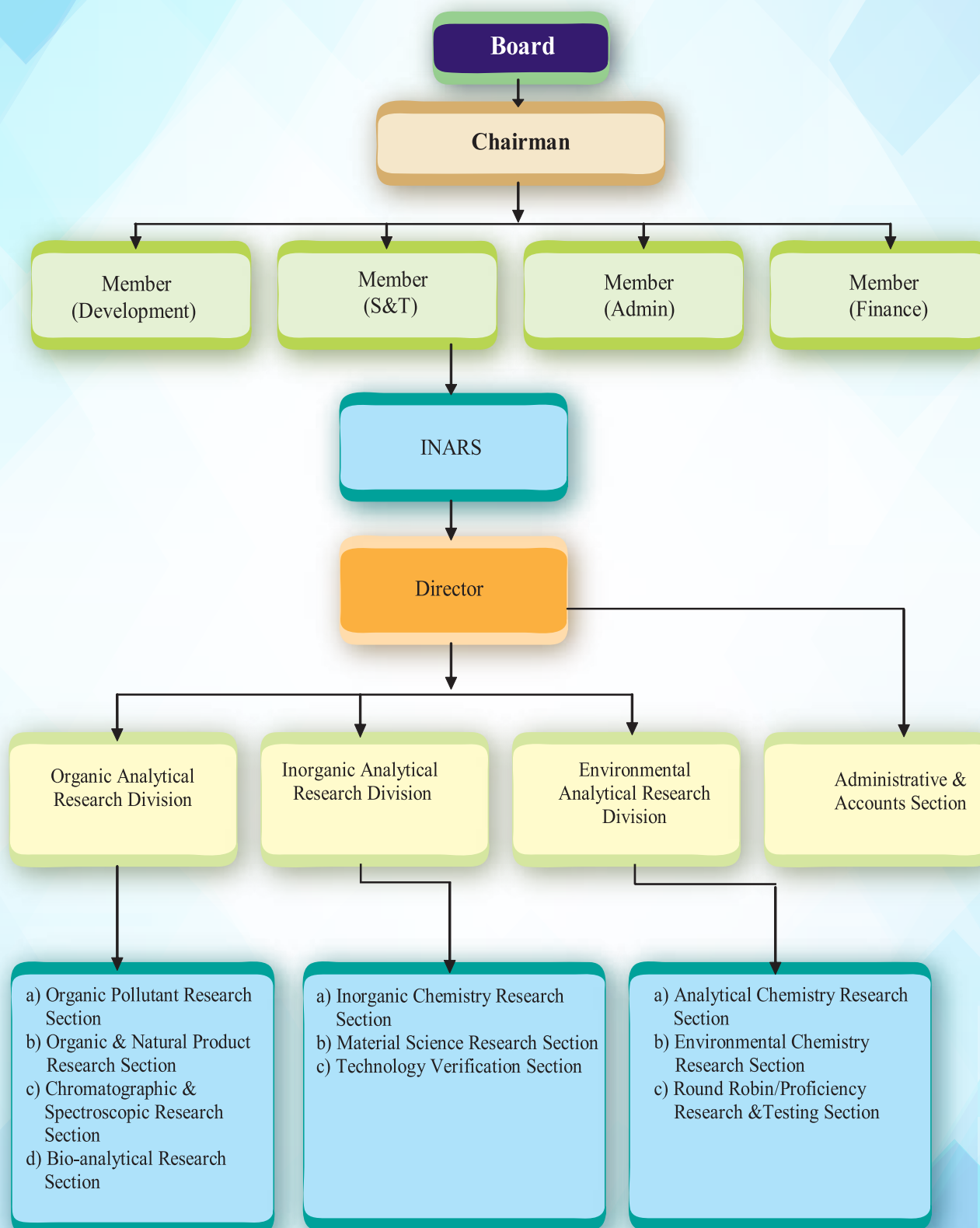
Our Vision

To achieve the leading position on conducting analytical research and services focusing on safe water.

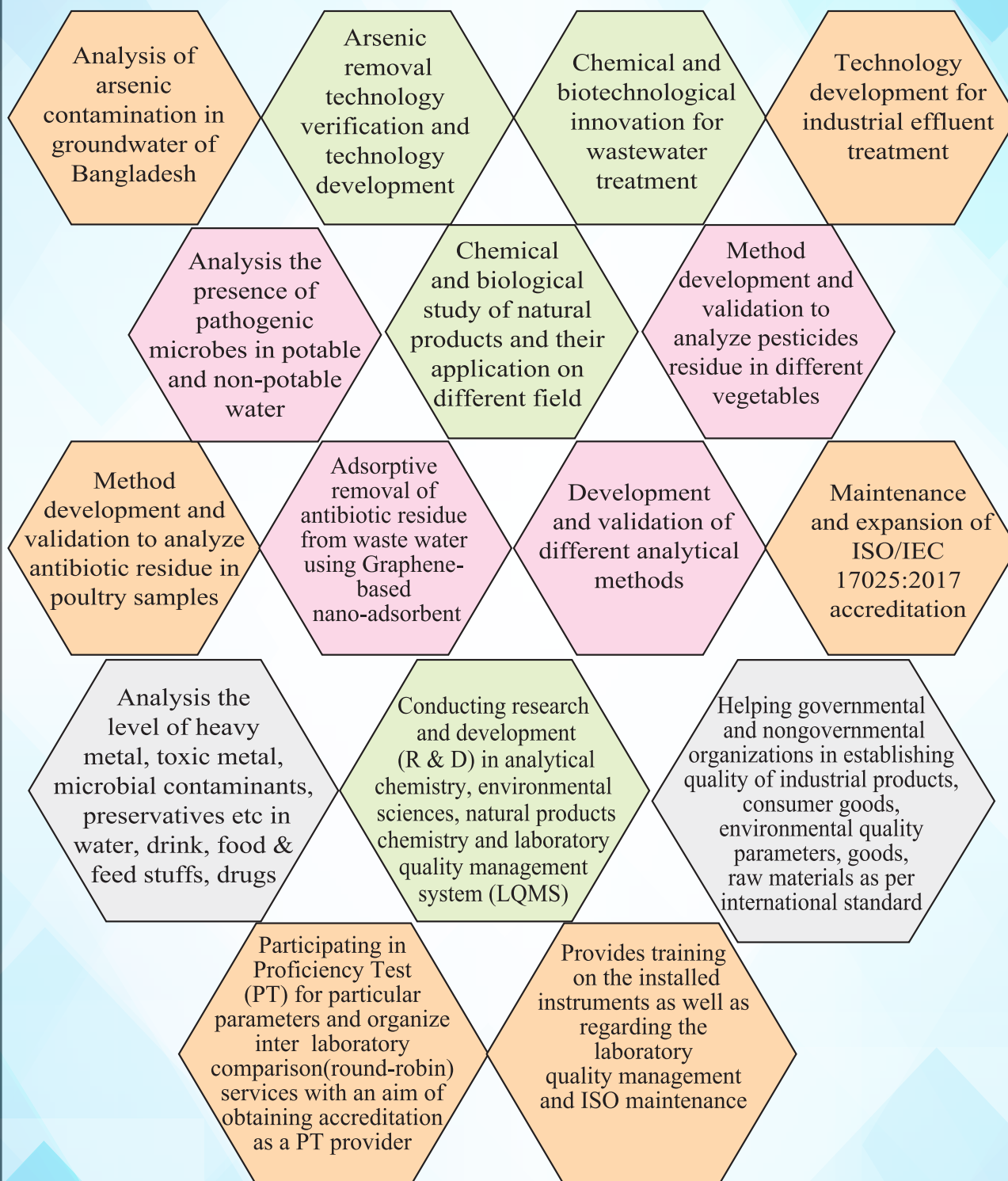
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Organizational structure



Activities conducted in INARS



Research Divisions at INARS

Organic Analytical Research Division	Inorganic Analytical Research Division	Environmental Analytical Research Division
Name and Designation	Name and Designation	Name and Designation
Dr. Muhammad Abdullah Al-Mansur, PSO (Division in-charge)	Dr. Md. Ahedul Akbor, SSO (Division in-charge)	Sarker Kamruzzaman Director (Add. Charge)
AHM Shofiul Islam Molla Jamal, SSO	Mehedi Hasan, SO	Dr. Md. Humayun Kabir, SSO (Division in-charge)
Md. Ripaj Uddin, SO	Aynun Nahar, SO	Dr. Ajoy Kanti Mondal, SSO
Sharmin Ahmed Trisha, SO	Pallabe Saha, SO	Dr. Sabina Yasmin, SSO
Md. Atikur Rahman, SO	Md. Al-amin, SO	Tajnin Jahan, SO
Partha Paul, SO	Md. Khandakar Parvez Ahammed, Technician	Md. Tanzil Ahmed Shawon, SO
Md. Jahangir Alam, Jr. Technician	Md. Jamir Ali, Sr. Lab Attn.	Md. Nurul Islam, Tech
Shah Jalal Sharkar, Jr. Technician	Md. Moin Uddin, Sr. Lab Attn.	Ahammad Ali Islam, Lab. Tech
Md. Hanif Miah, Lab Attn.	Md. Shipar Miah, Lab. Attn.	Nazmul Islam, Sr. Lab. Attn.
		Md. Ismail Hossein, Lab. Attn.

Administrative Section	Accounts Section
Name and Designation	Name and Designation
Sheikh Md. Wazed Ali, Account Officer (Addl. Chrg)	Sheikh Md. Wazed Ali, Account Officer (Addl. Chrg)
Md. Woaz Kazi, LDA	Rokhsana Akter, UDA
Shamima Akter, LDA	Nasima Begum, Junior Technician
Md. Amir Hossen, MLSS	

Budget Allocation and Expenditure of INARS

Fiscal Year (2023-2024)	Allocation (Tk)	Expenditure (Tk)
Salary of Scientist/Officer/Staff	2,41,83,000/-	2,10,40,250/-
Goods and Service	68,70,000/-	67,33,431/-
R&D and other Grants	91,30,000/-	91,17,489/-
Capital	4,80,000/-	4,77,300/-
Total	406,63,000/-	3,73,68,470/-

Structure of Stake holder (INARS)

INARS has been providing testing services alongside its research activities to solve analytical problems of different industries. Customers are mostly from Bangladeshi industries, different government departments/organizations/institutions, donor governments and NGOs. The followings comprise major stake holder structure of INARS:



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On Going
Research & Development projects

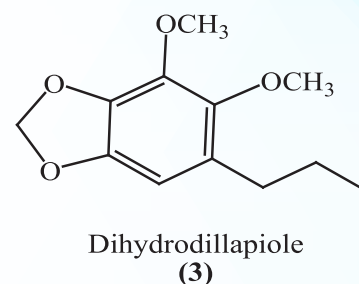
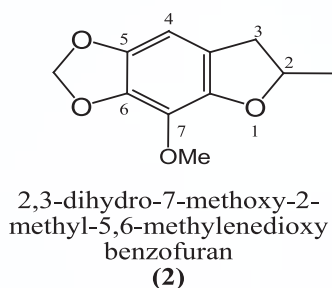
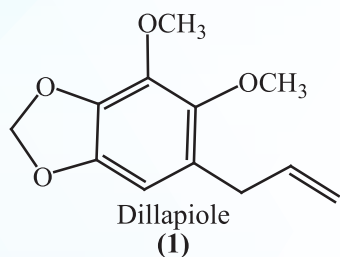


Pharmacological potential, Molecular docking and Pharmacokinetics Studies on *Anethum sowa* L. (Shulfa) Herb

Dr. Muhammad Abdullah Al-Mansur(PL), Dr. Md. Ahedul Akbor, AHM Shofiul Islam Molla Jamal, Sharmin Ahmed, Mustafizur Rahman Naim, Professor Dr. Koushik Saha, Professor Dr. Md. Abdur Rashid

Introduction

The main aim of this R&D Project is to discover novel, potent and selective compounds with potential activity to treat diseases. All aspects of this programme have been designed to streamline the isolation, evaluation, purification and characterization of potentially useful bioactive compounds. Bangladesh has a great treasure of medicinal plants. They play a significant role in providing primary health care services to rural people. They serve as important therapeutic agents as well as important raw materials for the manufacture of traditional and modern medicines. *Anethum sowa* L. belonging to the family *Apiaceae* (*Umbelliferae*) which are widely distributed all over the World. Literature survey revealed some compounds like



RESEARCH OBJECTIVES

- To study on the herb of *Anethum sowa* L. growing in Bangladesh for its phytoconstituents.
- To extract the powdered herb of *A. sowa* using different solvents in successive manner & to evaluate biological activities of different extracts using various established methods.
- To elucidate the structure of the pure isolated compounds by various modern spectroscopic methods and to investigate biological activities of the isolated compounds.

PROGRESS / OUTCOME

- Preliminary phytochemical screening of the plant extracts were done & found many valuable bioactive metabolites.
- Biological activities like cytotoxicity, antimicrobial, antioxidant, thrombolytic, membrane stabilizing, antidiarrheal, analgesic & hypoglycemic activity of the plant extracts were done.
- Draft writing

Synthesis of Graphene Oxide Quantum Dot from Waste Toner for Electrochemical Application

Dr. Sabina Yasmin, SSO, (PL), Dr. Md. Humayun Kabir (SSO), Tajnin jahan (SO), Md. Atikur Rahman(SO),Tanzil Ahmed Shawon (SO)

Introduction

Graphene is a two-dimensional material composed of carbon atoms arranged in a hexagonal lattice. Graphene oxide quantum dots (GQDs) are small fragments of graphene. They have similar properties to graphene, but they have a smaller size and a higher surface area to volume ratio, which makes them more reactive and able to interact with other molecules.

Due to the office automation, there would be lots of waste toner powder in use, especially when printer toner powder needs to be added again, the residual toner powder in the toner cartridge and waste powder storage box should be eliminated and probably discarded. Therefore, the waste toner powder should be properly disposed by an effective way, it has attracted great attention at home and abroad. In this study, we have investigated the potential application of waste toner powder as the precursor for preparing Graphene oxide quantum dots (GQDs) based on the hydrothermal method. The as prepared quantum dot can be used for electrochemical application such as super capacitor and glucose sensing.

Research Objectives:

- a. Synthesis of graphene oxide quantum dots from waste toner
- b. To use this material for glucose sensing
- C. Development of clean energy storage device i.e, super capacitor from the waste of toner

Progress/ Outcome:

1. Waste toner collection from office and market place.
2. Synthesis of graphene oxide quantum dot from waste toner by hydrothermal method.
3. Characterization of as prepared nanocomposite by XRD, SEM, FTIR, and Elemental analyzer.
4. Electrochemical study of graphene oxide quantum for super capacitor application and glucose sensing by potentiostat.
5. A manuscript has been submitted in international journal (ACS Omega)

Assessment of pesticide residues in common vegetables of Bangladesh

Dr. Md. Humayun Kabir (PL), Dr. Sabina Yasmin, SSO, Dr. Shamim Ahmed (PSO), Tajnin jahan (SO), Md. Atikur Rahman(SO),Tanzil Ahmed Shawon (SO), Dr. Md. Moniruzzaman (PSO), BCSIR laboratories, Dhaka, Sarker Kamruzzaman (CSO)

Introduction

Nowadays, consumers are changing their food choices from conventional commodities to high-value food commodities such as vegetables, fruits, spices, fishes, meats, etc. From the viewpoint of dietary satisfaction and economic returns, therefore, vegetable farming activity has become important. Over the last two decades, the productivity of Bangladesh's vegetable sector has increased by approximately 195 %. Vegetables are very important for nutritional, financial, and food security in any country. These are strongly associated with improvement in digestive health, good vision, and decreased risk of heart disease, stroke, chronic diseases like diabetes, and certain type of cancer. The extraction of insecticides from vegetable is a hard task, due to the low concentration that these targets are often present in. Several extraction procedures have been proposed to extract insecticides from foods, such as solid phase extraction (SPE), liquid-liquid extraction (LLE), magnetic solid phase extraction (MSPE), solid phase microextraction (SPME), supercriticalfluid extraction (SFE). These extraction procedures are time-consuming and labor-intensive. Nowadays, a quick, easy, cheap, effective, rugged and safe method (QuEChERS) is the most common extraction procedure for extracting pesticide from food samples. QuEChERS allows one to attain a final extract with fewer interferences. Optimization of extraction solvents, and measurements of amounts of salts, buffers, sorbents, should be done to increase the extraction efficiency. Current analytical methods include tandem mass spectrometry (MS/MS) detection, coupled to liquid chromatography (LC). The aim of the current research was to optimize a QuEChERS extraction procedure and quantify pesticides on okra. After the optimization of experimental and instrumental parameters, the analytical method was validated in terms of linearity, selectivity, precision, recovery, limits of detection (LOD) and quantification (LOQ), and applied to different okra samples to monitor the occurrence and determine the levels of pesticides present in different varieties of samples.

Research Objectives:

- a. Easy method development to determine pesticides residues
- b. Finding the occurrence of pesticides residues in common vegetables
- c. Reports and publications to make awareness in control unnecessary use of pesticides

Progress/ Outcome:

1. Developed method can be used in relevant food industries
2. At least four papers would be published in prestigious journal (High IF/SCI indexed)
3. Two Manuscript has been accepted in International Journal

Removal of haloforms from treated water by adsorption onto carbon aerogel and waste tea leaf

Md. Ahedul Akbor, PSO (PL), Md. Abu Bakar Siddique, SSO, Aynun Nahar, SO, Mehedi Hasan, SO

Introduction

Chlorine-treated drinking water generates disinfectant by-products (DBPs) due to the reaction between natural organic complexes, halides in water, and disinfectants. Among different disinfectants like Trihalomethanes (THMs), haloacetic acids (HAAs), haloacetaldehydes (HALs), etc. THMs consider the most hazardous DBPs. Dichlorobromomethane (DCBMs), dibromochloromethane (DBCM), and tribromomethane (TBM) are all THMs. Long-term exposure of these hazardous DBPs may cause an increase in the risk of bladder cancer, colorectal cancer, poor pregnancy outcome, spontaneous abortions, stillbirth defect, etc. In order to reduce health risks, the removal of DBPs precursors before disinfection is considered to be the most effective method. The effective removal of DBPs can be achieved by several treatment processes such as adsorption, anion exchange, biological treatment, enhanced coagulation, membrane techniques, and advanced oxidation processes (AOPs). Among them, adsorption is considered the most promising technology that can efficiently remove organic compounds from groundwater, drinking water, and wastewater. Various waste materials, including kap fibre, bamboo pulp, tree leaves, and landfill refuse, have been used to produce carbon aerogels over the past decade. This study represents a valuable method for transforming waste paddy straw into aerogels of carbon with excellent quality, stability, and high adsorption capacity of halo methane pollutants in water. Moreover, waste tea leaves are a potential bio-sorbent for removing organic pollutants due to intricate porosity and higher specific surface area. In this study, waste tea leaves were utilized as bio-adsorbent for the removal of DBPs from drinking and surface water.

Research Objectives:

To develop an effective, low cost and durable technique for the removal of haloform pollutants to treat tap water.

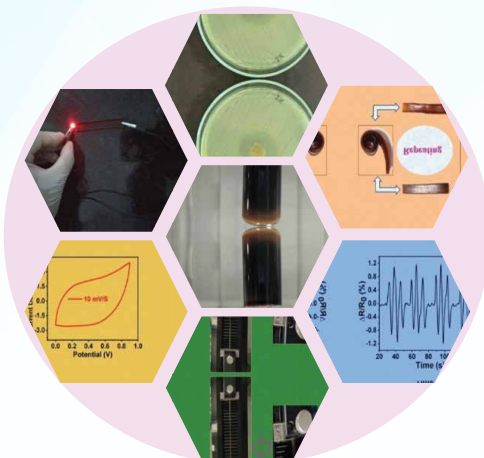
Progress/ Outcome:

One manuscript has been submitted for the publication.



Preparation of hide powder from raw trimmings for the formulation of functional material

Dr. Ajoy Kanti Mondal, SSO, (PL), Dr. Md. Tushar Uddin (SSO); Md. Ashraful Alam (SO); Khandoker Tahmina Tasnim (SO); Md. Sefiatulla Ridoy (SO); Dr. Anamul Haque, Associate Prof. DU.



Introduction

The livestock population of Bangladesh has shown a steady growth trend which indicates that Bangladesh has enough raw materials that are required to support the increasing production of leather and leather goods. Hides and skins, a by-product of the meat industry is converted into value added products. In Bangladesh, a lot of animal (cow, goat, buffalo, sheep) hides are produced all around the year, especially during Eid-ul-Azha. In the last Eid- ul- Adha, about 11.8 million cattle, buffalo, sheep and goat were supplied. Statistics show that every year 70% of the total amount of animal skins is collected during Eid-ul-Azha in Bangladesh. Annually hides of six million cows and 7-8 million goats are processed around Dhaka city. According to an estimate, about 2,00,000 tons of chemicals are used in processing hides and skins in the tannery. These are mainly salt, chromium and different kinds of acid. The uses of huge amounts of chemicals are a big threat to the environment. So it is a great concern to the researchers to use the animal hide for alternate purposes, such as preparation of functional materials, hydrogel, adsorbent, etc. Our current research is an effort to the preparation of hide powder from raw trimmings for the formulation of functional materials, such as conductive hydrogel and evaluates the properties of the resultant hydrogel.

Research Objectives:

- To synthesize hide powder from raw trimmings
- To characterize the hide powder
- To apply the hide powder as a raw material for the preparation of hydrogel or functional materials

Progress/ Outcome:

Two manuscripts have been submitted.

Source apportionment and assessment of polyfluorinated substances in water

A. H. M. Shofiul Islam Molla Jamal, SSO (PL), Mohammad Moniruzzaman, PSO, Muhammad Abdullah Al-Mansur, PSO, Md. Ahedul Akbor, SSO, Dr. Humayun Kabir, SSO, Tajnin Jahan, SSO, Rashed Mahmud, RC, Dr. Ahsan Habib, Prof. D U.

Introduction

A large number of products containing polyfluoroalkyl substances (PFASs), including textiles, fire-fighting foam and floor polishes, have been produced and applied widely since the 1950s, because of their characteristics such as surfactivity, heat resistance and acid fastness. According to the previous studies, fluoropolymer manufacturers released large amounts of PFASs into the environment around the industrial area, which seriously threatens the ecosystem health. Though drinking water source areas are well protected, the PFASs originating from anthropogenic activities and atmospheric precipitation may release into the pedosphere and aquatic ecosystem. Moreover, removing PFASs from the environment is not readily through traditional treatment approaches. Accordingly, it is vital to identify and prevent PFASs pollution from headwater source.

Research Objectives:

- a. To develop easy and quick method for determining PFAS analytes of potable & non-potable water
- b. To establish method validation of PFAS analytes in potable & non-potable water

Progress/ Outcome:

We have already collected samples, which are ready for further analysis. Collected samples will be analyzed in the laboratory of Institute of National Analytical Research and Service and Center of Excellency lab. All testing parameters will be carried out by following APHA and ASTM methods. LC-MS-MS is a major instrument needed for this research. We have purchased some Apparatus (SPE Column strata X-AW Cartridge (6cc/200 mg 33 μ m), Centrifuge tube, Mesh sieve etc.), Chemicals (PFBS, PFBA, PFDS, PFD_oA, PFOS, PFOA etc.) and Reagent (Acetonitrile Ammonium Acetate).

Assessment of tetracycline residue in poultry eggs using LC-MS/MS

Tajnin Jahan, SO (PL), Dr. Md. Humayun Kabir, SSO, INARS, Dr. Sabina Yasmin, SSO, INARS, Md. Atikur Rahman, SO, INARS, Dr. Mohammad Moniruzzaman, PSO, CARF, BCSIR, Md. Kamrul Hasan, Associate prof., Dept. of Chemistry, DU

Introduction

Tetracycline antibiotics are commonly used worldwide in veterinary therapy, especially in poultry farming as medicine. However, the abundant and improper use may result in the presence of their residues in edible animal tissues, which can be dangerous for human health. In addition, low-level doses of antibiotic in foodstuffs consumed for long periods can lead to the spread of drug-resistant microorganisms. To ensure human food safety, the European Union laid down maximum residue limits (MRLs) 100 mg.kg⁻¹ in muscle. Therefore, monitoring of antibiotic residues is very important in controlling the safety of foods for human consumption.

During recent years, many analytical methods to detect tetracyclines in foods have been described. There are two types of analytical methods including screening methods, immunoassay-based methods and confirmatory methods performed based on gas-chromatography or liquid chromatography. Mass spectrometry (MS) techniques can confirm the residual tetracyclines with high sensitivity and selectivity. Thus, a method combining a simple and precise chromatographic separation with an appropriate MS determination technique would offer a significant confirmation of the residual tetracyclines in poultry chicken eggs. Therefore, the aim of this study is to develop an easy method to analyse four tetracyclines (tetracycline, oxytetracycline, chlorotetracycline and doxycycline) residue in poultry chicken eggs.

Research Objectives:

- a. To develop an easy, simple and efficient analytical method to determine four tetracyclines using LC-MS/MS
- b. Validate the method with recovery study, accuracy, precision and RSD data
- c. To analyze tetracycline residue in chicken egg samples collected from local market of Dhaka city

Progress :

1. An analytical method has been developed to determine four antibiotic residues simultaneously using LC-MS/MS
2. Validation of this method is done by monitoring accuracy, precision, LOD, LOQ etc.
3. Poultry egg samples were collected for antibiotics residue analysis.
4. Analysis of poultry samples are ongoing.

Preparation of carbon aerogel from waste paper for the removal of organic pollutants from wastewater

Aynun Nahar, SO (PL), Shamim Ahmed, PSO, Md. Ahedul Akbor, PSO, Md. Abu Bakar Siddique, SSO, Mehedi Hasan, SO

Introduction

Organic solvents, a variety of carbon-based pollutants, have been employed for a vast array of purposes despite their inherent dangers. Exposing these pollutants regularly may harm the central nervous system's function (CNS) and other body parts. The level of impact, signs, and symptoms will depend on concentration, time, duration, frequency, and nature of solvents, leading to common effects like headache, dizziness, tiredness, blurred vision, behavioural changes, unconsciousness, and even death. Many methods and techniques have been thoroughly studied to remove organic solvents from wastewater, including advanced oxidation, adsorption, extraction, chemical precipitation, membrane separation, and photocatalysis. Among them, adsorption is considered the most promising technology that can efficiently remove organic compounds from groundwater, drinking water, and wastewater. However, activated carbon has many micropores that cannot be reached by organic molecules and are only usable in powder form, which leads to a reduced capacity to adsorb and re-use.

Due to their remarkable properties such as open-pore structure, large specific surface area and high thermal and mechanical stability, carbon aerogels have gained tremendous interest in many science and technology fields. Various waste materials, such as kap fibre, bamboo pulp, tree leaves, and landfill refuse, have been used to produce carbon aerogels over the past decade. The abundant and inexpensive waste paper is a popular substrate for efficient and economical carbon aerogels among these waste materials. In general, this study represents a valuable method for transforming waste paper into aerogels of carbon with excellent quality, stability, and high adsorption capacity of organic pollutants in water. As far as we know, in Bangladesh, this technique would be the first organic solvent removal technique that will be developed from waste paper.

Research Objectives:

- a. To develop an effective organic pollutant removal technique from wastewater
- b. To develop a method for converting waste paper into adsorbent

Progress :

One manuscript has been submitted to a Q1 journal.

Characterization of Chromium Tolerant Bacteria Isolated from Tannery Wastewater

Sharmin Ahmed, SO (PL), Subarna Shandhani Dey, SO, IFST, Shahariar Siddque, SO, IFST, Dr. Morshed Hasan Sarker, SSO, BCSIR Dhaka Lab, Md. Ahedul Akbar, SSO, Mehedi Hasan, SO, Shamim Ahmed, PSO

Introduction

Human activities and the discharge of industrial waste have resulted in the accumulation of metals like chromium in the environment which are eventually gathered through the food chain, leading to serious ecological and health problems. Among the two forms of chromium, hexavalent chromium is more deadly to living system. The biotransformation of Cr (VI) to Cr (III) thus offers as a substitute process for treating Cr (VI) contaminated wastes. Many facultative and strictly anaerobic bacteria commonly found in soils and marine sediments are capable of reducing Cr (VI) to Cr (III). Bioremediation of Cr (VI) appears to be universal since, Cr (VI) reducing consortia were isolated from Cr (VI) contaminated sites as well as uncontaminated sites. Microbial bio reduction of Cr (VI) to innocuous Cr (III), has gained increasing attention as a strategy for bioremediation of chromium contaminated sites as it provides green technology due to its in situ operation, selective removal and low cost. Exploring the world of microbes for searching suitable candidates of reducing Cr (VI) to Cr (III) have significant potential in development of in situ or on situ bioremediation strategies. So far studies revealed that Cr (VI) concentration could be lowered after microbial treatment under the controlled experimental conditions, but it is difficult to restore the environment during in situ operations. To implement its practical application at field scale, such studies need further attention because the potency of Cr (VI) resistance and reduction to Cr (III) depends on the interaction of bacteria with the environment, and the entire process is genetically regulated.

RESEARCH OBJECTIVES

- To isolate microbes from tannery waste
- To characterize microbes on the basis of their enzymatic activity, biochemical property and reduction potential of chromium
- To identify microbes by gene sequencing
- To assess the capability of microbes for bioremediation process

PROGRESS.

Isolation of 16 Chromium tolerant bacteria has been done.

Contamination levels of toxic elements in Gazipur industrial area of Bangladesh and their phytoremediation study

Mehedi Hasan, SO(PL), Md. Abu Bakar Siddique, SSO, Md. Ahedul Akbor, SSO, A. H. M. Shofiul Islam Molla Jamal, SSO, Tajnin Jahan, SO, Md. Ripaj Uddin, SO

Introduction

Since the beginning of the modern scientific era, globalization along with industrialization spread out rapidly in the world for the betterment of human beings. But with the rapid industrialization, the world getting polluted which affects the health of all organs of the environment such as air, soil, sediment, and water as well as both ecosystem and biodiversity due to the uncontrolled discharge of industrial pollutants (Bhuiyan et al., 2011, 2015). For this reason, pollution is a global concern for all living beings (Ahsan et al. 2019).

Bangladesh is one of the most densely populated countries in the world. To manage the essential demand of the population and to develop this country, a strong economic strength is needed. As a consequence, at the beginning of the 21st rapid industrialization has been started privately and publicly around the country. There are around 30,000 large and small industries in Bangladesh that mostly have an unplanned infrastructure with unworking ETP system and are discharging their untreated or partially treated effluents directly to the surrounding environment which is very alarming. The industries discharged both organic and inorganic pollutants, among which, the persistent inorganic pollutants such as toxic elements including Cr, Cd, Pb, As, and Hg are very harmful to the environment as these can never be destroyed (Islam et.al., 2018; Rahman et. al., 2022) and can have an adverse impact on human health and the environment (Rakib et al. 2013; Chandra et al. 2010).

Recent studies have focused on a particular method for toxic element removal, such as electrocoagulation, adsorption using synthetic and natural adsorbents, adsorption using nanomaterials, magnetic field implementation, advanced oxidation processes, membranes, etc. (Qasem et al. 2021). The removal of significant amounts of toxic elements content using these processes is costly and results in massive secondary waste (Ahmadpour et al., 2012). Phytoremediation using native plants growing around the industrial sites could be the best alternative solution to the current situation. Even, in comparison to alternative manual procedures (acid leaching and electrokinetic soil remediation) or natural ways (membrane filtration, ion exchange, and adsorption), the operation cost for phytoremediation is minimal, and there are no environmental side effects. Few researchers already used this phytoremediation technique for removing toxic elements from the contaminated environment (Hasan et al., 2021; Babu et al., 2021), however, most of the studies are discrete and conducted randomly depending on the specific research purpose. In the present work, a comprehensive study will be carried out to conclude a sustainable green solution for the removal of toxic elements from contaminated industrial sites.

Research Objectives:

- a. To identify human's unusable native plants commonly grown around the industrial sites
- b. To collect and analyze the industrial effluent, effluent-impacted soil, and the native plants

grown naturally on the effluent-impacted soil for the toxic elements by Atomic Absorption Spectrometer (AAS)

- c. To investigate the level of toxic elements, and evaluate their accumulation, co-distribution, and migration behavior through the effluents, effluent-impacted soil, and native plant samples
- d. To disclose the basic and advanced chemistry of elemental transfer from contaminated effluent and soil to the root-to-shoot-to-leaf of native plants
- e. To study the uptaking capability of the toxic elements by the individual native plants grown in the industrial site
- f. To propose a sustainable green solution for the removal of toxic elements from the contaminated environment of industrial sites through the identification of potential native plants for phytoremediation of toxic elements

Progress:

1. There are a lot of native plants around the industrial region in Gazipur where about 20 potential native plant species commonly grown have been identified and characterized.
2. Sample collection has been conducted: the effluents, effluent-impacted soil, and native plant samples were collected, and then sample preparation for metal analysis has been carried out.

Removal of toxic elements from waste water using Bone char

Mehedi Hasan, SO (PL), Md. Abu Bakar Siddique, SSO, Rashed Mahmud, RC, Ashraful Alom, SO, IGCRT, A. H. M. Shofiul Islam Molla Jamal, SSO, Md. Ahedul Akbor, PSO, Sarkar Mohammad Kamruzzaman, Director (add. charge)

Introduction

Rapid industrialization, urbanization, and various anthropological activities have driven the wide dispersion of toxic metals like cadmium (Cd), lead (Pb), and chromium (Cr) in the environment (Islam et.al.,2018). Industrial effluents released on the land as well as dumped into the surface water, which ultimately lead to contamination due to accumulation of toxic metallic components and resulted in a series of well-documented problems in living beings, because they cannot be completely degraded (Rahman et. al.,2022). Industrial effluents discharged by industries are major contaminants causing environmental pollution and create serious disruption to people's livelihoods by polluting adjacent water, soil, and plants which can have an adverse impact on human health and the environment (e.g., Rakib et al. 2013;Chandra et al. 2010). The increasing pollution by heavy metals have significant adverse health effects for invertebrates, fish, and humans (Martin et al. 2015; Ahmed et al. 2015). The soil/sediment is generally the final sink for industrial pollutants (Khan et al. 2019a; 2018) and soil contamination due to toxic pollutants ultimately has an adverse effect on plants and poses a serious risk to human health via food chain (Hasan et al. 2020).

Thus this study will keep the environment free from animal waste bone i.e they can be converted to a value added materials bone char that may play an important role to remove the toxic metals from waste water through adsorption technique.

Research Objectives:

The major objectives of the current project are:

- a. To produce a value added material (Bone char) from animal waste bone by pyrolysis technique
- b. To modify and characterize the bone char (FT-IR, BET, FE-SEM, XRD, TEM etc.)
- c. To conduct the adsorption-desorption study for toxic metals (As, Pb, Cd, Cr, Hg, Ni)
- d. To conduct other applications of the studied material

Progress/ Outcome:

1. So far, Bone char from animal waste bone has been prepared by pyrolysis technique.
2. Preliminary characterizations (BET, FE-SEM, XRD) have been done.

Graphene oxide-supported manganese-zinc oxide nanocomposites synthesized from spent zinc-carbon batteries for supercapacitors application

Md. Atikur Rahman(PL), Md Humayun Kabir, Md. Tanzil Ahamed Shawon, Sabina Yasmin,

Introduction

Dry cell batteries, in particular the Zinc-Carbon batteries, are low cost and high in demand for various portable applications including, flash lights, remote controls, clocks, toys, watches, transistor radios and portable electronic devices etc. A zinc-carbon battery contains a carbon rod or graphite rod as a positive electrode in the middle portion of the battery. The electrode is surrounded by a mixture of manganese dioxide and carbon powder. All of the components are packaged in zinc which acts as a container as well as a negative electrode. Thousands of tons of zinc-carbon batteries are used every year around the world and are often not recycled. These disposed dry cell batteries disintegrate with time and the chemicals and metals inside the batteries leach to the environment. Eventually, they may contaminate ground and surface water and enter our food chain through fruits and vegetables. Direct or indirect consumption of heavy metals may have neurological impacts, damage the kidney and even cause cancer. Utilization of extracted graphite rods and zinc-case cover obtained from spent dry cell batteries for the synthesis of graphene oxide supported manganese-zinc oxide (GO/MnO₂/ZnO) nanocomposite is explored in a greener way. The synthesized nanocomposite has been used for supercapacitor application, which is an energy-efficient green technology. It also serves the vital purpose of waste management.

Research Objectives

- a. Recovery of Zinc and graphite from spent batteries
- b. Development of Graphene oxide-supported manganese-zinc oxide nanocomposites for supercapacitor application

Progress/Outcome

Graphene oxide-supported manganese-zinc oxide nanocomposites have been successfully synthesized and confirmed from various characterization results. Further endeavor has been going on for developing a prototype super-capacitor.

Project Programs under Special Allocation for the Science and Technology

Ministry of Science and Technology

Government of the People's Republic of Bangladesh

E-Waste-derived graphene-based materials as efficient catalyst for energy storage application.

Dr. Sabina Yasmin (SSO), (PL), Tajnin jahan (SO), (RA)

Introduction

Waste from electrical and electronic equipment exponentially increased due to the innovation and the ever-increasing demand for electronic products in our life. The global market for electronics recycling is expected to reach \$65.8 billion by 2026. However, electronic waste management in developing countries is not appropriately handled, as only 17.4% has been collected and recycled. This study proposes a cost-effective reduced graphene oxide/Manganese oxide (rGO/MnO₂) nano-hybrid, entirely synthesized from electronic waste, for supercapacitor application. The graphite and metallic Mn precursors obtained from a discarded battery were employed to synthesize rGO and MnO₂, respectively. The successful characterization of the prepared rGO and rGO/MnO₂ nanocomposite was conducted through scanning electron microscopy, energy dispersive X-ray spectroscopy, transmission electron microscopy, Fourier-transform infrared spectroscopy, X-ray diffraction analysis, cyclic voltammetric analysis. The rGO/MnO₂ modified glassy carbon electrode (GCE) exhibited superior conductivity and a larger surface area. Electrochemical properties of rGO/MnO₂ were investigated via cyclic voltammetry, galvanostatic charging/discharging, and electrochemical impedance spectroscopy in a three-electrode system. The rGO/MnO₂ sheet exhibited an exceptional specific capacitance (C_{sp}) of 728.64 F/g at 0.5 A/g which was significantly higher than that of the rGO (16.42 F/g) and the MnO₂ (8.7 F/g). The prepared rGO/MnO₂ sheet exhibited a power density of 175 W/Kg at an energy density of 49.58 Wh/Kg. Moreover, the electrode demonstrated outstanding cycle stability, maintaining 97.62% efficiency over 3000 cycles. So rGO/MnO₂ nanocomposite will be a good choice for the fabrication of new flexible energy storage as well as electronic devices in the future.

Research Objectives:

- a. Synthesis of reduced graphene oxide/Manganese oxide (rGO/MnO₂) nanocomposite from electronic waste
- b. To use rGO/MnO₂ as a potential catalyst for supercapacitor applications

Progress/ Outcome

1. Synthesis of reduced graphene based manganese oxide (rGO/MnO₂) nanocomposite from waste battery
2. Characterization of as prepared catalyst by XRD, SEM FTIR, and Elemental analyzer.
3. The supercapacitive performance of rGO/MnO₂ has been measured by cyclic voltammetry (CV), Galvanstatic charge discharge (GCD) and chronoamperometry (CA).
4. A manuscript has been submitted to international journal

Determination of Caffeine, Taurine, Alcohol, Guarana, Ginseng, and Other Harmful Constituents in Beverages Available in the Bangladeshi Market.

Md. Ahedul Akbor (PL)

Introduction

Energy drink consumption has increased dramatically in the past two decades, particularly among adolescents and young adults[1]. Energy beverages are aggressively marketed with the claim that they enhance physical and mental performance by providing an energy boost. However, few studies corroborate these claims. Several adverse health effects have been linked to energy drinks, raising the issue of whether or not they are safe[2]. In Bangladesh, most of popular energy drink brands in the market contain artificial caffeine higher than the allowed level, and some of the lesser known and imported varieties even contain Viagra (sildenafil citrate) and alcohol as ingredients, said the results of two laboratory tests conducted in Bangladesh in 2014 and 2017.

In 2014, the Department of Narcotics Control of Bangladesh recommended banning 39 energy drink products that did not have BSTI licenses. The Directorate General of Drug Administration and BSTI had also recommended legal action against the companies selling these products. According to a number of studies conducted worldwide, excessive consumption of energy drinks may lead to risks of cardiac arrest, headaches and migraines, anxiety, insomnia, type 2 diabetes, jitters and nervousness, vomiting, allergic reactions, high blood pressure, release of stress hormones in the long run, and adverse interactions with drugs.

Research Objectives:

This study aims to determine caffeine, taurine, alcohol, guarana ginseng, and other harmful constituents in beverages available in the Bangladeshi Market

Progress/ Outcome:

One manuscript has been submitted for publication.

**ANNUAL REPORT
2023-2024
(ISO/IEC 17025:2017
Accreditation for International
Acceptance)**

Maintaining ISO/IEC 17025:2017 Accreditation in INARS

The dependability of test results produced by a laboratory is laid upon a system which follows international standards. One of the standards is ISO 17025:2017 that must be executed in a testing laboratory to demonstrate the authenticity of the test data. The sophistication of the instrument alone does not safeguard good quality data, rather, a complete quality management system, as shown below in the flow chart, will offer internationally acceptable test results. In this context, INARS, formally known as analytical research division, has implemented a complete setup of quality management system since 2009. A quality management system in a testing laboratory requires a great deal of works for continual improvement of a laboratory. The works include developing quality manual (QM), standard operating procedure (SOP), quality system procedure (QSP), quality system forms (QSF), method validation, management review, internal audit etc. A list has been shown in a table below to depict the works involved in maintaining ISO 17025:2017 in the institute. By doing all these works, we received accreditation for twelve (12) water quality parameters in 2009 from NABL, India as a first ever govt. testing laboratory in Bangladesh. The scope of accreditation was expanded to twenty-four (24) in 2012 and subsequently, it was increased to thirty-four (34) in 2014, then it was achieved 88 parameters in 2021. At present, in 2024 INARS achieved accreditation of One hundred (100) water quality parameters from Bangladesh Accreditation Board (BAB).

An ISO/IEC accredited laboratory has to manage all of this!



Figure: Process Flow of Maintaining ISO/IEC 17025:2017

List of quality system documents developed at INARS as below:

Document Name	Number
Standard operating procedure	100
Quality system procedure	12
Quality system form	50
Method validation	100
Quality manual	1
Quality policy	1
Calibration of pipette	20
Calibration of volumetric flask	50
Control chart	100
Participation in international proficiency testing program	7
Conducting round robin in Bangladesh	7



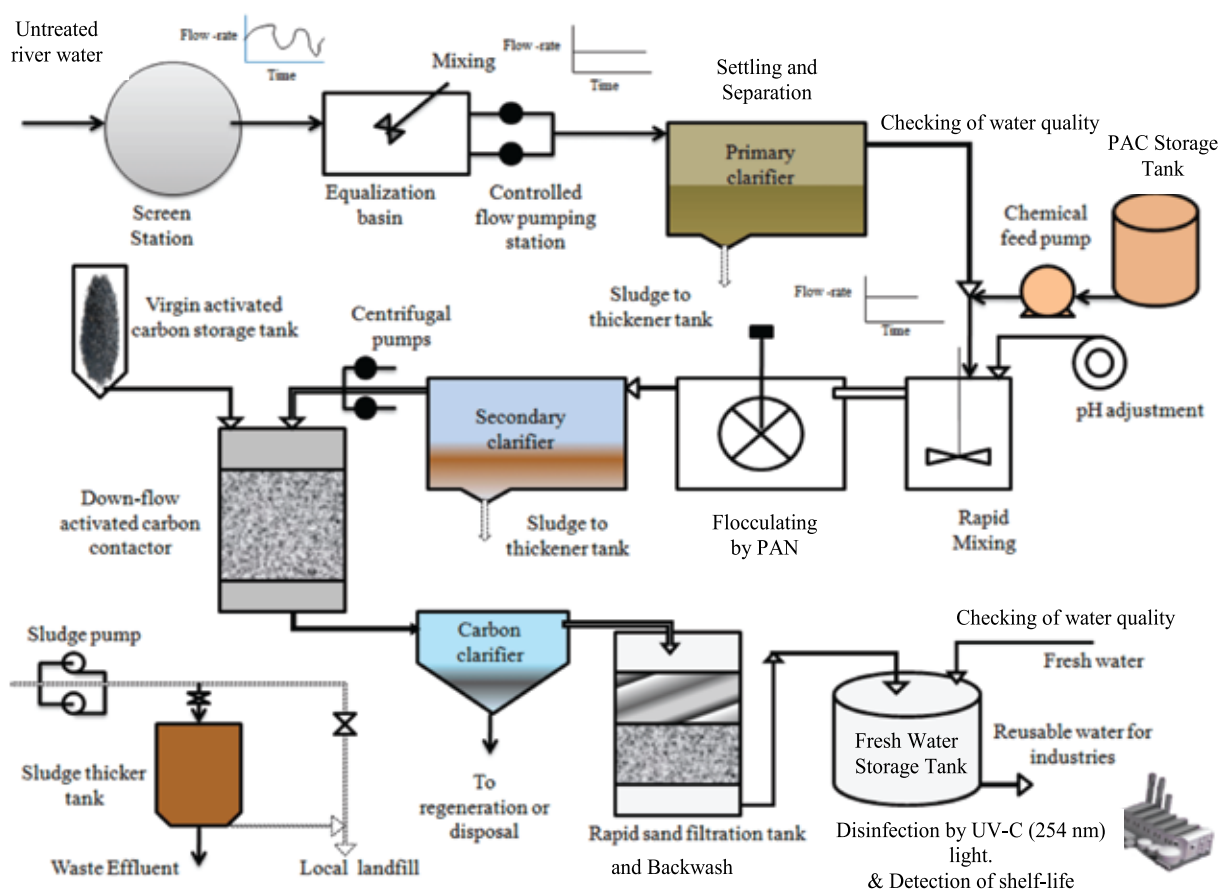
To maintain the tradition of accreditation achievement, a four member of BAB team was invited to conduct the assessment of the laboratories of INARS on January 3, 2024 and INARS team has passed the whole evaluation process successfully and achieved accreditation of 12 new water parameters with a sum of 100 parameters

ANNUAL REPORT

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(A Noteworthy Attempt of INARS)

Attempt for safe drinking water





1. BCSIR Digital Arsenic Test Kit



2. Standard Buffer Solution



3. Rain Water Harvesting System

Endeavors to ensure safe drinking water for all

The scientific community in Bangladesh has given their efforts since last few decades in order to mitigate arsenic in drinking water. Still, research has been going on in this field to find possible sustainable options. Many Arsenic Removal Technologies (ARTs) have evolved in the last decades to ensure arsenic safe water. Most of them have not been verified yet for natural arsenic contaminated water. It was necessary to verify the efficacy of the filter using Bangladesh groundwater. Bangladesh Council of Scientific and Industrial Research (BCSIR) is mandated by the Government of Bangladesh to verify performance claims of ART. Subsequently, BCSIR has nominated INARS, previously known as Analytical Research Division (ARD), to perform this work in 2003. Since then, INARS has been involved with the process and continuing its effort to ensure arsenic free drinking water for everyone in Bangladesh. It is noted that ARD conducted performance claims verification of Arsenic Removal Technology (ART) in collaboration with Canadian International Development Agency (CIDA) through ETV-AM and BETV-SAM project in 2003 and 2006, respectively. We verified thirteen (13) arsenic removal technologies and six of them were certified for marketing in Bangladesh.



Alcane



Nelima



Read-F



Swadesh



Sidko



Sono

Presently, we have received a number of applications from different proponents for verification of their technologies such as Xiano filter. In addition, we have assessed WASA supply water throughout Dhaka city to investigate any possible contamination. Currently, we have collected so-called mineral water bottles from local market to examine correct level of minerals in them.

Process and Patent of INARS

Institute Name: Institute of National Analytical Research and Service (INARS), BCSIR
(An ISO/IEC 17025:2017 Accredited Laboratory)



Process Name	BCSIR Mineral Water
Inventor	Md. Ahedul Akbor, Md. Ripaj Uddin, Shamim Ahmed, Rokaia Sultana, Shahanaz Sultana, Shakila Akter, Md. Abu Bakar Siddique, Muhammad Abdullah Al Mansur and Md. Aminul Ahsan
Raw Material	CaCl_2 , NaHCO_3 , MgSO_4 and NaHCO_3
Uses	Mineral Water
Statutus Of Development	Waiting for lease out
Product Description	1. We claim that if we could successfully formulate our process, it would be the very first bottled mineral water in Bangladesh ensuring safe drinking water for country people. 2. We affirm cost- effective process development to make safe and healthy drinking water affordable for all of our people. 3. Once the innovation is established, it will help save our country's economic sector by reducing importation of mineral water from abroad. 4. Our assertion is to process mineral water free of harmful bacteria and pathogens 5. We ensure health benefit of the consumers by supplying all required nutrients in appropriate proportion.
Major Plant Equipment/ Machinery	Booster Pump, Multimedia Filler, Activated Carbone Fillter, Softner, UV Unit, Mineral Dosing system, Reverse Osmosis System (RO), Micron Filter System, Ozone plant, Low Comreesor, Water reserver Tank, Automatic bottle blowing machine, feeling machine, Auto labeling Machine, Date Coding Machine, Full Automatic Wrapping Machine, Hydraulic Trolley, Cooling Tower, Water Chiller, Vacuum Auto Loader, & Crusher.

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**(Publications, Trainings, Conferences
and Others)**

Publication List

1. Yasmin, S., Kabir, M.H., Shaikh, M.A.A. and Jeon*, S., 2023. Electrochemically Reduced Graphene Oxide Supported Palladium-Cobalt Alloy Nanoparticles as Highly Efficient Electrocatalyst for Oxygen Reduction Reaction, *ECS Journal of Solid State Science and Technology*, 12, 111004. <http://dx.doi.org/10.1149/2162-8777/ad0d04>
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Training offered

- ❖ Dr. Humayun and Dr. Sabina Yasmin offered Training Course on **Liquid Chromatography with tandem mass spectrometry (LC-MS/MS)** held on 22-26 June 2024 at Central Analytical and Research Facilities (CARF) Bangladesh Council of Scientific and Industrial Research (BCSIR).
- ❖ Aynun Nahar attended and successfully provided the in-house training program on **“Operation and maintenance of Gas Chromatography- Mass Spectrometer (GC-MS)”** organized by Planning and Development (P&D), BCSIR, Dhaka during 11-15 February 2024, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- ❖ Dr. Md. Ahedul Akbor attended and successfully provided the in-house training program on **“Introduction to Inductively Coupled Plasma Mass Spectrometry (ICPMS)”** organized by **Central Analytical and Research Facilities (CARF), BCSIR, Dhaka** during 05-09 May 2024, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- ❖ Dr. Md. Ahedul Akbor attended and successfully provided the in-house training program on **“Operation and maintenance of Gas Chromatography- Mass Spectrometer (GC-MS)”** organized by Planning and Development (P&D), BCSIR, Dhaka during 11-15 February 2024, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- ❖ A. H. M. Shofiul Islam Molla Jamal successfully provided the in house training on **“Atomic Absorption Spectrophotometer (AAS)”** organized by Planning and Development (P&D), BCSIR, Dhaka during 21-25 April 2024, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.

Training obtained

- I. Training Course on Liquid Chromatography with tandem mass spectrometry (LC- MS/MS) held on 22-26 June 2024 at Central Analytical and Research Facilities (CARF) Bangladesh Council of Scientific and Industrial Research (BCSIR).
- II. Dr. Ajoy Kanti Mondal attended and successfully completed the in-house training program on **“Photo-Electrochemical workstation with Frequency Response Analyzer”** organized by Planning and Development Division, BCSIR, Dhaka during 08-12 October 2023, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- III. Dr. Ajoy Kanti Mondal attended and successfully completed the in-house training program on **“Introduction to Inductively Coupled Plasma Mass Spectrometry (ICPMS)”** organized by Central Analytical and Research Facilities (CARF), BCSIR, Dhaka during 05-09 May 2024, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.

- IV. Mehedi Hasan Attended and successfully completed the Training program on **“Field Emission Scanning Electron Microscope (FESEM)”** organized by **Planning and Development Division, BCSIR, Dhaka** during 26-30, May 2024 at Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- V. Md.Tanzil Ahamed Shawon attended and successfully completed the in-house training program on **“Ion Chromatography & UV-visible spectrophotometry”**, organized by Planning and Development Division, BCSIR, Dhaka during 8-12 October 2023, Venue: INARS
- VI. Md.Tanzil Ahamed Shawon attended and successfully completed the in-house training program on **“Glove box”**, organized by Planning and Development Division, BCSIR, Dhaka during 5-9 June 2024, Venue: IERD
- VII. Md. Atikur Rahman attended and successfully completed the training course as a trainer on Operation and maintenance of **“UV-Visible Spectrophotometer & Ion Chromatography”** organized by **Institute of National Analytical Research and Service (INARS), BCSIR, Dhaka** during 1st -5th October 2023, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- VIII. Md. Atikur Rahman attended and successfully completed the training course on Operation and maintenance of **“Atomic Absorption Spectrophotometer(AAS)”** organized by **Institute of National Analytical Research and Service(INARS), BCSIR, Dhaka** during 21st - 25th April 2024, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- IX. Md. Atikur Rahman attended and successfully completed the training course on **“Introduction to Inductively Coupled Plasma Mass Spectrometry (ICPMS)”** organized by **Central Analytical and Research Facilities (CARF), BCSIR, Dhaka** during 12th -16th February 2023, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- X. Aynun Nahar attended and successfully completed the in-house training program on **“Photo-Electrochemical workstation with Frequency Response Analyzer”** organized by Planning and Development Division, BCSIR, Dhaka during 08-12 October 2023, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.
- XI. A. H. M. Shofiul Islam Molla Jamal successfully completed In house training on **“X-ray Photoelectron Spectrometer (XPS)”** Organized by Planning and Development Division, BCSIR, Dhaka during 03-07 December 2023, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.

Participation in Seminar/Conference/Symposium

1. **Dr. Ajoy Kanti Mondal** participated on oral presentation titled on “**Facile strategy of collagen-based lignin functionalized hydrogel for antibacterial, electricity harvesting, sensing and supercapacitor applications**” in “**Advancements in Material Characterization: A Glimpse into Diverse Applications**” held on 14-16 February 2024, CSIR-CLRI, Chennai, India.
2. **Dr. Ajoy Kanti Mondal** participated on oral presentation titled on “**Development of Fe³⁺ rich mussel-inspired collagen-based composite hydrogel for antibacterial, electricity harvesting and sensing applications**” in BCSIR Congress-2023, 08-10 March, 2024, BCSIR, Dhanmondi, Dhaka-1205, Bangladesh.
3. **Dr. Sabina Yasmin** Participated as oral presenter in **BCSIR Congress-2023**, held on n 8-10 March 4 at the premises of Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka main campus.
4. **Dr. Md Humayun Kabir** Participated as oral presenter in **BCSIR Congress-2023**, held on n 8-10 March 4 at the premises of Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka main campus.
5. **Dr. Md Humayun Kabir** Participated as oral presenter in 2nd Joint CSIR-BCSIR Symposium on “**Advancements in Material Characterization: A Glimpse into Diverse Applications**” held in 14 February 2024-16 February 2024
6. **Mehedi Hasan** Participated in ‘**BCSIR Congress -2023**’, organized by BCSIR, Dhaka, Bangladesh on 08-10 March 2023 and presented a poster presentation entitled “**Evaluation of physiochemical Parameters and Heavy metals characteristics in Shamasundori canal of Rangpur City, Bangladesh**”.
7. **Md. Atikur Rahman** participated on oral presentation titled on “**Graphene oxide-supported manganese-zinc oxide nanocomposites synthesized from spent zinc-carbon batteries for supercapacitors application**” in BCSIR Congress-2023, 08-10 March, 2024, BCSIR, Dhanmondi, Dhaka-1205, Bangladesh.
8. **Aynun Nahar** participated on poster presentation titled on “**Removal of antidiabetic drug (metformin) residue from aqueous system through carbon aerogel.**” in BCSIR Congress-2023, 08-10 March, 2024, BCSIR, Dhanmondi, Dhaka-1205, Bangladesh.
9. Lagshoi seminar: **A. H. M. Shofiul Islam Molla Jamal** According to source no. 39.02.0000.011.36.149.2021/950 date: 18/10/2021, Permission has been granted to demonstrate the technology of “First flush rain water harvesting system” developed by INARS in the seminar titled “Application and expansion of locally developed lagsai technology in the country”. Rainwater Harvesting System was exhibited in 30 (Thirty) Upazila in Lagshoi programme

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2023-2024

1Bangladesh Council of Scientific and Industrial Research
Institute of National Analytical Research and service (INARS)

In-house Training schedule-2023-2024

INARS always organizes hands on practical training internally all the year around.it provides practical knowledge of a certain research parameter to the scientists of INARS.

Student supervision

Name and session of students	Name of university	Subject	Degree	Title of thesis	Name of Supervisor	Working Duration
Md. Sumon Ahmed, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Analysis of Antibiotic residue in Poultry Chicken	Dr.Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Nishat Tasnim Bristy, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	An efficient adsorptive removal of Bisphenol-A from river water of Bangladesh	Dr.Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Khadija Akhter Poly, Session: 2020-2021	Jagannath University	Pharmacy	M.S.	Development and characterization of Artificial Blood	Dr. Muhammad Abdullah Al-Mansur, PSO	02.01.2023-01.01.2024
Abir Sufi Islam, Session: 2022-2023	Jahangirnagar University	Environmental Science	M.S.	Elemental contamination level in the water, sediment and aquatic species (fish, crab and snail) in the Buriganga river and associated risks assessment	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Sunjida Akhter, Session: 2020-2021	Hajee Mohammad Danesh Science and Technology University	Environmental Science	M.S.	Elemental contamination level in the water, sediment and aquatic species in the Bongshai river and associated risks assessment	Dr. Muhammad Abdullah Al-Mansur, PSO	02.01.2023-01.01.2024
Md.Toha, Session: 2021-2022	Bangladesh University of Professionals	Environmental Science	M.S.	Determination of Trace Metals from Landfill Sites in Dhaka City	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Amina Saleha, Session: 2020-2021	University of Dhaka	Environmental Science	M.S.	Physicochemical and Microbiological Contamination Analysis in Drinking Water of Different Hospitals in Dhaka City	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Shova Akter Session: 2022-2023	Khulna University	Environmental Science	M.S.	Heavy metal accumulation in the different soil aggregate fraction through atmospheric deposition	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Ananya Bhuiya, Session: 2020-2021	Noakhali Science and Technology University	Oceanography	M.S.	Method Development and Validation to Analyze Organochlorine Pesticides in Water and Fishes of Pond and River	Dr. Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Bishoonath Paul, Session: 2020-	Jagannath University	Pharmacy	M.Pharm.	Antibiotics residue analysis in Poultry Chicken	Dr. Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Md Shakib Khan, Session: 2021-2022	Noakhali Science and Technology University	Fisheries and Marine Science	M.S.	Trace metal toxicity assessment in available fish and shellfish species from southeastern coast of Bangladesh and their impact on human health	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Md. Abu Hasnat, Session: 2019-2020	Begum Rokeya University, Rangpur	Chemistry	M.S.	Assessment of trace elements and multi parameters of water quality in Rangpur city: A case study of Shamasundari canal, Rangpur, Bangladesh	Mehedi Hasan , SO	02.01.2023-01.01.2024

Asef Raj, Session: 2020-2021	University of Dhaka	Pharmacy	M.Pharm.	Phytochemical and biological investigations of leaves of Ceriops decandra (Family: Rhizophoraceae)	Dr. Muhammad Abdullah Al-Mansur, PSO	02.01.2023-01.01.2024
Md Rayhanul Islam Rayhan, Session: 2019-2020	Jahangirnagar University	Environmental Science	M.S.	Investigation of polychlorinated Biphenyls in Indoor Air of Dhaka, Bangladesh	Dr. Md. Ahedul Akbor, PSO	10.10.2022-09.10.2023
Mr. Md. Mehedi Hasan, Session: 2020-2021	Lincon University College, Malaysia	Chemistry	M.S.	Investigation of thermo-kinetic and thermo chemical conversion and combustion behavior of different indigenous solid wastes for potential energy production.	Dr. Muhammad Abdullah Al-Mansur, PSO	10.10.2022-09.10.2023
Mehreen Farid, Session: 2020-2021	Chattogram veterinary and Animal Sciences University	Applied Chemistry and Chemical Technology	M.S.	An effective method development to analyse sulfa drugs residue in bovine milk	Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Razia Sultana Ankhy, Session: 2019-2020	University of Dhaka	Chemistry	M.S.	Source apportionment of atmospheric brown carbon by the analysis of the spectral characteristics and chromophores of brown carbon in the ambient air of Dhaka city, Bangladesh	Dr. Md. Ahedul Akbor, PSO	10.10.2022-09.10.2023
Md. Sohag Hossain, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Synthesis of Reduced Graphene Oxide Based Nanocomposite and its Application in Antibiotic Adsorption from Aqueous Media.	Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Ilnaz Fargul Chowdhury, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Fabrication of Graphene Oxide Based Hydrogel for the Removal of Dyes and Antibiotics from Aqueous Solutions.	Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Nishat Tashin, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Preparation of Graphene Oxide Metal Oxide- Hydrogel Composite for Waste water Treatment.	Dr. Sabina Yasmin, SSO	10.10.2022-09.10.2023
Md. Amran Hossen Suvo, Session: 2020-2021	University of Dhaka	Physics	M.S.	Graphene Oxide (GO) based semiconducting Nanocomposites	Dr. Sabina Yasmin, SSO	10.10.2022-09.10.2023
Ndia Bulbul, Session: 2020-2021	Hajee Mohammad Danesh Science and Technology University	Food Science and Nutrition	M.S.	Impact of Abamectin pesticide exposure on tea-leaf metabolome and tea quality: A metabolomics approach using LC-MS and ¹ H NMR Spectroscopy	1. Shamim Ahmed, PSO 2. Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Abdur Rouf Azad, Session: 2019-2020	Chittagong University of Engineering And Technology	Chemistry	M.Phil.	----	Md. Ripaj Uddin, SO	10.10.2022-09.10.2023
Sagor Das, Session: 2019-2020	Jagannath University	Pharmacy	M.Pharm.	Development and Characterization of Artificial Meat	Md. Ripaj Uddin, SO	10.10.2022-09.10.2023

Research Fellow

SL	Research Fellow	University	Supervisor	Research Title
1	Md.Sanwar Hossain (30.06.2022)	Jashore University of Science & Technology, Jashore	Dr. Sabina Yasmin, SSO, INARS, Dhaka	Synthesis of Graphene Oxide-Based Nanocomposite and its Applications
2	Nasrin Akter Bhuiyan (30.06.2022)	Noakhali Science and Technology University, Noakhali	Sharmin Ahmed Trisha, SO, INARS, Dhaka	Determination of Antibiotic Resistance & Relevant Resistance Genes in Isolated Bacteria From Poultry Samples, Bangladesh
3	Md. Yeasin Pabel (01.03.2023)	University of Dhaka, Dhaka	Dr. Humayun Kabir, SSO, INARS, Dhaka	Graphene-Based Nanocomposites for the Electrochemical Sensing of Trace Level Arsenic in Aqueous Media
4	Nisat Taslum Jhumur (01.03.2023)	Jahangirnagar University, Dhaka	A.H.M Shofiul Islam Molla Jamal, SSO, INARS, Dhaka	Source Apportionment & Hydro-geochemical Evaluations of Shallow Groundwater & Its Suitability of Drinking & Irrigation Purposes in Kaligonj Upazila of Satkhira District, Southwestern Part of Bangladesh
5	Farjana Ashraphy (27.08.2023)	University of Rajshahi, Rajshahi	Mehedi Hasan, SO, INARS, Dhaka	Contamination levels of toxic elements in Gazipur industrial area of Bangladesh and their phytoremediation study
6	Nusrat Tabassum Shristy (01.04.2024)	University of Dhaka, Dhaka	Dr. Md. Ahedul Akbor, PSO, INARS, Dhaka	Removal of haloforms from treated water by adsorption onto carbon aerogel and waste tea leaf
7	Ilnaz Fargul Chowdhury (01.04.2024)	University of Dhaka, Dhaka	Dr. Ajoy Kanti Mondal, SSO, INARS, Dhaka	Preparation of functional hydrogel from industrial waste materials for its application in flexible electronics
8	Fahima Mojumder (01.04.2024)	Noakhali Science and Technology University, Noakhali	Dr. Humayun Kabir, SSO, INARS, Dhaka	Removal of Antibiotic Residue from Water using Graphene Based Materials

Strategic Objectives, Activities, Performance indicators and Goals of INARS 2023-2024:

Strategic Objectives	Activities	Performance Indicators	Target	Achievement
			2023-24	2023-24
1	2	3	4	5
1.Increase support for science and technology research	1.1 Research assistance in thesis / report editing	1.1.1 Supervising Thesis / Report	15	15
	1.2 Science and technology training	1.2.1 Trained manpower	20	20
	1.3 Method validation aimed at increasing the capacity of sample analysis	1.3.1 Validated method	06	06
2.Popularization of science and technology	2.1 Organizing seminars and workshops on science	2.1.1 Organized seminars and workshops	14	15
	2.2 Learning sessions on current issues	2.2.1 Learning sessions on current issues	1	1
3. Innovation of eco-friendly and sustainable technology for socio-economic development	3.1 Implementation of projects adopted for innovation and development of science, industry and technology	3.1.1 Ongoing and completed R&D project	12	12
	3.2 Informing stakeholders of research results	3.2.1 published scientific paper	15	25
		3.2.2 Organized seminars and workshops	1	1
	3.3 Transferable technology invented for industrial and commercial use	3.3.1 Process	1	1
		3.3.2 Patents	1	1
	3.4 Technology / Procedure Leasing and signing of Memorandum of Understanding (MoU)	3.4.1 Lease granted and Memorandum of Understanding signed	2	2
	3.5 Identification and solution of technical problems by inspecting industrial establishments	3.5.1 Inspection of industrial establishments and solution of identified problems	4	4
	3.6 Provide sample analysis and technical services	3.6.1 Analysis Services provided	1200	1330



ANNUAL REPORT 2023-2024 (Analytical Facilities)

Sophisticated Analytical Instruments Facilities at INARS



Total Organic Carbon (TOC) Analyzer



Gas Chromatograph (GC)



UV-Visible Spectrophotometer (UV-Vis)



High Performance Liquid Chromatograph (HPLC)



Ion Chromatograph (IC)



Preparative HPLC



PCR and Gel electrophoresis



Elemental (C, H, N, S) Analyzer



Microbiology Laboratory



Atomic Absorption Spectrometer (AAS)



Microscope



Fourier Transform Infrared Spectrometer (FT-IR)

Analytical Services Provided by INARS

Sample Matrix



Arsenic Filter Verification



Chemical Raw Materials



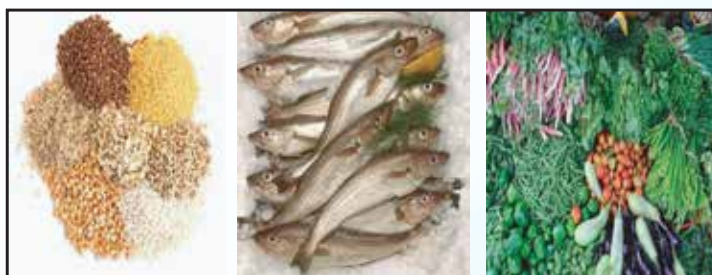
Coal, Oil and Petroleum Products



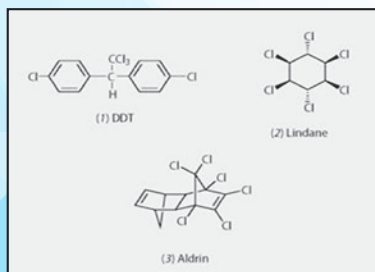
Drinking Water/Ground Water/Surface Water/Industrial Water/Waste Water



Drinks/Beverage



Feed, Fish, Vegetables



Synthetic Compounds



Soil and Minerals



Hand Sanitizer

ISO 17025:2017 Accredited Analytical Parameters for Water Quality Testing

1. Arsenic (As)	2. Phosphate (PO_4^{2-})/P	3. Fluoride (F^-)	4. Chloride (Cl^-)
5. Nitrite (NO_2^-)	6. Bromide (Br^-)	7. Nitrate (NO_3^-)	8. Sulphate (SO_4^{2-})
9. Iron (Fe)	10. Conductivity	11. Manganese (Mn)	12. pH
13. Total Dissolved Solids (TDS)	14. Hardness	15. Copper (Cu)	16. Zinc (Zn)
17. Sodium (Na)	18. Potassium (P)	19. Alkalinity	20. Oil & Grease
21. Aluminium (Al)	22. Cobalt (Co)	23. Nickel (Ni)	24. Lead (Pb)
25. Cadmium (Cd)	26. Chromium (Cr)	27. Calcium (Ca)	28. Magnesium (Mg)
29. Mercury (Hg)	30. Total Organic Carbons (TOC)	31. Phenolic Compounds	32. Acidity
33. Total Solids (TS)	34. Total Suspended Solids (TSS)	35. Turbidity	36. Ammonia (NH_3)
37. Chemical Oxygen Demand (COD)	38. Biological Oxygen Demand (BOD)	39. Salinity	40. Aldrin (Pesticides)
41. Alpha-BHC (Pesticides)	42. Beta-BHC (Pesticides)	43. Delta-BHC (Pesticides)	44. Gamma-BHC (Pesticides)
45. Alpha Chlordane (Pesticides)	46. Gamma Chlordane (Pesticides)	47. 4,4' -DDD (Pesticides)	48. 4,4' -DDE (Pesticides)
49. 4,4' -DDT (Pesticides)	50. Dieldrin (Pesticides)	51. Endrin (Pesticides)	52. Endrin aldehyde (Pesticides)
53. Endrin ketone (Pesticides)	54. Endosulfan I (Pesticides)	55. Endosulfan II (Pesticides)	56. Endosulfan sulphate (Pesticides)
57. Heptachlor (Pesticides)	58. Heptachlor Epoxide (Pesticides)	59. Methoxychlor (Pesticides)	60. Acenaphthene (PAH)
61. Acenaphthylene (PAH)	62. Anthracene (PAH)	63. Benzo (a) anthracene (PAH)	64. Benzo (a) pyrene (PAH)
65. Benzo (k) fluoranthene (PAH)	66. Benzo (g,h,i) perylene (PAH)	67. Benzo (k) fluoranthene (PAH)	68. Chrysene (PAH)
69. Dibenzo (a,h) anthracene (PAH)	70. Fluoranthene (PAH)	71. Fluorene (PAH)	72. Indeno (1,2,3-cd) pyrene (PAH)
73. Phenanthrene (PAH)	74. Pyrene (PAH)	75. 1-Methylnaphthalene	76. 2-Methylnaphthalene
77. Naphthalene	78. Carbonate (HCO_3^-) hardness by Titration Method	79. Non-carbonate Hardness	80. Negative Hardness
81. Carbon di-oxide (CO_2)	82. Carbonate by Titration Method	83. Bi carbonate (HCO_3^-) by Titration Method	84. Elemental Analysis - Carbon (%C)
85. Elemental Analysis - Nitrogen (%N)	86. Elemental Analysis- Hydrogen (%S)	87. Elemental Analysis- Hydrogen (%H)	88. Chlorine
89. Total Nitrogen	90. Color	91. Odour	92. Antimony
93. Molybdenum	94. Selenium	95. Silver	96. Vanadium
97. Beryllium	98. Lithium	99. Barium	100. Hydrogen per oxide

Other Analytical parameter

Additives	Selenium (Se)
Adulterants	Silica (SiO ₂)
Antimony (Sb)	Silicon (Si)
Appearance	Silver (Ag)
Barium (Ba)	Solvent Residue
Boron (B)	Strontium (Sr)
Cytotoxicity	Temperature
Dissolved Oxygen	Taste
Elemental Analysis- Oxygen (%O)	Tin (Sn)
Gold (Au)	Vanadium (V)
Pesticides residue	Volatile Organic Compounds (VOC)
Poly Chlorinated Biphenyls (PCB)	Total Coliform
Persistent Organic Pollutants (POPs)	Total Plate Count
Purity (Organic Solvent)	<i>E. Coli</i>
Molybdenum (Mo)	Fecal Coliform

For analytical service, please visit us at <http://bcsir.eserve.org.bd/users/login> or
 Contact us at the following address:
 Analytical Service Cell (ASC)
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Committees of INARS 2022-23

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2.	Umme Sharmin Akter, SSO, IGCRT, BCSIR, Dhaka.	Member
3.	Aynun Nahar, SO, INARS, BCSIR, Dhaka.	Member Secretary

Request for Quotation (RFQ) Process and direct purchase committee:

Sl. No.	Name	
1.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Mosharoff Hossain, PSO, IFRD, BCSIR, Dhaka.	Member
3.	Sheikh Md. Wazed Ali, Accounts Officer (Addl-charge), INARS, BCSIR, Dhaka	Member Secretary

Tender evaluation committee:

Sl. No.	Name	
1.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka	Convener
2.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka	Member
3.	Dr. Md. J.M. Golzar Hossain, Professor, Dept. of Chemistry, DU	Member
4.	Dr. Md. Shofiul Alam, Professor, Dept. of EEE, DU	Member
5.	Mahbub Hasan Khan, Director (accounting and finance)	Member
6.	Asst. Accounts Officer, INARS, BCSIR, Dhaka	Member
7.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Member Secretary

Technical Sub-Committee:

Sl. No.	Name	
1.	Aynun Nahar, SO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Tanim Rana, Engineer, PP&PDC BCSIR, Dhaka	Member Secretary

Technical Specification Committee:

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1.	Dr. Ajoy Kanti Mondal, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka	Member
3.	Aynun Nahar, SO, INARS, BCSIR, Dhaka	Member Secretary

Verification Committee (Apparatus and Chemicals):

Sl. No.	Name	
1.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Mohammad Moniruzzaman, PSO, BCSIR Laboratory, Dhaka.	Member
3.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka.	Member Secretary

Repair Committee

Sl. No.	Name	
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2.	Md. Sadequl Islam, ME, BCSIR, Dhaka.	Member
3.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka.	Member Secretary

Research & Development (R&D) Monitoring

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2.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka.	Member
3.	Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Member Secretary

Integrity and Ethics Committee:

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2.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka	Member
3.	Md. Abu Bakar Siddique, SSO, INARS, BCSIR, Dhaka.	Member
4.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Member Secretary

Innovation Committee:

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2.	Tajnin Jahan, SO, INARS, BCSIR, Dhaka.	Member
3.	Md. Tanzil Ahmed Shown, SO, INARS, BCSIR, Dhaka	Member Secretary

Service Provide and Implementation Committee:

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2.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Member Secretary

GRS Committee:

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1.	Sarker Kamruzzaman, Director (Addl. Charge), INARS, BCSIR, Dhaka.	Appeal Officer
2.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Grievance Mitigation Officer

Information right Committee:

Sl. No.	Name	
1.	Dr. Ajoy Kanti Mondal , SSO, INARS, BCSIR, Dhaka.	Convener
2.	Aynun Nahar, SO, INARS, BCSIR, Dhaka	Member Secretary

Annual Progress Report

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2.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Convener
3.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Member
4.	Dr. Ajoy Kanti Mondal , SSO, INARS, BCSIR, Dhaka.	Member
5.	Dr. Sabina Yasmin, SSO, INARS, BCSIR, Dhaka .	Member
6.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Focal point

Web-site Update Committee:

Sl. No.	Name	
1.	Sharmin Ahmed, SO, INARS, BCSIR, Dhaka.	Convener
2.	Rashed Mahmud, RC, INARS, BCSIR, Dhaka.	Member Secretary

4th Revolution Challenge Progress Report Committee:

Sl. No.	Name	
1.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Tanzil Ahmed Shown, SO, INARS, BCSIR, Dhaka	Member Secretary

Monthly Coordinated Program Progress Report Committee:

Sl. No.	Name	
1.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka	Convener
2.	Md. Tanzil Ahmed Shown, SO, INARS, BCSIR, Dhaka	Member Secretary

ISO Implementation Committee:

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2.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Member
3.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Member
4.	Dr. Ajoy Kanti Mondal , SSO, INARS, BCSIR, Dhaka.	Member
5.	Dr. Sabina Yasmin, SSO, INARS, BCSIR, Dhaka .	Member
6.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Member Secretary



Photo Gallery





First-Place Crest in BCSIR innovation showcasing



Celebration of ISO/IEC accreditation of 100 water Quality Parameters



Celebration of ISO 100 water Quality Parameters



BCSIR innovation showcasing Crest Received by INARS Scientist



Scientist Presenting on Congress-2023 at INARS



In-house training on BOD, COD and DO



In-house training on TDS and SS



Opening ceremony in INARS Microbiology lab



INARS Stakeholder meeting-2023



In-house training on pH and Conductivity



Scientist working on Microbiology lab



INARS Stakeholder meeting-2023



In-house training on Alkalinity and free chlorine



BCSIR-BNACWC training programme on Sampling



In House training on sample collection procedure



BCSIR-BNACWC training ceasing ceremony



Welcome spech of INARS Stakeholder meeting-2023 by INARS Director



In-house Traing on AAS



Scientists at BCSIR Congress 2023



In House training on AAS



Scientists enjoying technical session of BCSIR Congress 2023



Meeting on R&D progress of INARS



Scientists receiving certificate from BCSIR Congress 2023



In House training on AAS



Training on AAS



Seminar on Lagshoi exhibition at Cox's Bazar



Scentists visit Dhaka WASA



Cleaning and Washing glassware by INARS
Lab attendant



Monthly Coordination meeting, 2023



ISO Team of INARS



Scentists Presentating on R & D work



Research fellow of INARS, BCSIR



Research fellows of INARS, BCSIR



Analytical Report preparation by INARS technician



Administration Division of INARS



Administration Division of INARS