Bangladesh Academy of Sciences
NEWSLETTER
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Condolence for the departed soul of National Emeritus Scientist Dr. Kazi M Badruddoza, former Secretary, Bangladesh Academy of Sciences

National Emeritus Scientist Dr. Kazi M Badruddoza, former Secretary, Bangladesh Academy of Sciences died in Dhaka (Inna lillahi wa inna ilayhi raji'un) at the Crescent Hospital on 30 August 2023, at the age of 96. On his sad demise, the Academy has lost a valued scientist and the country a great son. The Fellows of the Academy expressed heartfelt sympathy to his bereaved family.

Dr. Kazi M Badruddoza (1927-2023)

National Emeritus Scientist Dr. Kazi Mohammad Badruddoza was born on 1 January, 1927 at Bogra, Bangladesh. He received M.Ag., Dhaka University in 1952. Ph.D., La. State University, USA in 1975. Dip-in-Genetics, Lund University, Sweden, 1960.

He was honored with (a) National titles (Tamgha-e-Imtiaz and Tohfa-e-Pakistan) of distinction for meritorious services in Agricultural Research and Education in Pakistan; "Kazi Mahbubullah Award 1982" Gold Medal for contributions in Institution Building in Bangladesh; and D.Sc. (Honoris Causa, India); (b) National Emeritus Scientist, Bangladesh; Gold Medal from several National Institutes and Associations and Recipient of "Independence Award 2012". As a pioneer agricultural scientist, Dr. Badruddoza developed the well known "Kazi Peara" (a special variety of guava); introduced field scale cultivation of wheat and initiated maize research in Bangladesh. He has been honored as Emeritus Scientist, National Agricultural Research System (NARS), Bangladesh. His specialization is in Plant Breeding/ Institution Building.

Dr. Badruddoza was Head, Economic Botany Division, Agril. Research Inst., Dhaka, (1957-1964); Senior Director of Research, National Emeritus Scientist, was Executive Director, Pakistan Agricultural Research Council, 1964 – 1972; Director General, Pakistan Agricultural Research Council, 1972; Director Agriculture (Research and Education), Bangladesh and Founder Director, Bangladesh Agriculture Research Institute (BARI), 1974–1979; Chairman, Bangladesh Agricultural Research Council (BARC), 1974-1977 and 1979–1981; Chief Research Adviser, FAO/UNDP, Hanoi, Vietnam, 1985-1988. Chairman International Life Sciences Institute, Bangladesh.

Dr. Kazi Badruddoza was a Member of Agricultural Resource Coordination Board, Pakistan (1964-1971); Central Cotton Committee, Pakistan (1968); Pakistan American Joint Agricultural Research Evaluation Team (1968); Board of Governors, Bangladesh Rice Research Institute (1974-1985); Board of Governors, Bangladesh Jute Research Institute (1974-1985); Syndicate of the Bangladesh Agricultural University (1974-1988); Senate of Dhaka University, Bangladesh (1981-1984); Member, Syndicate of Sheikh Mujibur Rahman Agricultural University; Advisory Board, Bangladesh Atomic Energy Commission (1980 - 1984); Bangladesh National Council for Science and Technology; Chairman, Bangladesh Milk Producers Co-operative Union Ltd. Milk Vita: (1979-1982); Pesticide Technical Committee, Govt. of Bangladesh (1976-1984).

Dr. Badruddoza was a member of Advisory Committee, Tropical Products Institute (TPI), London 1977-1979; Consultation Group, Agril. Information Bank for Asia (AIBA); Task Force constituted by Consultative Group Intl. Agricultural Research (CGIAR) for the establishment of Intl. Service for National Agril. Research (ISNAR); Board of Trustees, International Service for National Agricultural Research (ISNAR), the Hague 1979–1984; International Federation for Agricultural Research and Development (IFARD); Country Coordinator, Agricultural Research Management for Asia; Member, Governing Board of CGPRT Centre (ESCAP), Bogor Indonesia; Consultant, UNDP, FAO and ESCAP; Member, Quinquennial Review Team, International Rice Research Institute (IRRI), Manila 1987; Chairman, Agricultural Group South Asian Assoc. for Regional Cooperation.

He was President, Section of "Agriculture, Animal Husbandry and Forestry" of the Bangladesh Association for the Advancement of Science (1975). Also President, Bangladesh Association for the Advancement of Science (1978); Director of the Board of Management, Bangladesh Bank;

Dr. Badruddoza established or prepared concept papers for the Bangladesh Agricultural Research Institute (BARI); The Bangladesh Fisheries Research Institute; The Bangladesh Livestock Research Institute and reorganized the Bangladesh Agricultural Research Council (BARC); the Arid Zone Research Institute (Pakistan) and the Institute of Genetics (Vietnam).

Condolence for the departed soul of Professor Dr. A. K. Md. Ehsanes Saleh Expatriate Fellow, Bangladesh Academy of Sciences

Professor Emeritus and Distinguished Research Professor Dr. AK Md. Ehsanes Saleh, School of Mathematics and Statistics, Carleton University, Canada has passed away in a nursing home in Ottawa, Canada on 03 September 2023 (Inna lillahi wa inna ilayhi raji'un). He peacefully departed from this world at the age of 91. The Academy has lost a valued scientist and the country a great son. The Fellows of the Academy expressed heartfelt sympathy to his bereaved family.

Professor A. K. Md. Ehsanes Saleh (1932-2023)

Professor A. K. Md. Ehsanes Saleh was born on 01 January 1932 Birkrampur in the district of Munshigonj, Dhaka, Bangladesh.

He earned B.Sc. in Statistics (1951), Dhaka University; M.Sc. in Statistics (1953), Dhaka University; M.A. in Mathematical Statistics (1962), University of Western Ontario; and Ph.D. in Mathematics in Mathematical Statistics (1965), University of Western Ontario.

Professor A. K. Md. Ehsanes Saleh, currently Distinguished Research Professor and Professor Emeritus, School of Mathematics & Statistics, Carleton University, Canada.

After late Q.M. Hossain, Dr. Saleh is the lead Statistician of Bangladesh and for many decades he is known as a leader for Canadian Statistics. He is a Fellow of the Institute of Mathematical Statistics, Fellow of American Statistical Association Honorary member of Canadian Statistical Society, Bangladesh Statistical Association, elected member of Royal Statistical Soceity and International Statistical Institute. Dr. Saleh supe vised 14 Ph.Ds, 5 prominent Postdoctoral and 30 Masters students from all around the world.

He worked as Statistical Officer, in the Central Statistical Office, Karachi (1954 - 1961); Lecturer, Department of Mathematics, University of Western Ontario (1964 - 1966); Assistant Professor, Department of Mathematics, Carleton University (1966 - 1967); Associate Professor, Department of Mathematics, Simon Fraser University (1967 - 1968), Associate Professor, Department of Mathematics and Statistics, Carleton University (1968 - 1978).

Distinguished Research Professor and Professor Emeritus, School of Mathematics and Statistics, Carleton University (1997 - till dead).

Prof. Saleh's research areas includes, Nonparametric Statistics; Order Statistics; Robust Estimation; Preliminary Test and Shrinkage Estimation; Empirical Bayes Estimation; Multivariate Analysis; Survival Analysis; Time-Series Analysis; books Regression Quantities; Asymptotic Theory. He has published more than 250 scholarly papers and 5 books with WILEY, and 2 edited books.

Dr. Saleh was awarded Gold Medal (2006) by the Institute of Statistical Research and Training (ISRT), Dhaka University, Bangladesh; Gold Medal 2005 by ISOSS for outstanding contributions to statistical sciences and the impact of the Wiley Book "An Introduction to Probability and Statistics; He was honored with a plaque by the Federation of Bangladesh Association of North America (FOBANA) at the 14th Annual Meeting at Toronto (September 1 - 4, 2000). [Citation: Most Outstanding Statistician and Academic of Bangladesh and Pride of Bangladesh]. Awarded ISESCO- ISOSS Gold Medal (1999). Award of Gold Medal and a certificate by the Islamic Society of Statistical Sciences (ISOSS) and Islamic Educational, Scientific & Cultural Organization (ISESCO), 1999; Award of Excellence with a plaque by the Canada Bangladesh Muslim Community, Ottawa, 1999. Professor Saleh's achievements have brought pride and glory to the people of Bangladesh and to Muslims all over the world; Eugene Lukacs Distinguished (visiting) Professor, 1992 - 1993, Bowling Green State University, Ohio; Award of Q.M. Hosain Gold Medal by Bangladesh Statistical Association, 1992. Ogawa Award jointly with T. Kubokawa for best paper in the Journal of Japanese Statistical Society, 1991.

He was Editor-in-Chief, Journal of Statistical Research (18 years); Journal of Nonparametric Statistics (from inception to 2003).

Dr. Saleh was visiting Professor at MIT, Charles University, Prague, Stanford University, California, Michigan State University, University of TORONTO, Adjunct Professor, Kansas University, Kansas.

NATIONAL EVENT

Lecture on Drug Discovery: Bioactive compounds from Medicinal Plants, Microbes and Marine Organisms by Prof. Dr. Md. Abdur Rashid

Bangladesh Academy of Sciences (BAS) organized the Academy Lecture on "Drug Discovery: Bioactive compounds from Medicinal Plants, Microbes and Marine Organisms" on 13 June 2023 at 11:00 a.m. at the Pharmacy Lecture Theatre, Faculty of Pharmacy, University of Dhaka. Dr. Md. Abdur Rashid, Fellow, BAS and Professor, Department of Pharmaceutical Chemistry, University of Dhaka was the speaker.

Dr. Md. Abdur Rashid delivering his Academy Lecture

Participants at the Academy Lecture

Emeritus Professor Dr. AK Azad Chowdhury, President, BAS was present at the Lecture as the Chief Guest. Prof. Dr. Sitesh Chandra Bachar, Dean, Faculty of Pharmacy, University of Dhaka was present at the Lecture as the Special Guest and Prof. Dr. Zahurul Karim, Vice President, BAS presided over the occasion. Prof. Dr. Yearul Kabir, Associate Secretary, BAS, moderated the lecture.

Address by Emeritus Professor Dr. AK Azad Chowdhury, President, BAS at the Academy Lecture

Address by Prof. Dr. Sitesh Chandra Bachar, Special Guest at the Academy Lecture

About 120 Fellows, Faculty members, scientists, researchers and students of different departments were present and enjoyed the presentation.

A summary of the Academy Lecture is given below:

Prof. Rashid started his deliberation saying that the cure for a disease in a particular geographical location is available in the natural resources and emphasized the importance of working with naturally-derived substances, especially plants, microbes and marine sources. Accordingly his lecture was organized into several sections, including natural products combating antimicrobial resistance (AMR), AIDS, cancer, diabetes, pain, oxidative stress, and hypertension.

Traditionally, natural products (NPs) have been the primary sources of therapeutic substances and continue to play a significant role in advancing the fields of chemistry, biology, and medicine due to their extensive range of diverse structures and chemical properties. According to the WHO, approximately 80% of the global population still relies on traditional medicines as their primary form of healthcare. Out of the 1,394 new small molecule drugs approved by the US-FDA between 1981 and 2019, 71 were in their original natural form, 14 were botanical drugs consisting of defined mixtures, 356 were derivatives of natural products, 65 were synthetic drugs based on the pharmacophores of natural products, and 424 were mimic of natural products.

Antimicrobial resistance (AMR) has emerged as a serious global public health problem. It occurs when microorganisms undergo modifications over time, yielding them unresponsive to medications. As a result, infections become challenging to treat, and the likelihood of disease transmission, severe illness, and death increases. Currently, nearly one million people lose their lives per year due to AMR. Scientists and researchers predict a further escalation, with a projected death toll of over 10 million people annually by 2050, even in basic surgeries or infections due to AMR. At this stage, currently, antimicrobial products of natural origin have been positioned as compounds of great scientific interest due to their enormous chemical diversity and intrinsic properties.

Prof. Rashid emphasized the importance of volatile oil of Nigella sativa (black seed, Kalojira) against bacterial infections based on his research findings. It was observed that in-vitro anti-shigella activity against eight multi drug-resistant strains of Shigella flexneri. In vivo model, the serum of monkeys showed anti-shigella activity within 45-60 minutes of receiving 0.5 and 1.0 ml of the volatile oil orally. When tested on monkeys with shigellosis, the oil displayed significant in-vivo anti-shigella activity against the same strain, completely curing the infected monkeys in just 3 days.

Prof. Rashid also explained very promising antimicrobial compounds, such as garuganin V (diarylheptanoid) and usnic acid, isolated from Garuga pinnata and Parmelia kamtschandlis, respectively. Both compounds exerted higher or comparable zone of inhibition against various gram positive and gram-negative bacteria than the standard antibacterial drugs. Four compounds belonging to the diphenylpropanoid class were isolated from Quisqualis indica. All compounds underwent testing for anti-staphylococcal activity to assess their effectiveness against multidrug-resistant and methicillin-resistant Staphylococcus aureus strains. The minimum inhibitory concentrations (MICs) for these compounds ranged from 128 to 256 µg/ml. Similarly, the antimicrobial properties of the petroleum ether extract from the stem bark of Polyalthia longifolia var. pendulla and the diterpenes isolated

from the species were investigated. Among the diterpenoids, 16-oxocleroda-3,13 E-dien-15-oic acid demonstrated the highest antimicrobial potential against several bacteria and kanamycin-resistant fungal strains, including Asperigillus fumigatus, Saccharomyces caulbequence, S. cerevaceae, Candida albicans, and Hensila californica, surpassing the effects of kolavenic acid and 16β-hydroxycleroda-3,13E-dien-15,16-olide. The minimum inhibitory concentrations of all these compounds were determined, which revealed 8 to 64 µ g/mL against various microbial strains.

Two novel compounds, stellettapeptins A and B, were obtained from a marine sponge called Stelletta sp., obtained from northwestern Australia. These compounds effectively prevented the infection of human T-lymphoblastoid cells by HIV-1RF, with EC50 values of 23 and 27 nM, respectively. These unique tridecapeptides consist of several uncommon non-proteinogenic amino acids. Notably, they are the first naturally occurring peptides to contain a β-hydroxy-p-bromophenylalanine residue. Additionally, another promising compound named microspinosamide was isolated from a collection of the marine sponge Sidonops microspinosa, originating from Indonesia. Microspinosamide is a cyclic depsipeptide consisting of 13 amino acid residues. In an XTT-based in vitro assay, it exhibited significant inhibition against the harmful effects of HIV-1 infection, with an EC50 value of approximately 0.2 µg/mL.

Poecillastrin A, a new polyketide-derived macrolide lactam, was obtained from a deep-water collection of the marine sponge Poecillastra species. The compound exhibited cytotoxicity and antiproliferative effects with EC50 that ranging from <25 nm to >10000 nm, which were comparable to those observed with the chondropsins. Haligramides A and B were purified from Haliclona nigra, which displayed cytotoxic properties in a 2-day in vitro assay with promising IC50 (µg/mL) 3.89-15.62 against the lung (A-549), colon (HCT-15), CNS (SF-539 and SNB-19) human tumor cell lines.

Eclalbasaponin II, a saponin isolated from Eclipta prostrata (L.), demonstrated significant antidiabetic property in rat model. The blood sugar lowering efficacy was almost identical to that of the standard drug, glibenclamide after 7 days of treatment. In another study, antidiabetic megastigmane glycoside namely(E)-4-hydroxy-4-[3′-(β-D-glucopyranosyloxy) butylidene]-3,5,5-trimethyl-2-cyclo-hexen-1-one, isolatedfrom the leaves of Pterospermum semisagittatum, showed a significant insulin releasing effect on rat pancreatic isolets .

Moreover, several phenolic constituents isolated from Wendlandia tinctoria var. grandis (Roxb.) DC., which exhibited promising antioxidant capacity with IC50 ranging from 6.20 ± 0.10 to 16.11 ± 0.02 µg/mL.

Address by Prof. Dr. Yearul Kabir, Associate Secretary, BAS

Address by Prof. Dr. Zahurul Karim, Chairperson and Vice President, BAS

At the end Dr. Rashid discussed an interesting study with Moringa oleifera, locally known as drumstick tree or Shojna. Various parts of this plant such as the leaves, roots, seed, bark, fruit, flowers and immature pods are being employed for the treatment of different ailments in the indigenous system of medicine, particularly in South Asia. Traditionally, M. oleifera is reputed for antihypertensive activities. Prof. Rashid and his team were able to prove its safety through in vivo studies on rat model and blood pressure lowering efficacy through extensive investigation on animal model. In a clinical study, they found statistically significant blood pressure lowering effect of oral administration of M. oleifera leaf at 1500 mg/day.

Lecture on Nonlinear Optical Single Crystals: Its Beauty and Importance in Technology by Prof. Dr. Jiban Podder

An Academy Lecture was delivered on "Nonlinear Optical Single Crystals: Its Beauty and Importance in Technology" by Dr. Jiban Podder, Fellow, BAS and Professor, Department of Physics, Bangladesh University of Engineering and Technology (BUET) on Tuesday, 20 June 2023 at 11:00 am at the Council Building, BUET,. Emeritus Professor Dr. AK Azad Chowdhury and President of Bangladesh Academy of Sciences attended the lecture as the Chief Guest. Prof. Dr. Abdul Jabbar Khan, Pro-Vice-Chancellor, Bangladesh University of Engineering and Technology as the Special Guest and Professor Zahurul Karim, Vice President of the Bangladesh Academy of Sciences presided over the occasion and Prof. Dr. Yearul Kabir, Associate Secretary of BAS, gave the opening address and introduced the speaker to the audience.

Prof. Dr. Jiban Podder delivering his Academy Lecture

Participants at the Academy Lecture

This very well attended Academy Lecture was participated by a good number of BAS Fellows, BUET Faculty members and students.

Prof. Podder discussed the importance of crystallization of single crystal as an important field both for basic research and industrial applications in many scientific disciplines. Crystals always captivate the eye with their wondrous geometric shapes, transparency, shiny and glittering surfaces, sharp bounded planes and hardness. Single crystals are highly ordered structures that give them unique properties. Today, crystals are the backbone of modern technology. Without crystals, there would be no electronic industry, no photonic industry, and no fiber–optic communications. The rapid development of optical communication systems has led to the demand for high-performance nonlinear optical materials in electronic and optoelectronic devices.

In this regard, the growth of artificial single crystals from small to large sizes has received considerable attention.The advantage of single crystal over polycrystalline is that it has fewer point defects and dislocations. They have the uniformity of composition and there are no grain boundaries between individual grains. Thus, there is no optical absorption, no scattering effects, or trapping of conduction electrons. From a technical point of view, some potential organic, inorganic, and semi-organic single crystals have been grown in the laboratory by low-temperature solution growth techniques. Further, the growth mechanism, nucleation kinetics, origin of nonlinearities and the effect of transition metal impurities on the habit modification of some nonlinear optical crystals viz. Potassium dihydrogen phosphate (KDP), ammonium dihydrogen phosphate (ADP), KDP-ADP mixture, potassium acid phthalate (KAP), potassium chloride (KCl), urea, thiourea, triglycine sulfate (TGS), L-alanine, MgSO4, ZnSO4, K2SO4, etc., and their structures, mechanical and optical properties, and second harmonic generation properties are discussed in detail.

Guests in the dais

Address by Emeritus Professor Dr. AK Azad Chowdhury, President, BAS

The solubility data at different temperatures and the width of the metastable zone are found very important to determine the saturation level and the faster growth rates by employing faster cooling rates. In a supersaturated system, few atoms or molecules join together and a change in energy takes place in the process of formation of the cluster. Nucleation is the initial stage of all modes of crystal growth. Both the rate of formation of nuclei and the rate of crystallization are affected by the nature of the crystallizing substance, the concentration, the temperature, pH, agitation, and the impurities present in the solution.

Nonlinear processes can be used in optical communications, signal processing, laser medicine, parallel image processing, and the emerging fields of integrated optics. The nonlinear optical properties arise from the polarization of the molecules, which depends on the higher power of the applied field. Now a days, nonlinear single crystals with sufficient second-order nonlinearities are very attractive for photonic applications, especially terahertz (THz) photonics. Laboratory-grown L-asparagine monohydrate doped with magnesium sulfate heptahydrate semi-organic crystals have shown the possibility of terahertz generation using picosecond/femtosecond laser pulses.

The lecture addressed the accumulated experience of Dr Jiban Podder's of work in the field of crystal growth research at BUET.

After the persentation the full audience was engaged right away by asking lots of questions to the speaker and this led to a very invigorating discussion.

Inception Workshop of 5th Phase Projects (April 2023-March 2026)

In the 5th phase of BAS-USDA Endowment Program, a total of thirty projects have been awarded and these projects commenced in April 2023. Inception Workshop and Orientation on Accounting System for Part-time Accountants of all these projects have been completed during May-August 2023.

Inception workshop at BSMRAU on 04 June 2023

Inception workshop at DU on 08 June 2023

Orientation on accounting system at BAU on 04 June 2023

Orientation on accounting system at DU on 08 June 2023

INTERNATIONAL EVENTS

S20 Thematic Conference, Bangaram Island, Lakshadweep, May 1-2, 2023, India

S20 Thematic Conference on 'Universal holistic health' Bangaram Island, Lakshadweep, India, held on 1-2 May 2023. Prof. Dr. Mamun Al Mahtab, Fellow, Bangladesh Academy of Sciences represented the Academy.

Address byProf. Dr. Mamun Al Mahtab

International Science Council (ISC) mid-term meeting in Paris, May 10-12, 2023

The International Science Council held its mid-term meeting in Paris, France from May 10-12, 2023. This was the first physical meeting after the pandemic. Prof. Haseena Khan was invited as the Secretary of the Bangladesh Academy of Sciences for participation. Accordingly she has participated.

Mid-term meeting in Paris

There was representation of about 150 Science Academies, Unions and Affiliated Bodies in this event. This ISC meeting had a few take home messages. Among them one was the gender bias in all Science Academies. There is a general recognition that women need greater representation in the Academies. The case of the Royal Netherlands Academy of Arts and Sciences was discussed. The Dutch Academy had taken a bold step in 2017 to have a women-only election in order to reduce their perpetual gender imbalance.

In this regard the Academies have been asked to take effective and visible measures to increase female representation. There were even discussions of disallowing fellowships/grants to member academies which fail to take steps in this direction.

Another issue which came up very strongly was the value of science in decision-making, and the importance of taking steps for multilateral cooperation and exchange of information and data. In this regard there was discussion on a group recently launched by UN called the 'Friends on Science for Action'. This initiation by Belgium, India and South Africa was announced during the second scientific briefing of the UN General Assembly in April 2023. It is meant to be a platform to help Member States during the future negotiations and way beyond.

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BANGLADESH ACADEMY OF SCIENCES
National Science & Technology Complex
Agargaon, Dhaka-1207, Bangladesh
Phone: +8802 41025084, +8802 41025086,
E-mail: office@bas.org.bd,
Website: www.bas.org.bd

Printing at: Ritubanna Printing Press
Cell: 01712-836566