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Antioxidant and acute toxicity of stem extracts of the *Ficus iteophylla*

M Mukhtar[1*], H Muhammad[2], S Ibrahim[3], G Ahmad[4], Y Muhammad[5], S Abubakar[6]
[1-4, 6] Department of Science Laboratory Technology, Binyaminu Usman Polytechnic Hadejia Jigawa, Nigeria
[5] Department of Animal Health, Binyaminu Usman Polytechnic Hadejia Jigawa, Nigeria

Abstract
The aims of this Study is to evaluate the Antioxidant activity and acute toxicity of the extracts of *Ficus iteophylla* by reactions with 1, 1-diphenyl-2-picryhydrazyl radical (DPPH) and method developed by Lork 1983 respectively. Stem of *Ficus iteophylla* was collected, air dried, pulverized to fine powdered and sequentially extracted using acetone, methanol and water in order of increasing polarity. The result show strong radical scavenging activity against DPPH for all the extracts when compared with Vit. C. The LD50 of 316mg/kg was calculated for all the three extras and the values were found to be within the practically toxic range and therefore care should be taken when using the plants in traditional medicine.

Keywords: antioxidant, acute toxicity and *Ficus iteophylla*

Introduction
Medicinal plants have long being used by man for treatment of various illnesses. According to world health organization (2001), 80% of the world population uses traditional medicine for the treatment of diseases. The number of people using traditional medicine is much higher in developing countries. World health organization estimated that 90% of the people leaving in developing countries depend on trational medicine for their primary health care need (WHO, 2002) [16]. Medicinal plants are widely accepted because they are safer, cheaper readily available than synthetic drugs (Ayonde and Adebiyre 2008). Despite the general assumption that medicinal plants are safer than synthetic drugs, there are many stuties that reported mutagenic, Cercinogenic and Toxic properties of some medicinal plants (Deciga *et al*., 2007, Ferreira ICFS *et al*., 1999 and Mohd-Fuat AR *et al*., 2007) [3]. The term antioxidant refers to the activity of numerous vitamins, minerals, and other phytochemical to protect against the damage cause by reactive oxygen species (Dula 2018) [4]. The reactive oxygen spacies are involved in various physiological process diseases such as ageing, cancer, diabeties and atherosclerosis (Priyanka p, 2011) [15]. The antioxidant activities of medicinal plants are due to the presence of flavones, isoflavone, flavooids, anthocynin, catechin, isocatechin, phenolic compounds and tannins (Killedar 2013) [7]. Plants or drugs must be ensuring to be safe before the can be uses as medicine. A key stage in ensuring the safety of drugs is to conduct a toxicity test in an appropriate animal. Acute toxicity studies is one of the procedure for toxicity test that are in use. The main aim of this study was to evaluate the antioxidant of the stem extract of *Ficus iteophylla* and also to evaluate it acute toxicity before it can be recommended for application that are important for public.

Material and Method
Collection of Plant Material
Ficus iteophylla are available at Hadejia Nguru wet land and it was collected from Gaffa area of the wet land. The plant was identified by the taxonomist at the herbarium of Ahmadu Bello University Zaria and is deposited with voucher number 2504. It was wash thoroughly, air dried and grounded to fine powdered.

Extraction
100g of the fine grounded plants was successively extracted using Acetone (1000ml), methanol (1000ml) and water (1000ml) for 48 hours and evaporated to formed acetone extract, methanol extract and water extract.

Experimental Animal
Experiment was performed using healthy swiss albino mice of both sexes. They were purchase from the Department of Pharmacology Aminu Kano Teaching Hospital, Bayero University. Kano.

Antioxidant Assay
The antioxidant activity of the extracts and standards were measured on the basis of the radical scavenging effect of the stable 1, 1-diphenylpicryhydrazyl (DPPH) free radical activity method modified by Braca *et al.*, 2002. The working solutions of the of the extracts were prepared in methanol, Ascorbic acids was used as a standard in 0.01g/ml. 0.004% of DPPH was prepared in methanol and 2 ml of the sample was mixed with 2 ml of this solution and standard solution separately. These solution mixtures were kept in dark for 30 minutes and optical activity was measured at 517nm using spectrophotometer. Methanol (2ml) with DPPH solution (0.004%, 2 ml) was used as blank. The optical density was recorded and the % inhibition was calculated using the formula given.

$$AA\% = \frac{A_b - A_s}{A_b} \times 100$$

Where AA% = Antioxidant activity (%)

A_b = Absorbance of the blank
A_s = Absorbance of the sample

Acute Toxicity
The acute toxicity study was conducted according to the method describe by Lork, 1983 [10]. The study was conducted in two phases using total of sixteen rats. In the first phases nine rats were divided in to three groups of thrice. Group 1, 2 and 3 were given 10, 100 and 1000ml/kg of body weight of the extract respectively. In the second phases 1600, 2900 and 500mg/kg were giving to the three rats respectively to determine the correct LD_{50} values. All the treatments were given through interpretoneal. All animal were frequently observed on the day of treatment and surviving animal were further monitored daily for five days for the other sing of acute toxicity.

Statistical analysis
The experiments were done in triplicate. The result are given as mean +_ standard deviation (SD).

Result

Table 1: The mean values of antioxidant free radical scavenging of the stem of ficus iteophylla by DPPH.

Extract	Percentage (%) DPPH it scavenged (mean +sdandard deviation)
Acetone	89.1+0
Methanol	84.6+0.5
Ascorbic acid	91.8+0.05

Table 2: Acute lethal effect of methanol extract of *Ficus iteophylla*.

Phase one		
Doses (mg/kg)	**No. of Rat**	**Raton of Rat dead rate**
10	3	0/3
100	3	0/3
1000	3	2/3
Phase 2		
1600	1	1
2900	1	1
5000	1	1

$LD_{50} = \sqrt{a\ x\ b}$ (where a is the hihest non lethal doses and b is least lethal doses of the extract administerd.)
$= \sqrt{100\ x\ 1000}$ = 316mg/kg (Oral)

Discussion
The uses of DPPH provided an easy and rapid way to evaluate antioxidant. The result of this investigation shows that the stem of *Ficus iteophylla* possess appreciable antioxidant activity agaist DPPH. The DPPH contains an odd electron which is responsible for purple color and the absorbance wavelength of 517nm (C. F. R. Ferreira. *et al.,* 2007) [5]. Singh *et al.,* 2011 [14] Studied the antioxidant of properties of using DPPH assay and found that different phytochemicals in leaves are responsible for higher antioxidants. Various studies have reported the presence of flavonoids, tannins, terpene and alkaloids in the extracts of *Ficus iteiphylla.* The flavonoids have been shown to possess antimicrobial, and antioxidants activities in various studies (Lin *et al.*, 2008, Lopez, 2004, Yoshidu *et al.*, 2009 and Amoral *et al.*, 2009) [8, 3]. The presence of alkaloids also had shown an antioxidant activity (Maiza *at al.,* 2007) [11] The presences of tannin in the extract may explain the antioxidant activity of the extracts as tannins are known to possess antioxidant properties (Zhang and Lin, 2008) [20], The saponins have also shown antioxidant activity (Gulcin *et al.,* 2004) The acute toxicity study of the methanolic stem extract reveal the LD_{50} value of 316.22 mg/kg suggested by Matsumura (1975) [12] who classified chemicals base on their LD_{50} values, and point out that LD_{50} of 500-5000 mg/kg as slightly toxic to the experimental model. Weaknesses may be attributed to the phytochemical's constituents of the extract like tannins and saponins which are anti-nutritional factors (Umaru *et al.,* 2007).

Conclusion
The present study shows that the *Ficus iteophylla* is good source of antioxidant and the results of the acute toxicity show that the plant does not cause any problem to experimental animal. Therefore the plant can be uses in traditional medicine.

References

1. Ayedele AA, Adebiyi AO. The Phytochemical Analysis and Antimicrobials Screening of Extracts Of Oxaxsubs Conpiodea. African Journal of Biotechnology, 2006; 7:868
2. CFR Ferreira, Baptista P, Vilas-Boas M, Barros L. "Free-radical scavenging capacity and reducing power of wild edible mushrooms from northeast Portugal: individual cap and stipe activity," Food Chemistry. 2007; 100(4):1511-1516.
3. Deciga-Campos M, Rivero-Cruz I, Arriaga-Alba M, Castaneda-Corral G, Angeles- Lopez GE, Navarrete A, *et al*. Acute toxicity and mutagenic activity of Mexican plants used in traditional medicine. Journal of Ethnopharmacology. 2007; 110(2):334-342.
4. Dula DE, Zelalem A. Antioxidant Activity Assessment of Calpurnia aurea Root Extract. Nat Prod Chem Res, 2018; 6:307. doi:
5. Ferreira ICFS, Vargas VMF. Mutagenicity of medicinal plant extracts in Salmonella/ microsome assay. Phytotherapy Research. 1999; 13(5):397-400.
6. Gulciu L, Oktay M Kufrevioglu, Aslan A. Determination of antioxidant activity of Lichen Cetraria islandica (L.) Ach. Journal of Ethanopharm. 2004; 79:325-329.
7. Killedar S, More H, Shah G, Gaikwad S. Phytochemical Screening and In vitro Antioxidantactivity of Memecylon Umbellatum Rootb Extracts. World J Pharm Pharmaceut Sci. 2013; 2:5988-5996.
8. Lin Y, Shi R, Wang X, Shen HM. Luteolin, a Flavonoids with potential for Cancer prevention and therapy. Curr. Cancer Drug target. 2008; 8:634-646.
9. Lopez – Lazaro M. Distribution and Biological activities of flavonoid. Luteolin Mini Rev. Med. Chem. 2009; 9:31-59.
10. Lorke DA. A new approach to practical acute toxicity. Archives of Toxicology, 1983; 54:275.
11. Maiza – Benadesselam F, Khentache S, Bougotta K, Chibane Y, Laurain Matta D. Antioxidant activity of alkaloids extract of two Algerian spacies of Fumariah capreolata and Fumariah basterdii. Record of Natural Product, 2007, p. 28-35.
12. Matsumura F. Toxicology of insecticides. Plenum press. York and London, 1975, Pp 24.

13. Mohd-Fuat AR, Kofi EA, Allan GG. Mutagenic and cytotoxic properties of three herbal plants from Southeast Asia. Tropical Biomedicine. 2007; 389(1):3-122.
14. Singh P, Shrivastava R, Saxena RC, Sharma M, Karchuli MS, Tripathi J, *et al*. Phytochemical screening and evaluation of antioxidant activity of Parkinsonia aculeate L. (Family-Leguminoseae) leaves extract," International Journal of PharmTech Research. 2011; 3(4):1952-1957.
15. Priyanka P, Junaid N, Gagandeep C, Kalia AN. In vitro antioxidant potential of Jasminum mesnyi Hance (Leaves) extracts. RJPBCS, 2011, 2:351.
16. WHO Traditional medicine – growing needs and potentials. WHO policy perspective, 2002.
17. WHO Traditional medicine – growing needs and potentials. WHO policy perspective med, 2002.
18. WHO Legal status of traditional medicine and complementary and alternative medicine worldwide review, 2001, 1-3.
19. Xiong Q, Kadota S, Tani T, Namba T. Antioxidative effect of Phenylethanoids from Crische deserticola. Bio/pharm. Bull, 1996, 1580-1585.
20. Zhang LL, Lin YM. Tannin from Canarium album with potent antioxidant activity J Zhejiang Univ. Science B. 2008; 9:407-415.