

## THE NATURAL PRODUCTS INSTITUTE



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Executive Director

### WORK OF THE INSTITUTE

The Natural Products Institute (NPI), which operates as a collaborative, multidisciplinary research institute in the Faculty of Science and Technology, has as its mission, the development of natural products. Towards that end, the NPI strives to enhance the compilation of biological, chemical, toxicological profiles of natural products, thereby increasing their effective value and safe use, in multiple applications. The year 2013–2014 saw the achievement of a significant milestone, as a decade long effort came into fruition, in the launch of a dedicated cytotoxicity, anti-cancer screening laboratory. The facility which was opened by the Minister of Health, the Honourable Fenton Ferguson, at a public ceremony, is aimed at investigating cancer treatment and preventive value of Jamaican (and eventually Caribbean) natural products, from various sources including terrestrial, marine and microorganisms.

NPI celebrated as Dr. Trevor Yee and Dr. Simone Badal received national and international recognition for their work, being awarded the Musgrave Bronze Medal for natural product research and Elsevier early career woman scientist in Chemical sciences for the Caribbean and Latin America, respectively. Ms. JeAnn Murray (M.Phil. candidate) received the American Foundation for the University of the West Indies scholarship. Members of NPI also received recognition at the Principal's research day awards as well as at the Faculty awards day, under several categories, which are detailed in the awards section below.

NPI members and friends gathered together to bid farewell to Dr. Yee, our former Head who plans for retirement in the coming year. While NPI had two temporary posts approved for this year, it looks forward to the recruitment of more permanent members (with the support from the Principal of UWI, Mona), which will allow significant growth and output.

The year has also seen the formalization of multiple, internal procedures and protocols, and also the launch of a monthly journal club and seminar series, which have been successful with full participation by staff and graduate student members. During the year, NPI has also hosted the Biotech R&D Institute to carry out their scientific studies.

## **PAPERS PRESENTED**

### **Key note presentations:**

- **Delgoda R**, "Research: the platform for participation in global development", Northern Caribbean University, Science Symposium, 11th March, 2014, Mandeville, Jamaica.

### **Oral and poster presentations**

- **Francis S**, "Plant & Marine based extracts inhibition of Mosquito CYPs", delivered at Liverpool school of medicine, Liverpool, U.K., August 2013 (oral presentation).

- **Badal S**, Hunang G, Vedantam P, Francis S, Davis W, Brantley E, Tzeng J, Jacobs H and Delgoda R, “Potential anti-cancer and chemopreventive properties of Jamaican natural products”. Presented at the 3rd Cell Biochemistry and Biophysics (CBB) conference held in Toronto, Canada. September 16th–17th 2013 (oral presentation)
- Badal S, Hunang G, Vedantam P, Francis S, Davis W, Brantley E, Tzeng J, Jacobs H and **Delgoda R**, “Glaucarubulone glucopyranoside, a natural quassinoid inhibits procarcinogen bioactivating CYP enzymes *in vitro* and displays potent impact on breast cancer cell proliferation”, International Society for the Study of Xenobiotics (ISSX), held in Toronto, Canada, 29th September–4th of October 2013 (poster presentation).
- **Delgoda R**, “Use of drug metabolising enzymes as therapeutic targets”, Society for Scientific Advancement”, 2nd annual meeting, Mona, Jamaica, 22nd November, 2013 (oral presentation).
- **Badal S**, Delgoda R, “Screening Jamaican natural products for anticancer and chemopreventive properties”, CARISCIENCE meeting and AGM: November 14–16, 2013, Ocho Rios, Jamaica (oral presentation).
- **Picking, D.**, Mitchell, S., Delgoda, R. “The Contemporary Use of Medicinal Plants in Jamaica & *In-Vitro* Assessment of Potential Herb-Drug Interactions & Chemopreventive Properties of Select Plants”, 25th Mona Symposium, Natural Products & Medicinal Chemistry. Department of Chemistry, UWI, Mona, Jamaica, January 2014 (oral presentation).
- **Picking, D.** “Balancing the Risks & Benefits of the Use of Herbs, Vitamins & Foods for good Health.” Caribbean College of Family Physicians Scientific Workshop. Kingston, May 2014 (oral presentation).
- **Badal S** and Delgoda R “*In vitro* testing: using cancer cell lines to aid drug development.” 2014 University of Technology Health Professionals conference at the New Kingston Conference Centre. June 20th 2014 (oral presentation).

## PUBLICATIONS

## Refereed Journal Articles

- Penicooke N, Walford K, **Badal S, Delgoda R**, Williams L, Joseph-Nathan P, Gordillo-Roman B, Gallimore W, “Antiproliferative activity and absolute configuration of zonaquinone acetate from the Jamaican alga *Styopodium zonale*”, *Phytochemistry*, 87 (2013):96–101.
- **Badal S and Delgoda R**, “CYP1B1: Friend OR Foe? A critical review”, *OA Biochemistry*, 1(1) (2013):8–15
- **Picking D, Delgoda R**, Boulogne I and Mitchell S, “*Hyptis verticillata* Jacq: A review of its traditional uses, phytochemistry, pharmacology and toxicology”, *Journal of Ethnopharmacology*, 147 (2013): 16–41.
- **Badal S and Delgoda R**, “Role of the modulation of CYP1A1 expression and activity in Chemoprevention: A Mini Review”, *Journal of Applied Toxicology*, (2014) doi: 10.1002/jat.2968. [Epub ahead of print].
- **Francis, S and Delgoda, R** “Patent reiev on the development of cytochrome P450 inhibitors”, *Expert Opinion on therapeutic patents*, 24(6), (2014): 1–19.
- **Badal S**, Collins-Fairclough A, Stewart C, Smith K, “Potential for naturally-derived therapeutics: The Caribbean as a Model. Insights from the Conference on Therapeutics & Functional Genomics”. *Expert Opinion on Biological Therapy*, 14, (2014): 1–4,
- Lowe H, Watson C, **Badal S**, Toyang N, and Bryant J. “Unearthing the medicinal properties of *Tillandsia recurvata* (ball moss): A mini review”. *European journal of medicinal plants*, 4 (2104): 1138–49
- Lowe H, Watson C, **Badal S**, Toyang N, and Bryant J. “Promising efficacy of the *Cola acuminata* plant: A mini review”. *Advances in Biological chemistry*, 2 (2104): 240–45.

## Media

**Picking, D.** Television Jamaica, All Angles with Dionne Jackson-Miller. Potential for nutraceuticals in Jamaica with particular focus on *Petiveria alliacea* (Guinea Hen Weed). 14th May 2014. [www.televisionjamaica.com/Programmes/AllAngles.aspx/Videos/34728](http://www.televisionjamaica.com/Programmes/AllAngles.aspx/Videos/34728)

## Patents Filed

**Delgoda R, Badal S,** et al filed a US patent application (PCT/US2014/040375) May 2104, for natural compounds with cancer preventive properties.

## INCOME GENERATION

**Delgoda, R** and Lindo, L, Grant by Forest Conservation Fund (J\$11.95M) was extended by one year. Project entitled, “Bioprospecting Forest Medicinal Plants for the Development of a Nutraceutical Industry: Aiding alternative livelihoods projects: Grant FCF/PP/09/01/011”

## PUBLIC SERVICE

### Simone Badal

- Science Policy chair, Society for Scientific Advancement (SoSA)

### Rupika Delgoda

- Co-Licencee and organizer of TEDxJamaica
- Member, International Society for Study of Xenobiotics
- Member, American Society for Pharmacognosy
- Executive committee member, Jamaica Sri-Lanka Friendship Association

### Sheena Francis

- Member, Caribbean Diaspora for Science, Technology and Innovation (CADSTI)
- Organiser for Sagicor Visionaries Competition

**Trevor H. Yee**

- Treasurer, the International Society for the Development of Natural Products (ISDNP).
- Executive Committee, the Natural History Society of Jamaica (NHSJ).

**AWARDS**

- The American Foundation for the University of the West Indies scholarship was awarded to **JeAnn Murray** (M.Phil. student), August 2013.
- Bronze Musgrave Medal for Natural Products Research, awarded by the Institute of Jamaica, October 2013: awarded **Dr. Trevor Yee**.
- Elsevier Early Career Woman Scientist in Chemical Sciences for the Caribbean and Latin America region; **Dr. Simone Badal**, Presented at the 2014 AAAS meeting in Chicago, February, 2014.
- Winner of Mona Principal’s Research Award for 2013: for Research Project with the Greatest Business/Economic/Development: **Trevor H. Yee**, Ruby Lisa Alexander-Lindo, Denise Daley-Beckford, and Paul Reese.
- Winner of Mona Principal’s Research Award 2013: for Best Research Paper entitled, “Antiproliferative activity and absolute configuration of zonaquinone acetate from the Jamaican alga *Styopodium zonlae*”: Penicooke N, Walford K, **Badal S**, **Delgoda R**, Williams LA, Joseph-Nathan P, Gordillo-Romn B, Gallimore W.
- Impact in the Faculty of Medical Sciences for 2013. “Novel Treatment of Hyperglycaemia and Hypertension, High Blood Sugar Levels and High Blood Pressure, in Rat Models”. March 2014, Faculty of Science and Technology Awards. Winner of the award for the Research project with the greatest Business/Economic/Development Impact for 2013. **Trevor H. Yee**, Ruby Lisa Alexander-Lindo, Denise Daley-Beckford, and Paul Reese.
- Impact in the Faculty of Science and Technology, Mar. 2014,

Faculty of Science and Technology Awards; Penicooke N, Walford K, Badal S, Delgoda R, Williams LA, Joseph-Nathan P, Gordillo-Romn B, Gallimore W.

#### STUDENT MATTERS

- David Picking, Ph.D. candidate. Successfully upgraded from M.Phil. to PhD, on 25th October 2013, and submitted his thesis in April 2014, entitled, “The Contemporary Use of Medicinal Plants in Jamaica & Assessment of Potential Herb-Drug Interactions & Chemoprotective Properties of Select Plants”. (Supervised by Delgoda R and Mitchell S).
- JeAnn Murray, M.Phil. candidate submitted her thesis, entitled, “The inhibition of human Cytochrome P450 enzymes by local herbs, natural and synthetic isolates” in April 2014.