ANTIMICROBIAL PROPERTIES OF Kigeliaafricanas AGAINST MICOORGANISMS ASSSOCIATTED WITH SKIN INFECTIONS

OJO Olubunmi Peter
Biology Department, School of Secondary Education (Science Programmes)
Emmanuel Alayande College of Education, Oyo

Abstract
The antimicrobial properties and effect of methanol, ethanol and aqueous extract of Kijelia Africana on four different microorganism namely; Staphylococcus aureus, Escherichia coli, Pseudomonas aerugnosa and Candida albicans were determined using agar well diffusion and paper disk diffusion methods. The result revealed that methanol has the best extractive solvent for kigelia Africana leaf followed in order by ethanol and aqeous extractions. The methanol extract of kigelia Africana gave the widest zone of inhibition (19mm) against Eschenchia coli using agar-well diffusion method. The growth of all the microorganism used were inhibited by the three extract with methanol proving to be the most effective followed by ethanol and aqueous extract. The loves zone 7 inhibition was recorded by aqueous extract (1.5m). this result however supported the ethnopharmaceutical claim of kijeliaafricana leaf extract against bacteria implicated in skin infections in traditional medicines. Effect toward con……. this properties into a conventional drugs should therefore be intensified and pursed.

Introduction

Plants have been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural resources, many of these isolations were based on the uses of the agents in traditional medicines for their primary health care (Fansworth 1985).

Kigeliaafricana is atropical Africa plant found on river banks where it may reach 20m along streams and on flood plain also in open woodland. The plant is widely grown and distributed in south central and west Africa belonging to the family of Bignoniaceae and commonly called the Sausage tree because of its huge fruits. The African common names include: Pandoro (yoruba), Uturubien (igbo), and Hantsargiuaa (hausa) (Ayeloja and Bello 2006).

It is widely grown as ornamental plant in tropical region for its decorative flowers throughout Africa, India, and middle east has been cultivated as an endemic species in different habitat for it various medicinal purposes (Onyemaechi 2013). Preparations of Kigelia Africana have been known to possess antimicrobial and medicinal properties not only because of its perceived characteristics such as bitterness, astringent taste or smell but also because of forces that it seems to emit in connection with its location, orientation and association with other plants.

In some African countries like Malawi during famine, the seeds are roasted to eat. Baked fruits are used to ferment beer while the boiled one is used in the making of red dye. The fruits and barks grinded and boiled in water are taken orally or used as enema in treating stomach ailments (Burkill 1985).

Most commonly traditional healer have used the sausage tree to treat a wide range of skin ailments from relatively mild complaints such as fungal infections, boils, psoriasis and eczema, through to the more serious diseases like leprosy, syphilis and skin cancer (Burkill 1985). The aim of this work is to therefore obtain extract of kigeliaafricana leaf (Ethanol, Methanol and aqueous), to determine the antimicrobial properties of the extract against microbial isolates from skin infection and to verify the ethano-

pharmacuetical claim on the efficiency of the plant extract against skin diseases.

Materials and Methods

Plant Material

Kigeliaafricana leaves were purchased from a popular market, Eleekara Oyo, and was authenticated at Forestry Research Institute Nigeria. Immediately the plant was collected, the leaves were washed thoroughly with tap water and dried at room temperature. Dried leaves were grinded to fine powder using a blender. This was weighed and kept for further analysis.

Extraction of Plant Material

The powdered kigelia Africana leaf (60g) was transferred one by one to three Erlenmeyer flasks containing 300ml of distilled water, ethanol and methanol. The mixtures were placed in a shaker at 30rpm/min for 72 hours at 20^0c to allow extraction of active compounds. The extract solutions were filtered with whatman No1 filter paper then bacterial filters and the filtrate were concentrated, stored in universal bottles, sealed and kept at 4^0c for further use.

Microorganisms

A total of twelve different micro-organisms were used which include gramve and gram-ve bacteria and were obtained from university college hospital medical laboratory Ibadan. All microorganisms isolates were from skin infections.

Agar Well Diffusion Technique

Antimicrobial activity was carried out using agar well diffusion technique. 1ml of microorganisms culture were transferred into a petri-dish plate and 15 ml of nutrient agar was poured into the plates. After the culture solidified wells of size 5 mm were punched using a sterile cork borer. Each well was filled with plant extracts. Treated plates were placed in a refrigerator for about 1 hour to allow diffusion of the plant extract the plates were then incubated for 48 hours at 37^0C. Antimicrobial activity was recorded in millimetre measuring the zones of inhibition around the wells. All experiments were carried out in three replicates.

Paper Disc Technique

Sterile filler paper disc (7mm) were soaked with the test extracts and dried at 40^0C for 30 minutes. The prepared nutrient agar plates were seeded with each of the test bacteria and the filter paper disc were placed on each plate. The plates were incubated at 37^0c for 48 hours. For the fungi the test were carried out on saboround dextrose agar plates and incubated at 30^0C for 72 hours. The zone of inhibition were measured and then recorded.

Result

The result obtained from various sample of extract used are presented below:

Table1: Microorganisms and their sources

1. **Staphylococcus Aureus**

Laboratory Number	Source
ATC 2014	Skin sores
AAC 3342	Ezcema
ATC 2023	Skin boil

2. **Escheriehia Coli**

Laboratory Number	Source

ATT 2016	Wound
AAC 3342	Sores
AAT 3424	Burn

3. Pseudomonas Aeruginosa

Laboratory Number	Source
ATC 2244	Wound
ACC 3446	Skin cut
ATT 3667	Skin burn

4. Candida Albicans

Laboratory Number	Source
ACC 6467	Wound
ACT 6627	Skin stas
ATC6630	Sores

Table 2: Antimicrobial Activities of Kigelia Africana extracts using paper disc method

Test Organisms	Zone of Inhibition(mm)			
	Laboratory Number	**Aqueous Extract**	**Ethanol Extract**	**Methanol Extract**
1. Staphylococcus aureus	ATC 2014	3.5	10.0	14.5
	AAC 3342	2.5	11.0	13.5
	ATC 2023	4.5	1-.5	10.0
2. Eschenchia coli	ATT 2016	4.5	12.5	15.0
	AAC 3342	3.5	10.5	14.0
	AAT 3424	6.5	8.5	13.5
3. Pseudomonas aeruginosa	ATC 2244	3.5	11.5	14.5
	ACC 3446	2.5	10.5	15.5
	ATT 3667	4.0	14.5	12.5
4. Candida albicans	ACC 6467	1.5	11.5	14.0

	ACT 6627	2.0	12.0	10.0
	ATC 6630	2.5	11.0	9.0

Table 3: Antimicrobial Activities of Kigelia Africana extracts using agar well diffusion technique

Test Organisms	Zone of Inhibition(mm)			
	Laboratory Number	**Aqueous Extract**	**Ethanol Extract**	**Methanol Extract**
1. Staphylococcus aureus	ATC 2014	4.5	12.0	18.5
	AAC 3342	6.5	11.0	18.0
	ATC 2023	5.5	12.0	16.0
2. Eschenchia coli	ATT 2016	5.5	13.0	18.5
	AAC 3342	6.5	13.5	19.0
	AAT 3424	6.0	13.0	18.0
3. Pseudomonas aeruginosa	ATC 2244	4.0	12.5	16.5
	ACC 3446	5.0	12.5	17.0
	ATT 3667	5.5	12.0	16.0
4. Candida albicans	ACC 6467	3.5	11.5	15.0
	ACT 6627	4.5	12.0	10.0
	ATC 6630	4.0	12.0	10.0

Discussions

From the results obtained, methanol is the best extracting solvent compared to ethanol and aqueous solvent. The highest zone of inhibition (19.0) was demonstrated by the methanol extract of kigeliaafricana while the value drop to 13.5 and 6.5mm for ethanol and aqueous extracts respectively when tested against the same organism (Table 1). This implies that both the aqueous and ethanol extract are not effective as methanol extract against the tested microorganisms. From the result, it was observed that methanol extract has the highest zone of inhibition (19.0mm) followed by ethanol with (13.5mm) and lastly by aqueous extract with (6.5mm).

This result agrees with Takazaua, Tajimoi and myashifa (1982) that there is need to employ broad range of extractive solvents in the extractions of possible phytochemicals from medicinal plants.

Also, it was noticed that the agar well diffusion method gave large zones of inhibition compared to paper disc diffusion method (Table 2).

The zone of inhibition was 19.0m for the methanol extract of kigeliaafricana against E.coli when agar cup diffusion method was used as agent and 14.0mm for paper disc

methods. According to Omenka and Osuola (2000) agar well diffusion methods allow better diffusion of the extracts into the medium thus enhancing contact with the organisms. Generally the observed values of the extracts against the selected pathogenic fungi were lower compared to the other bacterial organisms.

Finding from this study present kigelia Africana as a potential therapeutic agents that the other extract.

Conclusion

The result obtained in this research work indicates that the leaves of kigeliaafricana contain antimicrobial substances which is capable of inhibiting the growth of several species of bacteria and fungi implicated in skin diseases. It is also a pointer to the fact can be used as an antibiotics agent agains different skin diseases. Studies have implicated s. aureus, E.coli and P. aeruginosa as leading causative agent in skin infections hence the possible use of Kigelia Africana plant extracts in the treatment of these infections. Also from the result, the Methanol extract of the plant possess stronger antibacterial compounds in comparisms to

that if the crude extract are subjected to purification the active component will record higher zones of inhibition than what is obtained now.

Recommendation

Converting and harnessing this properties of kigelia Africana into a conventional drug in combating various skin ailment on human population should be the next focus now.

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