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Phytochemical screening and antimicrobial activities of the leaves extracts of *Ficus iteaphylla*

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Abstract
The leaves of *Ficus iteaphylla* was investigated for their phytochemical constituents and antimicrobial activity. Air dried pulverized *Ficus iteaphylla* leaves was sequentially extracted with n-hexane, ethyl acetate, acetone, methanol and water in order of increasing polarity using cold extraction (maceration). The acetone, methanol and water extracts were found to be effective against the clinical isolate: *Staphylococcus aureus*, *Escherichia coli*, *Aspergillus niger*, and *Candida albican*. The phytochemical analysis of these extracts revealed the presence of flavonoids, saponins, steroids, and anthraquinone in all the extracts. Therefore the results justify the traditional medicine.

Keywords: antimicrobial activity, phytochemical constituents and *Ficus iteaphylla*

1. Introduction
Human being used plants for the treatment of diverse ailment for thousands of years (Sofowora, 1982: Hill, 1989) [14, 9]. According to world health organization, most population still relay on traditional medicine for their psychological and physiological health requirement (Rabe and Van stoden, 2000) [13], due to the high coast of western pharmaceuticals (Salie *et al*., 1996) together with their side effect (Griggs *et al*., 2001) [7] In Nigeria traditional medicine is generally accepted as a viable therapeutic alternative (Kafaru E 1994) [10] and almost all the plants have some medicinal application (Babayi H 2004) [3] d. *Ficus iteaphylla* belongs to the family Moraceae, the plant bark is used for the treatment of dysentery and rheumatic pain (Burki, 1997) [4], the root is used for the treatment of paralysis, tuberculosis, epilepsies, convulsion, spasm and pulmonary trouble (Burkili, 1997), the leave part have revealed analgesic, anti-inflammatory activity (Abdulmalik *et al*., 2011) [1] and antibacterial activity. Despite the various uses of plants in herbal medicines including *Ficus iteaphylla*, some of the plants also poses a lot of medical challenges on the users and therefore their phytochemical constituents and biological activities need to be evaluated for scientific proof

2. Plants Identification
The Plants were identified by taxonomist at the herbarium of Ahmadu Bello University, Zaria, and corresponds to voucher numbers of 2504.

3. Samples Collection and Treatment
Fresh leaves of *Ficus iteaphylla* were collected from Hadejia-Nguru wet land Area of Jigawa State. It was washed in water and re-washed in distilled water, air dried and ground to fine powder.

4. Extraction
100g of finely grounded leave of *Ficus iteaphylla* was soaked in n-hexane with occasional stirring for 48hrs, the soaked material was filtrated and the extract was concentrated using rotary evaporator and dried in moist free environment, weighed and kept for further uses. The residue after extraction with hexane was soaked in ethyl acetate for 48hrs with occasional stirring for 48hrs, the mixture was then filtered and the filtrate was concentrated using rotary evaporator and dried in moist free environment, weighed and kept for further uses. The residue was soaked in acetone for 48hrs followed by filtration, concentration, drying and weighing. The residue was also extracted with methanol which was filtered, concentrated, dried, and weighing, and then the residue was extracted with water followed by filtration, concentration, drying and weighing.

5. Phytochemical Screening
The crude extracts were subjected to phytochemical screening to test for secondary metabolites as described by Chindo (2010) [5] Sofowora (2008) [16], and Trease & Evans (2002) [17].

6. Determination of Antimicrobial Activity of Crude Extracts
The organisms used in this study are *Staphylococcus aureus, Escherichia coli,* for antibacterial test, *Aspergillus niger* and *Candida albican for* antifungal test, they were clinically isolated and obtained from ATBU Teaching Hospital. The strains were maintained from and test on nutrient ager (bacteria) and sabroud dextrose ager (fungi).Ager well diffusion method was used to evaluate the antimicrobial activities of the extract as describe by Artizzu *et al.,* (1995): The degree of inhibition were determine by size of the zone of inhibition measured in mm and were taken as evidence of antimicrobial activity of each of the extracts.

7. Results and Discussions

Table 1: Phytochemical Analysis

Extracts/ Phytochemical	Acetone/ Extract	Methanol/Extract	Water/Extract
Alkaloids	-	-	-
Sapanins	+	+	+
Tannins	+	+	+
Flavonoids	+	+	+
Terpenoids	-	-	-
Phalabotanins	-	-	-
Glycosides	+	+	+
Anthraquinones	+	+	+
Steroides	+	+	+
Carbohydrates	+	+	+
Proteins	+	+	+

Table 2: Antimicrobial activity

Test Organisms	Extract Conc. (mg/ml)	Zone of inhibition of extract(mm)				
		Acetone Extract	Methanol Extract.	Water Extract	+ Contr.	Control
E.coli	10^{-1}	20.00	20.00	17.00	28.50	0.00
	10^{-2}	18.50	17.00	15.00	22.00	0.00
	10^{-3}	18.00	16.00	14.00	21.00	0.00
	10^{-4}	17.00	16.00	12.00	20.00	0.00
S. aureus	10^{-1}	20.00	20.50	18.00	30.00	0.00
	10^{-2}	19.00	18.00	18.00	25.00	0.00
	10^{-3}	17.00	17.00	14.00	24.00	0.00
	10^{-4}	16.50	16.50	13.50	21.00	0.00
Candida albicn	10^{-1}	21.00	19.00	18.00	25.00	0.00
	10^{-2}	18.00	17.00	17.00	27.00	0.00
	10^{-3}	17.00	16.50	16.10	21.00	0.00
	10^{-4}	15.00	16.00	16.00	19.10	0.00
Aspergillus niger	10^{-1}	16.50	14.00	12.40	21.00	0.00
	10^{-2}	15.60	12.00	11.00	18.00	0.00
	10^{-3}	14.00	11.00	11.00	18.00	0.00
	10^{-4}	13.00	10.00	10.50	16.00	0.00

8. Discussion

The result of preliminary phytochemical screening showed the presence of saponnins, tannins, glycoside, terpenoids, flavonoids, anthraquinone, carbohydrate and protein in acetone, methanol and water extracts of the leaves of *Ficus iteaphylla*. This result have justify the study by Abdulmakil *et al*., (2009) which reported the presence of tannins, flavonoids and absence of alkaloids in the extracts of *Ficus iteaphylla*. The result of antimicrobial activity against *E. coli, Staphylococus aureus, Aspergillus niger* and *Candida albica* exhibited inhibitory effects. Phytochemical screening test is the first step in identifying the chemical substance presence in plants for their Therapeutic and Industrial uses. The phytochemical constituent of several plants have been investigated and reported (Ni *et al*., 2012 Lopes-Lutz *et al*., 2008) [11]. The result of various studies suggested that phytochemical constituents are responsible for antimicrobial activity for medicinal plants, while Cowan 1994 and Draughan 2004 attributed the presence of alkaloids, tannins and flavonoids to antimicrobial activities, also Arif (2009) [2] associated the antifungal acttivity to the presence of phenol, flavonoinds, coummarins, quinine, saponins, alkaloids, polypeptides, terpenoids and essential oils.

9. Conclusion

The observed antimicrobial activity can be justify by phytochemical constituents presences and they corroborate the use of *Ficus iteaphylla* in traditional medicine for the treatment of microbial infections.

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