ABSTRACT

Chemical and Toxicological Characterization of selected components of the Ackee (*Blighia sapida)* Fruit

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In this report, the ackee fruit, *Blighia sapida* is examined so as to obtain toxicological data on selected components of the fruit and to further characterize the toxins present in the fruit, to aid in the assessment of food safety regulations to protect ackee consumers.

Literature reviews of *Blighia sapida*, Chapter One, and the process of conducting a risk analysis, Chapter Two, were conducted in order to build on existing knowledge of the fruit. Chromatographic and characterization techniques, Chapters Three and Four, were employed to isolate, characterize, qualitatively and quantitatively assess specific components of the ackee fruit. The hypoglycin A intake of the Jamaican public was then assessed, Chapter Five. This data was subsequently used to conduct animal studies, to acquire toxicological information which could be used to determine the levels of hypoglycin A that are safe for consumption, Chapter Six, as well as to determine the safety of consuming ackee oil, Chapter Seven.

The results of the studies showed that

1. Hypoglycin A was successfully isolated from the ackee fruit (purity > 95%), as a pair of diastereoisomers in the ratio of 73.75% (2S, 4R) and 24.25% (2S,4S)-methylenecyclopropylalanine.
2. Both the R and S isomers of hypoglycin A were quantified in unripe ackee using a modified High Performance Liquid Chromatographic technique, with the R isomer being in 15% excess.
3. Unripe ackee fruit contained saponin(s) that may potentially have a cholesterol lowering effect, fungicidal and antibacterial properties, that may add value to the ackee fruit.
4. Children consumed a larger quantity of hypoglycin A than other members of the household, which explains the greater incidences of Jamaican Vomiting Sickness reported amongst this group.
5. Ackee oil produced an agranulocytotic effect in rats that had consumed the product orally. Thus, the possible commercial use of ackee oil for cooking purposes may not be safe.

Key words: *Blighia sapida*; ackee; ackee oil; hypoglycin A; ackee intake; agranulocytosis; diastereoisomers; saponins; toxicology; food safety.