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# Editorial

Praise be to Allah and peace and prayers be upon his messenger.

Dear readers, we thank you for your good response and acceptance of the previous issues of the magazine .We also thank you for your opinions and suggestions for improving the magazines issues and here we are thanks Allah and his success. We look at you the six volume of Merowe University of Technology/Abdulatif Alhamad. We all determined to continue efforts and take into account the development, innovation and improvement of magazine in form and contents. As we placed this volume in your hands, we appeal to you to continuously communicate with the magazine and provide it through the scientific papers that society needs in all fields, which we hope will satisfy you.

**Editorial Board**



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## **Effect of Compost on Some Soil Physical Properties and Yield of Forage Sorghum (*Sorghum bicolor* L.) in Desert Soil of Northern State of Sudan**

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### **Abstract:**

A field study was conducted for two consecutive winter seasons; 2017/18 and 2018/19, at the Research Farm of the National Institute of Desert Studies, New Hamdab Scheme, Northern State of Sudan. The objective was to study the effect of compost manure (5 and 10 ton ha<sup>-1</sup>), on fodder sorghum (*Sorghum bicolor* L.) yield and some physical properties in the area. The experimental design was randomized complete block design (RCBD) with four replicates. The results showed significant differences ( $P \leq 0.05$ ) to due to the application of compost on increasing fodder sorghum yield or biomass, very highly significant differences ( $P \leq 0.001$ ) in reducing bulk density and increasing total soil porosity, also result indicated that compost manure has highly significant differences ( $P \leq 0.01$ ) in increasing soil moisture content. Application of 10 tonne ha<sup>-1</sup> compost manure produced the highest means values of sorghum biomass of (44.13 and 53.9 ton ha<sup>-1</sup>) compare to the control of (20.9 and 25.4 ton ha<sup>-1</sup>) season one and two respectively, decrease soil bulk density from (1.7 and 1.8 gcm<sup>-3</sup>) to (1.40 and 1.44 gcm<sup>-3</sup>), increased total porosity from (47.6 and 45.4) to (34.4 and 31.8) and increase moisture content from (19.0 and 18.7%) to (9.6 and 8.7%) for the control season one and two respectively.

**Keywords:** *Sorghum bicolor* L., Compost, Soil, Physical Properties, sudan.

## المستخلص

نفذت التجربة الحقلية خلال الموسمين الشتوي للأعوام (2017/18) و (2018/19) في المزرعة البحثية للمعهد القومي لدراسات الصحراء - جامعة الجزيرة ، مشروع الحامدات الجديدة الزراعي - الولاية الشمالية - السودان وذلك لدراسة تأثير سماد الكمبوست (5 و 10 طن هكتار<sup>-1</sup>) علي إنتاجية علف الذرة الرفيعة وبعض الخصائص الفيزيائية للتربة. وزعت المعاملات عشوائيا بتصميم القطع العشوائية الكاملة في أربعة مكررا. أظهرت النتائج اختلافات معنوية (0.05) نتيجة لتطبيق سماد الكمبوست علي زيادة إنتاج علف الذرة الرفيعة ومعنوية عالية جدا (0.001) علي خفض الكثافة الظاهرية للتربة وزيادة مسامية التربة وكذلك أشارت النتائج إلي زيادة معنوية (0.01) علي محتوى الرطوبة. بتطبيق 10 طن هكتار<sup>-1</sup> من سماد الكمبوست تم الحصول علي القيم العليا لكثافة علف الذرة الرفيعة ( 44.7 و 53.9 طن هكتار<sup>-1</sup>) مقارنة بالشاهد ( 20.9 و 25.4 طن هكتار<sup>-1</sup>) للموسمين الأول والثاني علي التوالي. كما انخفضت الكثافة الظاهرية للتربة (من 1.7 و 1.8 جم سم<sup>-3</sup>) إلي (1.4 و 1.41 سم<sup>-3</sup>) وزادت مسامية التربة إلي (45.4 و 47.6 %) من (31.8 و 31.4%) في الشاهد وزاد محتوى رطوبة التربة إلي (18.7 و 19%) من (8.7 و 9.6%) في الشاهد للموسمين الأول والثاني علي التوالي.

**الكلمات المفتاحية:** الذرة الرفيعة، سماد الكمبوست، الخصائص الفيزيائية، السودان.

## Introduction:

Compost use is one of the most important factors, which contribute to increased productivity and sustainable agriculture. In addition, compost can solve the problem faced on farmers with decreasing fertility of their soil. Due to soil fertility problems, crops returns often decrease and the crops are more susceptible to pest and disease because they are in bad condition [1].

Compost consists of the relatively stable decomposed organic materials resulting from the accelerated biological degradation of organic materials under controlled, aerobic conditions [2].

Compost fertilizer is made from plant and animals remains with the objectives of recycling plant and animals remains for crop production. The decomposition process converts potentially toxic or putrescible organic matter into a stabilized state that can improve soil for plant growth. Composted organics has other beneficial effects, including diverting landfills wastes to alternative uses, removal of pathogen inocula or weed seeds and decomposition of petroleum, herbicide or pesticide residues, erosion control and as a nutrient source for sustainable re-vegetation of degraded soils. Using compost can improve the capacity to produce safe „clean

green horticultural produce and importantly increase the potential for large-scale organic food [2].

Sudan has a huge animal wealth that is estimated to be about 130 million heads of different animal classes. There is a feed gap to cope with this huge animal wealth as indicated by different studies [3]. This necessitated expanding irrigated forages vertically and horizontally to bridge this feed gap. Fertilization of forage crops to increase productivity and improve quality is of equal importance. With the rise in prices of chemical fertilizers beyond the capability of farmers, organic fertilizers seem to be more appealing [4].

### **Materials and Methods:**

The experiment was carried out during two consecutive seasons 2017/18 and 2018/19 in summer season at the National Institute of Desert Studies Research Farm, New Hamdab Scheme, in the Northern State of Sudan. The study area lies at the intersection of latitude 17° 55' N, and longitude 31° 10' E in the desert climate.

The soil of the study area belongs to El Multaga soil series which is classified as Haplocambids, coarse loamy, mixed, hyperthermic. The soil structure is moderate subangular blocky. It is non-saline and non-sodic (see Table 1 below) [5]. Generally, the soil chemical fertility is low and mostly this soil is deficient in nitrogen, phosphorus and organic carbon for optimum yield production of different cultivated crops. The physical and chemical properties of the soil are shown in Table 1.

Table 1. Some soil properties of the experimental site

Soil properties	Soil depth (cm)				
	23 – 0	65 – 23	80 - 65	105 - 80	125 - 105
(%) CS	37	33	43	42	40
(%) FS	40	23	22	21	24
(%) Silt	15	25	11	19	8
(%) Clay	8	19	24	18	28
Texture	LS	SL	SL	SL	SCL
CEC	6	14	26	24	26
(pH (paste	7.5	7.3	8.1	7.8	7.5
ECe	0.35	0.37	0.42	1.1	3.2
ESP	3.0	3.0	4.0	5.0	8.0
(%) CaCO <sub>3</sub>	0.8	2.6	10.4	0.2	27.5
(%) O.C	0.052	0.066	0.078	0.061	0.052
C/N ratio	4	4	5	5	5

L S = loamy sand, SL = sandy loam, SCL= sandy clay loam

Compost manure was manually broadcasted and incorporated on the designated experimental units (7x6 m) at the rates of 0, 5, and 10 ton ha<sup>-1</sup>. Seeds of Fodder Sorghum (*Sorghum bicolor* L.) were sown at the rate of 30 kg ha<sup>-1</sup> on the 12th of July 2017/18 and 2018/19. Nitrogen and phosphorus were added as recommended (43 kg N ha<sup>-1</sup> plus 43 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>) by ARC. The irrigation was carried out every 7 days. During all experimental period observations on soil dry bulk density, soil moisture content, soil total porosity and yield biomass of Fodder Sorghum were taken.

#### Methods of soil Physical Analyses:

The core sample method as described by the previous studies [6, 7] was used to determine the soil dry bulk density ( $\rho_d$ ). Soil core was obtained from 0-15 cm soil depth for each of experimental units at 60 days after sowing (DAS). The soil was oven dried at 105° C for 24 hours, and weighed. The soil dry bulk density ( $\rho_d$ ) for all soil samples were calculated in the laboratory using the equation below:

$$\rho_d = M_s / V_t$$

Where  $M_s$  is a dry soil mass and  $V_t$  is the total soil volume or the core volume.

Measurements of the soil moisture were done at 0-30 cm soil depths. Soil samples were taken by an auger. Readings were tak-

en at the field, two days after irrigation at 60 DAS. Gravimetric method was used to determine the soil moisture percentage ( $\Theta$ ) as described below:

$$\Theta = (M_m - M_d) / M_d$$

Where  $M_m$  is the moist soil mass and  $M_d$  is the oven dry soil mass. The soil total porosity (T.P) was calculated by following the equation below:

$$T.P = 1 - \rho_d / \rho_s$$

T.P = soil total porosity

$\rho_d$  = soil air dry bulk density

$\rho_s$  = soil particle density (taken as  $2.65 \text{ g cm}^{-3}$ )

Data were statistically analyzed using MSTAT program. Duncan's Multiple Range Test (DMRT) was used to show the significance in the differences between means.

### Results and Discussion:

Table 2 and 3 show the effect of compost fertilizer on soil bulk density, soil total porosity, soil moisture content and sorghum biomass. Application of 5 and 10 tonha<sup>-1</sup> of compost manure showed significant ( $P \leq 0.05$ ) increasing sorghum biomass from (44.13 season1 and 53.9tonha<sup>-1</sup> season2) compared to control (20.9 season1 and 25.4tonha<sup>-1</sup> season2). This result confirm with that of [8, 9, 10, 11] which stated that compostfertilizer increase significantly sorghum forage.

Also result as shown Table 2 and 3 indicated thataddition of 5 and 10 tonha<sup>-1</sup> of compost fertilizershowed very highly significant

( $P \leq 0.001$ ) in reducing bulk density from (1.4season1 and  $1.44 \text{ gcm}^{-3}$  season2) compared to control ( $1.74 \text{ season1}$  and  $1.80 \text{ gcm}^{-3}$  season2) and increasing porosity from (47.5season1 and  $45.43 \text{ gcm}^{-3}$  season2) compared to control ( $35.4 \text{ season1}$  and  $31.8 \text{ gcm}^{-3}$  season2). This result confirm with that of [12,13,14,15] who stated thatCompost application generally influences a beneficial way by lowering soil density,this passively effect has been detected in most cases and it is typically associated with an increase in porosity.

As shown Table 2 and 3 moisture increase highly significant ( $P \leq 0.01$ ) by adding compost fertilizer from (19.0 season 1 and 18.66% season 2)

compare to the control to (9.6 season 1 and 8.7% season 2) and from observed result we can find a proportional relation between compost level and soil moisture content. This result is in conformity with that of [16] who stated that compost manure increase significantly moisture content. Table 2. Effect of Compost fertilizer on bulk density, total porosity, moisture content and sorghum biomass

Parameters Control	Bulk Density (g cm <sup>-3</sup> )	Total Porosity	Moisture Content (%)	Yield (ton ha <sup>-1</sup> )
C5	1.74a	34.4b	17.00a	31.13a
C10	1.47b	44.9a	19.00a	44.13a
C.V	1.40b	47.5a	9.76	24.53
SE	2.54	3.5	0.839	4.56
Sig	0.023	0.030	**	*

Table 3. Effect of Compost fertilizer on bulk density, total porosity, moisture content and sorghum biomass

Parameters	Bulk Density(gcm <sup>-3</sup> )	Total Porosity(%)	Moisture Content (%)	Yield (ton ha <sup>-1</sup> )
Control	1.80a	31.80b	8.66b	<b>25.4b</b>
C5	1.50b	43.00a	16.33a	50.6a
C10	1.44b	45.43a	18.66a	53.9a
C.V	3.30	4.78	2.45	17.79
SE	0.030	1052	1.79	3.94
Sig	***	***	**	*

### Conclusion:

It can be concluded that in the high terrace soil of Northern State of Sudan the application of 10tonne ha<sup>-1</sup>compost manure produced the highest means values of sorghum biomass, improve physical soil condition by decrease soil bulk density from ,increased total porosity from and increase moisture content.

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## Evaluate Antibacterial Activity of *Calotropis procera* Alcoholic Extractions

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### Abstract

This study aims to assessment of the inhibition effect of alcoholic extractors of Aushar plant some parts (leaves, fruits and stems), on Gram-positive and Gram-negative bacteria. the Soxhlet apparatus used for extraction, use the disc diffusion method and minimum inhibitory concentration to assess the antibacterial activity of the extracts, to determine inhibition zones for different parts of plant extracts used *Bacillus subtilis* and *Staphylococcus aureus*) as gram-positive and gram-negative bacteria ( *Escherichia coli* and *Pseudomonas aeruginosa* ). The results show that all parts of the plant under study contain chemicals that can be used to inhibit the growth of bacteria .

Keywords :- Aushar plant, Extractors, Inhibition, Bacteria

### المستخلص

تهدف هذه الدراسة لتقدير الأثر التثبيطي للمستخلصات الكحولية لبعض أجزاء نبات العشر ( أوراق ، ثمار وسوق) علي بكتريا موجبة غرام والبكتريا سالبة غرام ، استخدم جهاز السوكسلت للاستخلاص. وطريقة نشر القرص والحد الأدنى من التركيز المثبط لتقييم النشاط المضاد للبكتيريا للمستخلصات لتحديد مناطق التثبيط لأجزاء مختلفة من المستخلصات النباتية استخدم بكتريا العصوية والبكتريا المكورات المنقودية كمثال لأنواع البكتريا موجبة جرام ، أما الأنواع سالبة غرام استخدمت بكتريا القولون وبكتريا الزائفة الزنجارية . أظهرت النتائج أن جميع المستخلصات لأجزاء النبات تحت الدراسة تحتوي على مواد كيميائية يمكن استخدامها لتثبيط نمو البكتيريا . يمكن أن توفر الدراسة أدلة علمية أولية لمزيد من البحث في تنقية المركبات من المستخلصات المختلفة وفحص فعاليتها التثبيطية والعلاجية علي بعض أنواع البكتريا والفطريات الاخرى.

**الكلمات المفتاحية:** - نبات العشر ، مستخلصات ، التثبيط ، البكتريا

## Introduction

Medicinal plants are abundant source of antimicrobial molecules. A wide range of medicinal plants extracts are used to treat several infections as they have potential antimicrobial activity. Some of these bioactive molecules are screened and traded in market as raw material for many herbal industries [1]. Experts turned their concentration back towards obtaining advantages from medicinal plants after observing more side effects of synthetic drugs compared to their benefits [2]. It is estimated that about 35,000 to 70,000 plants species are used as medicinal plants out of 422127 reported worldwide plant species [3].

Calotropis is used as a traditional medicinal plant with unique properties [4, 5, 6]. It has bitter, healing, laxative and anthelmintic properties that relieve strangury, cures and acts as an expectorant [7]. Traditionally, Calotropis is used alone or with other medicinals [8]. To treat common disease such as fevers, rheumatism, indigestion, cough, cold, eczema, asthma, elephantiasis, nausea, vomiting and diarrhea. Dried whole plant is a good tonic, expectorant, depurative and anthelmintic. The root bark is febrifuge, anthelmintic, depurative, expectorant, and laxative, also is used for dysentery, elephantiasis, syphilitic, ulcers, stomachic, and diaphoretic. Root emetic, expectorant. The powder root used in asthma, bronchitis, and dyspepsia [9]. The Calotropis procera plant has many medicinal properties due to the presence of numerous secondary metabolites, and phytochemicals. This compound includes various chemicals which are useful for various activities [10, 11, 12].

Previous workers have reported many phytochemical constituents in the various parts of Calotropis gigantea especially in the leaves [13, 14]. Calcium oxalate, alpha and beta-calotropeol, fatty acids (both saturated and unsaturated), hydrocarbons, acetates and the benzoates, a mixture of tetracyclic triterpene compounds, are also found to be present flavonol glycoside [14]. A vast number of research and review articles are published on the phytochemical and screening properties of C. procera. All parts of the plant have toxic potential, due to the presence of cardenolides (cardiac glycosides). The latex was found to be richest in cardenolides. The important cardenolides found in the plant are voruscharin, uscharidin, uzarigenin, calotroposide, calactin, calotoxin, uscharin, ascleposide, calotropagenin, coroglaucigenin, calotropin, proceroside, proceragenin, and syriogenin. Many of these compounds formed in the mechanism of extraction when hydrolyzed in a chemical reaction. Latex differs in the quantities of cardenolides from the other plant parts stem, fruit, leaves, and root bark. The main cardenolides in the various parts of the plant are uscharin and calotropagenin in the latex; calotropin and calotropagenin in the leaves; uscharidin, calotropin, proceroside, and calactin in the stem; calotoxin and calactin in the root bark; coroglaucigenin and uzarigenin in

the fruit pericarp. The seeds contain 0.23-0.47% cardenolides, mainly coroglaucigenin or frugoside [15]. Besides the cardenolides, other phytochemicals are also reported from the plant such as sterols, flavonoids, coumarins, alkaloids, triterpenes, saponins, tannins, and hydrocarbons were isolated from the plant. The major flavonoid is rutin (quercetin-3-rutinoside) [16].

The flowers mainly contain  $\alpha$ - and  $\beta$ -amyrins, an alkaline phosphate, cyanidin-3-rhamnoglucoside, cyclosadol, multiflorenol, progestrol, quercetin-3-rutinoside,  $\beta$ -sitosterol,  $\beta$ -sitost-4en-3one, and stigmasterol. Cyanidin-3-rhamnoglucose and the triterpene calotropenyl acetate are found in the flowers [17]. The leaves contain ascorbic acid, calactin, calotoxin, calatropagenin, calotropin, polysaccharide containing D-arabinose, D-glucose, D-glucosamine and L-rhamnose, calatropagenin, and 3-proteinase. The latex contains calotropin,  $\alpha$ -calotropeol, 3-epimoretenol, gigantol, giganteol, isogiganteol, and  $\beta$ -sitosterol, powerful bacteriolytic enzyme in latex [18]. The root-bark contains benzolisoloneolone, benzolloneolone, long-chain fatty acids, . The plant also reported to contain calactinic acid, choline and O-pyrocatechuic acid,  $\beta$ -sitosterol, taraxasterol, and taraxasteryl acetate [19]. Carruthers isolated and characterized isorahamnetin-3-O-rutinoside, isorahamnetin-3-O-glucopyranoside and taraxasteryl acetate, flavonoids from *Calotropis* [17]. Latex is milky fluid secreted by the ducts of laticiferous tissue found in roots, stems, leaves and fruits of flowering plants . It is a mixture of many pharmaceutically active substances which showed very high anti-bacterial [20]. Antiviral [21] antifungal [22] anti-protozoan activity. Latex from several plant species such as *A. Calotropis procera* [23] have shown very high antimicrobial activity. The leaves contain apigenin, vitexin and isovitexin, which along with other factors showed strong antibacterial activity against *Staphylococcus aureus* , *Escherichia coli* [24] *Salmonella typhimurium* and *Candida albicans*. Plant latex is a natural source of antiprotozoal drugs, which show schizonticidal activity [25, 26, 27].

### **The objectives of the study:**

To evaluate antibacterial activity of natural products as *Calotropis procera* parts extracts . and determine the inhibition zone of crud extracts on gram positive and gram negative bacteria.

### **Materials and Methods**

Chemicals:

All the chemical used are Analytical grade, ethanol 90%, methanol 90%, Muller-Hinton, Nutrient broth, dimethylsulfoxide.

Equipments:

Soxhlet apparatus, Filter paper (Whatman, England) and Hot plate , Petri

dishes, pipettes, tubes, Z-rod, and beakers, filter paper discs (6 mm in diameter), water bath, incubation oven.

### **Samples:-**

The samples for this study are leaves, fruits and stems of *Calotropis*. Plant. gram-positive bacteria (*Bacillus subtilis* and *Staphylococcus aureus*) and gram-negative bacteria (*Escherichia coli* and *Pseudomonas aeruginosa*).

### **Collection and preparation of Plant Samples –**

The Healthy plant *calotropis* .leaves, fruits and stems were collected from bakht Er-ruda area, sudan in April to May 2020. The Fresh plant samples were washing thoroughly 2-3 times with running tap water and distilled water. For drying the collected samples were kept apart from individual in shade dried for three weeks at room temperature, so as to retain the samples freshness, and also to prevent the decomposition of the potential active compounds, and pulverized into coarse powder using electric pulverizer and stored in an airtight, dark, glass container to prevent photochemical reactions until extraction

### **Extraction Methods:**

One hundred gram of powdered *C. procera* leaves, fruits and stems extracted individually by Soxhlet with 600 ml of ethanol 90% and methanol 90% for 6 hours, then alcoholic extracts cooled at room temperature and filtered through Whatman No.1 filter paper, the clear filtrate is evaporated to dryness under reduced pressure by rotatory evaporator at temperature 40°C to get ethanolic and methanolic crude extract of *C. procera* samples[28].

### **Antibacterial activity:**

The antibacterial activity of ethanolic and methanolic extracts from *C. procera* leaves, fruits and stems were investigated by the disc diffusion method (DD) and minimum inhibitory concentration (MIC) [29,30]. Four types of bacteria were used in this study, gram-positive bacteria (*Bacillus subtilis* and *Staphylococcus aureus*) and gram-negative bacteria (*Escherichia coli* and *Pseudomonas aeruginosa*), The test bacteria are known to cause severe infections in human, as they are found in multiple environmental habitats [31] were isolated and obtained from microbiology department, pharmacological college at Khartoum University.

### **Culture Media and Material:**

Generation of bacteria by culture media was achieved in sterilized nutrient broth (NB) at 37 °C for 16 hours., Muller-Hinton, (NB prepared by dissolving 8 g/L., and MH prepared by dissolving, 20 g/L), in distilled water. The glasses (pipettes, tubes, Z-rod, and beakers), filter paper discs (6 mm in diameter) and solution (NB, and MH) were sterilized in an autoclave for 2.5 hours at 121°C. The concentrations of bacteria, cultures were prepared by comparing

with a McFarland solution (9.95 ml of  $H_2SO_4$  solution 1% in broth, and 0.05 ml of  $BaCl_2$  solution 1% in broth) equivalent to  $150 \times 10^6$  colony-forming unit (CFU)/ml. Crude extracts (500  $\mu\text{g}/\text{mL}$ ) were prepared by dissolving 5.0 mg in 1.0 ml DMSO. (dimethylsulfoxide).

#### Disc Diffusion Method:

The crude extracts were investigated for antibacterial activity by disc diffusion method according to published reports with some modifications. First, the Petri dishes (90×15 mm) were spread with sterilized MH (17 ml) solutions, followed by 200  $\mu\text{l}$  of bacteria stock ( $150 \times 10^6$  CFU/ml); each was spread on the Muller Hinton agar (MH) medium using Z-glass rod, after that, 2 paper discs were individually impregnated with 20  $\mu\text{l}$  of extract (500  $\mu\text{g}/\text{mL}$ ), 2 blank discs (with DMSO only), The Petri dishes were incubated at 37°C for 48 hours. [32]. At the end of the incubation period the antimicrobial activity was evaluated by measuring the inhibition zones.

#### Statistical analysis

The data collected were subjected to analysis of variance using spss version 16.0 statistical package. Differences in means were done using the least significant difference (LSD) at  $P=0.05$ . The results were expressed as mean standard deviation of mean (S.D.M.).

#### Antimicrobial activities:

Table 1 Antibacterial activities (inhibition zones mm/ml) of leafs stem and fruits of *Calotropis procera* extracted with methanol.

Calotropis procera parts	Inhibition zones (mm)			
	E. coli	Staphylo coc-cus	Bascillus subtilis	Pseudomonas aeruginosa
Leaf	18.7±0.537 <sup>a</sup>	12.0 ±0.210 <sup>b</sup>	19.0 ±0.120 <sup>ac</sup>	16.0±0.33 <sup>d</sup>
Stem	10.0 ±0.01 <sup>a</sup>	12.0±0.030 <sup>b</sup>	16.0± 0.050 <sup>c</sup>	11.5±0.17 <sup>d</sup>
Fruit	11.0 ±0.01 <sup>a</sup>	13.0 ±0.32 <sup>b</sup>	11.0±0.22 <sup>ac</sup>	12.0 ±0.11 <sup>d</sup>

Data are presented as means  $\pm$  standard deviation .

<sup>a, b, c</sup> and <sup>d</sup> value with different superscripts in the same row are significantly different at ( $P \leq 0.05$ ).

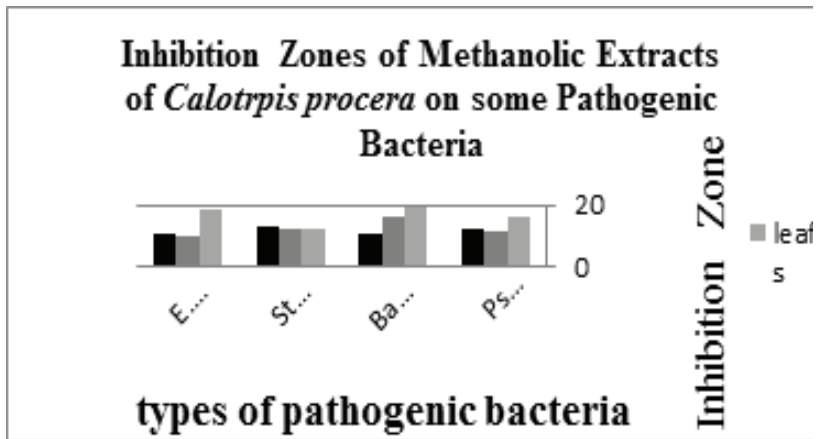


Figure 1 antibacterial activity of methanolic extract  
 Table 2 Antibacterial activities (inhibition zones mm/ml) of leafs stem and fruits of *Calotropis procera* extracted with ethanol.

Calotropis procera parts	Inhibition zones (mm)			
	E. coli	Staphylococcus	Bascillus subtilis	Pseudomonas aeruginosa
Leaf	10.0±0.02a	9.0 ±0.25b	5.5 ±0.16c	7.0±0.15d
Stem	7.5 ±0.06a	8.0±0.01b	12.0± 0.050c	6.0±0.22d
Fruit	9.5 ±0.27a	14.0 ±0.22b	6.0±0.33c	12.0 ±0.11d

Data are presented as means ± standard deviation.

a, b,c and d value with different superscripts in the same row are significantly different at ( $P \leq 0.05$ ).

## Inhibition Zones of ethanolic extracts of *Calotropis procera* on some pathogenic bacteria

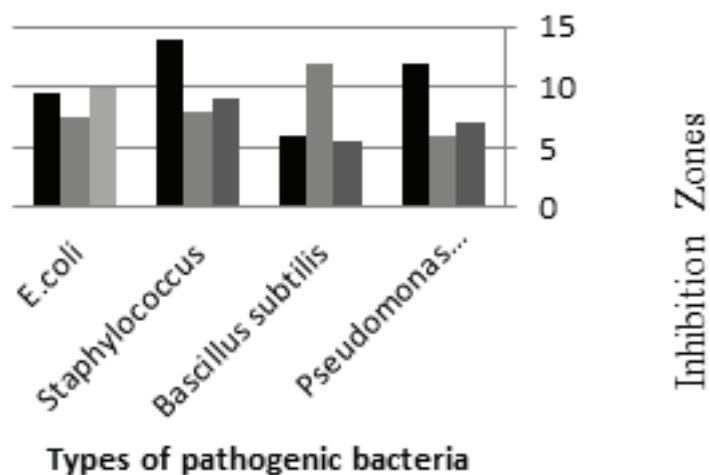


Figure 2 antibacterial activity of ethanolic extract

### Discussion

Antibacterial activity of leaves, stems and fruits extracts (500  $\mu\text{g}/\text{mL}$ ) of *Calotropis procera* against different types of pathogenic bacteria: The methanolic extracts of leaves of *Calotropis procera* showed significant difference activity against all examined bacteria (gram positive *Bacillus subtilis* and *Staphylococcus aureus*; gram negative *Escherichia coli* and *Pseudomonas aeruginosa*), gave the widest zone of inhibition with gram-positive bacteria  $19.0 \pm 0.12$  mm against *Bacillus subtilis* as the same with activity against *Escherichia coli*  $18.7 \pm 0.53$ , and  $16.0 \pm 0.33$  mm against *Pseudomonas aeruginosa* also showed an almost Antibacterial activity in *Escherichia coli*, and *Staphylococcus aureus* ( $12.0 \pm 0.210$ ). The methanolic extracts of stems of *Calotropis procera* showed an almost Antibacterial activity in *Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Escherichia coli* as flow  $16.0 \pm 0.05$ ,  $12.0 \pm 0.01$ ,  $11.5 \pm 0.17$  and  $10.0 \pm 0.01$  respectively. Also The methanolic extracts of fruits of *Calotropis procera* showed an almost Antibacterial activity in *Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Escherichia coli* as flow  $11.0 \pm 0.22$ ,  $13.0 \pm 0.32$ ,  $12.0 \pm 0.11$  and  $11.0 \pm 0.01$  respectively as shown in Table 1.

this findings might suggest that Phytochemical constituents in combination may be having synergy in their efficacy, which is in agreement with many other report that have shown higher antibacterial potency of crude extracts . The ethanolic extracts of leafes, stems and fruits showed significant activity was earlier reported. Antibacterial activity of stems methanolic extracts against *Bacillus subtilis* was higher than other two extracts the inhibition zones were measured to be  $16.0 \pm 0.05$  mm in their diameter.

Antibacterial activity of leaves, stems and fruits extracts (500  $\mu\text{g/mL}$ ) of *Calotropis procera* against different types of pathogenic bacteria: The ethanolic extracts of leaves of *Calotropis procera* showed significant difference activity against all examined bacteria (gram positive *Bacillus subtilis* and *Staphylococcus aureus*; gram negative *Escherichia coli* and *Pseudomonas aeruginosa* ), gave the widest zone of inhibition with gram- negative bacteria  $10.0 \pm 0.02$  mm against *Escherichia coli* and  $9.0 \pm 0.25$  against *Staphylococcus aureus*, and gave the lowest zone of inhibition against *Basillus subtilis* ( $5.5 \pm 0.16$ ) near with it activity against *Pseudomonas aeruginosa*  $7.0 \pm 0.15$ .,also showed significant difference Antibacterial activity of stems ethanolic extracts between all tested pathogens (*Escherichia coli*, *Staphylococcus aureus*, *Basillus subtilis* and *Pseudomonas aeruginosa* as flowed  $7.5 \pm 0.06$ ,  $8.0 \pm 0.01$ ,  $12.0 \pm 0.05$  and  $6.0 \pm 0.22$  respectively.also  $9.5 \pm 0.27$ ,  $14.0 \pm 0.22$ ,  $6.0 \pm 0.33$  and  $12.0 \pm 0.11$  respectively, for the fruits ethanolic extracts for above pathogens , table 2.

The extracts of *Calotropis procera* (leaves, stems and fruits ) could be useful for treatment of skin disorders like eczema, psoriasis, rashes and allergies. The antimicrobial activity was reported due to the presence of phenols, alkaloids, tannins and quinines . On the bases of GC-MS analysis of *C. procera* growing in region of the study was devoid of these compounds. The phytochemical analysis revealed that different derivatives of sterols and triterpenes were present in maximum quantity, which could be the reason for antimicrobial effect. These compounds could show good inhibitory activity against three human cell lines including lung cancer, glioblastoma and prostate cancer. Natural sterols present in herbal components attenuates all necessities of a human body's immune response which is important for general disease prevention, in degenerative diseases also sterols enhance immune system and delay various aging processes. These phytosterols are nontoxic chemicals. They lower cholesterol in human blood, by inhibiting the absorption of cholesterol from the gut. Sitosterols are effective for Tuberculosis, Rheumatoid Arthritis, Benign Prostatic Hyperplasia, HIV/AIDS, Anti-inflammatory and anti-pyretic activities . Due to the presence of large percentage of steroids and triterpenes this plant could have great value in the field of cardiology and immunology.



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## Fibrinogen Level among Sudanese Diabetic patients and its Relation to Glycemic Control

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### Abstract:

The high prevalence of classic cardiac risk factors and thrombotic risk in patients with type 2 diabetes mellitus does not explain the increased cardiovascular related morbidity and mortality in these patients. Fibrinogen may have a role in this excess risk. This study is undertaken to know the fibrinogen levels in type 2 diabetes mellitus and its relations to glycemic control. 100 diabetic patients(55 males 45 females ,60 controlled 40 un controlled ) were enrolled in this study. Results :fibrinogen is significantly increase in un controlled diabetic patients and found correlation with HbA1C (p-value=0.00) and in upper limit of normal range in controlled diabetic patients . the duration of diabetes ,age and sex of patient has no significant effect on fibrinogen.

**Keywords:** Diabetes,Fibrinogen, HbA1C, C-Reactive Proteins

### المستخلص :

إرتفاع معدل المخاطر القلبية ومخاطر الجلطات في مرضى السكري النوع الثاني لا يفسره إعتلال القلب والشرايين فقط قد يكون لزيادة الفيبرينوجين دور في هذه المخاطر الزائدة، أجريت هذه الدراسة لمعرفة مستويات الفيبرينوجين في داء السكري من النوع الثاني وعلاقته بضبط نسبة السكر في الدم. تم تسجيل 100 مريض مصاب بالسكري (55 ذكور 45 إناث، 60 متحكم في نسبة السكر و 40 غير متحكم) في هذه الدراسة. حيث لوحظت ان هنالك زيادة ذات دلالة إحصائية في مستوى الفيبرونوجين في المرضى الذين لا يتحكمون في مستويات السكر عندهم. وله ارتباط ذو دلالة إحصائية مع اختبار السكر التراكمي. المرضى المتحكمين في نسبة السكر فنسبة الفيبرونوجين مع الحد الاعلي من المستوى الطبيعي. مدة مرض السكري وعمر وجنس المريض ليس لها تأثير معتبر على الفيبرينوجين.

الكلمات المفتاحية : مرضى السكري ، الفيبرينوجين، اختبار السكر التراكمي، بروتين C المتفاعل .

### Introduction:

Diabetes mellitus defined as “a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many of the body’s systems, in particular the blood vessels and nerves [1]. Patients with type2 DM have been reported to be at increased risk of developing cardiovascular related diseases (Myocardial infarction, stroke, and atherothrombosis). Many studies elucidated that DM affects vascular integrity by its effect on endothelium, smooth muscle function, as well as propensity to thrombosis, in addition to increased level of coagulation procoagulant factors and decreased

fibrinolytic activity [2,3]. Poor glycemic control has been reported to be associated with increased vascular complications in diabetics [4].

Fibrinogen is the major coagulation protein in the blood from which fibrin clot is formed. It is an important determinant of plasma viscosity, platelet aggregation and thrombus formation; also it is an acute-phase reactant that increases in inflammatory states [3,5,6]. High fibrinogen level has been described as independent risk factor for cardiovascular diseases [7,8]. It has been suggested to be involved in the excess rate of cardiovascular diseases in patients with type 2 DM [9,10].

Diabetes is a global epidemic that affects more than 150 millions worldwide, projected to be 300 million [11].

Diabetes represents the ninth leading cause of hospital admission in Sudan.

### Materials and Methods:

A quantitative approach by measuring fibrinogen in Sudanese diabetics patients in Khartoum state, 100 diabetic patients (55males 45 females) were enrolled in this study. The medical history was taken carefully to collect information about general condition, physical activity and current medication. Subjects were excluded from the study in any case of history of platelet abnormalities, bleeding or vascular disorders, liver or renal disease, ingestion of any kind of drug affecting platelet function for at least 12 days prior to sample collection.

### Sampling and Laboratory Methods:

samples were collected using vacuum container containing Trisodium citrate. All samples were collected and properly mixed with the anticoagulant by gently inverting the tubes three to four times. Fibrinogen was measured using bio Bas semi automated coagulometer in elmolem Laboratory. C-Reactive Proteins (CRP) have been measured using latex technique to exclude the individuals with positive CRP because the high CRP level indicate inflammations which affect Fibrinogen .

HbA1C was measured using Nyocard semi automated apparatus in Gaber abo elez laboratory.

Statistical Analysis: Statistical analyses were performed with SPSS PC software package.

### Results and Discussion:

Table 1 : Distrbution of Population

Subject	All poulation	Controlled	Un controlled
(Age/years(mean	49.88	48.3	49.88
Duration/years (mean	9.62	7.58	10.98
% (HbA1C (mean	7.552	6.365	8.343
Fibrinogen (mean) mg/dl	416.71	352.58	459.47

Table 1 showed 100 subject where enrolled in this study age group range from 20-80 years has diabetes mellitus type2 55males and 45 females.

This based on descriptive case study carried out during the period of September - december 2013 in Khartoum State to estimate Fibrinogen in Sudanese diabetic patients(55 males 45 females ;40 controlled and 60 un controlled) were estimated.

The fibrinogen concentration (mg/dl) (mean) in controlled diabetic patient were 352.58 mg/dl and un controlled diabetic patient were 459.47 mg/dl which indicate that uncontrolled diabetic have higher fibrinogen level than controlled diabetic .

The obtained results apparently agreed with previous studies of Archana-Sachin Bembde, Jacqueline E. Vigilance, Harvey L. Reid. However, it is differ from Nizar M. Abdeurahman, Elshazali W. Ali [12, 13,14] .

The correlation between HbA1C and fibrinogen was found and statistically significant ( p value =0.00), and agreed with previous studies of Archana-Sachin Bembde A, Jacqueline E. Vigilance, Harvey L. Reid , Pieters M, van Zyl DG, Rheeder P, Jerling JC, Loots du T, et al. and un agreed with Nizar M. Abdeurahman, Elshazali W. Ali [12, 13,14, 15].

The duration of diabetes , age and sex of patient has no significant effect on fibrinogen level (p values 0.314 ,0.384 and 0.493 ) respectivity.

### **Conclusions:**

Our studies show that there is increase plasma fibrinogen level in un controlled diabetic patients in compare with controlled diabetic patients, the correlation between HbA1C and fibrinogen level is significant and The duration of diabetes , age and sex of patient has no significant effect on fibrinogen level .

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## Investigating the ELT Test Anxiety and its Impact upon EFL Learners' Achievement for Collegians

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### Abstract,

The study aims to investigate ELT test anxiety and its impact upon EFL learners' achievement for university students. The primary data collected via a questionnaire consist of (39) items prepared by the researcher and translated it into Arabic language to fit students understanding and awareness. The tool was distributed to University of Dongola - college of Education first level students. (100) students of (350) were selected randomly by the stratified random sample. in the academic year (2019-2020). The Descriptive Analytic Method was used to accomplish the statistical analyses process of the primary data; the statistical results proved that ELT test anxiety impact negatively on EFL learners and reduce their performance and achievement. it also showed that test anxiety caused by various elements; which directly associated to EFL learners themselves (confidence. academic standard and their background in the target subject). and parents' attitudes toward the students make them feel sorrow. afraid of failure and blame. surrounding environment and timing. To enhance efforts of solving ELT test anxiety problems these factors must be treated. the relationship between these factors and their impact on each other is a vital point of study that the researcher recommends.

Keywords: Test Anxiety Impact. EFL Learners' Achievement.

### المستخلص:

تهدف الدراسة إلى تقصي مشكلة قلق الإختبار لدى دارسي اللغة الإنجليزية كلفة اجنبية و تأثيره على التحصيل الاكاديمي، إستخدم الباحث استبيان لقياس قلق الإختبار اعدده الباحث وترجمه إلى اللغة العربية لكي يتناسب مع مستوى إستيعاب الطلاب؛ تكون الاستبيان من (39) فقرة موزعة إلى المحاور الخمس. اجاب على الاستبيان (100) طالب وطالبة من طلاب جامعة \_\_\_\_ دنقلا كلية التربية \_\_\_\_ مروى \_\_\_\_ المستوى الاول. اعتمد الباحث العينة العشوائية الطبقية في إختيار عينة الدراسة، وكانت (100) طالب وطالبة من بين (350) بكلية التربية للعام الدراسي (2019-2020). إستخدم الباحث منهج التحليل الوصفي لتحليل البيانات الاولية. اثبتت النتائج الإحصائية ان لقلق الإختبار تأثير كبير لدى دارسي اللغة الانجليزية كلفة أجنبية، اذ انه يؤثر في ادأتهم مما يؤدي إلى إنخفاض التحصيل الدراسي لديهم. كما اثبتت الدراسة ان لقلق الإختبار اسباب عدة، منها ما هو مرتبط بالدارسين انفسهم؛ كإنعدام الثقة او نقصها، المستوى الاكاديمي، والخلفية المعرفية بالمادة. و عوامل مرتبطة بمواقف الوالدين تجاه الدارسين متمثلة في الضغط عليهم واللوم

المبالغ عند الفشل، وعوامل أخرى كالبئثة الدراسية و وقت الإختبار. اوصى الباحث بمعالجة هذه العوامل لحل مشكلة قلق الإختبارات لدى دارسي اللغة الإنجليزية كلفة أجنبية، كما اوصى بدراسات متعمقة في العلاقة بين مسببات قلق الإختبار وتأثير كل منها على الآخر.

الكلمات المفتاحية: قلق الإختبار، دارسي اللغة الإنجليزية كلفة، التحصيل الاكاديمي

## Introduction:

Tests are tools that teachers use for making decision upon learners' levels and performances in particular materials or fields. these decisions enable teachers to ensure their judgments on their students' aspects of learning process. During or before the process of testing students may feel some worry because of different elements (lack of focusing, lack of confidence, fear of failure, his/her family attitudes towards his/her result, surrounding environment, timing.....etc.) these elements impact negatively on students psychological instance which increase their anxiety about the exam. subsequently it effects on the students' academic achievement . The interest in studying anxiety appeared and became the title of many psychological studies. whether those concerned with disturbed behavior in the individual or those related to achievement and examination as a specific form of anxiety related to assessment and success attitudes and recall habits. Many studies which includes habits, motivation, and students continuing to study, as well as exam positions. Anxiety in general is a state of comprehensive tension that students suffer from and affects mental processes such as perception, thinking, attention and remembering, and these processes are among the requirements for success in the study, and therefore this state of tension and anxiety affects students' achievement negatively, and it is normal for students to be anxious at some times during the study. It is also natural to express the emotion of anxiety once high and once at low, depending on the tasks assigned to them, including anger and frustration at one time, and pleasure and joy at another time. But if anxiety has reached a state in which students feel helpless from the pressures of studying and exams and their results, then anxiety becomes hindered and reduces work effectively and efficiently, and this is what Suinn called for asserting that many university students fail in their studies due to their inability to overcome Situations of anxiety and turmoil that affect their academic achievement.

Examination stress and test anxiety are pervasive problems in modern society. As the information age continues to evolve, test scores will be-



come even more important than they are today in evaluating applicants for demanding jobs and candidates for admission into highly competitive educational programs. Because test anxiety generally causes decrements in performance and undermines academic achievement, the development of effective therapeutic interventions for reducing its adverse effects will continue to be an important priority for counselors, psychologists, and educators. Alleviating test anxiety will also serve to counteract the diminished access to educational and occupational opportunities that are frequently experienced by test-anxious individuals [1]. It is almost impossible to live without anxiety or fear. It is widespread. A person feels anxious regularly, although, for each of person different events, situations or relationships will make him/ her feels anxious. Lots of things make people anxious or fearful, from everyday events such as crossing the road or meeting new people to bigger decisions such as which school the children should go to or whether or not they should visit the doctor because they develop pain. Anxiety affects everybody at times [2]. One of the main and the natural concerns for an educational scientist is to establish a good learning environment, hence, to make students attain academic success. Test anxiety is one of the main barriers to reach this goal. Feelings of anxiety toward examination have existed ever since examinations have been used in the educational settings and are frequently expressed in today's competitive academic environment. The study is limited in investigating the reasons of test anxiety. The population is University of Dongola Faculty of Education Merowe Freshmen for the academic year (2019-2020). The study aimed to achieve the following:

- 1-To give clear illustration about the concept of test anxiety.
- 2-To identify the reasons of test anxiety.
- 3-To diffuse the awareness of test anxiety symptoms, reasons and how to reduce it among teachers and students.
- 4-To find out effective solutions to the problem.

#### Hypotheses of the Study

- 1-Families' attitudes toward their students contribute in creating test anxiety.
- 2-Students' standards on the certain subject knowledge and background have a great role in the test anxiety.
- 3-Lack of confidence among EFL learners is one of test anxiety factors.
- 4-Surrounding environment and timing have a role in EFL learners test anxiety.

ety.

5-Test anxiety reduces English Language learners' achievement.

### Related Literature Review

#### Anxiety:

Anxiety is defined as a mental phenomenon which is experienced by all of the humans during their life. Although, anxiety is the cause of our inappropriate performance and many mistakes, but a normal level of anxiety seems to be necessary for hardworking and being responsible [4]

Anxiety is an unpleasant feeling that all experience at times. It is a word often used to describe when a person feel uptight, irritable, and nervous, tense, or wound up. When people are anxious they normally experience a variety of uncomfortable physical sensations. These include: Increased heart rate, Muscular tension, Sweating, Trembling Feelings of breathlessness. Anxiety is a type of fear usually associated with a perceived threat or something going wrong in the future, but it can also arise from something happening right now. Unlike fear itself, which is a response to an immediate danger, anxiety is an ongoing sense of worry without a specific cause.

#### Types of Anxiety:

According to [5] different types of anxiety have their characteristics and cause the body to react in a variety of ways.

1. Agoraphobia: Is intense anxiety which triggers a panic response, commonly associated with open spaces. The onset of agoraphobia is usually between the ages of 18 and 35.
2. Generalized Anxiety Disorder: Is the most commonly diagnosed anxiety disorder and usually affects young adults. While feelings of anxiety are normal, people find it hard to control them to an extent that limits their daily life.
3. Panic: Is an exaggeration of the body's normal response to fear, stress, or excitement. Symptoms include a pounding heart, feeling faint, sweating, shaky limbs, nausea, chest pains, breathing discomfort, and feelings of losing control.
4. A phobia: Is an intense and irrational fear of a specific object or situation which makes the person experiencing it goes to great lengths to avoid it.
5. Post-Traumatic Stress Disorder or syndrome: Is a reaction to highly stressful or traumatizing events. People commonly experience flashbacks, panic attacks, nightmares, or avoid situations that might trigger memories of the event.
6. Obsessive-Compulsive Disorders: Is characterized by unwanted intrusive and repetitive feelings that make the individual feels driven to do something

to get rid of the obsessive thoughts

### Anxiety Effects:

Whenever the fight or flight response is activated by danger, either real or imagined, it leads to changes in three “systems of functioning”: the way you think (Cognitive), the way your body feels and works (Physical), and the way you act (Behavioural). How much these three systems change varies, depending on the person and the context.

1. Cognitive: Attention shifts immediately and automatically to the potential threat. The effect on a person’s thinking can range from mild worry to extreme terror.

2. Physical: Effects include heart palpitations or increased heart rate, shallow breathing, trembling or shaking, sweating, dizziness or lightheadedness, feeling “weak in the knees,” freezing, muscle tension, shortness of breath, and nausea.

3. Behavioural: People engage in certain behaviors and refrain from others as a way to protect themselves from anxiety (e.g., taking self-defense classes or avoiding certain streets after dark).

### Symptoms of Anxiety and Test Anxiety:

Among types of anxiety, test anxiety is a psychological response; consist of worry, stress, emotionality, lack of confidence, fear of failure, and interference that can be experienced by an individual before, during, and after an exam or similar situations. [6] Like the other kinds of anxieties, a certain level of the test anxiety could be push students to work harder and learn better, but mostly the high level of this bad feeling causes psychological distress, low performance, underachievement, demotivation, etc. in the students. Personal factors like insufficient studying and defects in test skills are not the only causes of test anxiety, and the organizations performance could cause this [7]. According to McKenzie [2], there are many symptoms of anxiety. They can be broadly categorized as either physical or psychological.

Table (1) Symptoms of Anxiety

Physical	
Palpitations	Chest tightness
Sweating	Abdominal pain/ discomfort/ nausea
Tremor	Choking
Dry mouth	Hot flushes
Difficulty breathing	Tingling in fingers
Psychological	
Dizziness	Poor sleep
Fear of losing control	Tiredness
Fear of dying	Feeling on edge
Feeling out of it	Restlessness
Loss of appetite	Difficulty concentrating
Depression	

[2]

### Test:

A test is a procedure designed to elicit certain behavior from which one can make inferences about certain characteristics of an individual. Language test is the practice proficiency of an individual in using practice language. It is an experiment to find out more information about it [8]. The term test is constructed to refer to those aspects of knowledge or skills possessed by the candidate; it is a universal feature of social life [9].

### Modes of Test Administration

The way of presenting tests may lead to anxiety if all elements haven't considered some of the strategies can reduce the worry and make candidates feel relaxed with no more anxiety such as a computerized test and objective test (draw a circle, check and matching items questions); the first type used in Sudan lately in interviewing candidates for certain professional especially in private sectors. Computer-administered testing, with its advantages of speed, flexibility, and efficiency is currently complementing conventional paper and pencil testing in a wide variety of educational, industrial, and military contexts. The computerized testing situation is frequently claimed to have a number of anxiety-reducing properties which would be particularly facilitative for high-test anxious students. These include human-machine testing interactions that may be more objective and affectively neutral than the typical interactions between examiner and examinee, freedom from threatening examiners/proctors, a relatively non-competitive testing environment, individualization of testing, the opportunity to test examinees at their own pace

and whenever they so choose a provision of immediate item feedback, and greater examinee control of the order of item administration [10]. If these methods are found to reduce anxiety, then a clear advantage of computer-administered testing will have been identified. Although empirical research has yielded inconsistent data on the effects of computerized testing as compared to conventional paper and pencil testing on state anxiety, reviews of the research literature suggest that computerized testing does not generally reduce state anxiety relative to conventional testing. The amount of anxiety that is induced by computer-presented test materials appears to be more a function of the difficulty of the task and the amount of evaluative threat perceived by the student. [1]

### Test Anxiety:

Test-anxiety is a type of performance anxiety is a feeling someone might have in a situation where performance really counts or when the pressure is on to do well. Test-anxiety is defined as the “set of phenomenological, physiological, and behavioral responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation” [1]. Test anxiety is a sort of anxiety that appears in a specific situation that has symptoms like general anxiety, such as sweating, heartbeat increase, uneasiness, worry, doubt, hand trembling, and dizziness [11].

Although some anxiety before test-taking is normal and even necessary to do well, test anxious students experience crippling anxiety that can limit their ability to perform to their real level of proficiency. Defined test anxiety as a type of "self-preoccupation" which is determined by understatement and feeling doubt about one's capabilities. It is a kind of anxiety associated with exam situations, which give rise to an individual's feelings of annoyance and nervousness; it is a bad emotional instance happened before or/and after the exam characterized by tension and fear about the exam. The researcher believed that test anxiety is a nagged frame of mind with some emotional and intense tension before the test. It might occur suddenly during the test (when the student finds difficult questions or think about failure). Generally, anxiety has been defined as a complex state that is elicited by psychological stress which includes cognitive, emotional, behavioral, and physiological dimensions [12].

### Nature of Test Anxiety

Test anxiety has emerged as one of the most salient constructs in modern-day psychology and by far the most widely studied specific form of anxiety in the literature. Test anxiety is a ubiquitous phenomenon, with some degree of evaluative anxiety being experienced by most people in modern society. The

test anxiety construct has matured within a large cocoon of attention ever since its inception in the early 1950s. with researchers making important strides toward understanding its nature. components. origins. determinants. effects. and treatments [1].

The importance of test anxiety in understanding sources of student stress in evaluative situations and poor test performance is now readily apparent. The topic of test anxiety has prospered. in part. due to the increasing personal importance of test situations for people in modern society. making tests and their long-term consequences significant educational. social. and clinical problems for many. Since test results in most academic and occupational settings have important practical implications for a person's goals and future career. test anxiety is frequently reported to be a meaningful factor impacting upon test scores. Much of the test anxiety research over the past half-century has been motivated by the desire to ameliorate the debilitating levels of test anxiety in various settings and populations and to find ways of helping test anxious persons become more effective in the test or test like situations. Over the past few decades. there has been an upsurge of interest in test anxiety research among psychological and educational researchers. Hundreds of researchers have investigated the nature. antecedents. correlates. and consequences of test anxiety and the literature are prodigious. A wealth of studies relating to various facets of test anxiety has appeared in some of the premier journals in psychology and education. Test anxiety has become a major topic of research interest in education and various subareas of psychology. including personality and social psychology. educational and developmental psychology. cognitive psychology. health psychology. and counseling and clinical psychology [1]. Found consistent results for the relationship between academic achievement and test anxiety. Participants completed the test anxiety measure two weeks before the first exam. The relationship between test anxiety and examination performance on four midterm exams was investigated. Results showed that test-anxious students obtained lower examination grades than their non-test-anxious counterparts [13]. Test anxiety. on the other hand. refers to an individual difference in the disposition to experience feelings of apprehension and worry cognitions in academic environments where the performance of students is under evaluation [14]

### **Temporal Phases of Test Anxiety:**

The temporal course of test anxiety can be traced through the following four distinct stages of the evaluative stress process: the anticipatory stage. involving appraisals of the test situation and preparation for the exam; the confrontation phase. involving the actual test-taking experience; the anticipa-

tion phase, following test-taking, but before the announcement of grades; and the outcome stage, in which the uncertainty is resolved when grades are announced[1].

1. The Anticipatory Stage: a preparatory phase before the exam constitutes a period of warning regarding the imminence of the impending exam encounter and concomitant preparation for the upcoming exam. Thus, once an individual becomes aware of an upcoming exam, he or she typically becomes concerned with the demands, possibilities, and constraints connected with the future exam. Examinees are typically concerned about how best to prepare for the upcoming exam, and how to regulate feelings and aversive emotions associated with the exam, as well as with the prospects for success on the exam. Since ambiguity is expected to be at its height during the anticipatory stage because examinees do not know exactly what will be on the exam or what the outcome will be like the possibilities for both positive and negative outcomes can be seen[1].

High-test-anxious students are characterized by ineffectual study, often indulging in self-protective thoughts involving denial, wishful thinking, and avoidance elements. Although these actions may distance these individuals temporarily from the implications of failure, they will eventually contribute to the very features that students fear by disrupting effective study. By contrast, individuals high in success orientation apically perceive themselves as possessing sufficient effort and ability resources and are less preoccupied with fears of incompetency and negative consequences of performance. However, there are marked differences concerning exactly when anxiety peaks. For some, it is the same day as the exam, whereas for others it is as many as 4 days before the exam. Individuals prepare for upcoming tests largely through task-focused coping, while harboring feelings, expectancies, and cognitions regarding the futility, wisdom, or appropriateness of their study [15].

2. The Confrontation Stage: examinees confront the stressor, i.e., take the exam. It is anticipated that deficiencies in study skills (cognitive), fears about potential failure (motivational), and characteristic anxiety reactions (emotional) will coalesce to elevate interference and discomfort occurring during testing [15].

Each of these antecedent constructs is expected to trigger various intervening mediators, which in turn impinge upon each other and eventually upon performance. Research by [16] demonstrated that the last 10 minutes of a test represent a critical moment because negative thoughts and sensations of arousal essentially accumulate as students mount their final efforts to finish the test on time and check the accuracy of their answers. As discussed earlier, the Emo-

tionality component tends to peak during the first few moments of the actual encounter with the exam; Worry, the cognitive component of situational test anxiety, is relatively more stable throughout the exam [1].

3. The Waiting Stage: refers to the post-exam stage: examinees have already taken the exam, but grades have yet to be announced. Uncertainty about the specific nature and qualities of the test and test atmosphere has been resolved or meaningfully reduced, and feedback cues from the examination may help examinees predict their exam performance reasonably well [17].

4. The Outcome Stage: constitutes the last phase of the stressful encounter. After grades are posted, students finally learn how well they performed on the exam. Any uncertainty about the outcome is resolved at this stage, and the concerns of students turn to the significance of what has already happened and its implications (harm, benefit). The more an encounter unfolds, the more firmly the examinee should be making either a negative or positive appraisal of the outcome. Students who succeed on the exam would be expected to be happy and experience uplift. By contrast, those who do poorly would be expected to become anxious and moody. In particular, test-anxious subjects should suffer negative self-evaluation and diverse emotions following failure feedback.

During each of the phases described above, anxiety may vary as a function of cognitive appraisals, which, in turn, vary as a function of the objective properties of the specific phase of the test-taking process considered [1].

### **Test Anxiety Reactions**

Anxiety is a normal reaction, apprehension, tension, or uneasiness to any perceived threat or anticipation of danger. If a student believe something important to him/her is being threatened, and he/she overestimate the threat, underestimate his/her ability to cope with it, or underestimate the resources he/she have available to cope with it, then he/she will feel anxious.

Test anxiety often involves apprehensions of performing at levels below those at which students would like to perform or even apprehensions of failure. This type of anxiety may be a product of them underestimating their abilities to perform or of the resources they have available to help them to perform to their desired levels on tests. Conversely, test anxiety may be a natural reaction to insufficient test preparation.

Table (2) Test anxiety Indicators



- Physical Indicators	- Perspiration, sweaty palms, feeling too hot or cold
	- Headaches, upset stomach, nausea
	- Rapid heartbeat, shallow/irregular breathing, dizziness
	- Muscle tightness
- Emotional Indicators	-Feeling guilty, angry, depressed, or unsure
- Behavioral Indicators	- Procrastination and avoidance
	- Excessive study
	- Over/Under eating; Poor nutrition
	- Sleeping too much or too little
	- Fatigue or inability to relax
	- Alcohol or drug misuse
- Cognitive Indicators	- Negative or defeating self-talk
	- Excessive worry
	- Difficulty with concentration or focus
	- Difficulty retrieving or selecting key terms or concepts
	- Difficulty organizing, integrating or expressing your
	Thoughts
	- Going blank on exam questions
	Remembering the correct answers after the - exam is over

### Achievement:

While “student achievement” has been defined to varying degrees in the college impact research such as exam scores. grades. credits earned during the required academic period. progress from one grade to another. completion rates. and post-college employment and income.

Academic achievement was once thought to be the most important outcome of formal educational experiences and while there is little doubt as to the vital role such achievements play in student life and later [18].

In our society. academic achievement is taken as a key criterion to evaluate one’s total potentialities and capabilities. It occupies a very important place in teaching and learning process. The technology and information based society demands the people who are able to find out the solution of different issues. to analyze carefully and adapt to new

situations such as solving problems of various kinds and sharing their thinking successfully. The need to make systematic educational efforts primarily aimed at influencing attitudes, behaviour, values and personality of individuals to manage their growth and development well is very important.

For every student, who is under the process of acquiring education academic achievement is very essential, because it helps in the successful development of young people in contemporary society [19].

**Methodology:**

This current study entitled “Investigating the Reasons of Test Anxiety among EFL Learners”. This chapter will be devoted to the methodology that followed by the researchers to investigate the collected data; the researchers had adopted the Descriptive Analytic method, because it has great value in providing facts on which professional judgment can be based. The researchers identified the hypothesis of the study and selected the data instrument which is represented in a questionnaire; first the data has been collected, second analyzed and discussed.

**Subject:**

The population of the study was represented in the EFL learners in University of Dongola Faculty of Education - Merowe first level students, males, and females for the university year 2019-2020. This study was based on a random sample, primary data collected through a questionnaire distributed randomly among (100) students, as well the test has been answered by other group consist of (100) students currently registered in the academic year (2019-2020) first level-first semester

**The Tool:**

The researchers designed a questionnaire that consists of (34) items then translated into Arabic language to fit with students' level of understanding and awareness, the questionnaire was distributed into the four axes addressed as hypotheses, as in the table below.

Table (3) shows the distribution of the questionnaire to the Axes.

Hypothesis		Items
First	Families' attitudes toward their students contribute in creating test anxiety.	1-5
Second	Students' standards on the certain subject knowledge and background have a great role in the test anxiety.	6-13

<b>Third</b>	<b>Lack of confidence among EFL learners is one of the test anxiety factors.</b>	<b>14-26</b>
<b>Fourth</b>	<b>Surrounding environment and timing have a role in test anxiety.</b>	<b>27-34</b>

## Validity

To achieve the face validity, the researcher showed the instruments to experts who added some amendments on the questionnaire. To measure the validity subjective, and the fitness with the research population, the researchers did a pilot study on a sample that consists of (30) students (males and females), then the researcher relied upon the coefficient of the internal consistency, and then elicited the coefficient linear correlation between the degrees of the items and the total degree of their axes. The analyses resulted as in the table below:

Fifth Axis	Fourth Axis		Third Axis		Second Axis		First Axis	
	No	The Correlation	No	The Correlation	No	The Correlation	No	The Correlation
0.76**	27	0.61**	14	0.59**	6	0.75**	1	0.67**
0.51**	28	0.70**	15	0.67**	7	0.48**	2	0.52**
0.72**	29	0.73**	16	0.74**	8	0.46**	3	0.57**
0.59**	30	0.68**	17	0.75**	9	0.35*	4	0.56**
0.77**	31	0.69**	18	0.73**	10	0.69**	5	0.73**
	32	0.75**	19	0.50**	11	0.82**		
	33	0.71**	20	0.36*	12	0.78**		
	34	0.67**	21	0.68**	13	0.70**		
			22	0.40*				
			23	0.66**				
			24	0.42**				
			25	0.65**				
			26	0.33*				

## Reliability:

The researchers used the two ways of (Spearman & Brown) and (Cronbach alpha) to check the reliability of the measurement.

Table (5) correlations of the measurement reliability

Axes	Items	Sample	Cronbach Alpha correlation	Sper & Bro correlation
First	05	30	0.62	0.75

<b>Second</b>	<b>08</b>	<b>30</b>	<b>0.79</b>	<b>0.77</b>
<b>Third</b>	<b>13</b>	<b>30</b>	<b>0.83</b>	<b>0.84</b>
<b>Fourth</b>	<b>08</b>	<b>30</b>	<b>0.84</b>	<b>0.81</b>
<b>Fifth</b>	<b>05</b>	<b>30</b>	<b>0.70</b>	<b>0.66</b>

## Statistical Analyses Methods

T-test for one sample.

Cronbach alpha.

Mean and standard deviation.

Spearman and Brown.

## Procedures

To investigate test anxiety reasons the researchers designed a survey questionnaire where the instrument was showed to five associated professors for the purpose of arbitrating and reviewing. The study was applied in university of Dongola Faculty of Education Merowe; the sample was (100 students) freshmen. male and female currently registered in the academic year 2019-2020.

## Data Analysis and Discussion

Testing Hypotheses Results

Table (6) first hypotheses results

No.	Items	Mean	Std.	Touch-stone	T.test	Df	P.Value	Conclusion
100	5	10.30	2.03	10	1.48	99	0.14	Medium

The first hypothesis is "families' attitudes toward their students contribute in creating the test anxiety". the T. test value for the difference between the mean and students' opinions. and the affection of their families on test anxiety is (10.30). and the touchstone (10) is (1.48). It is not statistically significant. this indicates families' affection and contribution on the test anxiety is medium.

Table (7) second hypothesis results

No.	Items	Mean	Std.	Touch-stone	T.test	Df	P.Value	Conclusion
100	8	10.30	2.03	10	3.42	99	0.01	High

The second hypothesis is "students' standard on the certain subject knowledge and background have a great role in test anxiety" the results showed that the T-test value for the difference between the mean and students' opinions and the impact of the standard. knowledge. and background upon test anxiety is (16.88). and the touchstone (16) is (3.42). Its statistically significant. i.e.

students' standards on a certain subject, background, and knowledge cause mainly in test anxiety.

Table (8) third hypothesis results

No.	Items	Mean	Std.	Touch-stone	T.test	Df	P. Value	Conclusion
100	13	26.76	3.73	26	2.04	99	0.04	High

The third hypothesis is "lack of confidence among EFL learners is one of test anxiety factors" the results proved that lack of confidence considers one of the highest elements which cause test anxiety. The T. test value for the difference between the mean and students' opinions and the affection of lack of confidence on test anxiety is (26.76), and touchstone (26) is (2.04) it is statistically significant.

Table (9) fourth hypothesis results

No.	Items	Mean	Std.	Touch-stone	T.test	Df	P.Value	Conclusion
100	8	26.76	3.73	26	2.04	99	0.04	High

The fifth hypothesis is "test anxiety reduces English language achievement" the T. test value for the difference between the mean and students' opinions and the affection of the test anxiety on their English language achievement is (10.20), and the touchstone (10) is (7.01). It is statistically significant, i.e. the test anxiety directly effect on students' achievement; since the anxiety immobilizes thinking and impact on performance.

## Conclusion:

The study focused on the impact of the ELT test anxiety on EFL learners' achievement. it released students test anxiety can effect on their performance and reduce their achievement. The questionnaire result indicated ELT test anxiety took place by candidates' habits, their families' attitudes, surrounding environment, and other related factors. Test anxiety may be a part of general anxiety experienced by anyone in a situation, though it still has a bad reaction on students as they suffer some physical harms such as headache, choking, sweating, difficulty in breathing, and tingling. Test anxiety causes psychological problems too: poor sleep, loss of appetite, depressions, and different kinds of fear. These symptoms occur decreasing in performance. Though a little bit of anxiety sharpness-up the game, it puts a bit on edge, improves the performance, and helps to think quickly, but too much anxiety can cause unpleasant results. However, the study discovered that ELT test anxiety impacts negatively on EFL learners' achievement and reduce it. The Solution of the problem is in avoiding the occurring of test anxiety, by treating the contributed factors and diminishes the physical and psychological symptoms.

## Findings:

The result found that ELT test anxiety reduces EFL learners' achievement. and found that test anxiety happens through different elements. The following are the main finding of the research:

1. Families contribute to some extent in creating test anxiety.
2. Low standard. background. and lack of knowledge in a certain subject cause test anxiety.
3. Lack of self-confidence makes hesitation in performance. and lead to test anxiety.
4. The poor surrounding environment and test timing are reasons for test anxiety.
5. Test anxiety reduces the students' achievement as it proofed by the statistical result of the instrument

## Recommendations

1. Families mustn't press too much on students to study for long time.
2. Teachers should encourage students and change their unpleasant attitudes through giving them nice ideas about the tests.
3. Tests must be performed in good and comfortable environment.
4. Invigilators should avoid annoying and too much movement inside tests' hall.

## Suggestions

Additional studies are needed to:

1. Investigating ELT test anxiety and its impact upon EFL learners' performance
2. Investigating ELT teachers' role in creating test anxiety
3. Investigating the causes of ELT test anxiety "teachers perspective"
4. Investigating studying difficulties contribute in EFL learners' test anxiety
5. The difficulties that encounter ELF learners in controlling their test anxiety
6. Investigating the factors that rise test anxiety and ways of diminish it
7. Investigating the overlapping of teaching process elements and its impact in creating test.

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