

Annual Report  
2017-2018



**Institute of National Analytical Research and Service**

**Bangladesh Council of Scientific and Industrial Research**

Message from Chairman, BCSIR



It is an immense pleasure for me to know that Institute of National Analytical Research and Service (INARS) is going to publish their 2<sup>nd</sup> Annual Report for the period of 2017-2018. This report highlights the year-long research and development (R & D) along with other activities. Scientist of this institute is engaged in research and development activities with the aim to provide safe water in Bangladesh. It has a great contribution in Research and Development in the field of analytical, environmental and Natural Product chemistry. The researches of this institute include arsenic mitigation, water purification, environmental technology verification and identifying active ingredients in medicinal plants. This institute performs verification of arsenic technologies as mandated by Govt. of Bangladesh. By doing this, INARS contributes in achieving sustainable development goal to ensure safe water for all in Bangladesh.

I strongly believe that this report will satisfy you through providing a picture of the year-long recorded achievement and activities of INARS. INARS also serves as a first ever ISO 17025:2005 accredited Govt. testing laboratory in Bangladesh. This laboratory has grown up as a centre of excellence of a number of sophisticated equipment such as AAS, GC, GC-MS, NMR, Ion chromatograph, Elemental analyser etc. INARS got accreditation on seventy four water quality parameters from Bangladesh Accreditation Board.

I would like to express my heartiest gratitude to the Director, members of the editorial committee, Scientist and all staff of INARS for their great contribution to the nation through relevant area of research.

Md. Faruque Ahmed  
Chairman  
BCSIR



#### Message from Director INARS

It's my pleasure to see that the annual report of Institute of National Analytical Research and Service (INARS) for the year 2017-2018 has been published. The annual report of INARS focuses on the overall activities of this institute and also describes other activities like participation in and offering training, seminars, testing services etc. It touches on the overall R & D activities including the achievement accomplished by the devoted scientists of this institute in publications. The research conducted in this institute is mainly based on analytical and environmental and natural product chemistry. This institute has been involved with research in arsenic mitigation from groundwater since last decade.

INARS enriched with some sophisticated equipment including AAS, GC, GC-MS, HPLC and NMR etc. The facility will encourage us to initiate innovative need based research in various fields in future.

In addition, we are committed to ensure quality testing service to our stakeholders using sophisticated equipment. In this context, INARS received ISO 17025:2005 accreditation certificate from Bangladesh Accreditation Board on seventy four (74) water quality parameters.

Finally, I would like to express my gratitude to honorable chairman of BCSIR for his encouragement and guidance and support in bringing out this annual. We gratefully acknowledge to his keen interest in research and development activities of this institute. I express my thanks to the editorial committee & the scientists for their cooperation.

Md. Aminul Ahsan  
Director (Addl. Charge)  
INARS, BCSIR

## Message from Convener

I feel immense honor that I am the convener of 2<sup>nd</sup> annual progress report 2017-2018 of Institute of National Analytical research and Service (INARS). The annual report of INARS for the year 207-2018 covers with great scientific aspect of its research activities. Along with its research activities INARs provide its analytical services to different government organization, different industries, NGOs, public and private universities through devoted scientists of this institute.

INARS is the first government laboratory in Bangladesh and only one in BCSIR that achieved ISO/IEC 17025:2005 accreditation from Bangladesh Accreditation Board on seventy four (74) water quality parameters. This institute plays a vital role in arsenic mitigation in Bangladesh.

INARS is equipped with some state of the arts instrument for enhancing the research and development as well as increasing the capacity of analytical services.

I would like to express my gratitude to the Director, INARS, BCSIR for his time to time guidance and enthusiastic support for completing this annual report. Finally, my heartiest appreciation goes the editorial committee for their hard work and also admits continuous support from all scientists, officers, and staff at the institute.

Shamim Ahmed  
Senior Scientific Officer &  
Convener, Annual Report 2017-2018

## Message from Member Secretary

It was my honor to be a member secretary of Institute of National Analytical Research and Service (INARS) publication committee for the period of 2017-2018. The annual report reflect the overall research and development activities, achievements, analytical services, participation and offering training, seminars, conferences and workshops .I hope it would be very useful for the researchers, industrialist, entrepreneurs, students and also other people. INARS has played a great role for providing safe drinking water. And maintained quality control and quality assurance protocol for the betterment of test results as an ISO/IES 2005; 17025 certified laboratory. INARS is always committed to serve the nation by doing quality research and services.

I express my sincere gratitude to the chairman of BCSIR for his continuous support and inspiration to prepare this annual report. I would also like to express my heartiest thanks to the Director, INARS for his time to time guidance and continuous support for completing this annual report.

I would like to express my thanks to all members of the publication committee, scientists, technologist, officers and staffs of INARS, BCSIR, Dhaka for their cooperation to prepare this report.

Md. Ahedul Akbor

SSO and Member Secretary

Annual Publication Committee

INARS, BCSIR, Dhaka

# Publication Committee

## Convener

Shamim Ahmed  
Senior Scientific Officer

## Members

Muhammad Abdullah Al-Mansur  
Senior Scientific Officer

Dr. Sabina Yasmin  
Scientific Officer

AHM Shofiul Islam Molla Jamal  
Scientific Officer

Md. Ripaj Uddin  
Research Chemist

## Member Secretary

Md. Ahedul Akbor  
Senior Scientific Officer



#### Institute of National Analytical Research and Service (INARS)

Institute of National Analytical Research and Service (INARS) was established in September 2016. Since then INARS has been conducting research mainly in the field of analytical, environmental and natural products chemistry. This institute is specialized in doing research on water chemistry, more specifically mitigating arsenic and other heavy metal contamination in water. The current trend of research of this institute has also expanded to investigate the organic contaminants in water. A significant contribution in this area of research has come from INARS as it has been involved with arsenic removal technology verification process since last decade. Through this, the institute has come up with the solution to ensure arsenic free drinking water for everyone in Bangladesh.

Besides, INARS has achieved ISO 17025:2005 accreditation as a first ever govt. testing laboratory in Bangladesh. Initially, it received accreditation for thirty four (34) water quality parameters which has been expanded to seventy four (74) parameters this year. The institute is always committed to provide testing services compliant to international standard.

The institute has a dedicated team consisting 24 scientists and technical staffs. The team has been contributing in research and development since last few decades. The team is always committed to personal and professional integrity and work together to fulfill a clear vision of the institute.



# Mission and Vision

## Our Mission

- Carrying out innovative research that create benefit for national economy of Bangladesh.
- Provide analytical services compliant to ISO/IEC 17025:2005 standard.

## Our Vision

- Achieve the status of INARS as a centre of excellence in analytical research and service by the year 2021.

Dr. Muhammad Qudrat-I-Khuda





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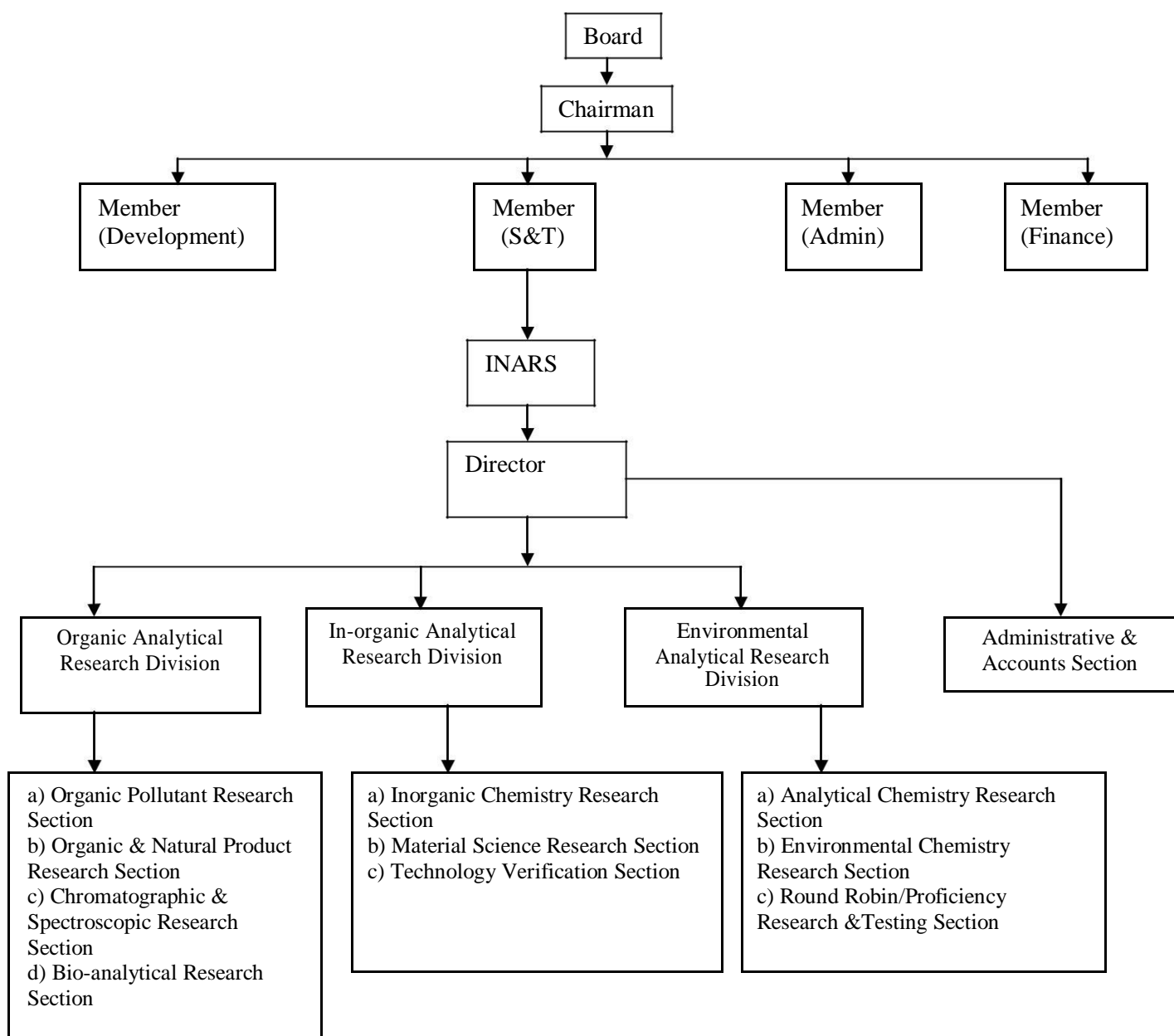
**Other analytical parameters**

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# Organizational Structure



## Divisions at INARS

<b>Organic Analytical Research Division</b>	<b>Inorganic Analytical Research Division</b>	<b>Environmental Analytical Research Division</b>
<b>Name and Designation</b>	<b>Name and Designation</b>	<b>Name and Designation</b>
1. Shamim Ahmed, SSO (Division in-charge)	1. Md. Ahedul Akbor, SSO (Division in-charge)	1. Dr. Shajahan Siraj, SSO (Division in-charge)
2. Mohammad Abdullah Al-Mansur, SSO.	2. Md. Abu Bakar Siddque, SO	2. Shakila Akter, SSO
3. AHM Shofiul Islam Molla Jamal, SO	3. AKM Habibur Rahman, JEO	3. Sabina Yasmin, SO
4. Md. Ripaj Uddin, RC	4. Nur Nabi Chowdhury, Technician	4. Khondaker Md. Abu Taleb, Jr. Tech.
5. Md. Nurul Islam, Jr. Tech.	5. Md. Jahangir Alam, Sr. Lab. Attn.	5. Ahammad Ali Islam, Lab. Tech.

## Budget Allocation and Expenditure of INARS

Year	Allocation (Tk)	Expenditure (Tk)
2017-2018	1,77,70,968/=	1,57,77,586/=

# Structure of Stakeholders of INARS

## Stake holder of INARS

- 1) BCSIR (Scientists & Research Fellow)
- 2) UNIVERSITY (Public & Private University Example- DU, JU, RU, CU etc)
- 3) RESEARCH ORGANIZATIONS ( BARI, BAEC, ICDDRB etc)
- 4) GOVERNMENT ORGANIZATIONS ( BSTI, FIQC, WASA, Dhaka Metro-rail Project, BARAPUKURIA COAL MINING COMPANY LIMITED)
- 5) INTERNATIONAL ORGANIZATIONS ( UNDP, UNHCR, UNEP etc)
- 6) CONSULTING ORGANIZATIONS ( ENRAC, EQMS, BETS, ABDUL MOMEN Group ,etc)
- 7) INDUSTRY ( KAFCO, SQUARE Pharmaceuticals, Rahim-Afroz, POWER PLANT, QTEX SOLUTIONS, AAA Corporations, SAMUDA Chemicals etc)
- 8) ANALYTICAL & ENVIRONMENTAL Monitoring ORGANIZATIONS (SURVEY BANGLADESH, SGS, BUREAU VERITAS)





# Research and Development



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## **Development of Low cost Arsenic Removal Technologies to mitigate Arsenic from contaminated water**

*Md. Ahedul Akbor, SSO, PL, Dr. Mohammad Mostafa, PSO, Md. Aminul Islam, PSO, Dr. Shajahan Siraj, SSO, Shamim Ahmed, SSO, Md. Abu Bakar Siddique, SO*

### **Introduction**

Water intended for human consumption should be both safe and wholesome. Without ample safe drinking water, communities cannot be healthy. Arsenic contamination of groundwater in Bangladesh is widespread and acute and an estimated 30 million Bangladeshi (Heikens 2006) obtain their drinking water from shallow tubewells that are contaminated with arsenic above the national drinking water standard of 50 mg/I (Government of Bangladesh [GoB], 1997). Arsenic is poisonous and known cancers causing agent (Centeno et al. 2002, Loewenberg 2007) and approximately 10,000 - 30,000 Bangladeshis have already been diagnosed with arsenicosis (Heikens 2006). Thus, meeting the need for arsenic-safe drinking water in Bangladesh is urgent. Arsenic removal filters could help meet the needs of some arsenic- affected populations, especially in areas where no arsenic-free water sources are available. Indeed, as a supplementary option, filters could help the government.

### **Objectives**

Developed a low cost Arsenic Removal Technology to mitigate Arsenic from the contaminated water and

- Provide technical information governing the performance of ART with various water matrices,
- Produce statements on the performance of ART under “real world” conditions,
- Support large-scale future technology deployment and installations
- Knowledge regarding the ART’s ability to remove other harmful chemicals from contaminated groundwater,
- Highlight ways and means of improving ART’s performance
- More importantly, obtain better knowledge and understanding of ARTs and their efficacy for generating safe drinking water for populations in arsenic-affected areas of Bangladesh

### **Progress / Outcome**

A literature review on existing technologies has been conducted for developing a low coat arsenic removal technology. One of the media and possible structure of this technology has been developed. Testing process is going on to find out how much arsenic it can remove, how much water it can treat without media saturation and tried to estimate it flow rate. Now we have tested it by using synthetic water. Site selection and well characterized has been done for real water testing.

## Removal of Heavy Metals from Polluted Water Using Low Cost Adsorbent Materials

*Md. Abu Bakar Siddique, SO, PL, Dr. Mohammad Mostafa, PSO, Md. Aminul Islam, PSO, Dr. Shajahan Siraj, SSO, Shamim Ahmed, SSO, Md. Ahedul Akbor, SSO*

### Introduction:

Heavy metal pollution has become one of the most serious environmental problems nowadays. The removal of heavy metals from the environment is of special concern due to their persistence. The presence of zinc, cadmium, nickel and other metals in the aqueous environment has a potentially damaging effect on human physiology and other biological systems when the acceptable levels are exceeded. Heavy metals cannot be degraded or destroyed. The conventional method for heavy metal removal includes chemical precipitation, membrane filtration, ion exchange, reverse osmosis, electro-dialysis, solvent extraction, evaporation, oxidation and adsorption. However, adsorption has proven to be economical and efficient for removing heavy metals, organic pollutants and dyes from polluted waters. In our work, a number of low cost adsorbent materials will be synthesized, processed and will be used as adsorbents for heavy metal removal.

### Objectives

- To remove heavy metals from waste water and ground water using low cost adsorbent materials.
- To find out a suitable adsorbent materials which acts as better adsorbents for heavy metals removal.
- To prepare an appropriate media which will help local people to remove toxic heavy metals from ground water for drinking purpose.
- To minimize heavy metals pollution in surface water.
- To mitigate heavy metal pollution due to industrial waste water.
- To develop a new appropriate technology for heavy metals removal.
- To Support large-scale future technology deployment and installations.
- To gather knowledge regarding the ability of this technique to remove other harmful chemicals from contaminated groundwater and waste water.

### Progress / Outcome:

Nine adsorbent materials including different oxides of Manganese, Graphene and their composites have been synthesized and characterized by XRD, FT-IR, SEM and TGA successfully. The materials are now using as adsorbent for heavy metals removal and **this whole process is under working.**

## Removal of Lead from waste water by low cost Adsorbents

*Md. Aminul Islam, PSO, PL, Md. Ahedul Akbor, SSO, Shamim Ahmed, SSO, Md. Majedul Haque, SSO, Md. Abu Bakar Siddique, SO, AHM Shofiul Islam Molla Jamal, SO*

### Introduction

Heavy metals such as lead can often be found in industrial wastewater and their discharge to the environment poses a serious threat **due** to their acute toxicity to aquatic and terrestrial life which includes humans. As a result of increasing industrialization more heavy metals are being continually released to the environment and this has prompted environmental engineers and scientists to investigate methods by which heavy metal-bearing wastewaters **can** be treated effectively and economically. Enhanced industrialization and discovery of various uses for lead however have caused humans to disinter it, which has caused the release of large quantities of the by-product of this material into air, soils and surface waters. It is used as an industrial raw material in manufacturing of storage batteries, television tube, printing, paints, pigments, photographic materials, fuels, matches and explosives. The manufacturing process of these materials produces lead-bearing wastewaters, which have to be treated and disposed of. One of the largest consumers of lead is the storage battery industry followed by the petroleum industry in producing gasoline additives. Lead concentrations in wastewater from battery manufacturing, acid mine drainage, tailing pond and steel production plants range from 0.5 to 25 mg/L.

### Objectives

- To find out a suitable and low cost adsorbent material(s) for developing a technology to remove toxic lead metal from industrial waste water.
- To prepare an appropriate media which will be helpful for lead base industries to remove toxic lead metal from their effluent.
- To mitigate heavy metal (Lead) pollution in our environment due to industrial waste (polluted) water.
- To Support large-scale future technology deployment and installations.
- To gather knowledge regarding the ability of this technique to remove other harmful chemicals from contaminated waste water.

### Outcome

## Chemical fingerprint profile of secondary metabolites of selected medicinal plants

*Shamim Ahmed, SSO, PL, Dr. Mohammad Mostafa, PSO, Muhammad Abdullah Al-Mansur, SSO  
Shakila Akter, SSO, Md. Ahedul Akbor, PL, Md. Ripaj Uddin, RC*

### Introduction

Plants may be regarded as libraries of small molecule secondary metabolite organic compounds with considerable structural diversity, which would otherwise probably be unavailable in a synthetic chemical laboratory. Plants have developed chemical defenses over millions of years against environmental threats such as UV radiation, reactive oxygen species and microbial attacks. Therefore phytochemicals are less toxic and biologically active. The present scenario shows the demand for plant drugs throughout the world because of its valuable phytochemicals. Now a day's new technology have made it possible to identify, screen and isolate these active compounds. The chromatographic and spectral fingerprints play an important role in the quality control of complex herbal medicines. Development of chemical fingerprints using TLC, HPLC is an effective tool for linking the identity for estimation of chemical and bio chemical markers. The advancement of TLC, High Performance Chromatography (HPLC) can provide an electronic image of chromatographic finger print and densitogram to detect the presence of a marker compound in the plant sample. It is efficient and economic for the analysis of broad number of compounds. It has the potential to determine authenticity and reliability of chemical constituent of herbal drug and formulation.

### Objectives

1. To develop HPLC fingerprints to distinguish the adulterant and standardization of herbal formulations.
2. To develop analytical method for isolation of marker chemicals from the standard herbal drugs or medicinal plants.
3. To ensure the quality of the herbal drugs using modern analytical techniques, for therapeutic efficacy and safety.

### Progress / Outcomes

Four medicinal plants *Adhatoda vasica*, *Andrographis paniculata*, *Asparagus racemonus* and *Withania somnifera* herbal monograph has been completed. Two compounds namely Neoandrographolides and quercetin 3-O-beta-D-glucopyranoside were isolated.

## **Development of value added products from *Aquillaria malaccensis* Lam (Agar) and *Tagetes erecta* Linn (Genda phul)**

*Dr. Mohammad Mostafa, PSO, PL, Shamim Ahmed, SSO, Shakila Akter, SSO, Md. Ahedul Akbor, SSO, Ms. Katrun Nada, CSO*

### Introduction

Agar is traded in several forms from large sections of trunk to highly processed fine products including incense and perfumes. The essence extracted from agar wood is now widely used as a fragrance to manufacture beauty soaps and shampoos etc. Trade in the agar wood dates back as early as the 13th century. Agar is one of the most promising non-timber forest products (NTFPs) of Bangladesh, and earned Tk.1 300M through exports of attar (agar oil) in 2004. About 25,000 workers were engaged in cultivation, collection, processing and marketing of agar and agar-based products in that year. Despite the huge demand in local and international markets, no major extension program has so far been conducted by governments or other agencies in Bangladesh. The plant *Tagetes erecta* Linn. Locally known as Genda Phul (Marigold) belongs to the family Asteraceae. It is a stout, branching herb, native of Mexico and other warmer parts of America and naturalized elsewhere in the tropics and subtropics including India and Bangladesh. The flower is useful in fevers, epileptic fits (Ayurveda), astringent, carminative, stomachic, scabies and liver complaints, skin diseases and is also employed in diseases of the eyes. The Essential Oil of *Tagetes* is extracted from its leaves, stem, stalk, and flowers by the process of steam distillation. The main components of this oil are limonene, ocimene, tagetone and valeric acid.

### Objectives

- To Extract, Fractionate and characterize of the active ingredients from *Aquillaria malaccensis* Lam and *Tagetes erecta* Linn.
- To evaluate the biological activities of the extracts as well as active ingredients.
- To develop of value added products from these active ingredients.

### Progress / Outcomes

The antibacterial and antioxidant activities as well as phytochemical screening of different extracts of *Tagetes erecta* L flowers have been completed. Two compounds were isolated from the ethylacetate extract by Column Chromatography and identified as Erythrodiol-3-palmitate and  $\alpha$ -Amyrin palmitate by NMR studies.

## **Development and validation of analytical methods for the estimation of vitamins in medicinal and dietary products**

*Dr. Shajahan Siraj, SSO, PL, Md. Aminul Islam, PSO, Shamim Ahmed, SSO, Muhammad Abdullah Al-Mansur, SSO, AHM Shofiul Islam Molla Jamal, SO, Md. Ripaj Uddin, RC*

### **Introduction**

Vitamins are organic compounds, essential nutrients, which are important to human and animals for the existence of their life. Vitamins are also crucial for the maintenance of good health. Our body obtains them from our diet. Most of the vitamins needed are found in foods. Shortage of vitamins in our body can develop deficiencies and result in health issues. Often doctors prescribe vitamins supplement to make up shortages. For this reason, the estimation of vitamins in medicinal and dietary products needs to be checked and it is very essential, in order to ensure correct intake and the accuracy of the label statements.

### **Objectives**

1. To develop a selective and sensitive analytical method for rapid quantification of water and fat soluble vitamins in various matrices.
2. To validate the analytical methods for specific vitamins in different matrix (plant products, dairy products, poultry products, beverages and drinks, candies, baby cereals and vitamin syrups etc).
3. To obtain ISO/IEC:17025 accreditation on analysis of vitamins in food supplements.

### **Progress / Outcomes**

A literature review on existing analytical methods has been conducted to find out the possible methods for application and room for further improvement. Standards of water and fat soluble vitamins such as vitamin B<sub>1</sub>, B<sub>2</sub>, B<sub>5</sub>, B<sub>6</sub>, B<sub>9</sub>, B<sub>12</sub>, ascorbic acid, Vitamin A, D,  $\beta$ -carotene etc. have been purchased separately and a mixed standard of the vitamins has been prepared. The prepared mixed standard has been analyzed using High performance liquid chromatograph and separate peaks are identified for individual vitamin standard. Some parameters *e.g.*, linearity, specificity, method detection limit are determined as part of validating the developed method. Some of the food supplementary products *e.g.*, baby cereals, vitamin syrups have been collected from local market to examine the amount of vitamins if they comply with the concentration shown on the label of the product.



## **Isolation and characterization of Bioactive compounds from *Anethum sowa* Linn.**

Muhammad Abdullah Al-Mansur, S.S.O Dr. Mohammad Mostafa, P.S.O., Md. Aminul Ahsan, P.S.O., Shamim Ahmed, S.S.O., Shakila Akter, S.S.O., Md. Ahedul Akbor, S.S.O., Mohammad Majedul Haque, S.O.

### **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. The purpose of extensive phytochemical research is to isolate the active constituents in the pure form to avoid unwanted effect and to ensure safe use of herbal medicines.

### **Objectives:**

The objective of this research project is to discover novel bioactive molecules from medicinal plants such as *Anethum sowa* Linn. (Family: Apiaceae ; Bengali name: Shulfa, Soya, Solup, Hoilfa, Sowa) using modern separation, isolation and spectroscopic techniques. Value addition of discovered bioactive molecules will be achieved through the development of precise, rapid and sensitive analytical method of detection and quantification useable for the quality evaluation of the source, followed by the non-destructive extraction, fractionation and isolation processes. The isolated bioactive molecules will be assessed for their safety and efficacy in animal models to find out the suitable lead compounds for the clinical study. Logical modification of constituents will be attempted for improved activity.

### **Progress / Outcomes**

The plant *Anethun sowa* Linn was collected from Karanigonj, Dhaka and it was identified by Bangladesh National Herbarium .The stems and seeds of the plant were extracted separately by n-hexane, dichloromethane, ethyl acetate and methanol in successive manner. Total eight extracts from different parts of the plant were examined for their bioactivity like Cytotoxic, Antimicrobial ,Antioxidant, Thrombolytic, Membrane Stabilizing, Antidiarrhoeal , Analgesic and Hypoglycemic activity using different well established bioassay procedures. The results of these bioassays were encouraging. Preliminary phytochemical screening of the plant extracts were performed & many valuable bioactive metabolites were found. Analyses of proximate composition, mineral, heavy metal contents and gas chromatography-mass spectroscopy (GC-MS) of different extracts have been carried out by separate experiments. The results of these analyses were significant.

## **Assessment of physicochemical properties of rainfall water in Bangladesh.**

A.H.M. Shofiul Islam mollajamal, SO, PL, Md. Aminul Ahsan, PSO, Shamim Ahmed, SSO, ShakilaAkteer, SSO, Md. Abu Bakar Siddique, SO, Md. Ripaj Uddin

### **Introduction**

Groundwater has been reported to be contaminated by the Arsenic (As) in Bangladesh since 1993, which was highly hazardous for human health and for food safety as well. To overcome the As contaminated health hazards, rainwater harvesting was found to be one of the best remedial measures for the rural people of Bangladesh. Bangladesh has a subtropical monsoon climate characterized by wide seasonal variations in rainfall, moderately warm temperatures, and high humidity. The number of mills and industries is increasing day by day. The time has come to identify the correlation between the quality of rainwater and the emission of the medium and heavy industries in the different area of Bangladesh.

### **Objectives**

To assess physicochemical properties of rainfall water in different regions ( Dhaka, Chittagong, Rajshahi, and Khulna) of Bangladesh during Spring, Summer, Autumn and Winter season. To assess the rainfall water whether it is acidic or not in different regions of Bangladesh. To investigate the variation of different physicochemical properties like PH, Electrical Conductivity, Acidity, Alkalinity, Hardness, Carbon dioxide, various anions, Volatile Organic Carbon, Total Organic Carbon, Total solids, Total dissolved solids, Silica, Lead etc of rainfall water. To use statistical data on physicochemical properties of rainfall water to harvest rainwater for drinking and agriculture purposes more scientific method.

### **Progress/Outcome**

Rainwater sample was collected two times in February and June in 2018 from Dhaka, Chittagong, Rajshahi, and Khulna and tested. The analysis result was significant. The dissolved oxygen of rainwater of Dhaka is the lowest and Rajshahi is the highest among collected samples. The quality of rainwater of Rajshahi and Khulna is better than that of Dhaka and Chittagong.

## **Scaling and Modeling on bottled and filter water quality from locally available in Bangladesh.**

Md. Ripaj Uddin, R.C. (PD), Md. Aminul Ahsan, P.S.O, Shamim Ahmed, S. S.O.

Md. AhedulAkbor, S. S.O, ShakilaAkter, S.S.O, Md Abu BakarSiddik, SO,A.H. M. Shofiul Islam Molla Jamal, S.O.

### **Introduction:**

Water is a basic need in our daily life and is essential in carrying out various physiological functions in the human body. Humans can survive without food for a month, but they can survive without water for only seven days. More than 50 national, regional, governmental and non-governmental industries produce drinking water every day but this water does not fulfil our demand or sanitation. Lack of law and policy of drinking water most of the companies produce distilled water which is very harmful to our health. The demand of drinking water is increasing day by day million liters per day so we should be careful about this matter. Government will be able to implement drinking water related law and policies.

### **Objectives:**

- To determine the minimum amount of mineral should be in drinking water
- To make scaling of water quality parameters in bottled water.
- To monitor on the bottled water and filter water in the local market and making a data sheet for modeling.

### **Expected outcome of the project:**

- Publish papers in international Journals.
- Determine fix amount of minimum mineral in drinking water
- Make sure a data sheet for modeling.
- Make sure scaling of water quality parameters in bottled water

Recommended to government for implement of water law and policies

## **Easy process development of desalination from saline water in Bangladesh.**

Md. Ripaj Uddin, R.C. (PD), Md. Aminul Ahsan, P.S.O, Shamim Ahmed, S. S.O.

Abdullah Al Mansur, S.S.O, Sabina Yeasmin, SO, Md Abu Bakar Siddik, SO.

### **Introduction:**

Salinity problem is the common problem in Costal area of Bangladesh. River or sea water available in Bangladesh but this water is not drinkable. The demand of drinking water incised day by day million liters per day so we should be careful about this matter. Every city has fallen below the level of water so it is time to do alter. Without mineral we do not ensure a defense against several diseases, such as congenital cataracts, nephrogenic problems, and diabetes. Government may earn foreign currency by the way of import business and fulfill domestic interest. Government will be able to implement drinking water related law and policies.

### **Objectives:**

- Salinity free drinking water
- To enrich values of potassium and sodium reflect its alleged ability to affect the human nervous system by drinking water.
- To make sure higher concentration of calcium and magnesium in drinking water this helps to maintain strong bones.
- To confirm the balanced mineral and nutritional composition of drinking water.
- To product higher quality of drinking water for drinking purposes obviously helps all kinds of people in Bangladesh.

### **Expected outcome of the project:**

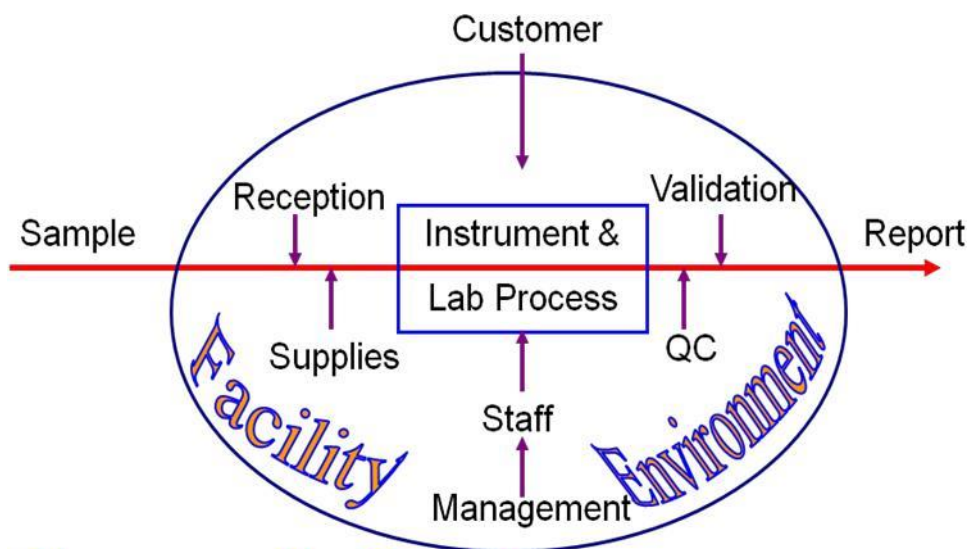
- 1. Publish papers in international Journals.
- 2. Development allow cost process which will be commercially important
- 3. Development an easy salinity refines process of sea or river water.
- 4. Recommended to government for implement of water law and policies

Picture will taken from ISO room

# ISO 17025:2005 Accreditation for international recognition

## Maintaining ISO 17025:2005 accreditation at INARS

The reliability of test results produced by a laboratory is laid upon a system which follows some international standards. One of the standards is ISO 17025:2005 that must be implemented in a testing laboratory to demonstrate the reliability of test data. The sophistication of the instrument alone does not ensure 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 17025:2005 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. At present INARS achieved accreditation of seventy four (74) water quality parameters from Bangladesh Accreditation Board (BAB).



***Manage all of this!***



List of quality system documents developed at INARS as below:

Document Name	Number
Standard operating procedure	74
Quality system procedure	10
Quality system form	30
Method validation	74
Quality manual	1
Quality policy	1
Calibration of pipette	7
Calibration of volumetric flask	50
Control chart	12
Participation in international proficiency testing program	5
Conducting round robin in Bangladesh	7

  
**Bangladesh Accreditation Board (BAB)**  
 91, Motijheel C/A, Dhaka-1000, Tel: +880-2-9513221 Fax: +880-2-9513222  
 Email: info@bab.org.bd Web: www.bab.org.bd

## Certificate of Accreditation

This is to certify that

**Institute of National Analytical Research and Services (INARS) BCSIR**  
 Dr. Qudrat-I-Khuda Road  
 Dhanmondi, Dhaka-1205, Bangladesh

has been granted accreditation in respect of the scope of accreditation described in the attached document, subject to the terms and conditions governing the relevant Conformity Assessment Body (CAB) accreditation

This Testing Laboratory having met the requirements of ISO/IEC 17025:2005 and the BAB, is accredited for Chemical Testing as described in the associated Scope of Accreditation.



Accredited for ISO/IEC 17025:2005

**Certificate Number :** 01.047.18

**Issued on :** 27 February 2018

**Accreditation Date :** 27 February 2018

**Valid until :** 26 February 2021

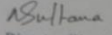
  
**Md. Monwarul Islam**  
 Director General  
 Bangladesh Accreditation Board (BAB)

This certificate has been issued under the authority of Bangladesh Accreditation Act, 2006 and must be returned on request; reproduction must follow guidelines in place at date of issue. For the specific scopes to which this accreditation applies, please refer to the directory of accredited CABs at <http://www.bab.org.bd/directory-of-accredited-cabs>

## QUALITY POLICY

**INSTITUTE OF NATIONAL ANALYTICAL RESEARCH AND SERVICE,**  
**BCSIR LABORATORIES, DHAKA**

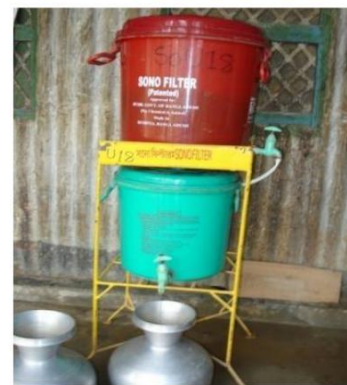
- INARS, BCSIR is committed to provide highest level of testing service in compliance with the regulatory and legal requirements and ISO/IEC 17025:2005 Standard and demonstrate compliance by the accreditation agency, clients audits, internal audits, management reviews and corrective action to continually improve the effectiveness the management system.
- INARS, BCSIR management is committed to maintain high ethical standards, good laboratory practices and good professional practice of our testing services to our clients.
- It is the policy of this laboratory that all testing services shall always be carried out in accordance with stated standardized methods and/ or our customer requirements.
- All employees of INARS must be aware of the relevance and importance of their activities in meeting customer, regulatory and legal requirements and implement these policies and procedures.

  
 Director/Head  
 INARS  
 BCSIR Laboratories, Dhaka

# **Endeavor for safe drinking water**

## Attempts to ensure safe drinking water for all

Arsenic contamination in groundwater in Bangladesh is a major concern. 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. Arsenic removal filter has been considered as a robust option in this process. Many ARTs have evolved in the last decades to produce arsenic safe water. Most of them have not been verified in the real world arsenic contaminated water. Their efficacies have been projected by relying on laboratory based experiment only. Therefore, it was necessary to verify the efficacy of the filter in real world using Bangladesh groundwater. Bangladesh Council of Scientific and Industrial Research (BCSIR) is mandated by the Government of Bangladesh to verify performance claims of Arsenic Removal Technologies (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. 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.



# Publications, Training, Conference and Others

## Publications

### Paper published in international journal

1. Sarwar Jahan., M. Azharul Islam., M. Mostafizur Rahman., Jannatun Nayeem., **Shamim Ahmed** and M. A. Quaiyyum. Steam and hot water pre-hydrolysis of bamboo and its Effect on residual lignin structure and pulping. *Cellulose Chem. Technol.*, 51 (5-6), 455-463 (2017).
2. Uddin MN., Majumder AK., **Ahamed S.**, Saha BK and Motalab M. Development of Method for Rapid Quantification of Glucose, Fructose and Sucrose in Mango Juice by Chemometric Techniques in De-noised FTIR Spectroscopic Data. *Int J Food Sci Nutr Diet.* 6(1), 338-344, 2017.
3. Zihan Rahman Khan, FatemaMoni, SuriyaSharmin, **Muhammad Abdullah Al-Mansur**, Abdul Gafur, Obaidur Rahman and FarhanaAfroz: Isolation of Bulk Amount of Piperine as Active Pharmaceutical Ingredient (API) from Black Pepper and White Pepper (*Piper nigrum* L.). *Pharmacology & Pharmacy*, 2017, 8, 253-262 <http://www.scirp.org/journal/pp> ISSN Online: 2157-9431 ISSN Print: 2157-9423,DOI: 10.4236/pp.2017.87018 July 31, 2017.
4. Shammi Akhter, Satyajit Roy Rony, **Muhammad Abdullah Al-Mansur**, Choudhury Mahmood Hasan, Khondaker Miraz Rahman and Md Hossain Sohrab : Lawsonol, a new bioactive naphthoquinone dimer from the leaves of *Lawsonia alba*. *Xumurnpupodhbixcoeduhehuu*, 2018, No1.
5. Anath Chandra Roy, Md. Eyazul Haque, Shakila Rahman, Muhammad Abdullah Al-Mansur: Piperine and isoflavan-4-one from the stems of *Piper chaba* Hunter and their *in vitro* antimicrobial activities. *Journal of Pharmacognosy and Phytochemistry* 2018; 7(1): 2653-2662.
6. **M. A. Akbor**, M. K.Uddin and M. A. Ahsan *J. Environ. Sci. & Natural Ressources*, 10(1): 75-80, 2017 ISSN 1999-7361 Investigation of Water Quality Parameters at Different Points in the Buriganga River, Bangladesh
7. **S. Yasmin**, M.S. Ahmed, S. Jeon, A noble silver nanoflower on nitrogen doped carbon nanotube for enhanced oxygen reduction reaction. *International Journal of Hydrogen Energy*, 42 (2017) 1075-1084.
8. **S. Yasmin**, Y. Joo, S. Jeon, 2,3-diaminopyridine functionalized reduced graphene oxide-supported palladium nanoparticles with high activity for electrocatalytic oxygen reduction reaction. *Applied Surface Science* 406 (2017) 226–234.
9. **S. Yasmin**, S. Cho, S. Jeon, Electrochemically reduced graphene-oxide supported bimetallic nanoparticles highly efficient for Oxygen Reduction Reaction with excellent methanol tolerance. *Applied Surface Science* 434 (2018) 905–912.
10. M. Shahidul Islam, Suman C. Mohanta, **Md. Abu Bakar Siddique**, M. Abdullah-Al-Mamun, Nazmul Hossain , UmmeyHafsaBithi, “Physico-chemical assessment of water quality parameters in Rupsha river of Khulna region, Bangladesh”, *The International Journal of Engineering and Science (IJES)*. Volume: 7, Issue: 1, PP. 73-78, 2018.

### Paper published in national journal

11. M. N. Uddin., A. K. Majumder., **S. Ahamed.**, B. K. Saha and B. Mumtaz. Chemometrics assisted method for classification of mango juice by FTIR spectroscopic data. *Bangladesh J. Sci. Ind. Res.* 52(2), 73-80, 2017.
12. **Muhammad Abdullah Al-Mansur**, M. Mahboob Ali Siddiqi, Md. AhedulAkbor and Koushik Saha : Phytochemical Screening and GC-MS Chemical Profiling of Ethyl Acetate Extract of Seed and Stem of *Anethumsowa* Linn. Dhaka Univ. J. Pharm. Sci. 16(2): 187-194, 2017 (December).
13. **Muhammad Abdullah Al-Mansur**, M. Mahboob Ali Siddiqi and KoushikSaha:Analgesic, Antidiarrheal and Antidepressant Activities of *Anethumsowa* Linn. in Swiss-Albino Mice Model. *Bangladesh Pharmaceutical Journal* 21(1): 1-6, 2018.
14. Mohammed Ibrahim, Md. Ruhul Kuddus, Md. Aslam Hossain, **Muhammad Abdullah Al-Mansur** and Mohammad A. Rashid : Preliminary Phytochemical Screenings and Pharmacological Activities of Three Medicinal Plants of Bangladesh. Dhaka Univ. J. Pharm. Sci. 16(2): 195-203, 2017 (December).
15. Akhtaruzzaman Chowdhury, Md. Ashraful Alam, Md. Shafiullah Shajib, **Muhammad Abdullah Al-Mansur** and Mohammad A. Rashid : Chemical Constituents and Protection of Biodiversity of *Coryphataliera*Roxb., a Critically Endangered Plant of Bangladesh. *Bangladesh Pharmaceutical Journal* 20(2) : 213-220, 2017.



## Training Obtained:

1. Shamim Ahmed, SSO has successfully completed fellowship programme on “parameterization of pH dependencies of spectral parameters for selected CWC-related chemicals and preliminary studies of plasma sample analysis using NMR” held in University of Helsinki, Finland on 01 September 2017 – 28 February 2018.
2. Dr. Shajahan Siraj, SSO and Md Abu Bakar Siddik, SO has participated training on Operating system and maintenance of "Wavelength Dispersive X-ray Fluorescence (WD-XRF)" during 22-24 October, 2017 at IMMM, BCSIR, Joypurhat, Bangladesh under In house training program.
3. Md Abu Bakar Siddik, SO has participated training on Operating system and maintenance of "Microwave Plasma Atomic Emission Spectrometer (MP-AES)" during 26-28 November, 2017 at IGCR, BCSIR, Dhaka, Bangladesh under In house training program.
4. Md Abu Bakar Siddik, SO has participated training on Operating system and maintenance of “Gas Chromatography-Mass Spectrometry (GC-MS/MS)” during 24-26 April, 2018 at DRiCM, BCSIR, Dhaka, Bangladesh under In house training program.
5. Md Abu Bakar Siddik, SO has Attended and successfully completed the Training Course on “Environmental Issues of Project Management” conducted by National Academy for Planning and Development (NAPD), Ministry of Planning of the People’s Republic of Bangladesh, Nilkhet, Dhaka, Bangladesh during 06-10 May, 2018.
6. Muhammad Abdullah Al-Mansur, S.S.O and Md. Ripaj Uddin, RC has participated training on Structure Based Drug Design, during 18-20 february, 2018 at Chitagong BCSIR.
7. Md. Ripaj Uddin, RC has participated training on English Language Proficiency, 14 February, 2018 to 25 April, 2018 at National Academy for Planning and Development (NAPD).
8. Dr. Shajhan Siraj, SSO and Md. Ripaj Uddin, RC have successfully Completed Training on Application of Chemo metrics and the Unscramber in Industrial Research. October, 2018 at BCSIR, Dhaka.
9. Shakila Akter, S.S.O and Md. Ripaj Uddin, RC have successfully completed training as a trainer on Ion Chromatograph (IC), 26-28 December, 2017, INARS, BCSIR, Dhaka.
10. Shamim Ahmed, S. S.O., Md. Ahedul Akbor, S. S.O, Md Abu Bakar Siddik, SO, A. H. M. Shofiul Islam Molla Jamal, S.O. and Md. Ripaj Uddin, RC have successfully Completed In house Training on Air Analyzer, August, 2018, INARS, BCSIR, Dhaka.
11. Sabina Yeasmin, SO, A. H. M. Shofiul Islam Molla Jamal, S.O. and Md. Ripaj Uddin, RC have successfully Completed In house Training on Atomic Absorption Spectroscopy, March, 2018, INARS, BCSIR, Dhaka.
12. Md. Ahedul Akbor, S. S.O, and Md. Ripaj Uddin, RC participated Basic Training on Triple Quadrupoles Inductively Coupled Plasma Mass Spectrometer (ICP-MS) held on 8-12 April 2018 at BCSIR organized by M/s. A&E International Pvt. Ltd. Dhaka

13. Md. Ahedul Akbor, S. S.O, and Md. Ripaj Uddin, RC have participated Training on e-GP and PPR-2008, 17 July, 2017, BCSIR Laboratories Dhaka.
14. Abdullah Al Mansur, S.S.O Successfully completed in the training course on "FOI Analytical Skills Development Course 2017" from 21 August – 01 September 2017 on GC and GC-MS at Umea, Sweden.
15. A. H. M. Shofiul Islam Molla Jamal, SO, Training on „Operating system and maintenance of Thermo gravimetric Analysis (TG/DTA)“ held at PP & PDC from 29-31 October 2017 organized by Planning and Development Division, BCSIR.
16. A. H. M. Shofiul Islam Molla Jamal, SO, Training on „Innovation in Public Service“ held at BCSIR, Dhaka from 16-17 November 2017 organized by Cabinet Division, Access to information (a2i) Programme, Prime Minister Office & BCSIR
17. A. H. M. Shofiul Islam Molla Jamal, SO, Training on „ Use, maintenance and troubleshooting of High Performance Liquid Chromatography (HPLC)“ held at IFST from 23-29 December organized by Network of Instrument Technical personnel and User scientists of Bangladesh ( NITUB)
18. A. H. M. Shofiul Islam Molla Jamal, SO, Training on „Real time polymerase chain reaction (PCR)“ held at BCSIR Laboratories, Rajshahi from 18-20 March 2018 organized by Planning and Development Division, BCSIR.
19. A. H. M. Shofiul Islam Molla Jamal, SO, Training on „ Public Procurement Management “ held at IGCRT, BCSIR, from 15-17 April 2018 organized by IGCRT, BCSIR.
20. A. H. M. Shofiul Islam Molla Jamal, SO, Training on „Capacity Building Training for Researchers, Batch-1“ held at BCSIR, Dhaka from 06-15 May 2018 organized by Planning and Development Division, BCSIR.
21. Rashedul Islam, LDA, Woaz Kazi, LDA, Hazera Akter, Office Shohayok, Moin Uddin, Lab.Attend, Md. Mashud Rana, Lab.Attend, have been successfully completed 5 days orientation Course, at IFST Conference room.
22. Md. Sikender Ali, AAO, Rashedul Islam, LDA, Woaz Kazi, LDA, have been successfully completed 5 days Basic Computer & E-filing Course, at Council Secretariat Computer Lab room.
23. Shakila Akter, S.S.O Participated in the training course on "Enhancement of Laboratory Skills on Quantitative Mass Spectrometry (QMS) " organized by Organization for the Prohibition of Chemical Weapons (OPCW) held at VERIFIN, University of Helsinki, Finland from 11 September 2017 to 22 September 2017.
24. Md. Ahedul Akbor, S. S.O, participated training on Office Management, 11-22 March, 2018 (20<sup>th</sup> Batch) held on NAPD, Ministry of Planning, Dhaka



## Participation in Seminar/Symposium/Workshop:

1. Shamim Ahmed, SSO has participated in the International Workshop on Analysis of Chemical Warfare Agents to Mark the 20th Anniversary of the CWC in Helsinki during 11-13 December 2017.
2. Md. Aminul Ahsan, P.S.O., Dr. Shajahan Siraj, SSO, Md. Ahedul Akbor, S. S.O, Abdullah Al Mansur, S.S.O, Shakila Akter, S.S.O, Md Abu Bakar Siddik, SO, A. H. M. Shofiul Islam Molla Jamal, S.O and Md. Ripaj Uddin, R.C has attended in the symposium on environmental chemistry for securing water quality, organized by BJSIR on 30 July 2017.
3. Md. Aminul Ahsan, P.S.O., Dr. Shajahan Siraj, SSO, Md. Ahedul Akbor, S. S.O, Abdullah Al Mansur and A. H. M. Shofiul Islam Molla Jamal, SO, has participated and presented postal presentation on „ Synthesis of Chitosan Succinate and Trimellate Chloride“ in International Conference on Chemical Science & Technology (ICCST-Chem) held KUET, Khulna from 24-25 February,2018.
4. Shamim Ahmed, SSO, and Shofiul Islam Molla Jamal has participated workshop on “Role of INGSA in building government science advice in Bangladesh” at BCSIR laboratories, Dhaka on 19 March 2018.

## Training Offered

1. Md. Aminul Ahsan, PSO, Shamim Ahmed, SSO, Muhammad Abdullah Al-Mansur, SSO, Shakila Akter, SSO, Md. Ahedul Akbor, SSO, Md. Abu Bakar Siddique, SO, AHM Shofiul Islam Molla Jamal, SO and Md. Ripaj Uddin, RC offered training to Student of Rajshahi University at INARS on AAS, IC, GC-MS, HPLC and NMR spectroscopy held 13-17 May, 2018.

## Industry visit

Shamim Ahmed, SSO, Muhammad Abdullah Al-Mansur, SSO, Md. Ahedul Akbor, SSO, has visited GSK pharmaceuticals on 25 June 2018 and Energy Pac Confidence Power Venture, Chittagong, Bangladesh on 26 June, 2018.

## Degree awarded

Sabina Yasmin, SO, awarded Ph.D Degree on “Metal-carbon nanomaterials as high performance catalyst for fuel cell and bio-molecule sensing” on 2018.

Md Abu Bakar Siddik, SO, awarded M.Phil degree on “Electrochemical capacitive properties of synthesized nano structured manganese oxides-graphene composites” on 31 March 2018.

## Student Supervision

1. Mr. Aminul Ahsan, Director (Addl. Charge), supervised thesis work of Nahid Sajia Afrin, Department of Chemistry, Jahangirnagar University, on “ The chemical analysis of natural products of medicinal plant *cuscuta reflexa*”.
2. Mr. Aminul Ahsan, Director (Addl. Charge), supervised thesis work of Tarannum Tasnim, Department of Chemistry, Jahangirnagar University, on “ The chemical investigation of medicinal plant *ctusifolia*”.
3. Dr. Samina Ahmed, Director (Addl. Charge) and Mr. Ahedul Akbor, SSO, supervised thesis work of Ekram Hossain, Department of Applied Chemistry and Chemical Engineering, Dhaka University, on “ Removal of heavy metals (Cr and As) from waste water using chitosan based adsorbants.

# Sophisticated Analytical Instruments Facilities at INARS



Nuclear Magnetic Resonance Spectrometer



Atomic Absorption Spectrometer



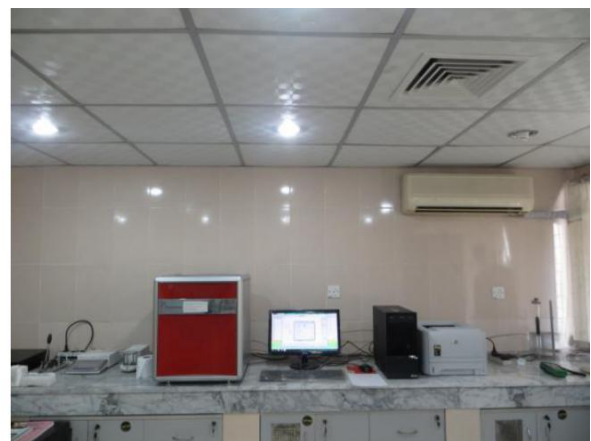
Gas Chromatograph



Gas Chromatograph – Mass Spectrometer



High Performance Liquid Chromatograph



Elemental Analyzer

## Analytical Services Provided by INARS

### Sample Matrix

Arsenic Filter Verification	Herbs/Herbal Products
Chemical Raw Materials	Natural Product Sample
Coal	Oil and Petroleum Products
Drinking Water/Ground Water/Surface Water/Industrial Water/Waste Water	Pharmaceuticals Products
Drinks/Beverage	Quality Assessment of food Products
Edible Oil	Soil and Minerals
Feed	Spices
Fish	Supplementary food
Food Samples	Synthetic Compounds
Fruits	Vegetables

### ISO 17025:2005 Accredited Analytical Parameters for Water Quality Testing

Acidity	Manganese (Mn)	Alpha-BHC (Pesticides)	Acenaphthylene (PAH)
Alkalinity	Mercury (Hg)	Beta-BHC (Pesticides)	Anthracene (PAH)
Aluminium (Al)	Nickel (Ni)	Delta-BHC (Pesticides)	Benzo (a) anthracene (PAH)
Ammonia (NH <sub>3</sub> )	Nitrate (NO <sub>3</sub> <sup>-</sup> )	Gamma-BHC (Pesticides)	Benzo (a) pyrene (PAH)
Arsenic (As)	Nitrite (NO <sub>2</sub> <sup>-</sup> )	Alpha Chlordane (Pesticides)	Benzo (b) fluoranthene (PAH)
Biological Oxygen Demand (BOD)	Oil & Grease	Gamma Chlordane (Pesticides)	Benzo (g,h,i) perylene (PAH)
Bromide (Br <sup>-</sup> )	pH	4,4' -DDD (Pesticides)	Benzo (k) fluoranthene (PAH)
Cadmium (Cd)	Phenolic Compounds	4,4' -DDE (Pesticides)	Chrysene (PAH)
Calcium (Ca)	Phosphate (PO <sub>4</sub> <sup>2-</sup> )/P	4,4' -DDT (Pesticides)	Dibenz (a,h) anthracene (PAH)
Chemical Oxygen Demand (COD)	Potassium (P)	Dieldrin (Pesticides)	Fluoranthene (PAH)
Chloride (Cl <sup>-</sup> )	Salinity	Endrin (Pesticides)	Fluorene (PAH)
Chromium (Cr)	Sodium (Na)	Endrin aldehyde (Pesticides)	Indeno (1,2,3-cd) pyrene (PAH)
Cobalt (Co)	Sulphate (SO <sub>4</sub> <sup>2-</sup> )	Endrin ketone (Pesticides)	Phenanthrene (PAH)
Conductivity	Total Dissolved Solids (TDS)	Endosulfan I (Pesticides)	Pyrene (PAH)
Copper (Cu)	Total Organic Carbons (TOC)	Endosulfan II (Pesticides)	
Fluoride (F <sup>-</sup> )	Total Solids (TS)	Endosulfan sulphate (Pesticides)	
Hardness	Total Suspended Solids (TSS)	Heptachlor (Pesticides)	
Iron (Fe)	Turbidity	Heptachlor Epoxide (Pesticides)	
Lead (Pb)	Zinc (Zn)	Methoxychlor (Pesticides)	
Magnesium (Mg)	Aldrin (Pesticides)	Acenaphthene (PAH)	

### Other Analytical parameter

Additives	Pesticides residue
Adulterants	Poly Chlorinated Biphenyls (PCB)
Antimony (Sb)	Persistent Organic Pollutants (POPs)
Appearance	Purity (Organic Solvent)
Barium (Ba)	Selenium (Se)
Bicarbonate ( $\text{HCO}_3^-$ )	Silica ( $\text{SiO}_2$ )
Boron (B)	Silicon (Si)
Carbon di-oxide ( $\text{CO}_2$ )	Silver (Ag)
Chlorine ( $\text{Cl}_2$ )	Solvent Residue
Colour	Strontium (Sr)
Cytotoxicity	Taste
Dissolved Oxygen	Temperature
Elemental Analysis- Carbon (%C), Hydrogen (%H), Oxygen (%O), Nitrogen (%N), Sulphur (%S)	Tin (Sn)
Gold (Au)	Vanadium (V)
Molybdenum (Mo)	Volatile Organic Compounds (VOC)

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)

Dr. Qudrat-I-Khuda Road, Dhanmondi, Dhaka-1205, Bangladesh.

Telephone: + 88 02 9671108, Fax: +88 02 9671108, E-mail. [asc@bcsir.gov.bd](mailto:asc@bcsir.gov.bd)

# List of Employees

## List of Scientists

Sl. No.	Name	Designation	Field of Specialization	E-mail	Phone
1.	Md. Aminul Ahsan	Director (Addl. Charge)	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation, Method Validation, Measurement uncertainty	<a href="mailto:aahsan_61@yahoo.com">aahsan_61@yahoo.com</a>	01712111195
2.	Dr. Shajahan Siraj	Senior scientific Officer	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	<a href="mailto:Shajahan.siraj.au@gmail.com">Shajahan.siraj.au@gmail.com</a>	01942840438
3.	Shamim Ahmed	Senior scientific Officer	Analytical, Environmental & Natural Product Chemistry, ISO 17025:2005 accreditation	<a href="mailto:shamimchem@yahoo.com">shamimchem@yahoo.com</a> <a href="mailto:shamiminars@bcsir.gov.bd">shamiminars@bcsir.gov.bd</a>	01959906726
4.	Muhammad Abdullah Al-Mansur	Senior scientific Officer	Analytical, Environmental & Natural Product Chemistry, ISO 17025:2005 accreditation	<a href="mailto:nayeembcsir@gmail.com">nayeembcsir@gmail.com</a>	01715010829
5.	Shakila Akter	Senior scientific Officer	Analytical, Environmental & Natural Product Chemistry, ISO 17025:2005 accreditation	<a href="mailto:shakilabcsir@yahoo.com">shakilabcsir@yahoo.com</a>	01913382006
6.	Md. Ahedul Akbor	Senior scientific Officer	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	<a href="mailto:akborbcsir@yahoo.com">akborbcsir@yahoo.com</a>	01816188859
7.	Dr. Md. Humayun Kabir	Senior scientific Officer	Analytical & Environmental Chemistry,	<a href="mailto:h.kabir79@yahoo.com">h.kabir79@yahoo.com</a>	01906750461
8.	Dr. Sabina Yasmin	Scientific Officer	Analytical Chemistry, ISO 17025:2005 accreditation	<a href="mailto:sabinausha@yahoo.com">sabinausha@yahoo.com</a>	01908468186
9.	Md. Abu Bakar Siddique	Scientific Officer	Inorganic, Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	<a href="mailto:sagor.bcsir@gmail.com">sagor.bcsir@gmail.com</a>	01723454310
10.	AHM Shofiul Islam Molla Jamal	Scientific Officer	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	<a href="mailto:shofiuljamal@yahoo.com">shofiuljamal@yahoo.com</a>	01717258753
11.	Md. Ripaj Uddin	Research Chemist	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	<a href="mailto:md.ripajuddin@gmail.com">md.ripajuddin@gmail.com</a>	01737134073

## List of Technical Personnel

Sl. No.	Name	Designation	E-mail	Phone
1.	A.K.M Habibur Rahman	Junior Experimental Officer	<a href="mailto:hrahmanzhontuinars@yahoo.com">hrahmanzhontuinars@yahoo.com</a>	01911152118
2.	Nur Nabi Chowdhury	Technician		01933180081 01670996960
3.	Khandakar Md. Abu Taleb	Technician		01726427249
4.	Md. Nurul Islam	Junior Technician		01726101456
5.	Md. Jahangir Alam	Junior Technician	<a href="mailto:Jahangirbesir8888@gmail.com">Jahangirbesir8888@gmail.com</a>	01722930929
6.	Ahmed Ali Islam	Sr. Lab Attendant		01718635031
7.	Moin Uddin	Lab Attendant		01910433143
8.	Masud Rana Talukdar	Lab Attendant		01718094780

## Personnel in Administration

Sl. No.	Name	Designation	E-mail	Phone
1.	Md. Sikender Ali	Assistant Accounts Officer	<a href="mailto:alimdsikender@gmail.com">alimdsikender@gmail.com</a>	01817590675
2.	Rashedul Islam	LDA	<a href="mailto:Rashedulislam.inars@mail.com">Rashedulislam.inars@mail.com</a>	07123369864
3.	Md. Woaz Kazi	LDA	<a href="mailto:Mkwoaz_1994@gmail.com">Mkwoaz_1994@gmail.com</a>	01688376427
4.	Md. Amir Hossen	MLSS	<a href="mailto:Amirtapon4898@gmail.com">Amirtapon4898@gmail.com</a>	01872647972
5.	Dithi Rani Dhoom	Cleaner		

**Innovation team**

Sl. No.	Name	
1.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Convener
2.	A.H.M Shafiul Islam Mollah Jamal, SO, INARS, BCSIR, Dhaka.	Member
3.	Md. Ahedul Akbor, SSO, INARS	Member Secretary

**Tender opening committee:**

Sl. No.	Name	
1.	Muhammad Abdullah Al-Mansur, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Nasir Uddin, SSO, Laboratory, BCSIR, Dhaka.	Member
3.	Md. Ahedul Akbar, SSO, INARS, BCSIR, Dhaka.	Member Secretary

**Tender evaluation committee:**

Sl No.	Name	
1.	Director, INARS, BCSIR, Dhaka.	Convener
2.	Nominated Representative, Department of Chemistry, Dhaka University, Dhaka.	Member
3.	Nominated Representative, Department of Chemistry, BUET, Dhaka.	Member
4.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Member
5.	Md. Mahbub Hasan Khan, Director (Addl. Charge), BCSIR, Dhaka	Member
6.	Md. Ahedul Akbor, SSO, INARS, BCSIR, Dhaka.	Member
7.	Md. Sikender Ali, Assistant Accounts Officer, INARS, BCSIR, Dhaka.	Member Secretary

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

Sl No.	Name	
1.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Shahriar Bashir, SSO, IFRD, BCSIR, Dhaka.	Member
3.	Md. Sikender Ali, Assistant Accounts Officer, INARS, BCSIR, Dhaka.	Member Secretary

**Technical Sub-Committee:**

Sl No.	Name	
1.	Shakila Akter, SSO, INARS, BCSIR, Dhaka.	Convener
2.	A.H.M Shafiul Islam Mollah Jamal, SO, INARS, BCSIR, Dhaka.	Member
3.	Md. Abu Bakar Siddique, SO, INARS, BCSIR, Dhaka.	Member Secretary

**Estimated Price Verification Committee:**

Sl No.	Name	
1.	Muhammad Abdullah Al-Mansur, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Ripaj Uddin, RC, INARS, BCSIR, Dhaka.	Member
3.	Shakila Akter, SSO, INARS, BCSIR, Dhaka.	Member Secretary

**Verification Committee:**

Sl No.	Name	
1.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Mohammad Moniruzzaman, SSO, BCSIR Laboratory, Dhaka.	Member
3.	Md. Ahedul Akbor, SSO, INARS, BCSIR, Dhaka.	Member Secretary

**Annual Performance Agreement (APA)**

Sl No.	Name	
1.	Md. Ahedul Akbor, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Member
3.	Muhammad Abdullah Al-Mansur, SSO, INARS, BCSIR, Dhaka.	Member
4.	Md. Shakila Akter, SSO, INARS, BCSIR, Dhaka.	Member
5.	Dr. Sabina Yasmin, SO, INARS, BCSIR, Dhaka.	
6.	A.H.M Shafiul Islam Mollah Jamal, SO, INARS, BCSIR, Dhaka.	Member
7.	Md. Ripaj Uddin, RC, INARS, BCSIR, Dhaka.	Member
8.	A.K.M. Habibur Rhaman, JEO, INARS, BCSIR, Dhaka.	Member
9.	Md. Abu Bakar Siddique, SO, INARS, BCSIR, Dhaka.	Member Secretary



**Annual Report:**

Sl. No.	Name	
1.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Muhammad Abdullah Al-Mansur, SSO, INARS, BCSIR, Dhaka.Dhaka.	Member
3.	Dr. Sabina Yasmin, SO, INARS, BCSIR, Dhaka.	Member
4.	A.H.M Shafiul Islam Mollah Jamal, SO, INARS, BCSIR, Dhaka.	Member
5.	Md. Ripaj Uddin, RC, INARS, BCSIR, Dhaka.	Member
6.	Md. Ahedul Akbor, SSO, INARS, BCSIR, Dhaka.	Member Secretary

**Committee for monitoring daily activities of INARS**

SI No.	Name	
1.	Md. Aminul Ahsan, Director (addl. Charge), INARS, BCSIR	Convener
2.	Shamim Ahmed, SSO, INARS, BCSIR, Dhaka.	Member
3.	Muhammad Abdullah Al-Mansur, SSO, INARS, BCSIR, Dhaka.	Member
4.	Md. Shakila Akter, SSO, INARS, BCSIR, Dhaka.	Member
5.	Md. Ahedul Akbor, SSO, INARS, BCSIR, Dhaka.	Member
6.	Md. Sikender Ali, Assistant Accounts Officer, INARS, BCSIR, Dhaka.	Member Secretary

# **Photo Gallery**



















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