

ABSTRACT

Investigating the Hypoglycaemic Principle(s) of *Sechium edule* (Cho-Cho) Leaves and Stems in Normoglycaemic Sprague-Dawley Rats

Nicolia Nadine Nelson

Diabetes mellitus is a pandemic disease. Conventional treatments such as acarbose and metformin have been used to control it however; they have not proven to be completely effective. Hundreds of plant species purportedly display hypoglycaemic properties; which could prove to be more effective than conventional treatments. Notwithstanding, more research should be done in order to isolate and characterize the active principles. *Sechium edule* is a cucurbit with a myriad of therapeutic uses.

Sechium edule leaves and stems were extracted sequentially in hexane, ethyl acetate and methanol. These crude extracts were administered orally and intravenously at varying dosages to normoglycaemic Sprague-Dawley rats. The effect on the blood glucose concentration was then measured using the Oral Glucose Tolerance Test (OGTT). The most active extract was analysed using various chromatographic and spectroscopic techniques.

The glucose tolerance curves for all three crude extracts showed hypoglycaemic activity however that of the methanol extract was the most significant. It sustained the hypoglycaemic activity throughout the test. It antagonized the expected glycaemic peak after the glucose load was administered. It was reduced from 6.43 ± 0.420 mmol/L for the dimethyl sulfoxide (DMSO) control to 4.96 ± 0.200 mmol/L ($p = 0.007$) for the rats treated with the crude methanol extract.

Purification of the methanol extract produced three fractions NN/1, NN/2 and NN/3 all of which showed hypoglycaemic activity. Further purification was done using TLC and HPLC. FT-IR and GC-MS analysis revealed two hypoglycaemic compounds which were comparable to metformin in activity. The compound in NN/3 was the most potent and also showed hypotensive activity.

The compound present in NN/1 and NN/2 was identified as dicyclohexylamine and that in NN/3 as methanethioamide; both were alkaloidal in nature. Alkaloids tend to have a diverse range of pharmacological uses. Hence these two compounds could serve as potential treatments for diabetes.

Keywords: Nicolia Nadine Nelson; hypoglycaemic; methanethioamide.