



TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO

ID CODE 6478

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Bioscienze dell'Università degli Studi di Milano**

Scientist- in - charge: Prof. Conti Lucio

Ekta Bhattacharya

[Name and surname]

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	BHATTACHARYA
Name	EKTA

PRESENT OCCUPATION

Appointment	Structure
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI	PROJECT STAFF

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree	MSc. in Botany	Barasat Government College	2013
Specialization	Botany(Cytogenetics and Tissue Culture)		
PhD	Life Sciences and Biotechnology	Jadavpur University	2023
Master			
Degree of medical specialization			
Degree of European specialization			
Other			



REGISTRATION IN PROFESSIONAL ASSOCIATIONS

Date registration	of	Association	City

FOREIGN LANGUAGES

Languages	level of knowledge
English	Fluent(Read, Write, Speak)
Hindi	Fluent(Read, Write, Speak)
Bengali	Fluent(Read, Write, Speak)

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2016	National Eligibility Test, All India Rank 59 out of 1335
2016	Indian Statistical Institute PhD Research Fellowship
2014	Graduate Aptitude Test I Engineering, All India Rank 867 out of 8527

TRAINING OR RESEARCH ACTIVITY

<p>description of activity</p> <p>Research Summary: I, Ekta Bhattacharya, completed my PhD in Life Science and Biotechnology from Jadavpur University on 22.06.2023, under the guidance of Dr. Suparna M. Biswas, Associate Professor at the Indian Statistical Institute, India. I possess over six years of expertise in phytochemistry and molecular biology. At present, I am contributing as a project staff at the Indian Institute of Technology, Guwahati, India, focusing on the intriguing study of root dynamics using microfluidics and live imaging. My research delves into the intricate root morphodynamics of <i>Brassica juncea</i> when exposed to microplastics, employing advanced techniques such as fluorescence microscopy and Raman spectroscopy.</p> <p>Throughout my academic and professional career, I have honed my skills in the isolation, solvent-based fractionation, purification, and identification of secondary metabolites from plants and microorganisms. My research goals extend to designing experiments that analyze the antioxidant, antimicrobial, and allelopathic properties of purified bioactive compounds from plants and microbes. Additionally, I have delved into the detection and quantification of heavy metal accumulation in plants, unravelling their rhizospheric responses through root exudates. My hands-on experience with sophisticated instrumentation, including LC-MS/MS, LC-Q (ToF)/MS, GCMS, and preparative-scale chromatography systems, positions me with the technical prowess required for analytical development and optimizing liquid-extraction methodologies. Further, I have conducted SEM and TEM analyses for cell imaging, enhancing my proficiency in comprehensive research methodologies.</p> <p>I worked as a project fellow at University of Calcutta after completion of my Masters degree, India, where I received comprehensive training in recombinant DNA techniques, encompassing gene cloning, agrobacterium-mediated transformation of novel genes in model plants, in-planta expression of cloned genes, promoter analysis, and the maintenance of transgenic lines through tissue culture techniques on model plants such as <i>Nicotiana tabacum</i> and <i>Physcomitrium patens</i>.</p>
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Scientific collaborations: A scientific collaboration was conducted with Prof. Prasanta C. Bhowmik, Professor at Stockbridge School of Agriculture, University of Massachusetts, Amherst. We studied the antioxidant potential of hot-tasting spices in terms of their DNA damage protection abilities against oxidative stress to validate their utilization as functional foods. I have collaborated with Hughes Lab at the University of Leeds. We assessed quality, performed chemical profiling, and compared the nutritional properties of the *Sterculia foetida* seed oil with common edible oils. Our aim was to propose *Sterculia* oil as a potent edible alternative owing to its unique fatty acid composition and non-toxicity. Together, we conducted a second comparative study of the bioactive potentialities of the widely distributed tropical plant genus, *Ficus* sp. As a co-author, I isolated and purified the bioactive compounds from the selected species and determined the antioxidant properties. Effective bioactive substances, such as carvacrol, phytol, and tocopherol, were found in the selected *Ficus* species after fractionation-based purification and untargeted GCMS analysis, suggesting these plants as possible sources of nutraceuticals. Collaborative research was also performed nationally with Prof. Panchanan Pramanik, Professor, Indian Institute of Technology, Kharagpur, India where we innovated a cheap, non-toxic, post-harvest anti-sprouting agent of potato tubers from organic acids. This simple technique would lead to delayed sprouting for about 6 weeks, which is immensely useful for small vendors. These leave no toxic residues like commercial agents like CIPC or maleic hydrazide.

Academic duties: I take on the role of scientific reviewer for reputed journals such as *Frontiers in Environmental Sciences*, *Chemical Papers*, and *Archives of Microbiology*.

Scientific Discourse: Proficient in statistical techniques applicable to measurement, statistical analysis, and experimental design using SPSS and R, I have published my research in 12 reputable peer-reviewed scientific Q1 journals, contributing to an h-index- 4 with a total of 65 citations. Beyond technical qualifications, I possess excellent communication, presentation, and writing skills—essential attributes for effective scientific discourse and knowledge exchange. I have provided academic guidance summer internship projects, as directed, to undergrad and graduate students, guiding them in experimental design, data analysis, and manuscript writing. We identified a strong allelopathic agent Pipericyclobutanamide-A from a less known medicinal spice *Piper chaba*, Hunter. stem which may be seen as a source of natural weedicide agents. I have participated in training workshops offline to learn high-end techniques like GCMS and online to learn SPSS, R and Python in reputed national institutes.

PROJECT ACTIVITY

Year	Project
2023-Present	Development of Underwater Organism-supported Breathing System: A Plant-Based approach, Principal Investigator- Dr. Pranab Kumar Mandal, Funding Agency: IIT Guwahati; Technology, Innovation and Development Foundation. (I joined this Project as a Project staff. I am currently working with M.Tech students to innovate a device that would work as an underwater breathing system with an ability to produce enough O ₂ but will be plant based. We are focusing on the submerged plant species like <i>Hydrilla</i> sp., quantifying the amount of O ₂ produced in a controlled environment and formulating techniques to scale-up the production by modulating the nutrients).
2014-2015	Identification of novel drought tolerant gene(s) by comparative analysis between Rice and Sorghum: Isolation and validation through bacterial and in planta expression. Principal Investigator- Dr. Sudipta Ray, Funding agency: DST, Govt. of India, Dept. of Botany, University of Calcutta. (I worked as a JRF and acquired knowledge of molecular biology methods and scanning electron microscopy for cell imaging. I constructed transgenic lines with a greater resistance to heat and drought stress by cloning and transforming the drought-tolerant dehydrin genes of <i>Sorghum bicolor</i> into model <i>Nicotiana tabacum</i> plants. I induced



the overexpression of recombinant proteins of dehydrin genes in the bacterial expression system, purified the proteins and performed downstream identification using Western blot analysis).

PATENTS

Patent
NA

CONGRESSES AND SEMINARS

Date	Title	Place
24-28th July, 2017	Ekta Bhattacharya and Suparna M. Biswas. 2017. Chemical Ecology of fruit pulp- A case study with <i>Tamarindus indica</i> L. 8th World Allelopathy Congress. (Oral presentation)	International Allelopathy Society, Aix-Marseille University, Marseille, France.
24-28th July, 2017	Ekta Bhattacharya and Suparna M. Biswas. 2017. Preliminary study of exploring the potential of <i>Cleome rutidosperma</i> - an invasive allelopathic species and its probable role as phytoremediator. 8th World Allelopathy Congress. (Poster)	International Allelopathy Society, Aix-Marseille University, Marseille, France.
8-9th December, 2017	Ekta Bhattacharya and Suparna M. Biswas. 2017. Preliminary study of exploring the potential of <i>Cleome rutidosperma</i> – an invasive allelopathic species and its probable role as phytoremediator. 7th International Science Congress. (Poster)	International Science Community Association and College of Science and Technology, Royal University of Bhutan, Bhutan.
24-27 October, 2016	Ekta Bhattacharya and Suparna M. Biswas. 2016. Evaluating the Phytoremediation efficiency of <i>Cleome rutidosperma</i> DC., for both inorganic and organic wastes through chemical signalling and heavy metal sequestration. 4th India Biodiversity Meet. (Poster) Acquired 3rd position	Indian Statistical Institute, Kolkata, India

PUBLICATIONS

Research articles
1. Bhattacharya, E., Hazra, A., Dutta, M., Bose, R., Dutta, A., Dandapat, M., Guha, T & Mandal Biswas, S. (2024). Novel Report of <i>Acinetobacter johnsonii</i> as an Indole-Producing Seed Endophyte in <i>Tamarindus indica</i> , L. Archives of Microbiology. (Accepted on 24.01.24)
2. Dutta, M., Hazra, A., Bhattacharya, E., Bose, R., & Mandal Biswas, S. (2023). Characterization and metabolomic profiling of two pigment producing fungi from infected fruits of Indian



Gooseberry. Archives of Microbiology, 205(4), 141. DOI: 10.1007/s00203-023-03483-2
3. Hazra, A., Dutta, M., Dutta, R., Bhattacharya, E., Bose, R., & Biswas, S. M. (2023). Squalene synthase in plants-Functional intricacy and evolutionary divergence while retaining a core catalytic structure. Plant Gene, 100403. DOI: 10.1016/j.plgene.2023.100403
4. Dutta, R., Bhattacharya, E., Pramanik, A., Hughes, T. A., & Biswas, S. M. (2022). Potent nutraceuticals having antioxidant, DNA damage protecting potential and anti-cancer properties from the leaves of four Ficus species. Biocatalysis and Agricultural Biotechnology, 102461. DOI: 10.1016/j.bcab.2022.102461
5. Bhattacharya, E., & Mandal Biswas, S. (2022). First Report of the Hyperaccumulating Potential of Cadmium and Lead by <i>Cleome rutidosperma</i> DC. With a Brief Insight into the Chemical Vocabulary of its Roots. Frontiers in Environmental Science, 10, 830087. DOI: 10.3389/fenvs.2022.830087
6. Bhattacharya, E., Saha, S., Dutta, R., Dutta, M., & Biswas, S. M. (2022). Fractionation based evaluation of phytochemical constituents, antimicrobial and allelopathic potential of <i>Piper chaba</i> , Hunter. stem and identification of “Pipericyclobutanamide-A” as a strong allelopathic agent. Biocatalysis and Agricultural Biotechnology, 42, 102356. DOI: 10.1016/j.bcab.2022.102356
7. Bhattacharya, E., Pal, U., Dutta, R., Bhowmik, P. C., & Mandal Biswas, S. (2022). Antioxidant, antimicrobial and DNA damage protecting potential of hot taste spices: A comparative approach to validate their utilization as functional foods. Journal of Food Science and Technology, 59(3), 1173-1184. DOI: 10.1007/s13197-021-05122-4
8. Bhattacharya, E., Mandal Biswas, S., & Pramanik, P. (2021). Maleic and l-tartaric acids as new anti-sprouting agents for potatoes during storage in comparison to other efficient sprout suppressants. Scientific reports, 11(1), 1-12. DOI: 10.1038/s41598-021-99187-y
9. Bhattacharya, E., & Mandal Biswas, S. (2021). Role of Tartaric Acid in the Ecology of a Zoochoric Fruit Species, <i>Tamarindus indica</i> . L. International Journal of Fruit Science, 21(1), 819-825. DOI: 10.1080/15538362.2021.1936347
10. Bose, R., Bhattacharya, E., Pramanik, A., Hughes, T. A., & Biswas, S. M. (2021). Potential oil resources from underutilized seeds of <i>Sterculia foetida</i> , L.-Quality assessment and chemical profiling with other edible vegetable oils based on fatty acid composition, oxidative stability, antioxidant activity and cytotoxicity. Biocatalysis and Agricultural Biotechnology, 33, 102002. DOI: 10.1016/j.bcab.2021.102002
11. Bhattacharya, E., Dutta, R., Chakraborty, S., & Biswas, S. M. (2019). Phytochemical profiling of <i>Artocarpus lakoocha</i> Roxb. leaf methanol extract and its antioxidant, antimicrobial and antioxidative activities. Asian Pacific Journal of Tropical Biomedicine, 9(11), 484. DOI: 10.4103/2221-1691.270984
12. Bhattacharya, E., Bose, R., & Mandal Biswas, S. (2019). A comprehensive study on occurrence records of African neglected and underutilized weed species, <i>Cleome gynandra</i> L.(cat's whiskers) validating the ecogeographical range expansion in West Bengal, India (Vol. 19, No. 4, pp. 129-134). Melbourne: John Wiley & Sons Australia, Ltd. DOI: 10.1111/wbm.12189

Articles in reviews



NA

Congress proceedings
NA

OTHER INFORMATION

Previous positions	Position/Institution/Country
2023-present	Project Staff/Indian Institute of Technology Guwahati/India
2018-2023	Senior Research Fellow/Indian Statistical Institute/India
2016-2018	Junior Research Fellow/Indian Statistical Institute/India
2014-2015	Project Fellow/University of Calcutta/India
Computer Skills	Statistical softwares like SPSS, basic R and Python programming

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Please note that CV WILL BE PUBLISHED on the University website and It is recommended that personal and sensitive data should not be included. This template is realized to satisfy the need of publication without personal and sensitive data.

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Place and date: Kolkata, 27/02/2024