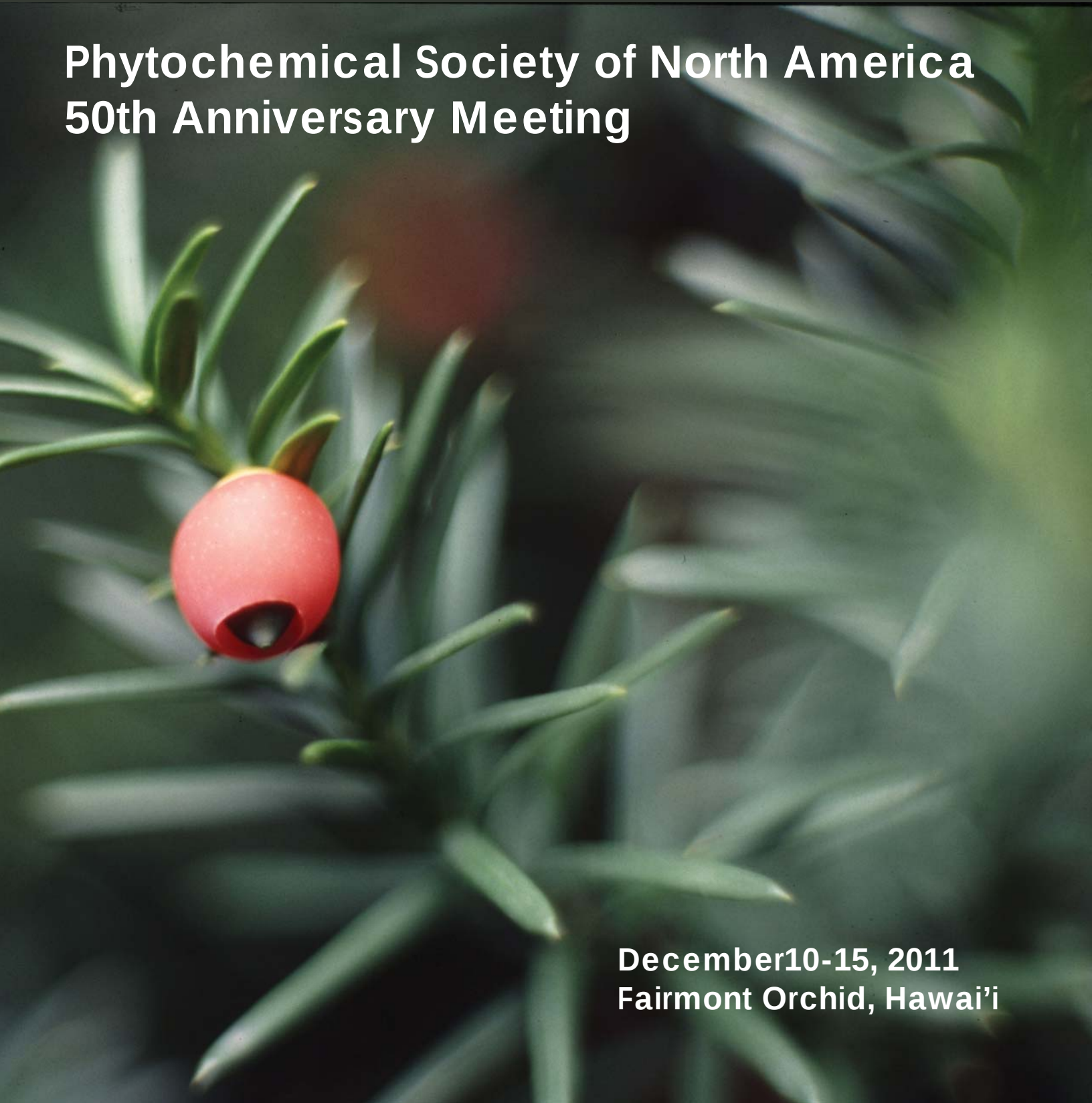


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BOT 7

INHIBITION OF QUORUM SENSING AND BIOFILM FORMATION BY TROPICAL PLANTS

Chieu Anh Ta,¹ Marie Freundorfer,¹ Ammar Saleem,¹ Ana Gargaun,² Muhammad Asim,² Mario Garcia Quesada,³ Marco Otarola Rojas,³ Pablo Sanchez Vindas,³ Luis Poveda,³ Victor Cal,⁴ Tony Durst,² John T. Arnason¹ (¹University of Ottawa, Biology, Ottawa, ON K1N 6N5, Canada, ²University of Ottawa, Chemistry, Ottawa, ON K1N 6N5, Canada, ³Universidad Nacional, Herbario Juvenal Valerio Rodriguez, Heredia, 86-3000, Costa Rica, ⁴Belize Indigenous Training Institute, Punta Gorda, Belize.)

This is a new approach to the discovery of new phytochemicals from tropical plants that can interfere with the formation of bacterial biofilms. Bacteria use a cell-to-cell communication system known as quorum sensing (QS) to coordinate gene expression for the formations of these biofilms. Ethanolic extracts of tropical and traditional anti-infective plants were screened for QS interference and biofilm inhibition. Extracts from the Melastomataceae, Meliceae, Sapindaceae, Lepidobotryaceae, Combretaceae, and Euphorbiaceae showed the highest inhibitory activities. QS inhibition ranges from 7.3 + 0.1 mm to 26.1 + 0.3 mm. Inhibition of biofilm growth ranges from 0 to 76.8 + 2.0 %. In particular, one Melastomataceae species (*Oxlaia chajom*) was most promising with QS inhibition zone of 25.9 + 0.6 mm and biofilm MIC (minimum inhibitory concentration) of 50 µg/mL. Interestingly, this is the first report of biological activity for this plant and very little is known about its phytochemistry. Bioassay-guided fraction of *Oxlaia chajom* showed that inhibitory activities are in the more polar fractions. Current work is being done on the isolation and identification of the active principles.

BOT 8

ETHNOPHARMACOLOGY OF ANTI-INFLAMMATORY BOTANICALS USED BY THE Q'EQCHI' MAYA OF BELIZE

Brendan Walshe-Roussel,¹ Christine Choueiri,² Max London,¹ Ammar Saleem,¹ Federico Caal,³ Victor Cal,³ Todd Pesek,⁴ Tony Durst,² John Thor Arnason¹ (¹University of Ottawa, Dept. of Biology, Ottawa, ON K1N6N5, Canada, ²University of Ottawa, Dept. of Chemistry, Ottawa, ON K1N6N5, Canada, ³Belize Indigenous Training Institute, Punta Gorda, Toledo Belize, ⁴Cleveland State University, Dept of Health Sciences, Center for Healing Across Cultures, Cleveland, OH 44115, USA.)

Indigenous pharmacopeias recognize the important role of inflammation in disease, and the Q'eqchi' Maya healers of Belize possess a practical understanding of a large number of immunomodulatory botanicals. Ethnobotanical interviews were held with 5 members of the Q'eqchi' Maya Healers Association using a list of 14

inflammatory symptom categories and one hundred and seven plant species were collected from primary and secondary semi-evergreen rainforest in the Maya Mountains of Belize. Ethanolic extracts of fifty-five species were assayed for anti-inflammatory activity in a LPS-stimulated THP-1 monocyte assay. Of these, 76% demonstrated significant anti-inflammatory activity relative to the vehicle control, and three species displayed activity equal to that of the parthenolide positive control. In addition, several sesquiterpene lactones isolated from *Neurolaena lobata* exhibit potent anti-inflammatory activity. These results demonstrate that plants used by the Q'eqchi' Maya Healers Association for the treatment of inflammatory-related symptoms do indeed possess immunomodulatory properties, and elucidating the active principles of these species can yield compounds with novel bioactivities.

BOT 9

ANTIOXIDANT, ANTIMICROBIAL AND ANTIVEROTOXIC POTENTIALS OF EXTRACTS OF CURTISIA DENTATA

James Doughari Hamuel, Patrick Alois Ndakidemi, Izzane Susan Human, Benade Spinney (Cape Peninsula University of Technology, Applied Sciences Faculty, Cape Town, 8000, South Africa.)

The potentials of *Curtisia dentata* as antimicrobial, antioxidant and antiverotoxin against environmental isolates of *E. coli* and *Acinetobacter* spp, the presence of phytochemicals and some organic compounds was investigated. The highest concentration of phytochemicals and organic compounds such as anthraquinones, alkaloids, essential oils, glycosides, phenols, steroids, saponins and tannins and the organic compounds quinones, anthocyanins, amines and carboxylic acids were found in the stem bark ethanol extracts compared to other parts of the plant or solvent extracts. Antimicrobial activity as relative inhibition zone diameters (%) ranged between 8-28% (MIC values, 100-2500 mg/ml) against *E. coli* serotypes, and 10-28% (MIC, 100-850mg/ml) and 6-28% (MIC, 150-2500 mg/ml) against *A. lwoffii* and *A. haemolyticus* respectively. The extracts demonstrated inhibitory action against the expression of both Vtx1 and Vtx2 genes in both *E. coli* and *A. haemolyticus* strains with the ethanol extracts demonstrating the highest antiverotoxin activity compared to other solvents. The ethanol root bark extracts consistently showed the highest DPPH radical scavenging activity (62.43%), total phenol content (TPH) (57.62 26 mg GAE/g) and reducing power (RP) (41.32%), followed by those of the stem bark and leaf extracts with the respective values of 54.68%, 37.77 mg GAE/g and 21.83%. Ethanol extracts demonstrated the highest values for both DPPH, TPH and RP followed by dichloromethane, hexane, acetone and distilled water in this order. *C. dentata* can be used to source novel antimicrobial agents for the treatment of verotoxin bacterial infections.