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Research Article

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Gas Chromatographic Characterization of Aqueous Saponin Extract of *Heinsia crinata* Leaves

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ABSTRACT

***Aim**: The quantitation and separation of bioactive phytochemicals by chromatographic methods is one of the procedures for drug testing and formulation.*
***Materials and Methods**: The aqueous saponin extract of Heinsia crinata was derivatized and used to screen for the presence and identification of bioactive fractions present in the aqueous medium with the view to ascertaining its antidiabetic property.*
***Result**: The chromatogram revealed the presence of eighteen types of the saponin fractions in the extract. The quantitative data shows that Sapogenin (93.60018 mg/100 g) was the highest, followed by Saponine (28.64542 mg/100 g), Neochlorogenin (11.72150 mg/100 g), Diosgenin (9.85961 mg/100 g) and the least been saponoside A (1.20487 mg/100 g) amount of the extract.*
***Conclusion**: The fractions with the high values are known to possess antidiabetic properties. This finding therefore supports the use of Saponin extract of Heinsia crinata in the treatment of diabetes mellitus and is a potential source for the development of such hypoglycaemic agents.*

Keywords: *Heinsia crinata*; Saponine; Sapogenin; Diosgenin; Gas chromatograpy; Quantitation

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INTRODUCTION

WHO noted the increased use of plants for medicinal values. About 80% of people in developing countries. Chromatographic techniques used for doing screening Development, Purity and impurity analysis, Isomer separation, support of Toxicity studies, Biotechnological drug development etc. *Heinsia crinata*, commonly known as Atama and used by locals for Diabetes treatments. Previous findings implicated saponin fraction as the bioactive fraction. Hence the chromatographic sereening of the aqueous saponin extract [1-22].

LITERATURE REVIEW

Plant bioactive substances require testing for purity, safety and usefulness [1,9] plants extract are rich sources of bioactive ingredient for drug development [3,14]. *Heinsia crinata* implicated as source of antidiabetic and antihyper-glycamic bioative substances [10,16]. Saponin extract of the aqueous fraction of *Heinsia crinata* implicated to be responsible for antidiabetic activity [7,9]. Hence the interest in the screening of the aqueous extract of *Heinsia crinata*…..??

MATERIALS AND METHODS

- *Heinsia crinata* obtained.
- Grinded to coarse form of weight 50 g.
- Dissolve in distilled water.
- Filtered after twenty-four (24) hours.
- Filtrate freeze dried to obtain a mass of weight 0.60 g.
- Dissolved in 20 ml re-distilled ethanol and used for saponin.
- Extraction by the method of Guo et al. [6].
- Extract concentrated to 1.0 ml in the vial of the chromatographic machine and used for the analysis.

RESULTS

The chromatogram revealed the presence of eighteen types of the saponin fractions in the extract (Table 1 and Figure 1).

Table 1: Chromatogram of aqueous saponin extract of *Heinsia crinata*

S/N	Name	Retention, Time (minus)	Amount (mg/100 g)
1	Sapogenin	22.603	93.6002
2	saponine	25.355	28.6454
3	Neochlorogenin	20.79	11.7215
4	Diosgenin	18.843	9.85961
5	Tribuloin	23.232	8.44968
6	Hacogenin	21.501	7.62862
7	Sapagenol B	23.624	5.91212
8	Sapagenol A	22.995	4.98902
9	Conyzorgin	24.611	3.24713
10	Hispogenin	17.667	3.18883
11	Celosin F	24.791	2.68616
12	Celosin E	24.725	2.36002
13	Celosin G	25.262	2.53185
14	Saponoside D	21.822	1.84635
15	Tigogenin	19.521	1.58324
16	Yanogenin	23.968	1.57018
17	Solagenin	18.592	1.46753
18	Saponoside A	21.328	1.20487
TOTAL			**192.492**

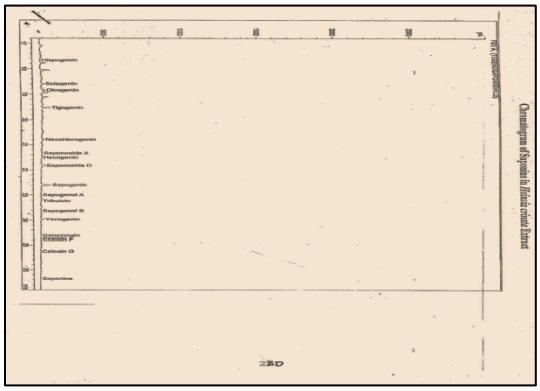

Figure 1: Saponin compounds identified in the aqueous leaf extract of *Heinsia crinata* showing their retention time (min) and amounts (mg/100 g)

DISCUSSION

Various workers have reported on the antidiabetic and antihyperglycaemic activities of *Heinsia crinata* [4,10]. Saponins possess antioxidant and antimutagenic properties and so protect DNA damage [19]. Constituent amounts of bioactive product in plant materials enhance therapeutic activity [18]. Diosgenin inhibits α-amylase and α-glucosidase and so treat diabetes mellitus [5]. It reduces cardiomyocetes apoptosis when used in combination with Mononiside [20]. Hecogenin used in the production of steroidal drugs. Tigogenin is a material used for the synthesis of steroid Hormones and drug to prevent Osteoporosis [8]. Tigogenin was reported to normalise glucose, glycogen levels and hexokinase activity in diabetic treated rats. It also decreased glycogen phosphorylase, glucose-6-phosphatase and Fructose-1,6- Biphosphatase activities in diabetic rats treated with the extract [8].

- Sapogenol A and B reported to be antiwrinkle ingredients.
- Neochlorogenin mentioned in older literatures as antihyperglycaemic
- Celocin A-G are steroids and have been implicated as antioxidant and antidiabetics [12,13].
- Sapogenins were implicated to be the active ingredients in Jamaican bitter yam (*Dioscorea polygonides*) that was responsible for itsuse in diabetes management [15].

CONCLUSION

Component compounds of aqueous extract of *Heinsia crinata* are implicated to be antidiabetic and antihyperglycaemic. Component compounds of aqueous extract of *Heinsia crinata* shown as drug sources. Therefore use as drug for treatment of diabetes mellitus by the locals is justified also a positive indicator of drug source.

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