



PHYTOCHEMICAL AND ANTIMICROBIAL SCREENING OF *HYBANTHUS ENNEASPERMUS* AND *PAQUETINA NIGRICENSE*

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Abstract

Phytochemical screening was carried out on aqueous leaf extracts of *Hybanthus-enneaspermus* [HE], *Oldenlandia Carymbosa L* [OL] and *Paquetina-nigricense* [PN], while antimicrobial screening was carried out on both methanolic and aqueous leaf extracts of the two plants. The result revealed the presence of Alkaloids [Flavonoids, Cyanogenic-glycosides among others], Tannin and reducing substances. The antimicrobial results showed that methanolic and aqueous leaf extract of OL possessed antimicrobial and antifungal activity as it inhibited *B. subtilis*, *Proteus*, *Staphylococcus aureus*, *Staphylococcus albus* and *Candida*. The methanolic and aqueous leaf extracts of PN, on the other hand also have similar effects like OL but at a different concentration. In addition, the antimicrobial activity of the two plants extracts decreases with increasing shelf life. The plants are usually used for several reasons in antenatal care by Traditional Birth attendants in South west Nigeria.

Key Words: *Hybanthus enneaspermus*; *Oldenlandia Carymbosa*; *Paquetina-nigricense*, phytochemical screening; Antimicrobial screening.

Introduction

In the recent past, there has been an increasing awareness of the beneficial values of medicinal plants to man [1]. *Paquetina nigricense* [PN] and *Hybanthus enneaspermus* [HE] and *Oldenlandia Carymbosa L* [OL] are three important medicinal plants used by Traditional Birth Attendants [TBAs] in the southwestern Nigeria in antenatal care. They claimed that the use of the plants invigorate the woman, making gestational period safe with easy and safe delivery. This work was carried out to investigate the active components of the two plants and any possible antimicrobial activities on some microorganism of importance to female reproduction.

Experimental

Plant material and Preparation

The two plants investigated are *Paquetina nigricense*, *Hybanthus Enneaspermus* and *Oldenlandia Carymbosa L*. The leaves were harvested during raining

season [June- August], oven dried, while aqueous and methanol extraction was carried out using Soxhlet extractor. The plants are shrubs growing in forest and in well watered area of the Southwestern Nigeria.

Uses in Traditional Medicine

Leaves of PN are used for treating hemintocasis and the root in treating rheumatic diseases according to folk medicine. It has also been used to treat insanity [2], and as Aphrodisiac [3]. The fresh liquid extract from the leaves of PN is also used as blood tonic. *Hybanthus enneaspermus* on the other hand is used along with PN as routine medication for pregnant women throughout the gestation period by Traditional Birth Attendants in Southwest Nigeria.

Phytochemical Screening

Phytochemical screening was carried out using standard method described by Trease and Evans [4].

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Antimicrobial Screening

This was carried out using agar dilution technique on both aqueous and methanolic leaf extracts of the two plants according to the method described by Wiat et al [5]

Results

Table 1. Results of Phytochemical analysis of the leaf extracts of *Hybanthus enneaspermus* [HE], *Oldenlandia Carymbosa* and *Paquetina nigricense* [PN].

S/N	Organic Compound	OC	PN	PN
1	Flavonoid	Present	Present	Present
2	Cardiac Glycosides	Present	Present	Present
3	Cyanogenic Glycosides	Present	Present	Present
4	Anthraquinene Glycosides	Present	Present	Present
5	Anthocyanosides	Absent	Absent	Absent
6	Saponins	Present	Present	Present
7	Tannins	Present	Present	Present
8	Hexose sugar	Present	Present	Present

Table 2. Summary of mean diameter of inhibition [MDI] zone in millimeter presented as Mean ± SEM for aqueous and methanolic leaf extract of *Hybanthus Enneaspermus*.

Concentration	<i>B. Subtilis</i>		<i>E. coli</i>		<i>Citrobacter</i>		<i>S. aureus</i>		<i>S. albus</i>		<i>Candida</i>
	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [meth]
2.0g/ml	8.0±2.0	10.0±0.1	11.0±0.1	15.0±0.1	25.0±0.1	15.0±0.1	10.0±0.1	10.0±0.1	10.0±0.1	0±0.0	0±0.0
1.0 g/ml	10.0±0.0	10.0±0.0	11.0±0.1	15.0±0.1	25.0±0.1	15.0±0.1	10.0±0.1	10.0±0.1	10.0±0.1	0±0.0	0±0.0
0.25 g/ml	0.0±0.0	0.0±0.0	0.0±0.0	0	15.0±0.0	15.0±0.1	10.0±0.1	0±0.0	0±0.0	0±0.0	0±0.0
Ciprofloxacin	26.0±0.0	34.0±0.1	10.0±0.1	10.0±0.1	35.0±0.2	10.0±0.1	10.0±0.1	10.0±0.1	31.0±0.1	0.0±0.0	0.0±0.0
0.05 g/ml											

Table 3. Summary of mean diameter of inhibition [MDI] zone in millimeter presented as Mean ± SEM for aqueous and methanolic leaf extract of *Paquentina nigricense*

Concentration	<i>B. subtilis</i>		<i>A. fumigatus</i>		<i>C. albicans</i>		<i>E. coli</i>		<i>C. trachealis</i>		<i>S. aureus</i>		<i>S. pneumoniae</i>		<i>C. neoformans</i>		<i>S. cerevisiae</i>		<i>C. glabrata</i>		<i>S. glabrata</i>	
	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]	OC [aq]	OC [meth]
10 g/ml	9.0±0.0	10.0±0.1	10.0±0.0	10.0±0.0	12.0±0.0	7.0±0.2	10.0±0.0	11.0±0.2	9.0±0.0	11.0±0.3	18.0±0.0	14.0±0.3	0.0±0.0	0.0±0.0	9.0±0.0	10.0±0.0	13.0±0.0	13.0±0.0	13.0±0.0	13.0±0.0	13.0±0.0	13.0±0.0
1.0 g/ml	8.0±0.0	8.0±0.2	8.0±0.0	8.0±0.0	6.0±0.0	NT	9.0±0.0	9.0±0.0	7.0±0.0	7.0±0.2	16.0±0.0	14.0±0.2	0.0±0.0	0.0±0.0	7.0±0.0	10.0±0.0	11.0±0.0	11.0±0.0	11.0±0.0	11.0±0.0	11.0±0.0	11.0±0.0
0.1 g/ml	0.0±0.0	0.0±0.0	NT	NT	0.0±0.0	NT	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.3	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
0.01 g/ml	0.0±0.0	0.0±0.0	NT	NT	0.0±0.0	NT	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
0.001 g/ml	0.0±0.0	0.0±0.0	NT	NT	0.0±0.0	NT	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
Methanol	14.0±0.0	10.0±0.2	10.0±0.0	10.0±0.0	10.0±0.0	NT	9.0±0.0	9.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
Ciprofloxacin	34.0±0.0	34.0±0.0	32.0±0.0	30.0±0.0	30.0±0.0	NT	30.0±0.0	28.0±0.3	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	28.0±0.0	28.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0

Conclusion

Aqueous and methanolic leaf extracts of *Paquentina nigricense* and *Hybanthus enneaspermus* showed antimicrobial activities on notable microorganism of importance to female reproductive tract, although at very high concentration compared to a standard antimicrobial drug Ciprofloxacin. Of importance is the inhibition of *Candida* a fungus of importance in female reproductive tract by methanolic leaf extract of *Hybanthus enneaspermus*. The antimicrobial activities were more

visible in methanolic leaf extract of *Hybanthus enneaspermus* than its aqueous extract. The activities were also found to have reduced to zero at two weeks of shelf life. The antimicrobial property may be one of the beneficial effects of these two medicinal plants been used in antenatal care by Traditional Birth attendants [TBAs] in Southwest Nigeria.

Table 4. Minimum inhibitory concentration [MIC] in grams/ml for aqueous and methanolic leaf extracts of *Paquentina nigricense* and *Hybanthus enneaspermus*

S/N	Microbial agent	HE [meth]	HE [aq]	PN [Meth]	PN[aq]
1.	<i>Enterococcus faecalis</i>	NT	NT	1.0	1.0
2.	Staph. Control	NT	NT	NT	0.29
3.	<i>S. albus</i>	NT	0.25	NT	NT
4.	<i>S. faecalis</i>	NT	NT	0.5	1.0
5.	<i>Staph. aureus</i>	0.25	0.25	NT	NT
6.	<i>Citrobacter</i>	1.0	1.0	1.0	1.0
7.	<i>E. coli</i>	1.0	NT	1.0	1.0
8.	<i>B. Subtilis</i>	1.0	NT	1.0	1.0
9.	<i>Candida</i>	2.0	NT	NT	1.0
10.	<i>Serrantia</i>	NT	NT	NT	1.0

NT = Not tested

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