



NATURAL PRODUCTS INSTITUTE

Dr. Rupika Delgoda, D.Phil. (Oxon), B.Sc. (Hons.) – Director

WORK OF THE INSTITUTE

The academic year 2022–2023 saw the staff members of the Natural Products Institute (NPI) developing a new MPhil/PhD program in Pharmacognosy and Ethnobotany & Ethnobiology. We look forward to its launch in January 2024. The year also engaged NPI's members in many activities towards the establishment of the Caribbean Centre for Research in Bioscience (CCRiB), into which NPI will be merged (and institutionalized) as of October 2023. Thus, we reflect over twenty years of activity and present here the last annual report under the NPI name.

We mourned the passing of Dr. Trevor Yee in June this year, former Director of NPI, who had served from its inception. His stellar contribution to research and innovation, and wide knowledge of local biodiversity, will be fondly remembered and deeply missed.

Staff and students of NPI continued their vibrant efforts at tackling several new research problems, and forging many new international collaborations (which are expected to be launched as MOUs or new projects). Our staff engaged in many international and local fora as speakers, panelists, experts and acted as reviewers and editors of well-cited, peer-reviewed journals, with Dr. Vandebroek being appointed as the Editor-In-Chief of the Journal of Economic Botany. We celebrated Dr. Francis getting an international grant from IAEA, her first. Four students (two PhDs, One MPhil and One MSc.) officially completed and/or received their research degrees under the supervision of NPI staff. This academic year saw the launch of the joint, monthly seminar series between NPI and Biotechnology Centre, for the benefit of graduate students. Multiple staff members won the Principal's research awards, while our student Dr. Kimberly Foster was named runner-up in the Young Scientist Competition held by the Scientific Research Council of Jamaica.

ACCESS

STUDENTS

Completed students (supervised by Prof. Rupika Delgoda).

- Isaac Morrison (PhD, high commendation, Biochemistry), “Assessment of chemopreventive and anti-cancer value of *Artocarpus heterophyllus* Lam. in colorectal cancer”; co-supervisor: Dr. Roy Porter
- Kimberley Foster (PhD, Biotechnology), “Assessing the use of local medicinal plants in the treatment of cancer and cytotoxic value of *Annona muricata*”; co-supervisor: Prof. Helen Asemota
- Shaniece Wauchope (MPhil, Biochemistry), “The impact of dibenzyl trisulfide, a key ingredient in *Petiveria alliacea* L. on the activities of Cytochromes P450 and its potential for chemoprevention”; co-supervisor: Prof. Gossell-Williams
- Renaldo Ramsay (MSc, Biomedical Sciences), “Inhibition of the activities of Cytochrome P450 enzymes by aqueous, ethyl acetate and ethanol extracts of *Arachis hypogaea* testa: Investigating Potential for Drug Interactions”; co-supervisor: Prof. M. McKoy

New and on-going

- Deiondra Robinson Tai, joined the institute as a part-time Ph.D candidate in 2022. (**Dr. Sheena Francis**); M.Phil. candidate, Stewart K (**Dr. Francis**) and M.Phil. candidate Frank C (**Dr. Francis**);
- Ella Vardeman, Biology PhD Program at The City University of New York (CUNY) (together with Dr. Edward Kennelly from CUNY, Lehman College): “Differences in chemotaxonomy of plants used by Haitian immigrants in New York City for women’s health,” 2024. (**Dr. I. Vandebroek**)
- The joint NPI, Biotech Centre Journal Club and Seminar Series, was launched on March 28, 2023 and coordinated by **W. Irvine**. The seminar allowed students from both departments to interact and engage in their research projects and wider topics.

PUBLICATIONS

Peer reviewed journal articles

- Albuquerque UP, Ladio A, Duarte Almada E, **Vandebroek I**, Pulido Silva MT, Stern da Fonseca-Kruel V (2023) Exploring biocultural diversity in urban

ecosystems: An ethnobiology perspective. *Ethnobiology and Conservation* 12: 10, <https://doi.org/10.15451/ec2023-06-12.10-1-12>

- Richter, I., Neef, N. E., Moghayedi, A., Owoade, F. M., Kapanji-Kakoma, K., **Sheena, F.**, & Ewon, K. (2023). Willing to be the change: Perceived drivers and barriers to participation in urban smart farming projects. *Journal of Urban Affairs*, 1–19. <https://doi.org/10.1080/07352166.2023.2232060>
- **W. Irvine**, M Tyler, **R. Delgoda**, (2023) In silico characterization of the psilocybin biosynthesis pathway, *Computational Biology and Chemistry* 104, 107854 doi: 10.1016/j.compbiolchem.2023.107854. Epub 2023 Mar 23.
- Khalifa Attallah O.M., **Delgoda, R.** and Benkeblia, N. (2023). Profiling primary metabolites of Governor’s Plum *Flacourtia indica* (Burm.f.) Merr. at two different ripe stages. *Journal of Tropical Agricultural Science*, Volume 46, Issue 1, pp. 1-15. <https://doi.org/10.47836/pjtas.46.1.0>
- Wooten J, Mavingire N, Araújo CA, Aja J, **Wauchope S., Delgoda R.**, Brantley E., “Dibenzyl trisulfide induces caspase-independent death and lysosomal membrane permeabilization of triple-negative breast cancer cells”, *Fitoterapia*.
- Moghayedi, A., Richter, I., Owoade, F. M., Kapanji-Kakoma, K. K., Kaliyadasa, E., **Francis, S.**, & Ekpo, C. (2022). Effects of urban smart farming on local economy and food production in urban areas in African cities. *Sustainability*, 14(17), 10836. <https://doi.org/10.3390/su141710836>

Book chapters

- **Vandebroek I.** (2023) Traveling traditions: Dominican ethnobotany in service of caring for the community. In: *Decolonizing Paradise: A Radical Ethnography of Environmental Stewardship in the Caribbean* (Ed. Rosalina Diaz), pp. 203–230. New York: Peter Lang.
- **Picking, D.** (2023) The global regulatory framework for medicinal plants. In: *Pharmacognosy: Fundamentals, Applications and Strategies* (Ed. Simone Badal and Yuri Clement). Second Edition. London: Elsevier.
- Spence, D., Grant, D., Brown, K., **Picking, D.**, Smith, S (2022) Jamaican cultural and spiritual guidance in caring for cancer patients. In: *Global Perspectives in Cancer Care: Religion, Spirituality, and Cultural Diversity in Health and Healing* (Ed. Michael Silbermann and Ann Berger), pp 454–474. Oxford: Oxford University Press.

Abstracts

- **Delgoda R.**, “Role of Academia In Innovation In Health and Wellness” Scientific Research Council, 7th Biennial Science and Technology Conference, 15–17 November, 2022, Kingston, Jamaica (invited speaker)

- **Foster K**, “The Nutraceutical of Soursop : Towards Improving Cancer care” Scientific Research Council, 7th Biennial Science and Technology Conference, 15–17 November, 2022, Kingston, Jamaica (Young Scientist Awards – Short-listed presenter)

ALIGNMENT

ACADEMIC AND PUBLIC PRESENTATIONS (INTERNATIONAL AND LOCAL)

Peer Review Activities

1. Reviewed peer reviewed articles
 - EcoHealth. (**S. Francis**)
 - *PLOS ONE* (**S. Francis**)
 - Ethnobotany (**S. Francis**)
 - American Journal of Tropical Medicine and Hygiene (**S. Francis**)
 - *Journal of Arts, Science and Technology* (JAST; UTECH) (**D. Picking**)
 - UNESCO – *Encyclopedia of Life Support Systems* (EOLSS) (**D. Picking**)
 - Computational and Structural Biology Journal (CSBJ) (**W. Irvine**)
2. Editor-In-Chief of the *Journal Economic Botany* (**I. Vandebroek**). IF - 2.6
3. Guest handling editor, *Frontiers of Pharmacology*, May–June 2023 (**R. Delgoda**). IF - 5.6

CONFERENCES/WORKSHOPS ATTENDED

- 16th International Herb Symposium – Native Plant Conservation and Cultivation In-Person Track. Wheaton College, Norton, Massachusetts. June 9th–11th, 2023 (**D. Picking**)
- Medicinal Plant Conservation Certificate Program. United Plant Savers, Rutland, Ohio. June 16th–July 14th, 2023 (**D. Picking**)
- First Research Coordination Meeting on Reproductive Biology of Male Aedes Mosquitoes for SIT Applications. Organised by Food and Agriculture Organization of the United Nations (FAO) and the International Atomic Energy Agency (IAEA) Vienna, Austria, from 3–7 July 2023 (**S. Francis**)
- **Delgoda R**, “Role of Academia In Innovation In Health and Wellness” Scientific Research Council, 7th Biennial Science and Technology Conference, 15–17 November, 2022, Kingston, Jamaica (invited speaker)
- **Foster K**, “The Nutraceutical of Soursop: Towards Improving Cancer care”

Scientific Research Council, 7th Biennial Science and Technology Conference, 15–17 November, 2022, Kingston, Jamaica (Young Scientist Awards - Short-listed presenter)

- ICH M12 Guidance on Drug Interaction Studies: Comparisons and Considerations. Tuesday, December 6, 2022 (**R. Delgoda**)
- Caribbean Strategy for Climate-Resilient Forests and Rural Livelihoods, Caribbean Natural Resources Institute (CANARI) for the Food and Agriculture Organization of the United Nations (FAO) 14 December 2022 (**I. Vandebroek**)
- Invited speaker for ‘International Museums Day 2023’ on the theme ‘History of heritage plants that are seen in Jamaica today.’ Institute of Jamaica, Ministry of Culture, Gender, Entertainment and Sport. Kingston Technical School, May 18, 2023 (**D. Picking**)
- National Forestry Conference Jamaica 2022. Forestry as a business, 7–8 December 2022 (**I. Vandebroek**)
- Reimagining Queen Nanny of the Maroons, organized by Prof. Leo Douglas from New York University (**I. Vandebroek**)
- NoxBox instrumentation for nitrate content determination and uses, April 24 2023, King’s College, London, hosted by Prof. Andrew Webb, St. Thomas Hospital, Dept of Clinical Pharmacology (**R. Delgoda**)
- American Botanical Council: Sustainable Herb Program webinar: Why using sustainable herbs matters. February 23–September 15, 2023. (**D. Picking**)
- Society for Medicinal Plant and Natural Product Research (GA) e-seminar. Brazilian biodiversity as a source of new drugs: Private sector perspective. February 10, 2023. (**D. Picking**)
- Guest on Power 106 Farm Talk speaking on Jamaican herbal teas. October 31, December 12, 2022. (**D. Picking**)
- Invited speaker for ‘Annual Heritage Festival’ on the theme ‘Jamaica’s Diverse Plants.’ National Gallery of Jamaica, Institute of Jamaica, Ministry of Culture, Gender, Entertainment and Sport. October 28, 2022 (**D. Picking**)
- Plenary meeting to discuss future trajectories for the newly established International Society for Gastronomic Sciences and Studies (ISGSS) 24 January 2023 (**I. Vandebroek**)

Teaching commitments

- BIOL3414 (formerly ZOOL3410): Advanced Topics in the Life Sciences (taught a class and led a tutorial on “Caribbean Ethnobotany and the UN Sustainable Development Goals (SDGs)”) (various lecturers) (**I. Vandebroek**)
- BC34B/BIOC 3011 Advanced Biochemistry (responsible for teaching “Drug Metabolism module) (**R. Delgoda**)

- BIOL2403: Principles of Ecology (with Drs. Trench and Tsatsaros) (**I. Vandebroek**)
- ZOOL2404 Coordination and Control in Animals (**S. Francis**)
- BIOL3413: Biology Project (Oral Examination Committee) (**I. Vandebroek**)
- BOT3404: Economic Botany (**D. Picking**)
- PHAR3031: Pharmacognosy (**D. Picking**)

PUBLIC SERVICE

Rupika Delgoda

- Associate Editor, *Pharmacology Research-Natural Products*, Elsevier
- Deputy Chair, Natural History Museum of Jamaica
- Member Subcommittee for Amendment of the Food and Drug Act, National Commission for Science and Technology
- Member, Jamaica Conservation Partners
- Member, Entrepreneurial Committee, Faculty of Science and Technology, UWI
- Member, Committee for Assessment of NPI and Biotech Future Arrangements
- Supervisor, Field Trip laboratory research
- Chair, potential merger of multiple units in the FST, UWI.

Sheena Francis

- Member Rearing and Evaluation of *Aedes aegypti* for Sterile Insect Technique Jamaica
- Member of the International Membership Committee (ICM) of ASTMH 2021–Present
- Member of the American Society of Tropical Medicine and Hygiene (ASTMH) 2014–Present
- Board Member of Caribbean Diaspora of Science and Technology (CSF) 2010–Present
- Education Outreach Mentor, Commonwealth Science Conference 2017–Present

Ina Vandebroek

- Editor-in-Chief, *Economic Botany*
- Guest Associate Editor, *Frontiers in Sustainable Food Systems*, Section *Social-Movements, Governance, and Institutions*. Topic Editor, Traditional Knowledge in Food Activism and Governance
- Deputy Editor, *Journal of Ethnobiology and Ethnomedicine*

- Editorial Board Member, Checklist in Ethnobiology
- Editorial Board Member, Ethnobiology and Conservation
- Member of the Alliance for Diversity and Inclusion in Ethnobiology (ADIE)
- Member, Biocultural/Ethnobotanical Collection Managers/Curators Group (USA)
- Ex-officio Council Member, *Society for Economic Botany* (USA)
- Member, *International Society of Gastronomic Sciences and Studies (ISGSS)*

David Picking

- Member, Organizing Committee for the establishment of a Pan-American Compendium of Medicinal Plants, composed of 12 members from seven countries and five organizations facilitated by the Brazilian Academic Consortium for Integrative Health (CABSIN (<https://cabsin.org.br>)). TRAMIL and Jamaican representative. June 2022 to present.
- Member, Technical Committee for the establishment of a Pan-American Compendium of Medicinal Plants tasked with preparing draft native medicinal plant monographs. Established May 2023.
- Council Member, *Society for Economic Botany* (USA)
- Board Director, Perishables Ltd, Jamaica
- Board Director, GWG Conservancy, Research Station & Agricultural Business Incubator, St Thomas
- Board member UJIMA Natural Farmers Market, Kingston
- Member Jamaican Organic Agricultural Movement (JOAM)
- Member American Botanical Council (ABC)
- Member Society for Economic Botany

William Irvine

- Appointment to MIIC/JANAAC Appeals Committee, UWI representative
- Institute representative for Faculty's committee on Principal's Research Awards

AGILITY

INCOME GENERATION

Food and Agricultural Organisation/International Atomic Energy Agency, Coordinated Research Project, Reproductive Biology of Male *Aedes* mosquitoes for SIT application (D44005): Evaluation of Nutrient on Survival, Sexual Competitiveness,

and Precopulatory Behaviour in Male *Aedes aegypti* Mosquitoes for SIT Application. (Grant # 26753) (S. Francis, C. Grant, D. Robinson, S. Huntley-Jones)

COLLABORATIONS AND ENTREPRENEURIAL ACTIVITIES

New Research Activities

- Discussions for expansion of analytical capabilities, and collaborative projects with Dr. Moses Langat, Kew Gardens and Prof. Morten L Kringelbach, Department of Psychiatry, Oxford University (April 25 and April 27, 2023, **R. Delgoda**).
- Collaboration with Massachusetts College of Pharmacy and Health Sciences, Boston for synthesis of bioactive natural and nature derived compounds. Meetings with Dr. Patrick Gordon; Prof. Delia Anderson, Dean of the School of Arts & Sciences and Dr. Joseph DeMasi, Chair, Department of Math & Natural Sciences. (**R. Delgoda**, Jan 8, 2023 in Boston at MCPHS; **W. Irvine**)
- Working group with Dean of the Faculty of Medical Sciences, FST and key players across all faculties for the establishment of a Campus Cannabis Committee. May 2023 to present (**D. Picking**, **R. Delgoda**).
- Engagement of the Government of Jamaica with the Faculty of Science and Technology for a proposed “Joint UWI and GOJ Indigenous Cannabis Research Centre.” March 2023. (**D. Picking**, M. Emanuel, T. Stephenson, E, Myers)
- Initiated discussions with the journal *Frontiers in Sustainable Food Systems*, Section Social Movements, Institutions and Governance, to discuss submissions for a Special Issue on “Traditional Knowledge in Food Activism and Governance” (**I. Vandebroek** with Dr. Andrea Pieroni and Dr. Michele Fontefrancesco)
- Collaborations and on-going research activities with Insecticide Resistance and Vector Control, Entomology Department at Roybal Campus, Atlanta. Exploration of Jamaican plants with Insecticidal activities (December 2022–February 2023) (**S. Francis**).
- Inter-departmental collaboration discussions initiated with Physical Chemistry to discuss the establishment of a teaching module for molecular modelling, as well as the acquisition of under- and postgraduate students for short- and long-term projects (**W. Irvine**).
- Working group established for developing a Panamerican Compendium of Medicinal Plants led by CABSIN (Brazilian Academic Consortium of Integrative Health). Collaborators include WHO, UWI/TRAMIL, United States Pharmacopeia (USP), Natural Products Association of Guatemala (**D. Picking**).

AWARDS

- Principal's Award 2023. Best Research Publication. Faculty of Science and Technology 2021. **Dr Ina Vandebroek, Dr David Picking and Dr Rupika Delgoda**. "Reshaping the future of ethnobiology research after the COVID-19 pandemic." *Nature Plants* (2020).
- Principal's Award 2023. Faculty of Science and Technology for Best Research Publication, Faculty of Science and Technology, 2022. **Dr Ina Vandebroek and Dr David Picking**. "Popular Medicinal Plants in Portland and Kingston, Jamaica." Second edition. *Advances in Economic Botany*. Springer Nature (2020).
- Principal's Research Award for Best Research Publication for your research entitled 'Challenges in the control of neglected insect vector diseases of human importance in the Anglo-Caribbean' for the 2023 (2021/2022) Academic Year; **Dr. Sheena Francis, R. Delgoda et al.**
- Principal's Research Award for Most Outstanding Researcher for your research entitled 'Producing five journal articles in Academic Year 2020/2021' for the 2023 (2020/2021) Academic Year., **Prof. R. Delgoda**
- Principal's Research Award for Best Research Publication for your research entitled 'Potential chemopreventive, anticancer and anti-inflammatory properties of a refined artocarpin-rich wood extract of *Artocarpus heterophyllus* Lam' for the 2022 (2020/2021) Academic Year, **I Morrison, R. Porter and R. Delgoda**.
- Faculty of Science and Technology Annual Awards 2023, UWI Mona. **David Picking and Ina Vandebroek**. Recognition for 'The Society for Economic Botany President's Award,' for successfully hosting the Joint Society for Economic Botany and International Society of Ethnobiology Conference, The University of the West Indies, Jamaica, May 29–June 2, 2022
- Society for Economic Botany President's Award 2022. **David Picking and Ina Vandebroek** for successfully hosting the Joint Society for Economic Botany and International Society of Ethnobiology Conference, The University of the West Indies, Jamaica, May 29–June 2, 2022.
- **Kimberley Foster**, Young Scientist of the year award (runner-up), Scientific Research Council.