

THE NATURAL PRODUCTS INSTITUTE

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– Executive Director

WORK OF THE INSTITUTE

During the year, further research has continued on improving even further the efficiency of the university's patented process for the extraction of the active ingredients of Bitterwood, *Picrasma excelsa* (Simaroubaceae). This is with the ultimate goal of enhancing a local extraction facility for the tree, of which Jamaica is the global supplier. Other research on the properties of the active ingredients is also being undertaken.



Research has almost been completed on a novel pest control methodology and its application against two pests of one of the island's important economic crops. The method of action and its range are being investigated as well as the application of this novel methodology, in other countries and against other pest species.

Investigations are also continuing on natural products which have exhibited herbicidal activity against other plants, and could find use as organic bio-herbicides. An investigation into possible local sources of bio-fuels has also been initiated.

The investigation of natural products with medicinal and nutraceutical value has been on-going. Bioactivity screens to test for properties in cancer prevention, has yielded several compounds with high potency. The protection of Intellectual property of these compounds is under consideration.

The investigation of potential of co-administered herbal medicines to interact with prescription medicines is another project in progress. We have now completed the third representative survey on drug and herbs co-usage. Results are indicative of high co-administration prevalence

up to 80% in the island. These survey data have provided information for laboratory investigations to get underway to test those herbal remedies that are likely to have pharmacokinetic interactions with prescription medicines. Several herbal teas and decoctions are now under laboratory investigations.

The protection of the Intellectual Property Rights of several of these investigations and their commercial applications, are being borne in mind and are likely to result in additional patent applications.

Research Grants

- Dr. Yee received a grant worth **J\$2.3M** from the Forest Conservation Fund for his project, “Propagation Research for Sustainable Management of Bitterwood”. The original grant proposal comprised three sections, the locating and determination of trees with the highest yield of active ingredients, propagation of the highest yielding varieties and specimens, and field trials of the propagated plants. The grant is for the first of the three sections of the proposed project. The ultimate goal of this research project will be to ensure that there will be an adequate supply of high yielding trees, especially if a local extraction plant is established.
- Dr. Delgoda received **US\$12,000** from the International Foundation for Science (Sweden) for a project entitled “Investigating potential drug herb interactions”. This is the second grant she has received from IFS.

PUBLICATIONS

Book Chapter

- * **Trevor H. Yee**, 2008, The Macro-Fungi of Jamaica, in Jamaica: A Photographic Journey through the Land of Wood and Water, Byron Wilson Ed., pp. 29-31. Eladio Fernandez, Publisher.

Refereed Journal Articles

- * Grace-Ann O. Junor, Roy B. R. Porter, **Trevor H. Yee**, 2008, The Chemical Compositions of the Essential Oils from the

Leaves, Bark, and Fruits of *Bursera simaruba* (L.) Sarg. from Jamaica. *J. Essent. Oil Res.*, 20, 426-429.

- * Grace-Ann O. Junior, Roy B. R. Porter, **Trevor H. Yee**, 2008, Chemical Composition and Insecticidal Activity of the Essential Oils from *Bursera holickii* (Britton) found in Jamaica, *J. Essent. Oil Res.*, 20, 560-565.
- * Shields M, Niazi U, Badal S, **Yee T**, Sutcliffe MJ and **Delgoda R**, Inhibition of CYP1A1 by Quassinoids found in *Picrasma excelsa*, 2009, *Planta Medica.*: 75:137-141
- * Badal S, Shields M, Niazi U, Jacobs H, Sutcliffe MJ and **Delgoda R**. Screening Natural Products for CYP1 Inhibitors, Proceedings of the 17th International symposium on Microsomes and Drug Oxidations, Saratoga Springs, New York, U.S.A, 2008, p63-67.

PUBLIC SERVICE

Dr. Trevor Yee

- Treasurer, International Society for the Development of Natural Products.
- Executive Committee Member, The Natural History Society of Jamaica.
- Member, Steering Committee: Towards a National Bioprospecting Programme, National Commission of Science and Technology, Office of the Prime Minister.

Dr. Rupika Delgoda

- Executive Committee Member, Jamaica-Sri Lanka Friendship Association.

Supervision of Research Students

Postgraduates

Ms. Grace-Ann Ofelia Junior, supervised by Drs. Roy Porter of the Dept. of Chemistry and Trevor Yee, of the Natural Products Institute, matriculated with a MPhil degree, her thesis was, “Seasonal Variation of the Chemical Composition of Essential Oils from *Bursera lunanii*, B.

simaruba, *B. aromatica*, and *B. holickii*, and their Biological Activities”, in 2008.

Three MPhil and one PhD students working jointly with the Natural Products Institute, the Depts. of Chemistry, Basic Medical Sciences and Life Sciences, are being supervised by Dr. Trevor Yee, Dr. Lisa Lindo, Dr. Jane Cohen, and Prof. Phyllis Coates-Beckford.

One PhD student is being supervised by Dr. Rupika Delgoda and one MPhil student by Dr. Delgoda and Dr. Sylvia Mitchell of the Bio-Technology Centre.

Undergraduates

One undergraduate student registered in the Dept. of Chemistry did her summer work-study program at the Institute and was supervised by Drs. Yee and Delgoda.

Dr. Delgoda lectured in the BSc final year Advanced Biochemistry course.

Drs. Yee, Delgoda, Mitchell and Mr. David Picking of the Institute coordinated and lectured in the Herbal and Complimentary Medicine course to the B. Pharm. final year students at the U. of Technology.