

ABSTRACT

Phytochemical and Biological Properties of the Leaves and Stems of Jamaican Blackberry (*Rubus jamaicensis*)

Ruth Eloise Williams

Jamaica plays host to numerous underexplored medicinal plants. The World Health Organization Traditional Medicine Strategy 2014-2023 aims at developing member states by promoting the use of traditional medicine in a safe and constructive manner. This research serves to explore the health-promoting properties of *Rubus jamaicensis* and thereby unlock its potential use in traditional medicine practices.

This thesis is comprised of five chapters. The first chapter contains a review of *Rubus* isolates. This is followed by the phytochemical study of *R. jamaicensis* which yielded a steroid, a terpenoid and three flavonoids, all being reported from this species for the first time. GC-MS analysis of the fatty acids (Chapter 3) revealed an $\omega 6:\omega 3$ ratio of 4.3:1. A CYP1A1 inhibition of 88.5% was demonstrated by the fatty acid extract, thereby indicating possible cancer chemopreventive properties.

A brief review of bioactivity and antioxidant studies is detailed in Chapter 4, while Chapter 5 reveals the overall health-beneficial potential of *R. jamaicensis*. These extracts showed antioxidant capacities which mirrored- and in the case of the methanol extract (84.58 mg GAE/g D.W (DPPH assay) - exceeded the antioxidant capacity of other *Rubus* plants. LCMS-MS studies revealed the presence of catechin, ellagic acid and epicatechin at levels of 3.48, 30.17 and 515.92 mg/g D.W, respectively. *R. jamaicensis* extracts showed anticancer activity against the DU-145 prostate cancer cell line, partitions from the crude methanol extract exhibiting 22 - 40 % inhibition. Antibacterial analysis revealed that the aqueous extract was most active, demonstrating activity against both Gram negative and Gram positive microbes. Oral glucose tolerance tests conducted on the plant extracts showed no hypoglycemic effects. These findings of favourable biological properties confirm the potential application of the aerial parts of *R. jamaicensis* in traditional medicine for the promotion of good health and in the production of health-beneficial food products.

Keywords: Ruth Eloise Williams; *Rubus jamaicensis*; polyphenols; antioxidant activity; traditional medicine.