ABSTRACT

Prenylated Benzophenone Derivatives from
Clusia and *Garcinia* Species of Jamaica

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This dissertation describes the isolation, structure elucidation and derivatization of natural products, mainly prenylated benzophenone derivatives, from three Jamaican Clusiaceae species.

Chapter one consists of a concise review of the family Clusiaceae. The most recent examples of the major secondary metabolites of the family, along with their reported biological activity, are also presented.

In Chapter two, a study of the native Jamaican Clusiaceae plant, *Clusia flava* is described. Three known benzophenone derivatives (compounds A–C) as well as the dammarane triterpenoid euphol (compound D) were isolated and characterized. Chapter two also deals with the derivatization of 7-*epi*-nemorosone to produce alkyl and methyl ethers as well hexahydro derivatives. Six compounds (compounds E, F, G, H, I and J) were obtained, four of which are new chemical entities. Additionally, biological screens for 7-*epi*-nemorosone and its derivatives against Gram-positive and Gram-negative bacteria, fungi, strains of *Plasmodium falciparum* and *Leishmania* were carried out to probe structure-activity relationships.

Chapter three provides a description of the isolation and characterization of the tautomeric pairs of the prenylated benzophenone derivatives compounds K, L, O and P from endemic *Clusia portlandiana* and *Garcinia decussata* of Jamaica. The biogenesis of compound L from compound K, utilising an intramolecular-Diels–Alder (IMDA) reaction, is also proposed. To our knowledge this is the first report that provides evidence for the IMDA reactions in the biogenesis of the tricyclo[4.3.3.0]decane core of the nemorosonol series. Two known pentacyclic triterpenoids, friedelin and 3β-friedelinol were also characterized.

Finally, a three-step synthesis of the degradation product of the acid treatment of 7-*epi*-nemorosone via Friedel–Crafts benzoylation reactions and Fries-rearrangement of phenyl acrylates is presented.

Keywords: Stacy-Ann Joy Parker; Clusia and Garcinia; prenylated benzophenone