EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 8
Issue: 7
633-639
Year: 2021

THE NUTRITIONAL AND ANTIOXIDATIVE ACTIVITIES OF *CHROMOLAENA ODORATA* AND *TRIDAX PROCUMBENS* EXTRACT IN WOUND HEALING

[1]*Nwokorie Chukwuma Chigozie, [2]Nwachukwu Nkechi C. [3]Ezeagha Chigozie Celestina [4]Ogbuebuna Jacinta. Ogechukwu and [5]Oyedum Uche Mary

[1]Dept. of Microbiology, Abia State University, Uturu.
[2]Dept of Microbiology Abia State Uturu.
[3,4]Dept. of Pharmaceutical and Medicinal Chemistry, Chukwuemeka Odumegwu Ojukwu University, Igbariam Anambra State.
[5]Dept of Microbiology, Federal University of Technology Minna, Niger State.

***Corresponding Author: Nwokorie Chukwuma Chigozie**
Dept. of Microbiology, Abia State University, Uturu.

Article Received on 19/05/2021 **Article Revised on /06/2021** **Article Accepted on 04/07/2021**

ABSTRACT
This study evaluated the nutritional profile and antioxidant activities of *Chromolaela odorata and Tridax procumbens* leaf and stembark extract. A total of One hundred and twenty(120),8-weeks old male albino wistar rats(220g and 229g bw) were divided into different groups(control and treatment groups),10g of pulverized plant extracts were homogenized in distilled water. The samples of the plant extract were soaked in ethanol and aqueous solvents. The percentage proximate composition of the moisture content, total ash, crude protein, total carbohydrate and crude fat were determined in all the plant extracts,and there was no significant different ($p<0.05$).Also the mineral compositions such as Calcium (Ca), Sodium(Na), Potassium(K), Phosphorus(P), Iron (Fe), Magnesium(Mg) and Zinc (Zn) of both the plant extracts were evaluated in (mg/kg). Moreso, the Vitamins B1(Thiamine), B2(Riboflavin), B3 (Niaci n), B6(Pyridoxine), C (Ascorbic acid), Biotin, Folic acid (Water Soluble) and Vit. A,D,E and K (Fat Soluble) in Mg/100g of *C odorata* and *T.procumbens* extract were analysed, ($P<0.05$) The antioxidant activities for aqueous and ethanolic extracts where compared with the ascorbic acid which shows no significant different ($P<0.05$) ranging from (10-400µg/ml) concentrations.

KEYWORDS: Wistar Rat, *Chromolaena odorata, Tridax procumbens*, Solvent and treatment.

INTRODUCTIONS
Historically, plants have provided a source of inspiration for novel drug compounds, as plant derived medicines have made large contributions to human health and well being. Medicinal plants represent a rich source of nutritional agents and natural antioxidants.

Many of the plant materials used in traditional medicines are readily available in rural areas at relatively cheaper than modern medicines.

Wound infection is one of the most common diseases in developing countries because of poor hygienic conditions (Akinpelu *et al*., 2015).

The World Health Organization (WHO 2012) is encouraging, promoting and facilitating the effective use of herbal medicine in developing countries for health programs. It has been proved that various plants extracts possess bacteriostatic and bactericidal effects, and most of these plants contain many active compounds. Consequently, they are multipurpose drugs at the same time and have formed the basis of sophisticated traditional medicine system and natural products make excellent leads for new drug development. In recent years there has been a growing interest to evaluate plants possessing antimicrobial activities for various diseases. Reactive oxygen species (ROS) are an entire class of highly reactive molecules derived from the metabolism of oxygen. (Diwan *et al*., 2012).

Reactive oxygen species (ROS) including free radicals such as superoxide anion radicals (O2-), hydroxyl radicals (OH-) non-free radicals such as H2O2, Singlet Oxygen (O2) along with various forms of active oxygen are involved in various physicochemical processes in the body and aging. Free radicals are implicated in a large number of chronic degenerative diseases, inflammation, cataract, atherosclerosis, rheumatism, arthritis, ischemia, etc. However, they may also cause great damage to cell membranes and DNA, inducing oxidation that causes membrane lipid peroxidation, decreased membrane

fluidity, and DNA mutations leading to cancer, degenerative, and other diseases. Antioxidant-based drugs/formulations for the prevention and treatment of complex diseases have appeared during the last 3 decades. (Paglione, 2003).

The potential of higher plants as a source of new drugs is still largely unexplored; hence last decade witnessed an increase in the investigation on plants as sources of new biomolecules for human disease management. Wound healing is a process by which a damaged tissue is restored as closely as possible to its normal state and wound contraction is the process of shrinkage of area of the wound. It mainly depends on the repairing ability of the tissue, type and extent of damage and general state of the health of the tissue. The granulation tissue of the wound is primarily composed of fibroblast, collagen, edema, and small new blood vessels. (*Begun et, al*., 2014).

To achieve the above the following were targeted. These include:
To determine the nutrient components of the leaf and stem bark extract of the plant, investigate the wound contraction after treatment, determine the antioxidant effects of the plant, determine the free radicals scavenging activities (enzymatic), investigate the Physiological effects and lipid content of the plant extract by evaluating certain haematological parameters, and to determine effects on liver and kidney function enzymes from the plant extract.

A total of 120, 8-week-old male albino Wistar rats weighing between 220 and 229 g were obtained from the laboratory animal unit, Faculty of Veterinary Medicine, University of Nigeria, Nsukka. They were fed on commercial growers mash (Top feeds®) and water was provided *ad libitum*. These rats were acclimatized for 2 weeks in the animal house at the Department of Veterinary Surgery, University of Nigeria, Nsukka.

2.2. Plant Collection and Identification
Fresh *C. odorata and Tridax procumbens* leaf and stem bark were collected from Iyiowa Odekpe town in Ogbaru Local Government Area Anambra State, Nigeria, in the month of February, 2016 and was identified at the International Center for Ethnomedicine and Drug Development (InterCEDD), Nsukka, by a plant taxonomist.

2.5. Extraction of the plant
One kilogram(kg) each, of the *C. odorata and T.procumbens* leaves and stem bark was washed with clean tap water and rinsed with distilled water. After that, they were sliced into smaller pieces; air dried with hot air oven (GL,England) at room temperature of 35 degree for 2 weeks and then pulverized using the laboratory grinding machine at the, Department of Food Science and Technology,Abia State University Uturu. The pulverized leaves and the stem bark were soaked in 70% ethanol and aqueous solution(hot water) respectively for 48 h with intermittent vigorous shaking. After 48 h, the mixtures was filtered using whatman no.1 filter paper and the extract concentration was produced using a rotary evaporator set at 40°C. The dried samples were weighed and the percentage yield was calculated. The extracts was stored at 4°C in a refrigerator. (Sofowara, 1993, Yogeshi *et. al*., 2012.

2.6.1 Ethanol Extract
Ten grammes (10g) of the leaf and stem bark were washed with clean tap water and rinsed with distilled water. They were blended into smaller pieces; air dried with hot air oven (GL,England) at room temperature for 2 weeks and then pulverized leaf were weighed using Satoric AG Gottingen Electronic Weighing balance. The weighed samples of *C.odorata* and *T.procumbens* leaf and stem bark was soaked in 100mls of ethanol(80%) in a conical flask. The mixture was swirled after 24h elaption with interval stirring. The mixture was filtered using Whatman no.1 filter paper into a clean beaker. The ethanol was recovered using a soxhlet apparatus and it was finally evaporated to dryness using a steam bath at 100^0C. Ethanol has dark brown colouration after extraction. (Azoro, 2002)

2.6.2 Aqueous Extract
Ten grammes(10g) of the pulverized leaves and stem bark were weighed and macerated in 100ml of distilled water. The mixture was vigorously swirled. After the elaption of 24h with interval stirring, the mixture was filtered using Whatman No.1 filter paper into a clean beaker,and the filterate was concentrated to dryness by evaporation using the steam bath at 100^0C.The filterates has the dark green colouration
The dried samples was weighed and the percentage yield was calculated. (Sofowara, 2008).

2.11 PROXIMATE ANALYSIS OF THE PLANT EXTRACTS
Proximate Analysis: The nutritional analysis comprises the moisture content, **Ash content, Crude proteins, Carbohydrate content and Crude fat** content were all investigated using a multi-digital analyzer machine (digital SSR 3200 England..

2.13.1 Mineral Compositions
Mineral content was determined by method of the Association of Official Analytical chemist (AOAC, 2010) using the flame system of the atomic absorption spectrophotometry (ASS), (Varian SpectrAA 220, USA). *C.odorata and Tridax procumbens* leaf and stem bark were ashed at 550^0C overnight and the ash was dissolved in concentrated nitric acid and filtered, diluted to 50ml with deionized water and the absorbance of the samples were read directly on the AAS. Working standard solutions of calcium (Ca), Potassium (K), Iron (Fe), Sodium (Na), Phosphorus (P) and magnesium (Mg) were prepared from stock standard solution (1000ppm), in 2N HNO_3 and absorbance was noted for standard solution of

each element and samples using atomic absorption spectrophotometer (AAS). The wavelength used for various elements in the standard solution prepared from pure salt samples were as follows:

(Na =589nm, Ca =422.7nm, Zn = 213.9nm, Mg =285.2nm, K=766.5nm, Fe =284nm)

Graphs obtained by plotting the concentration of standard solution (ppm) against their absorption spectra (calibration cone) was used in correcting the concentrations of mineral element and expressed in mg/100ml of the solution wet ash.

2.17 Free radical scavenging activity plant extracts(invitro)

About 2.5ml of the various concentrations of the plant extract *C.odorata* and *T.procumbens* were mixed with 5ml of 0.1Mm DPPH solution, the tubes were shaked properly and incubated for 20mins. In the dark. The changes in the absorbance of the sample was measured at 517nm using a Spectrophotometer. The radical scavenging activity of the extract at different concentrations were determined and compared with that of butyl hydroxyl anisole which was used as the standard (Draper and Hardly 2007).

2.18. Enzymatic Antioxidant effect of the plant extracts

Wound specimen was taken from 3 animals groups, and was placed in 10% paraffin buffered solution(PBS) and was used for biochemical assays of Catalase (CAT),Super oxide dismutase (SOD) and Malondiahyde (MDA) respectively (Okore, 2004).

2.17. Lipid Peroxidation

About 1ml of 14% of Trichloroacetic acid was measured into a test tube, 1ml thiobarbituric acid(0.6%) was added with 50microliters of the tissue (blood) homogenate. The mixture were incubated at 80^0C for 30min and was centrifuged at 300 x g for 19min. Malondialdehyde(MDA) was measured at 535nm,and the level of lipid profile of the low density lipids (LDL), high density lipids(HDL), tricygeride and total cholesterol were calculated on different days of treatment using the molar extinction coefficient of malondialdehyde. Draper and Hardley, (2007).

Statistical analysis

Data are presented as the means (±), standard deviation (SD).Statistical significance of the difference between groups were analysed using student t-test and one way analysis of variance ANOVA, with SPSS, VERSION 1.6 software, Chicago Illinos, USA. Means were considered statistically different at 95% level of confidence($p<0.05$).

RESULTS/DISCUSSION

Table 1: **Percentage proximate compositions of the plant extract.**

	LEAF		STEMBARK	
Parameter (%)	**C.O w/w(g)**	**DW(g)**	**T.P w/w(g)**	**DW(g)**
Moisture	89.2 ± 0.02	-	87.7 ± 0.01	-
Total Ash	0.20 ± 0.00	4.30 ± 0.02	0.80 ± 0.02	4.20 ± 0.02
Crude Protein	4.80 ± 0.02	36.57 ± 0.02	6.35 ± 0.03	35.00 ± 0.07
Total Carbonhydrate	5.230 ± 0.01	51.30± 0.07	5.75 ± 0.01	60.02 ± 0.02
Crude Fat	0.61 ± 0.02	6.13 ± 0.03	0.40 ± 0.01	0.80± 0.02
Total Energy (kcal/100g)	37.62 ± 0.0	397.54 ± 5.20	39.56 ± 0.26	321.54 ± 5.21

KEYS:
C.O *Chromolaela odorata*
T.P *Tridax procumbens*
WWWet weight, DW=Dry weight

Table 2: **Percentage proximate compositions of the plant extract.**

	STEMBARK		LEAF	
Parameter (%)	**C.O w/w(g)**	**DW(g)**	**T.P w/w(g)**	**DW(g)**
Moisture	89.5 ± 0.02	-	88.7 ± 0.01	-
Total Ash	0.22 ± 0.00	4.30 ± 0.02	0.83 ± 0.02	4.60 ± 0.02
Crude Protein	4.90 ± 0.02	36.57 ± 0.02	6.35 ± 0.03	36.00 ± 0.07
Total Carbonhydrate	5.30 ± 0.01	53.30± 0.02	5.75 ± 0.01	62.02 ± 0.02
Crude Fat	0.63 ± 0.02	6.16 ± 0.03	0.40 ± 0.01	0.83± 0.02
Total Energy (kcal/100g)	37.62 ± 0.0	397.54 ± 5.20	39.56 ± 0.26	321.54 ± 5.21

KEYS:
C.O *Chromolaela odorata*
T.P *Tridax procumbens*
WWWet weight, DW=Dry weigh

Table 3: Percentage mineral composition of the plant extracts *Chromolaela odorata* and *Tridax procumbens* (Composition mg/kg).

Minerals	Leaf C.O w/w	DW	Stembark T.P w/w	DW
Calcium (Ca)	20.09	20.96	1.96	10.56
Sodium (Na)	5.02	50.44	3.20	32.24
Potassium (K)	3.18	31.92	2.15	20.30
Phosphorus (P)	4.8	40.23	3.2	6.53
Iron (Fe)	5.0	52.30	4.2	10.21
Magnesium (Mg)	5.20	3.56	3.2	2.63
Zinc (Zn)	6.02	42.6	5.6	33.02

W/w = Weight-Weight, DW=Dry weight, CO=Chromolaela odorata, TP=Tridax procumbent

Table 4: Percentage mineral composition of the plant extracts *Chromolaela odorata* and *Tridax procumbens.*

(Composition mg/kg)				
Minerals	Stembark C.O w/w	DW	Leaf T.P w/w	DW
Calcium (Ca)	22.09	20.96	1.96	10.56
Sodium (Na)	4.03	52.44	3.20	32.24
Potassium (K)	3.29	30.92	3.15	22.30
Phosphorus (P)	4.5	40.5	5.5	6.71
Iron (Fe)	7.0	54.30	4.3	12.27
Magnesium (Mg)	5.43	4.56	3.2	2.64
Zinc (Zn)	6.04	43.6	6.6	37.12

Table 5: The Vitamin Composition of Leaf Extracts of The Plants.

Vitamin Elements	*Chromolaela odorata*				*Tridax procumbens*			
	Fresh Leaf Extract		Dry		Fresh Stembark Ex		DRY	
	Amount mg/100g	%Dv	Mg/100g	%Dv	Mg/100g	%Dv	Mg/100	%Dv
	WATER SOLUBLE							
B_1(thiamine)	0.0053	0.33	0.0131	0.81	0.0053	0.35	0.0536	3.45
B_2 (riboflaving)	0.00822	4.66	0.2030	11.50	0.0448	2.65	0.4602	26.30
B_3 (niacin)	0.3945	1.97	0.9741	4.87	0.1241	0.64	1.2572	6.25
B_6 (pyridoxin)	0.0060	0.32	0.0148	0.78	0.0039	0.30	0.0385	2.02
C (ascorbic acid)	49.6490	55.18	122.59	136.20	10.620	12.80	106.7507	119.65
Biotin	0.0299	99.67	0.0738	240.0	0.0042	15.00	0.0426	140.00
Folic acid	0.0125	3.10	0.0309	6.50	0.0014	0.30	0.0135	3.50
	FAT SOLUBLE							
A	0.0104	1.32	0.0265	3.25	0.0051	0.64	0.0513	6.50
D	0.0000	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
E	0.0161	0.05	0.0403	0.206	0.0019	0.01	0.0191	0.20
K	0.0436	55.20	0.1077	124.65	0.0058	7.35	0.0581	75.6

Table 6: The Vitamin Composition of Stemback Extracts of The Plants.

Vitamin Elements	Chromonella Odorata				Tridax Procumbens			
	Fresh Stembark		Dry		Fresh Leaf Extract		Dry	
	Amount Mg/100g	%DV	Mg/100g	% Dv	Mg/100g	% Dv	Mg/100g	% Dv
	WATER SOLUBLE							
B_1 (Tannin)	0.025	0.32	0.020	0.92	0.0053	0.35	0.0620	3.35
B_2 (Riboflavin)	0.053	3.88	0.200	10.25	0.0448	2.65	0.462	24.40
B_3 (Niacin)	0.2565	1.26	0.9520	4.35	0.1241	0.64	1.2572	6.25
B_6 (Pyridoxin)	0.0058	0.31	0.0135	0.78	0.0039	0.30	0.0385	2.02
C (Ascobic)	49.6490	53.18	132.59	136.20	10.6200	12.80	106.7507	119.65

acid								
Biotin	0.0299	99.52	0.0738	240.0	0.0042	15.00	0.0426	140.00
Folic acid	0.0032	2.1	0.0309	6.50	0.0014	0.30	0.0135	3.50
	FAT SOLUBLE							
A	0.021	1.30	0.0265	3.25	0.0051	0.64	0.0513	6.50
D	0.0000	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
E	0.0250	0.05	0.0403	0.206	0.0019	0.01	0.0191	0.20
K	0.0331	55.20	0.1077	124.65	0.0058	7.35	0.0581	75.60

KEY:
DV = DAILY VALUE

Table 7: The antioxidant effect of *C. odorata* leaf extract in wound tissue of the albino rat after treatment.

GROUPS	MDA(nmol/g)	SOD(nmol/g)	CAT(µ/mg)
A	16.30±1.22	5.30±0.35^{a}	145.2±2.60
B	22.50±1.02^{b}	6.2±1.2^{b}	102.6±2.70
C	26.70±2.06^{cc}	6.0±0.04	122.38±3.00^{a}
D	**24.30±2.02^{a}**	**3.5±0.25^{a}**	**125.35±3.00^{a}**

D= Control
VALUES WITH DIFFERENT SUPERSCRIPT SIGNIFICANT (P<0.05)
KEYS
MDA = Malondialdehyde
SOD = Superoxide
CAT = Catalase
A-D=Groups

Table 8: The antioxidant effect of *t. procumbens* stembark extract in wound tissue of the albino rat after treatment.

GROUPS	MDA(nmol/g)	SOD(nmol/g)	CAT(µ/mg)
A	18.25±1.05^{a}	3.6±0.42^{a}	136±2.30
B	26.35±1.05^{b}	7.3±1.06	106±2.61^{b}
C	25±1.36^{c}	5.6±0.25^{c}	7.3±2.45^{c}
D	**22.5±1.76**	**2.7±0.15^{a}**	**132.4±2.83**
D= Control			

VALUES WITH DIFFERENT SUPERSCRIPT SIGNIFICANT (P<0.05)
KEYS
MDA = Malondialdehyde
SOD = Superoxide
CAT = Catalase
A-D=Groups

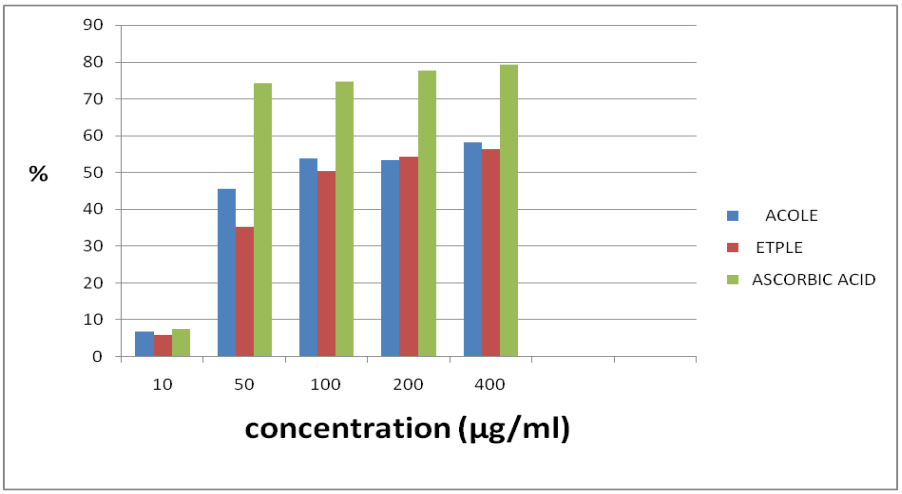

Fig.1: The antioxidative activities of the plant extract.

Knowledge of the nutritional constituent of plant is desirable not only for the discovery of therapeutic agent, but also because such information may be of value in disclosing new sources of economic materials. In addition, the knowledge of the chemical constituents of plant would further be invaluable in discovering the actual value of forklore medical remedy. This has accelerated the global effort to harness and harvest those medicinal plant that bear substantial amount of potential showing multiple beneficial effects. (Iwu.1986, Tiwari and Rao 2002).

In the proximate composition of the leaf and stem bark extract of C.odorata and T procumbens observed a higher protein content than those reported for A. hybridus, T. occidentalis, T. triangulare (Oguntona, 1998) and P. purpureum (Okaraonye and Ikewuchi, 2009); although this is lower than the value earlier reported for the same plants by Apori et al. (2000). The total fat content of C. odorata is less than those found in A. hybridus, T. occidentalis, T. triangulare (Oguntona, 1998) and P. purpureum (Okaraonye and Ikewuchi, 2009). Its total carbohydrate content is greater than those of A. hybridus, T. triangulare (Oguntona, 1998) and P. purpureum (Okaraonye and Ikewuchi, 2009). Crude fat content recorded in this study is greater than those reported for A. hybridus, T. occidentalis, T. triangulare (Oguntona, 1998) and P. purpureum (Okaraonye and Ikewuchi, 2009). Some epidemiological evidences suggest that decreased fat consumption may contribute to a reduction in the incidence of certain diseases including colon cancer, coronary heart disease, diabetes, high blood pressure, obesity and various digestive disorders (Walker, 1978; FAO, 1990; Eriyamremu and Adamson, 1994; SACN, 2008). They increase fecal bulk and rate of intestinal transit and have prebiotic effects. We observed a lower ash content (0.22%) in C.odorata stem bark than was reported for A. hybridus and T. occidentalis, although greater than those reported for T. triangulare(Oguntona, 1998) and P. purpureum (Okaraonye and Ikewuchi, 2009). The total metabolizable energy(Kcal/100g) in C. odorata and T.procumbens are greater than those of A. hybridus, T. triangulare (Oguntona, 1998) and P. purpureum (Okaraonye and Ikewuchi, 2009). Table 1 and 2.

The mineral composition of T. procumbens and C. odorata leaves and stembark extract is shown in Table 3 and 4. The calcium of C.odorata content is less than that reported for Boerhavia diffusa and Commelina nudiflora (Ujowundu et al., 2008). It contains less sodium than that reported for B. diffusa and C. nudiflora (Ujowundu et al., 2008). Its potassium, zinc and iron content in both plants extract are more than those of B. diffusa and C. nudiflora (Ujowundu et al., 2008). The level of magnesium recorded here is less than those of B. diffusa and C. nudiflora (Ujowundu et al., 2008). omparatively, C. odorata has the highest biotin content, while T. procumbens has the least. Their biotin content is comparable to that of groundnut [Elegbede, 1998]. A 100g serving of A. wilkesiana can provide about 80.33-189.33% of the RDA, while those of C. odorata and T. procumbens are 99.67-246% and 14.00-142.00% respectively (Table 1).

Comparatively, C. odorata has the highest biotin content, while T. procumbens has the least. Their biotin content is comparable to that of groundnut [Elegbede, 1998]. A 100g serving of A. wilkesiana can provide about 80.33-189.33% of the RDA, while those of C. odorata and T. procumbens are 99.67-246% and 14.00-142.00% respectivel

Comparatively, *C. odorata* has the highest biotin content, while *T. procumbens* has the least. Their biotin content is comparable to that of groundnut [Elegbede, 1998]. A 100g serving of *A. wilkesiana* can provide about 80.33-189.33% of the RDA, while those of *C. odorata* and *T. procumbens* are 99.67-246% and 14.00-142.00%

Comparatively, C. odorata has the highest biotin content, while T. procumbens has the least. Their biotin content is comparable to that of groundnut [Elegbede, 1998]. A 100g serving of A. wilkesiana can provide about 80.33-189.33% of the RDA, while those of C. odorata and T. procumbens are 99.67-246% and 14.00-142.00% respectivel.

Comparatively, C. odorata has the highest biotin content, while T. procumbens has the least. Their biotin content is comparable to that of groundnut [Elegbede, 1998]. A 100g serving of A. wilkesiana can provide about 80.33-189.33% of the RDA, while those of C. odorata and T. procumbens are 99.67-246% and 14.00-142.00% respectively (Table 1).

C. odorata has the highest folic acid in dry sample (6.50%) content, followed by *T. procumbens*. They all have lower folic acid content than groundnut [Elegbede, 2008]. The folic acid content of *C.odorata stembark extract and T. procumbens* are lower than that of cashew nut [NutritionData, 2008], while that of *C. odorata* is comparable to it. A 100g serving of *A. wilkesiana* can provide about 1.30-3.10% of the RDA, while those of *C. odorata and T. procumbens* are 3.10-7.70 and 0.30-3.40% respectively (**Table 5 and 6**). *C. odorata* has the highest content of vitamin A per 100g wet weight, *while T. procumbens* has the highest content per dry weight. *C. odorata* has the highest vitamin E content per 100g wet weight, while *T. procumbens* has the least. Their vitamin E content is lower than those of groundnut [Elegbede, 1998] and cashew nut [NutritionData, 2008]. It means that 100g of fresh/dry *T procumbens* and *C. odorata* can meet the recommended daily allowance (RDA) for vitamin E (8mcg) [FC&A, 1997], *C. odorata* has the highest vitamin K content, while *T procumbens* has the least. *C. odorata* has higher vitamin K content than cashew nut [NutritionData, 2008], and also *T. procumbens* is comparable. A 100g serving of *T.procumbens* can provide about 0.13-0.38% of the

RDA, while those of *C. odorata* are 54.50-134.63% respectively. Thus, 100g of dry *Chromolaena odorata* can meet the RDA for vitamin K (80mcg) [FC&A, 1997.

Results of the effect of the extracts on tissue concentrations of MDA, SOD, and CAT are presented in Table **7 and 8**. There was a significant (P<0.05) increase in MDA levels and decrease in SOD and CAT activities of group F, treated with CCl4 only relative to the untreated control group. This reflects hepatotoxicity of CCl4, as observed by Singh *et al*. The results were reversed on pretreatment with the leaf extracts. The MDA concentration of the pretreated groups was significantly lower (P<0.05) than the untreated. On the hand, the activities of SOD and CAT were significantly higher (P<0.05) in the pretreated groups than in the positive control. These observations are indicative of antioxidant property of the extracts.

The antioxidant activities of the leave extract shows that ascorbic acid has the highest oxidative properties at a higher concentration of 400ug/ml,followed by aqueous *C.odorata* leaf extract.It suggest that Ascorbic acid and the plant extract have the potentials to inhibit the oxidants which are capable of causing diseases in the body.Furthemore the plant can be used to maintain the nutritional value in the body when consumed.This work is in agreement with the work of (Okere *et al.,* 2003) **Fig.1.**

CONCLUSION

The plant extract *C. odorata* and *T procumbens* exhibits its wound healing property using multiple mechanisms. From the literature reviews, these mechanisms can be summarized as follows:(1) Both *C. odorata and T.procumbens* extract contains many nutritional and antioxidant compounds that enhance wound healing property, (2) *C. odorata* and *T procumbens* extracts reduces the bleeding and clotting time which may be the first line of action in the physiology of wound healing. (3) *C.* They *extracts* can protect the cells from destruction by inhibiting the inflammatory mediators. This review has attempted to compile the new medicinal plants to be the choices in the wound healing treatment.

ACKNOWLEDGEMENTS

I sincerely thank my wife Mrs Salvation Nwokorie,for supporting to me to explore the research and also my colleagues as in above for a peer contributions towards the success of this academic journal. Also my greetings go the my typist, Mirabel and for every one that contributed in any way. Thank you all.

REFERENCES

1. Harding K G, Morris H L. Medicine and the future-healing-chronic wounds *Britain Medical Journal, 2008;* 324: 160-163.
2. Bhagwat D A, Killedar S G, Adnaik R.S. Anti-diabetic activity of leaf extract of *Tridax procumbens. Int J Green Pharm.,* 2008: 2(2): 126-128.
3. Viswanathan R, Shivashangari K S, Devak T. Hepatoprotective activity of *Tridax procumbens* against D- galactosamine/ lipopolysaccharide-induced hepatitis in rats. *J Ethnopharmacol, 2005;* 101: 55-60.
4. Oladunmoye M.K. Immunomodulatory Effects of Ethanolic Extract of *Tridax procumbens* on Swiss Alblno Rats Orogastrically Dosed with *Pseudomonas aeruginosa* (NCIB 950). *Int J Trop Med.,* 2006; 4: 152-155.
5. Nia R, Paper DH, Essien E.E, Oladimeji OH, Iyadi KC, Franz G. Investigation into *in-vitro* radical scavenging and *in-vivo* anti-inflammatory potential of *Tridax procumbens. Niger J Physiol Sci.,* 2003; 18: 39-43.
6. Pareek H, Sharma S, Khajja BS, Jain K,and Jain GC. Evaluation of hypoglycemic and anti-hyperglycemic potential of *Tridax procumbens* (Linn.). BMC Comp *Alt Med.,* 2009; 48.
7. Salahdeen H M, Yemitan O K,and Alada A R Effect of aqueous leaf extract of *Tridax procumbens* on blood pressure and heart rate in rats. *Afr J Biomed Res.,* 2004; 7: 27-29.
8. Mahato R.B, Chaudhary R.P. Ethnomedical study and antibacterial activities of Selected plants of the Palpa District, Nepal. Scientific World, 2005; 3(3): 26-31.
9. Rajkumar S, Jebanesan A. Repellent activity of selected plant essential oils against the malarial fever mosquito *Anopheles stephensi. Trop Biomed, 2007;* 24(2): 71-75.
10. Saxena V K,Albert S. β-Sitosterol-3-O-β-D-xylopyranoside from the flowers of *Tridax procumbens* Linn. *J Chem Sci.,* 2005; 117(3): 263-266.
11. Bhalerao SA, Kelkar TS. Phytochemical and pharmacological potential of *Tridax procumbens* Linn. *Int J Adv Biol Res.,* 2009; 2(3): 392-395.
12. Nalwaya N, Pokharna G, Deb L, Jain N K.. Wound healing activity of latex of *Calotropis gigantea. Int J Pharm Pharmaceut Sci.,* 2009; 1(1): 176-181.
13. Shenoy C, Patil MB, Kumar R, Patil S. Preliminary phytochemical investigation and wound healing activity of *Allium cepa* linn (liliaceae*). Int J Pharm Pharmaceut Sci.,* 2009; 2(2): 167-175.
14. Tayade PM, Borde SN, Chandrasekar N, Jagtap SA, Joshi AS Evaluation of wound healing properties of *Psoreliya corolifolia* Linn in diabetic rats. Pharmaco online, 2011; 28-35.
15. Agarwal PK, Singh A, Gaurav K, Goel S, Khanna HD, Goel RK. Evaluation of wound healing activity of extracts of plantain banana (*Musa sapientum* var. paradisiaca) in rats. Indian *J Exp Biol., 2010;* 47: 32-40.