



Short Communication

Antibiotic Activity of Heinsia CrinitaCHARLES O EZEH*¹, UZOMA J NGENE², KENECHUKWU C ONYEKWELU¹¹Department of Medical Biochemistry, College of Medicine, University of Nigeria, Enugu Campus²Department of Biochemistry, Renaissance University Ugbawka, Enugu State, Nigeria**ARTICLE DETAILS***Article history:*

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*Keywords:*Antibacterial activity,
Heinsia crinita,
Staphylococcus aureus**ABSTRACT**

Antibacterial activity of leaf extracts of *Heinsia crinita* was observed in this work. *Heinsia crinita* was evaluated for antibacterial activity on *Staphylococcus aureus* which was gotten from skin surfaces of students of Renaissance University, 26 males and 24 females making a total number of 50 samples through swabbing. Organisms isolated include *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Bacillus* and because *Staphylococcus aureus* was the organism of interest it was sub cultured into Nutrient agar plates after which the antibacterial sensitivity testing was carried out. The organism was sensitive to Methanol and Aqueous extract but N-hexane showed no inhibition. The result obtained indicated that female isolates showed more significant effect of antimicrobial activities of leaf extracts of *Heinsia crinita* against *staphylococcus aureus* with the value of 25.76MM while for the male showed least significant effect with the value of 22.34MM. It was also found out that for the males: Aqueous extract inhibited the most with the mean value of 4.53MM followed by Methanol extract with the mean value of 3.93MM and N-hexane extract showed no inhibition. For the females, aqueous extract inhibited the most with the mean value of 4.67MM followed by methanol extract with the mean value of 3.93MM while N-hexane extract showed no inhibition. This study justifies the necessity of using *Heinsia crinita* for medicinal purposes.

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INTRODUCTION

The search for newer sources of antibiotics is a global challenge preoccupying research institutions, pharmaceutical companies, Academia, since many infectious agents are becoming resistant to synthetic drugs. [1] Infectious diseases are the world's major threat to human health and account for almost 50,000 deaths every day. [2] *Heinsia crinita* (Rubiaceae), also known as "Bush apple", is called "Atama", "Tonoposho" and "Fumbwa" in Efik, Yoruba and Igala dialects respectively. It is a scrambling shrub in secondary jungle, or small tree 8-13m high in under-storey of high evergreen forest. [3] The plant is common across the tropical region from Guinea to Western Cameroon and Equatoria Guinea and across the Congo basin to East and South Central Africa, Akwa ibom, Calabar.

Its scrambling shrub is persistent and very conspicuous leafy .calyx-lobes, produces edible yellow or reddish fruits, sweet when ripe and pleasantly acidic. [3] Almost All parts of the plant can be utilized by humans for food or for medicinal purposes. Its fruits, leaves and flowers are edible. Its roots can be used as medicine.

Recently, the medicinal status of *Heinsia crinita* has been established. [4] Orthodox medicine has overshadowed African traditional medicine, hence, the over dependence on industrialized nations for the treatment and control of diseases in Africa. Also, there are very few studies on African traditional plants including their physiochemical and phytochemical properties and safe doses of use. It is only recently that there is an increase concern in the need to source for locally available medicine because of non-affordability of conventional chemotherapeutic agents, drug failure and clinical cost due to an increased level of poverty in Africa. [5] The increase of antibiotic resistance of micro organism to conventional drugs has necessitated

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the search for new, efficient and cost effective ways for the control of infectious disease.

In light of the credits accorded to *Heinsia crinita*, this study was aimed at accessing antibiotic activities of leaf extracts of *Heinsia crinita* against *staphylococcus aureus*.

MATERIALS AND METHODS

MATERIALS

Plant Material

Leaves of *Heinsia crinita* (Atama leaves) were freshly harvested from farms in Ikot Nakanda in Akpabugo Local Government Area of Akwa Ibiom State and were identified by Prof. Okoli C.N a botanist from the Department of Microbiology Renaissance University Ugbawka, Enugu state.

The leaves were air dried at room temperature when they were dried enough to break they were ground to powdered form using a grinder and stored for extraction.

Extraction of Plants Extract

20 grams of the ground leaves was weighed into 100mls of distilled water, absolute methanol and n- hexane. They mixture was left for 24 hours for maximum extraction to take place. The soaked leaves were filtered using Whatmans' No. 1 filter paper and allowed to evaporate in a rotary evaporator.

Source of Organism

A total number of 50 Renaissance University students were swabbed on their skin surfaces using sterile and labeled swab sticks (26males and 24females). A nutrient agar was prepared to isolate *Staphylococcus aureus*.

METHODS

Antibacterial Sensitivity Testing

Testing for the antibacterial effects of the aqueous, methanol and n-hexane extracts were done using the technique described by Kirby-Bauer. [6] The isolates which was gotten from sub-culturing using nutrient agar in petri dishes, each of the petri dishes was divided into three and was added 0.02ml of Aqueous, Methanol and N-hexane extracts respectively and were incubated at 37°C for 24hours. Standard antibiotic were used as control for comparison with the raw extract. The plates were observed for zones of inhibition after incubation fold by calculation of the mean zones of inhibition (mm).

Phytochemical Screening

This was done using the methods of Sofowora (1993) [7] and Trease and Evans (2002). [8] The

aqueous, methanol and n-hexane extracts were subjected to Phytochemical screening to reveal the presence of its secondary metabolites.

RESULTS

Antibacterial Sensitivity Testing

Table 1: Antibacterial sensitivity testing of leaf extracts of *Heinsia crinita* on *Staphylococcus aureus* for 24 females. Zone of inhibition (mm)

<i>Staphylococcus aureus</i> isolates for 24 females	Aqueous Extract Zone of inhibition (mm)	Methanol Extract Zone of inhibition (mm)	N-Hexane Extract Zone of inhibition (mm)
1	0	6	0
2	4	5	0
3	4	4	0
4	8	0	0
5	4	6	0
6	8	5	0
7	4	5	0
8	0	4	0
9	6	4	0
10	5	0	0
11	4	0	0
12	6	5	0
13	5	5	0
14	8	4	0
15	4	6	0
16	6	4	0
17	8	5	0
18	8	0	0
19	5	4	0
20	4	6	0
21	8	4	0
22	4	4	0
23	6	5	0
24	5	8	0

DISCUSSION

Heinsia crinita has shown to have antibacterial activities against *staphylococcus aureus* in this study. The result obtained indicated that female showed more significant effect of antimicrobial activities of leaf extracts of *Heinsia crinita* against *staphylococcus aureus* with the value of 25.76MM while for the male showed least significant effect with the value of 22.34MM.

It was also found out that for the males, aqueous extract inhibited the most with the mean value of 4.53mm followed by Methanol extract with the

mean value of 3.93mm. N-hexane showed no inhibition.

Table 2: Antibacterial sensitivity testing of leaf extracts of *Heinsia crinita* on *Staphylococcus aureus* for 15 males. Zone of inhibition (mm)

<i>Staphylococcus aureus</i> isolates for 26 males	Aqueous Extract Zone of inhibition (mm)	Methanol Extract Zone of inhibition (mm)	N-Hexane Extract Zone of inhibition (mm)
1	6	0	0
2	0	4	0
3	4	6	0
4	6	7	0
5	4	8	0
6	5	6	0
7	6	4	0
8	5	4	0
9	5	4	0
10	0	0	0
11	4	0	0
12	5	4	0
13	6	5	0
14	8	7	0
15	4	0	0
16	4	6	0
17	8	8	0
18	5	4	0
19	4	6	0
20	6	8	0
21	6	5	0
22	8	0	0
23	5	6	0
24	0	8	0
25	4	4	0
26	6	5	0

For the females, aqueous extract inhibited the most with the mean value of 4.67mm followed by methanol extract with the mean value of 3.93mm. N-hexane extract showed no inhibition. *Heinsia crinita* also known as Atama leaf is used for preparing vegetable soup in Efik. It is also used for the treatment of ailments such as sore throat, cough, menstrual pain, internal heat, constipation, worm infestation, diarrhea.^[9] From the result of different studies it has provided evidence that some medicinal plants might indeed be potential sources of new antibacterial agents.^[10]

Table 3: Antibacterial sensitivity testing of antibiotics on *Staphylococcus aureus* isolates. Zone of inhibition (mm)

Antibiotics	Quantities	<i>Staphylococcus aureus</i> Zone of inhibition (mm)
Tarivid	10µg	-
Peflacin	10µg	-
Ciprofloxin	10µg	22
Augmentin	30µg	-
Streptomycin	30µg	24
Nalidixic acid	30µg	-
Septtrin	30µg	24
Ampicillin	30µg	16
Amoxil	10µg	22
Erythromycin	15µg	-
Gentamycin	30µg	-

This result showed that *Heinsia crinita* can be as effective as modern medicine to combat *Staphylococcus aureus*.

CONCLUSION

This study showed that the aqueous and methanolic extracts of *Heinsia crinita* are potential anti bacterial and could protect the body against the harmful effects of micro organisms. There is a need for further phytochemical investigation to isolate, characterize and identify the active compounds in this plant material and to evaluate such compounds for biochemical activity in order to confirm which compounds are responsible for anti-microbial activity.

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Phytochemical Analysis**Table 4:** Phytochemical Analysis of leaves extracts of *Heinsia crinite*

Test	Aqueous Extract	Methanol Extract	Hexane Extract
Sample + H ₂ O	Saponin +++	Saponin ++	Saponin -
Sample + 0.1M of NaOH	Flavonoids ++	Flavonoids +++	Flavonoids +++
Sample + 10% of FeCl ₃	Tannins +++	Tannins +++	Tannins +++
Sample + 2ml of HCL	Glycosides +++	Glycosides +++	Glycosides +++
Sample+ wagner reagent + three drops of H ₂ SO ₄ + two drops of K ₂ Cr ₂ O ₇	Alkaloid +++	Alkaloid +++	Alkaloid +++
Sample+ conc.HNO ₃ + diluted NH ₃	Morphinine Alkaloid -	Morphinine Alkaloid -	Morphinine Alkaloid -
Sample + three drops of conc.HCL +2ml of K ₂ CrO ₇ +2ml conc.NH ₃	Quinonline -	Quinonline -	Quinonline -
Sample + conc.HNO ₃ +dilute NH ₃ solution	Purine alkaloid +	Purine alkaloid +	Purine alkaloid +++
Sample + 5% of NH ₄ (OH) ₂	Anthra quinone alkaloid -	Anthra quinine alkaloid -	Anthra quinine alkaloid -
Sample + million reagent	Protein ++	Protein ++	Protein -

= Not present, ++ = Not fully present, +++ = fully present

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