IOSR Journal Of Pharmacy *www.iosrphr.org*
(e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219
Volume 9, Issue 8 Series. II (August 2019), PP. 57-86

Assessment of Phytochemical and Antimicrobial Screening of *Jatrophacurcas*(*Linn*)and *Nicotianatabacum*(*Linn*)Against Microorganisms From Wounds of Diabetic Patients.

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Received 15 August 2019; Accepted 30 August 2019

ABSTRACT: Investigations were conducted to determine the identity and sensitivity patterns of microorganisms isolated from wounds of diabetic patients to the selected medicinal plants. The efficacy of the plants was compared with standard antibiotics/ antifungal agents using agar well diffusion method. Ethanol, n-Hexane, cold water and hot water were used as solvents for the extraction at different concentrations. Bacteria isolated from the wound swabs include; *Bacillus subtilis, Enterobacter cloacae, Escherichia coli, Klebsiella pneumonia, Micrococcus luteus, Proteus vulgaris, Pseudomonas aeruginosa, Serratiamarcescens,Salmonella typhil, Shigellaflexineri, Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes*and *Pseudomonas Putidae,* and fungal isolates viz; *Candida albicans, Candida dubliniensis,Neurosporacrassa*and *Saccharomyces cerevisiae*. *Staphylococcus aureus*and *Pseudomonas aeruginosa*were the most frequently encountered bacteria, whereas *Candida dubliniensis* and *Candida albicans* were the most frequently isolated fungi from the wound samples. Quantitative phytochemical screening revealed the highest amount of saponins in *Jatrophacurcas*, while *Nicotianatabacum* had the highest concentration of alkaloids. *Nicotianatabacum* had considerable amount of anti-oxidant and total phenol compared with *Jatrophacurcas.* Ethanolic and hot water extracts induced remarkable antimicrobial activity, than the other solvents, hence, Ethanol rated best as the extraction solvent, followed by hot water, n- Hexane and cold water in that order. The extracts were found to induce remarkable antimicrobial potential against the test organisms, most especially the hot water and ethanolic extracts with varying ranges of inhibition against the isolates. Generally the antimicrobial potential of the extracts increased with a corresponding increase in extract concentration. *Proteus vulgaris* and *Escherichia coli*were most susceptible to 75% of ethanolicextracts, *Jatrophacurcas*at 75% ethanolic root extracts with12.50±0.00mm and 12.50±0.33mm diameter of the zones of inhibition. Ethanolic seed extracts of *Jatrophacurcas*at 75% concentration was most effective against *P. aeruginosa*with 10.50±0.33mm diameter of the zone of inhibition, whereas *P. aeruginosa*was least susceptible at 75% n-hexane extracts with 3.50±0.00mm diameter of the zone of inhibition.Antimicrobial efficacy of the extracts of *Jatrophacurcas*Linnand *Nicotianatabacum*Linnevaluated in this study had been proven to be well effective and cheap preventive therapy against the microbial effects in wounds treatment that often facing antimicrobial resistance and it could be a suitable source of new antimicrobial natural product or as a base for the development of new drugs in phytomedicine. This intends to procure prevention and cure to microbial effects in the cases of delayed healing of diabetic wounds in spite of the use of broad spectrum standard antibiotics and to provide clinically relevant and comprehensive information on the virulence of diabetes wound's isolates and their antibiotic resistance pattern of activity.

Key words: Antimicrobial, Antibiotics/ Antifungal, *Jatrophacurcas, Nicotianatabacum,* Phytochemical, Antimicrobial Sensitivity and Sensitivity.

I. INTRODUCTION

Plants is highly useful for medicinal treatments as found in human history and such traditional medicine were developed over years before the era of modern medicine for maintenance of health as well as in the prevention, diagnosis, improvement or treatment of human ill-health [Sofowora, 2006]. The World Health Organization estimates that 80 percent of the population of some Asian and African countries presently uses herbal medicine for some aspect of primary health care [World Health Organization 2002]. The use of some herbs for diverse of healing for patients with chronic diseases such as diabetes and other diseases is now in active practice in the traditional medicine [Mujumdar*et al*,.2001]. Medicinal plants are well notable among the people in search of health remedies with total or little ignorance to the side effect which is the problem of most chemically synthesized drugs [Susiarti*et al*,.1999]. Medicinal plants identified in traditional medicine are well known for application in medicine at different nations. However, traditional medicines is an unexhaustible resource for investigation on their efficacy and antimicrobial in phytomedicine [Ali *et al*,.2006].

1. *Jatropha*comes from the large family of Euphorbiaceae of trees, shrubs, and herbs which is mostly tropical. It belongs to the familyJatropheae of the subfamily Crotonoideae usually grown well in warm temperate and subtropical regions. *Jatrophacurcas* belongs to subgenus *curcas*. *Jatropha curcas* is represented by many cultivated species [Openshaw*et al*,.2000.]. They are monoecious with prominent in their flowers. The fruits are three-celled with one seed per cell, it is usually planted around houses. The seeds contain oil with medicinal properties and traditional uses which can also be used for lighting and applied as hair oil against lice. The root decoction is taken as an invigorating drink [Gübitz*et al*,.1999.].

Majorly in tropical Africa, different parts of Jatrophacurcas as a medicinal plant are known for a vast medicinal value. The oil obtained from the seeds can be used traditionally as a source of energy [Gottrup*et al*., 2004.]. The latex has a potential for healing wounds, as a dermal lotion and for curing skin problems; it is applied externally to treat infected wounds. Leaves are also applied on wounds [Openshaw*et al*,.2000.].Across the tropics and warm subtropics,*Jatrophacurcas* is well cultivated for bio-fuel purposes.*Jatrophacurcas* extracts are used in folk remedies for cancer. Reported to be antiseptic, diuretic, hemostat, burns, dermatitis, hernia, inflammation and sores [Gübitz*et al*,.1999.].

Nicotianatabacum (Tobacco) belongs to a family of Solanaceae. It is a family of herbs, shrubs and (rarely)small trees or climbers. The family is widespread in tropical and temperate environments. Members of this family have simple, alternate and exstipulate leaves; the leaves are sometimes lobed [Clinical and Laboratory Standards Institute, 2010]. Milky latex is lacking. It is of considerable economic importance being ornamentals and serve as food crops. The flowerare regular, hermaphroditic and pentamerous; they are borne on cymose inflorescences and are usually white, purple or blue. It's a perennial herbaceous plant that is cultivable andnative of tropical and subtropicalAmerica but now spread worldwide.Almost every part of the plant except the seed contains nicotine at different concentration depending on the specieswhich can be extracted and used as an insecticide[Clinical and Laboratory Standards Institute, 2010].

However, it was reported that tobacco leaf is rich in polyphenols which possess various bioactive compounds that affect the quality of tobacco leaf.Discarded tobacco leaves are valuable because of its inherent phytochemicals [Amarowicz*et al*,. 2007].The decoction of leaves also applied for muscle relaxation and relieving pain. It exhibited antibacterial activity against different Gram positive and Gram negative bacterial strain [Susiarti*et al*,. 1999]. More so, tobacco has known for its antifungal activity against *Fusariumsolani* and Mycobacterium tuberculosis in traditional medicine [Ali *et al* ,.2006].

1. The purpose of the present study was to investigate the antimicrobial activity of different parts of NicotianatabacumLinn and *Jatrophacurcas*Linnextracts against microbes colonizing the wounds of diabetic patients and to evaluate their antimicrobial susceptibility profile and thereafter make comperes between standard antibiotics discs and plant extracts potency against the isolates using disc and agar well diffusion method [Wayne *et al* ,.2010]. At present, microbiology of wounds has been actively researched, yet the microbial mechanisms that induce infection and prevent wound healing had not been adequately exploit [Fawole*et al* ,. 2004]. Consequently, debate regarding microbial involvement in wound healing is likely to persist [Gardner*et al* ,. 2009]. Phytochemical screening was done in order to reveal the presence and amount of inherent secondary metabolites in its aqueous and ethanolic extracts. Natural bioactive compounds have shown various anti-bacterial, anti-fungal, and anti-inflammatory properties. They are gaining considerable attention as eco-friendly alternative to synthetic antibacterial active compound [Openshaw*et al* ,2000].

II. MATERIALS AND METHODS

Collection and characterization of clinical specimens from the wounds of diabetic patients

A total of 454 clinical swab samples were collected from the wounds of diabetic patients at some government hospitals in Ondo state. Sterile swab sticks were used for clinical sample collection and transported in ice bath to the laboratory for analysis within 1h of collection for isolation, characterization and antimicrobial assay culturing using suitable culture media; Nutrient Agar, Chocolate Agar, Sabouraud Dextrose Agar, Eosin Methylene Blue Agar and Mueller Hinton Agar [Wayne *et al* ,. 2010]. The typed cultures were obtained from the department of Microbiology, University of Ibadan. The isolates were characterized and identified as described inBergey'smanual [Bakht,*et al* ,.2012][Mujumdar*et al* ,.2001].

Each of the swab sticks containing the wound sample were dipped in sterile normal saline and re-capped/tightened appropriately following immediate inoculation on the agar plate in a close interval to the time of collection, at most possibility of not more than 1h of collection. After the first introduction on the culture medial and further sub-cultured to obtain pure isolates and to maintain the viability of the cultures. The raw-clinical sample were grown on Nutrient Agar and re-sub-cultured the various growth of colony on the culture-plate of different selective agar both for bacteria and fungi [Wayne *et al* ,. 2010].

Standardization of inoculum

The identified isolates were sub-cultured to obtain pure isolates. The broth culture from the colony of overnight growth of the pure bacterial isolate were prepared using normal saline and incubated for 2h to ensure turbidity that matches that of 0.5 McFarland solutions. The use of colorimeter was used to adjudge the turbidity as accurate as possible [Bakht,*et al* ,. 2012][Mujumdar*et al* ,.2001]. However, a loopful of bacteria culture were aseptically inoculated into 100ml of nutrient broth and incubated for 24h. A 0.2ml portion of the 24h old culture were dispensed into 20ml sterile nutrient broth and incubated for 3-5h to standardize the culture to 0.5 McFarland standards ($1.5x10^8$cfu/ml) before use [Mujumdar*et al* ,.2001]. In addition, fungi spore suspensions were obtained by taking five colonies (1mm diameter) from 24h old cultures grown on Sabouraud dextrose agar. The colonies were suspended in 5mL of sterile normal saline (0.85% NaCl)[Cheesbrough, *et al* ,. 2010]. The inoculum suspensions were shaken for 15sec and the inoculum densities were adjusted to the turbidity of a 0.5 McFarland Standard (equivalent to $1–5 \times10^6$sfu/ml) with sterile normal saline. The suspensions were diluted 1:1000 in RPMI-1640 to give a final inoculums suspension equivalent to $0.5–2.5 \times10^3$sfu/ml [Ezeja*et al* ,. 2010].

Inoculation and incubation of cultures

The sterilized molten Nutrient agar and Sabouraud-dextrose agar (to culture the fungi) were poured into the plates and the plates were allowed to set. Standardized inoculum of each test organism was streaked on the gelled agar plates using sterile inoculating loop [Cheesbrough, *et al* ,. 2010]. The plates were incubated at 37℃ for 24h for the bacteria cultures on nutrient agar media and at 25℃ for 48h for the fungal cultures on sabouraud-dextrose agar media. When visible growth was observed on the plates, colonies were counted and sub-cultured to obtain pure cultures [Bakht*et al* ,.2012]. The conventional standard antibiotics discs of various types at different milligram (or microgramm) of concentrations were placed aseptically using sterile forceps onto the surface of the culture plate for antimicrobial sensitivity test as a positive control, using disc diffusion technique as described by Olutiola*et.al*[Mujumdar*et al* ,.2001], while 0.3ml of the plant extracts were dispensed into 3mm depth of well on Mueller Hinton agar plate, using agar well diffusion method for their antimicrobial sensitivity pattern [Mujumdar*et al* ,.2001]. The stock cultures were kept in refrigerated temperature (4^oC) prior use.

Collection of plant samples

Two different medicinal plants namely; *Nicotianatabacum*and *Jatrophacurcas*were collected from some farmlands in Ondo state and were identified using standard monograph and traditional method of identification. The plant samples were then authenticated at the Herbarium of the International Institute of Tropical Agriculture, Ibadan, Oyo State, Nigeria. Different parts of these species of plants (Root, Leaf, Stem, Seed and Shaft) were separately collected for process [Cheesbrough, *et al* ,. 2010].

Processing of plant extracts

The plant' parts were cleaned and shade air-dried for 5 weeks at room temperature (25^oC) and then ground to powder with a mechanical grinder (Thomas Wiley machine, model 5 USA), each of the different parts of the plant was milled separately and kept in the universal bottle for further use. Powders (200gs) of each plant were extracted with 1litre of sterile aqueous water (cold water and hot water at 95^oC), ethanol, methanol and normal Hexane separately at room temperature (25^oC). They were labeled as crude extracts[Bergey*et al*., 1994.].

Determination of percentage yield of the plant extracts

The crude plant extracts were filtered with sterile double layered muslin cloth and re-filtered using Whatman's No 1 filter paper with pore size of 110 mm. The high polar solvents (ethanol) extracts were concentrated at 45 ^oC using a rotary evaporator (RE -52 A Union Laboratories, England), while the water extracts were evaporated at 50 ^oC in a water bath [Cheesbrough, *et al* ,. 2010], thus:

$$\text{The percentage yield of the extracts} = \frac{\text{Weight of extract recovered after concentration}}{\text{Initial weight of dried-powdered plant sample}} \times 100$$

Preparation of plant extracts

A 150g portion of the powdered sample was soaked in 750ml in each of ethanol, n-Hexane, cold water (10% chloroform water) and hot water (95^oc) in a conical flask. The flask was shaken properly for 2mins and then allowed to stand for 72h. Thereafter, the mixture was filtered through Whatman No 1 filter paper and the filtrate was evaporated in vacuo using Buchi Rota vapor R-14. The raw extract was prepared using analer grade of ethyl acetate mixed together vigorously with the soaked extract and allowed to stand for 1hr after which the organic layer was decanted from the aqueous layer. Anhydrous 0.5g of sodium sulphate (Na_2SO_4) was added to the organic layer to remove excess water. It was left for 20minutes before the organic layer was decanted and

then concentrated using a rotary evaporator (BuchiRotavapor R-14). The rotary flask was rinsed with ethyl acetate and the solution was poured in a specimen bottle [Bergey*et al*., 1994.]. Thereafter, the bottle was kept in the hood for the ethyl acetate to evaporate, leaving the dried sample extract in the specimen bottle. The dried extract was later reconstituted with diluted 20% Tween 20 [Cheesbrough, *et al* ,. 2010]. Each extract was diluted with 20% Tween-20 to obtain different concentrations of 50% and 75%. The undiluted extract was taken as 100% extract concentration.

Incorporation of reconstituted plant extracts on cultured media

Hundreds of paper discs from sterile Whatman No 1 filter paper were made through the use of sterilized perforator of 6mm diameter for disc diffusion method and the discs were sterilized in an oven at 160^{o}C for 2h. Sufficient number of sterile discs was introduced into each extract concentrate and left for 48hr to ensure that the extract ($\simeq$ about 2µl) get infiltrated and incorporated into the disc. Each well label capped sterile-bottle of the disc-extract was kept in the refrigerator (4^{o}C) for further use, and in agar well diffusion method, 0.3ml of the extracts were dispensed into 3mm depth of the well created on the surface of culture plate using 6mm diameter sterile cork borer, and the set-up was allowed to stand for 1h in order to allow the extract to diffuse into the medium before proceeding into incubation for antimicrobial susceptibility test [Cheesbrough, *et al* ,. 2010].

Antimicrobial screening of the extracts

The antibacterial effect of the extracts was evaluated by agar well diffusion [Bergey*et al*., 1994.] and paper disc dilution method that were previously impregnated with the plant crude extracts. Inocula of test bacterial isolates were 24 hour culture prepared by inoculating a loopful of test bacteria from stock culture into a freshly prepared nutrient broth and incubated at 37 ^{o}C for 24 hours. Absorbance of the grown culture was read at 530nm after adjustment with sterile distilled water to match that of 0.5 McFarland standard solutions which is equivalent to 1.5 x 10^{8} cfu/ml. 0.3ml each of this bacterial suspension was pipetted and spread on Mueller-Hinton agar[Mujumdar*et al* ,.2001.]. The plates were allowed to stand for 1h for the test bacterial isolates to be fully embedded and properly established in the seeded medium. With a sterile cork borer (No 4 Gallenkamp) of 6mm diameter, wells of equal depth of 3mm were dug inside the agar[Ezeja*et al* ,.2010]. Each well was aseptically filled up with 0.3ml of respective extracts avoiding splashes and overfilling. Sterile 20% Tween-20 was used as negative control while different Gram positive and Gram negative conventional standard antibiotics were used as the positive control. The plates were incubated at 37^{o}C for 24 hours for bacterial and at 25℃ for 48h for the fungal cultures on sabouraud-dextrose agar media. The sensitivity of the test organisms to each of the extracts was indicated by clearing around each well. The halo's diameter as an index of the degree of sensitivity was measured with a transparent plastic ruler and also by measuring with the use of standard verniercalliper considering the total diameters of the zone of inhibition [Cheesbrough, *et al* ,. 2010].

Phytochemical screening of the extracts of *Nicotianatabacum*and *Jatrophacurcas*

Qualitative and quantitative phytochemical analyzes of the plant extracts (*Nicotianatabacum*and *Jatrophacurcas*) as applied in the method of Committee of Royal Society of Chemistry (2002), were carried out at the Central Research Laboratory of the Federal University of Technology, Akure using standard technique [Bergey*et al*., 1994.][Cheesbrough, *et al* ,. 2010].

Data Analysis

Each experiment was carried out in triplicate. Data obtained were presented as mean ± standard error (SE), and subject to two-way analysis of variance (ANOVA). Treatment means werecompared using Duncan's New Multiple Range Tests (DNMRT) at P≤0.05 level of significance with computer aided Statistical Package for Social Sciences (SPSS) version 17.

III. RESULTS

Table 1: Yield of the plant extract *Jatrophacurcas Nicotianatabacum*

	Percentage yield (%)									
Solvent	Stem	Leaf	Seed	Shaft	Root	Stem	Leaf	Seed	Shaft	Root
Ordinary Water	15	22	9	8	18	11	25	8	6	19
Hot Water	13	18	11	4	22	13	20	11	4	15
Normal –Hexane	12	15	12	9	19	15	15	15	13	20
Ethanol	25	29	15	10	25	22	27	17	18	27

Table 2: Qualitative phytochemical screening of *Jatrophacurcas* extract

Phytochemical test	**Stem**			**Leaf**					**Seed**						**Shaft**					**Root**				
	Ordinary water	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary water**	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary water**	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary water**	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary water**	**Hot water**	**n-Hexane**	**Ethanol**
Saponins(Frothing test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alkaloids(Dragendorff's test)	-	-	+	+	-	-	+	+	+	+	+	+	-	-	+	+	+	+	+	+
Flavonoids(Shinoda test)	+	-	+	+	+	+	-	+	+	+	+	+	-	-	+	+	+	-	-	-
Steroids(Liebermann-burchard test)	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Triterpenoids(Salkowski test)	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+
Tannins(Ferric chloride test)	+	+	-	+	+	+	+	+	+	-	+	+	+	-	-	+	+	+	+	+
Cholesterol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proteins(Trichloroacetic acid test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amino acids(Ninhydrine test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carbohydrates(Molisch's test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Phenol	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+
Terpenoid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cardiac glycoside	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	+	-	+	+
Carotenoids	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Glycosides	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Phlobalannin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fatty acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Key: + = Detected - = Not Detected

Table 3: Qualitative phytochemical screening of *Nicotianatobacum* extract

Phytochemical test	Stem			Leaf					Seed				Shaft			Root				
	Ordinary water	Hot water	n-Hexane	Ethanol	Ordinary water	Hot water	n-Hexane	Ethanol	Ordinary water	Hot water	n-Hexane	Ethanol	Ordinary water	Hot water	n-Hexane	Ethanol	Ordinary water	Hot water	n-Hexane	Ethanol
Saponins(Frothing test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alkaloids(Dragendorff's test)	+	-	+	+	+	+	+	+	-	-	+	+	+	-	-	+	+	+	+	+
Flavonoids(Shinoda test)	+	+	+	+	-	-	+	+	+	+	+	+	-	-	+	+	+	+	-	+
Steroids(Liebermann-burchard test)	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+
Triterpenoids(Salkowski test)	-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	+	+	+	+
Tannins(Ferric chloride test)	+	+	-	+	+	+	-	+	+	-	-	+	+	+	-	+	+	-	-	+
Cholesterol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proteins(Trichloroacetic acid test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amino acids(Ninhydrine test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carbohydrates(Molisch's test)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Phenol	+	+	-	+	+	-	-	+	+	-	-	+	+	+	-	+	+	+	-	+
Terpenoid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cardiac glycoside	-	-	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+	-	+	+
Carotenoids	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Glycosides	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Phlobalannin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fatty acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Key: + = Detected, - = Not Detected

Table 4: Quantitative phytochemical screening of *Jatrophacurcas* extract

Phytochemical test	Stem		Leaf					Seed					Shaft	Root					
	Ordinary	Hot water	n-Hexane	Ethanol	Ordinary	Hot water	n-Hexane	Ethanol	Ordinary	Hot water	n-Hexane	Ethanol	Ordinary	Hot water	n-Hexane	Ethanol	Ordinary	Hot water	n-Hexane	Ethanol
Saponins(%)	2.74	0.25	1.80	2.85	2.50	0.13	0.56	4.69	2.64	1.22	0.23	2.50	0.44	0.25	1.22	2.22	4.02	2.25	1.57	4.77
Alkaloids(%)	ND	ND	4.85	2.50	ND	ND	0.26	4.56	0.63	0.22	1.45	2.56	ND	ND	0.23	3.70	3.05	2.21	2.50	4.60
Flavonoids(mg/100g)	0.27	ND	0.29	1.00	0.20	0.65	ND	2.85	0.33	0.11	0.12	2.85	ND	ND	0.15	0.58	0.25	ND	ND	ND
Triterpenoid(%)	ND	ND	ND	ND	ND	ND	ND	ND	2.50	0.32	1.20	3.05	0.56	1.45	1.25	5.80	2.62	5.03	2.35	4.25
Tannins(mg/100g)	1.65	1.04	ND	1.67	1.68	1.04	1.49	1.95	1.00	1.00	ND	1.25	1.90	1.50	ND	ND	1.04	1.52	1.14	1.44
Phytate(mg/g)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anti-oxidant(mg/100g)	1.34	1.20	1.50	0.96	1.57	1.89	0.65	0.95	0.56	0.62	0.20	1.00	0.27	0.22	0.16	1.63	1.85	1.52	2.00	
Proteins(%)	1.82	1.20	1.00	2.00	1.80	2.05	1.52	2.32	1.20	1.05	1.52	1.89	0.95	0.95	1.08	1.58	1.90	2.05	1.80	
Carbohydrates(%)	1.52	1.20	1.20	1.00	1.60	1.05	1.32	1.53	0.95	1.05	1.20	1.95	0.53	0.08	1.55	1.55	1.45	1.65	1.85	
Total Phenol(mg/100g)	1.45	1.50	1.25	1.69	1.42	1.32	1.56	1.79	1.25	1.30	1.38	1.45	1.23	1.40	1.36	1.67	1.72	ND	1.69	
Terpenoid(mg/100g)	1.25	1.05	1.55	1.50	1.25	2.06	1.65	2.00	1.00	1.00	1.45	1.80	0.69	1.20	1.05	2.57	1.12	1.28	1.60	2.00
Carotenoids(mg/100g)	2.00	2.00	2.25	2.88	3.00	2.55	2.00	2.55	1.88	1.00	1.55	2.55	1.59	1.25	2.50	2.00	3.20	2.25	2.00	3.55
Oxalate(mg/g)	4.57	4.23	5.69	6.50	8.25	4.26	4.00	6.55	1.66	2.00	4.30	5.00	1.53	1.30	2.05	3.50	6.00	5.48	4.45	8.56

Key: ND = Not Detected

Table 5: Quantitative phytochemical screening of *Nicotianatobacum* extract

Phytochemical test	**Stem**		**Leaf**					**Seed**					**Shaft**			**Root**				
	Ordinary	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary**	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary**	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary**	**Hot water**	**n-Hexane**	**Ethanol**	**Ordinary**	**Hot water**	**n-Hexane**	**Ethanol**
Saponins(%)	3.50	1.25	2.25	5.20	2.56	2.00	1.50	3.54	0.55	0.21	2.43	3.76	0.32	0.23	1.58	2.00	3.00	2.25	1.77	4.50
Alkaloids(%)	3.50	ND	2.00	2.55	4.85	2.56	3.50	4.00	ND	ND	0.25	5.00	0.20	ND	ND	1.28	4.20	1.85	1.50	3.54
Flavonoids(mg/100g)	0.25	0.18	0.10	0.45	ND	ND	0.58	0.69	0.53	0.20	0.36	0.10	ND	ND	0.20	0.53	0.58	0.36	ND	4.20
Triterpenoid(%)	ND	ND	ND	ND	ND	ND	ND	0.25	2.00	0.15	1.00	3.52	0.10	1.25	ND	ND	4.20	2.00	1.65	3.50
Tannins(mg/100g)	1.40	1.69	ND	1.96	1.86	1.05	ND	1.89	1.00	ND	ND	1.25	1.10	1.00	ND	1.25	1.00	ND	ND	1.26
Phytate(mg/g)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anti-oxidant(mg/100g)	0.95	1.20	0.10	1.00	0.20	0.57	0.46	0.22	1.28	1.85	0.52	1.22	0.28	0.22	0.29	0.52	1.20	0.59	1.55	1.52
Proteins(%)	1.50	1.20	1.00	2.00	1.88	1.85	1.50	2.10	1.00	0.95	0.59	1.92	0.25	0.56	0.89	1.18	1.18	1.12	1.25	1.89
Carbohydrates(%)	1.20	1.05	1.00	1.05	1.65	2.00	1.00	1.55	2.55	1.56	8.01	0.00	0.05	0.95	2.55	0.56	2.00	1.79	1.81	1.81
Total Phenol(mg/100g)	1.56	1.45	ND	ND	1.20	ND	ND	1.24	1.40	ND	ND	1.65	1.20	0.05	ND	1.25	1.55	1.53	1.54	1.64
Terpenoid(mg/100g)	0.25	0.20	0.69	1.02	1.00	2.05	1.60	1.80	0.26	0.95	0.96	2.55	2.55	0.50	1.55	1.24	1.55	0.05	1.55	1.85
Carotenoids(mg/100g)	1.50	1.20	2.00	3.55	2.00	1.59	2.00	3.00	0.35	0.56	3.30	0.01	2.05	ND	2.00	1.20	1.10	1.50	2.55	2.56
Oxalate(mg/g)	3.20	2.00	3.00	4.56	7.50	5.00	8.26	8.56	2.51	1.69	3.55	5.98	1.56	2.00	1.45	5.00	8.02	6.25	4.50	8.65

Key: ND = Not Detected

Table 6: Antimicrobial potency of hot water extracts against clinical and typed microbial isolates. (Zone of inhibition 'mm')

	J.curcas extracts.						*N.tabacum*extracts.				
Isolates	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**	**Control(20% Tween20)**	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**
Bacteria isolates											
Proteus vulgaris(*P. vulgaris* NCIB67)	9.50±0.62^{bc} (6.00±0.00^{ac})	6.50±0.33^{a} (3.50±0.33^{bc})	6.20±0.57^{b} (6.00±0.33^{a})	6.00±0.57^{b} (5.50±0.00^{ac})	12.00±0.62^{a} (11.50±0.57^{a})	0.00±0.00^{bc}	11.00±0.62^{b} (8.00±0.33^{ab})	5.50±0.57^{bc} (5.00±0.33^{a})	6.80±0.00^{ab} (6.00±0.00^{ab})	4.50±0.25^{b} (4.00±0.33^{b})	9.20±0.33^{bc} (8.00±0.33^{ab})
S.aureus(*S.aureus*NCIB8588)	8.00±0.00^{a} (5.00±0.33^{a})	6.00±0.00^{b} (4.00±0.33^{b})	8.40±0.00^{b} (7.50±0.62^{a})	5.00±0.57^{b} (6.00±0.33^{b})	4.60±0.57^{a} (5.00±0.33^{a})	0.00±0.00^{ac}	9.50±0.00^{b} (7.50±0.57^{a})	7.00±0.57^{a} (6.00±0.33^{a})	8.90±0.00^{b} (8.00±0.33^{ab})	5.00±0.00^{b} (4.20±0.33^{a})	10.00±0.00^{b} (9.00±0.00^{ac})
P. aeruginosa (*P. aeruginosa* NCIB950)	6.50±0.57^{ac} (8.00±0.33^{ab})	5.00±0.33^{a} (6.00±0.33^{a})	5.20±0.33^{ab} (6.00±0.33^{a})	4.50±0.33^{bc} (2.00±0.00^{ab})	2.00±0.00^{ab} (5.00±0.57^{b})	0.00±0.00^{bc}	8.00±0.33^{ab} (7.50±0.33^{bc})	6.00±0.00^{ab} (5.00±0.33^{a})	7.50±0.33^{a} (5.00±0.33^{a})	4.00±0.33^{b} (7.20±0.33^{bc})	7.20±0.33^{bc} (6.00±0.33^{b})
E. coli(*E. coli* NCIB1023)	7.20±0.33^{bc} (6.50±0.57^{ac})	7.50±0.33^{bc} (6.50±0.57^{ac})	6.00±0.33^{a} (6.00±0.33^{a})	6.00±0.33^{b} (5.20±0.33^{ab})	11.50±0.57^{a} (11.00±0.33^{b})	0.00±0.00^{a}	11.00±0.33^{b} (8.40±0.00^{b})	6.00±0.00^{ac} (6.50±0.57^{ac})	12.50±0.62^{b} (8.00±0.33^{ab})	6.50±0.33^{bc} (6.00±0.00^{ab})	11.00±0.33^{a} (10.00±0.00^{b})
Bacillus subtilis(*B. subtilis* NCIB3610)	7.50±0.57^{a} (6.00±0.00^{b})	5.00±0.33^{bc} (6.00±0.00^{b})	7.90±0.33^{bc} (5.20±0.33^{ab})	5.00±0.33^{bc} (5.00±0.57^{b})	8.50±0.00^{ab} (7.50±0.33^{bc})	0.00±0.00^{bc}	7.50±0.62^{a} (7.50±0.33^{bc})	5.50±0.62^{ab} (5.20±0.33^{ab})	3.50±0.33^{ab} (4.60±0.57^{a})	4.20±0.33^{a} (4.00±0.33^{b})	6.50±0.33^{bc} (5.00±0.57^{b})
S. marcescens(*S. marcescens* NCIB16640)	5.00±0.57^{bc} (5.90±0.00^{b})	7.00±0.33^{b} (6.00±0.00^{b})	5.90±0.00^{b} (5.00±0.62^{a})	3.50±0.62^{b} (4.00±0.57^{bc})	4.00±0.00^{bc} (3.50±0.00^{a})	0.00±0.00^{bc}	8.00±0.57^{a} (7.00±0.33^{b})	5.00±0.62^{a} (4.50±0.00^{ab})	6.00±0.00^{b} (5.90±0.00^{b})	5.00±0.00^{bc} (4.50±0.00^{ab})	6.00±0.33^{a} (5.90±0.00^{b})
Fungi isolates											
Saccharomyces cerevisiae(*S. cerevisiae* ATCC1022)	2.00±0.33^{ab} (2.50±0.00^{a})	3.50±0.00^{a} (4.50±0.00^{ab})	5.00±0.33^{bc} (3.50±0.33^{a})	2.00±0.57^{bc} (2.50±0.00^{a})	3.50±0.00^{a} (2.00±0.33^{ab})	0.00±0.00^{a}	3.20±0.00^{ab} (3.50±0.33^{a})	3.00±0.00^{bc} (3.50±0.33^{a})	4.50±0.00^{b} (2.50±0.00^{bc})	2.00±0.33^{ab} (0.00±0.00^{a})	3.00±0.00^{b} (2.00±0.33^{ab})
Candida albicans(*C. albicans* ATCC10231)	1.50±0.33^{b} (0.00±0.00^{a})	4.50±0.00^{ab} (2.00±0.33^{ab})	5.20±0.00^{b} (3.50±0.33^{a})	3.50±0.33^{a} (2.50±0.00^{a})	4.50±0.00^{ab} (4.50±0.00^{ab})	0.00±0.00^{bc}	4.00±0.57^{bc} (5.00±0.33^{bc})	2.50±0.00^{a} (1.50±0.33^{b})	4.00±0.33^{a} (3.20±0.00^{b})	3.20±0.00^{b} (2.50±0.00^{a})	2.50±0.00^{bc} (1.50±0.33^{b})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05). Values in parenthesis represent effect of extracts on typed organism.

Table 7: Antimicrobial potency of cold water extracts against clinical and typed microbial isolates. (Zone of inhibition 'mm')

	J. curcas extracts.						*N. tabacum*extracts.				
Isolates	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**	**Control(20% Tween20)**	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**
Bacteria isolates											
Proteus vulgaris(*Proteus vulgaris* NCIB67)	6.50±0.62^{a} (4.50±0.33^{bc})	4.50±0.57^{a} (3.50±0.57^{bc})	6.30±0.57^{bc} (5.50±0.00^{a})	3.20±0.00^{bc} (4.50±0.33^{bc})	9.00±0.62^{bc} (8.00±0.33^{b})	0.00±0.00^{bc}	8.00±0.33^{ab} (6.50±0.33^{a})	6.50±0.00^{b} (6.00±0.57^{b})	8.90±0.62^{b} (8.00±0.33^{bc})	7.00±0.00^{b} (6.50±0.33^{a})	11.50±0.00^{b} (5.20±0.33^{ab})
Staphylococcus aureus(*Staphylococcus aureus* NCIB8588)	5.50±0.00^{ac} (7.00±0.33^{ab})	6.00±0.00^{ac} (4.50±0.00^{b})	11.00±0.25^{b} (8.00±0.33^{b})	5.00±0.57^{b} (6.50±0.00^{ab})	6.00±0.57^{ac} (4.50±0.00^{b})	0.00±0.00^{ac}	6.00±0.33^{ab} (5.00±0.62^{bc})	8.00±0.33^{b} (8.50±0.33^{ab})	10.50±0.33^{a} (9.00±0.00^{b})	6.00±0.33^{ab} (6.50±0.33^{a})	12.90±0.57^{b} (6.50±0.33^{a})
P. aeruginosa(*Pseudomonas aeruginosa*NCIB950)	5.00±0.00^{bc} (4.50±0.57^{a})	2.50±0.00^{a} (5.00±0.62^{bc})	6.00±0.33^{bc} (6.50±0.33^{a})	4.50±0.33^{bc} (4.50±0.00^{b})	5.50±0.00^{a} (4.50±0.00^{b})	0.00±0.00^{bc}	7.00±0.62^{b} (8.00±0.33^{b})	6.00±0.57^{b} (5.50±0.00^{ac})	8.00±0.33^{bc} (7.00±0.62^{b})	3.50±0.62^{b} (2.00±0.33^{b})	10.00±0.33^{a} (7.00±0.33^{ab})
Escherichia coli(*E. coli* NCIB1023)	7.50±0.00^{a} (6.00±0.57^{bc})	5.00±0.62^{bc} (3.50±0.33^{a})	7.00±0.62^{a} (6.50±0.00^{ab})	4.50±0.00^{b} (4.00±0.00^{ab})	8.50±0.00^{bc} (7.00±0.33^{ab})	0.00±0.00^{a}	6.50±0.33^{a} (5.50±0.00^{ac})	8.50±0.33^{ab} (6.00±0.57^{ac})	10.20±0.25^{b} (8.90±0.62^{b})	6.50±0.33^{a} (5.20±0.33^{ab})	6.20±0.62^{b} (2.50±0.00^{a})
Bacillus subtilis(*Bacillus subtilis* NCIB3610)	4.50±0.57^{a} (2.20±0.62^{b})	6.00±0.57^{bc} (5.20±0.33^{ab})	2.20±0.33^{b} (5.00±0.62^{bc})	3.00±0.25^{b} (0.00±0.33^{ab})	1.00±0.57^{ac} (0.00±0.33^{ab})	0.00±0.00^{bc}	8.00±0.33^{b} (6.50±0.33^{a})	9.00±0.00^{b} (7.00±0.62^{b})	5.80±0.62^{b} (4.20±0.33^{b})	4.50±0.62^{b} (3.50±0.57^{bc})	6.50±0.33^{a} (7.00±0.33^{ab})
Serratiamarcescens(*Serratiamarcescens* NCIB16640)	6.00±0.00^{ab} (6.50±0.33^{a})	6.00±0.33^{b} (5.00±0.62^{bc})	5.20±0.33^{ab} (4.50±0.33^{bc})	2.00±0.33^{b} (2.00±0.33^{b})	6.50±0.00^{ab} (4.50±0.00^{b})	0.00±0.00^{a}	9.50±0.57^{b} (10.00±0.33^{a})	7.00±0.33^{ab} (6.00±0.57^{b})	7.00±0.00^{b} (5.50±0.00^{a})	6.00±0.25^{b} (2.50±0.00^{a})	8.90±0.25^{b} (6.30±0.57^{bc})
Fungi isolates											
Saccharomyces cerevisiae(*Saccharomyces cerevisiae* ATCC1022)	3.50±0.57^{bc} (4.50±0.33^{bc})	1.59±0.33^{ab} (0.00±0.33^{ab})	2.20±0.62^{b} (3.50±0.62^{b})	0.00±0.33^{ab} (1.00±0.57^{ac})	0.20±0.33^{a} (3.00±0.25^{b})	0.00±0.00^{bc}	3.50±0.62^{b} (2.00±0.33^{b})	4.20±0.33^{b} (4.50±0.00^{b})	5.00±0.33^{ab} (5.00±0.62^{bc})	2.00±0.00^{b} (0.00±0.33^{ab})	2.00±0.33^{b} (1.00±0.57^{ac})
Candida albicans(*Candida albicans* ATCC10231)	4.00±0.00^{ab} (4.50±0.33^{bc})	3.50±0.33^{a} (4.20±0.33^{b})	4.00±0.00^{b} (3.50±0.62^{b})	1.20±0.33^{a} (2.00±0.00^{b})	2.00±0.62^{b} (0.00±0.33^{ab})	0.00±0.00^{ac}	0.25±0.33^{ab} (0.00±0.33^{ab})	3.20±0.62^{b} (2.00±0.33^{b})	2.52±0.33^{a} (1.00±0.57^{ac})	3.20±0.33^{b} (4.50±0.00^{b})	4.50±0.33^{ab} (4.50±0.57^{a})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05). Values in parenthesis represent effect of extracts on typed organism.

Table 8: Antimicrobial potency of 50% normal hexane extracts against clinical isolates and typed microbial culture.
(Zone of inhibition 'mm')

	J.curcas Extracts.						*N.tabacum* Extracts.				
Isolates	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**	**Control(20% Tween20)**	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**
Bacteria isolates											
***Proteus vulgaris*(*Proteus vulgaris* NCIB67)**	6.50±0.00^{bc} (3.90±0.33^{a})	5.00±0.57^{b} (3.50±0.33^{b})	5.90±0.62^{ab} (4.50±0.00^{b})	4.20±0.25^{b} (6.50±0.33^{ab})	5.90±0.25^{b} (5.00±0.62^{b})	0.00±0.00^{a}	6.50±0.00^{b} (0.50±0.33^{bc})	3.50±0.00^{b} (5.00±0.00^{ac})	5.00±0.57^{b} (4.20±0.33^{ab})	2.50±0.00^{bc} (0.00±0.00^{a})	3.00±0.33^{a} (3.50±0.62^{b})
***Staphylococcus aureus*(*Staphylococcus aureus* NCIB8588)**	6.20±0.33^{ab} (3.50±0.33^{a})	5.20±0.62^{b} (3.90±0.33^{a})	5.00±0.57^{ac} (2.35±0.00^{b})	6.00±0.00^{b} (5.00±0.33^{bc})	5.90±0.33^{ab} (3.00±0.33^{ab})	0.00±0.00^{bc}	5.50±0.33^{a} (2.50±0.62^{b})	4.50±0.33^{bc} (5.59±0.33^{ab})	5.00±0.33^{bc} (0.50±0.33^{bc})	1.00±0.33^{b} (2.50±0.33^{bc})	2.69±0.00^{bc} (2.50±0.33^{bc})
***Pseudomonas aeruginosa*(*Pseudomonas aeruginosa* NCIB950)**	7.00±0.33^{bc} (4.00±0.62^{bc})	5.00±0.33^{a} (6.20±0.33^{bc})	5.90±0.00^{ab} (6.20±0.33^{bc})	3.90±0.33^{a} (3.50±0.00^{b})	3.50±0.33^{b} (5.00±0.62^{b})	0.00±0.00^{ac}	4.00±0.62^{b} (2.90±0.33^{a})	6.52±0.33^{ab} (3.00±0.33^{ab})	5.20±0.00^{b} (3.00±0.33^{ab})	2.50±0.33^{bc} (4.50±0.33^{ab})	5.00±0.00^{ac} (4.50±0.33^{ab})
***Escherichia coli*(*Escherichia coli* NCIB1023)**	6.00±0.33^{b} (4.00±0.62^{b})	3.50±0.62^{b} (5.00±0.33^{b})	3.50±0.00^{bc} (2.35±0.00^{b})	6.00±0.33^{bc} (4.00±0.62^{bc})	7.90±0.00^{b} (5.50±0.62^{b})	0.00±0.00^{bc}	6.50±0.33^{ab} (5.00±0.62^{b})	5.50±0.33^{b} (4.20±0.00^{ac})	5.59±0.33^{ab} (4.90±0.57^{bc})	4.50±0.00^{b} (5.00±0.33^{b})	4.90±0.57^{bc} (6.20±0.33^{bc})
***Bacillus subtilis*(*Bacillus subtilis* NCIB3610)**	5.50±0.33^{ab} (3.50±0.33^{b})	5.00±0.33^{ab} (5.59±0.33^{ab})	6.00±0.00^{ab} (5.00±0.57^{b})	3.50±0.33^{b} (0.00±0.00^{a})	4.20±0.33^{bc} (5.00±0.57^{ac})	0.00±0.00^{a}	5.00±0.33^{b} (3.50±0.33^{a})	2.50±0.62^{b} (5.20±0.00^{b})	5.00±0.62^{b} (5.20±0.00^{b})	3.00±0.25^{b} (2.50±0.62^{b})	6.20±0.00^{bc} (5.00±0.33^{bc})
***Serratiamarcescens*(*Serratiamarcescens* NCIB16640)**	5.50±0.62^{b} (4.50±0.00^{b})	4.50±0.33^{b} (3.50±0.00^{b})	6.00±0.62^{bc} (5.00±0.57^{ac})	4.00±0.62^{b} (4.50±0.33^{b})	3.50±0.33^{a} (2.50±0.62^{b})	0.00±0.00^{bc}	5.50±0.62^{b} (0.50±0.33^{b})	5.00±0.33^{ab} (0.00±0.00^{b})	2.90±0.33^{a} (3.00±0.33^{ab})	2.00±0.00^{bc} (5.00±0.33^{bc})	4.00±0.33^{bc} (3.50±0.33^{a})
Fungi isolates											
***Saccharomyces cerevisiae*(*Saccharomyces cerevisiae* ATCC1022)**	5.50±0.33^{bc} (4.50±0.33^{b})	4.35±0.00^{b} (2.50±0.33^{bc})	3.00±0.62^{a} (4.50±0.33^{bc})	5.25±0.33^{ab} (1.50±0.33^{a})	4.50±0.62^{b} (5.50±0.33^{b})	0.00±0.00^{ac}	3.50±0.00^{b} (3.50±0.33^{a})	4.50±0.33^{a} (5.00±0.33^{ab})	1.00±0.33^{ab} (0.00±0.00^{a})	0.00±0.00^{b} (2.50±0.62^{b})	6.50±0.33^{a} (4.50±0.00^{b})
***Candida albican*(*Candida albicans* ATCC10231)**	5.00±0.33^{b} (4.00±0.62^{bc})	2.00±0.57^{b} (3.90±0.33^{a})	4.25±0.33^{b} (4.50±0.33^{bc})	2.00±0.33^{a} (3.50±0.33^{a})	5.90±0.33^{b} (6.20±0.33^{bc})	0.00±0.00^{bc}	2.00±0.33^{ab} (3.50±0.62^{b})	5.00±0.33^{bc} (4.00±0.62^{bc})	0.50±0.33^{b} (0.00±0.00^{a})	2.50±0.33^{ab} (2.35±0.00^{b})	4.00±0.33^{bc} (2.50±0.62^{b})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05).
Values in parenthesis represent effect of extracts on typed organism.

Table 9: Antimicrobial potency of 75% normal hexane extracts against clinical isolates and typed microbial culture.
(Zone of inhibition 'mm')

	J.curcas Extracts.						*N.tabacum* Extracts.				
Isolates	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**	**Control(20% Tween20)**	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**
Bacteria isolates											
***Proteus vulgaris*(*Proteus vulgaris* NCIB67)**	7.50±0.00^{b} (5.00±0.33^{bc})	3.50±0.62^{b} (3.50±0.00^{b})	6.50±0.25^{b} (2.00±0.33^{bc})	6.00±0.57^{bc} (5.50±0.33^{bc})	7.00±0.00^{b} (5.00±0.33^{b})	0.00±0.00^{bc}	5.00±0.57^{b} (6.50±0.33^{bc})	2.35±0.33^{bc} (7.90±0.25^{b})	5.20±0.25^{b} (2.00±0.33^{ab})	0.00±0.00^{bc} (2.00±0.33^{ab})	5.90±0.33^{b} (3.50±0.33^{bc})
***Staphylococcus aureus*(*Staphylococcus aureus* NCIB8588)**	5.20±0.33^{bc} (5.00±0.33^{bc})	4.50±0.33^{ab} (2.00±0.33^{bc})	5.50±0.62^{b} (5.00±0.62^{b})	5.90±0.00^{b} (4.00±0.33^{b})	8.00±0.33^{a} (5.00±0.00^{bc})	0.00±0.00^{b}	6.00±0.33^{ab} (6.00±0.33^{b})	2.50±0.00^{b} (3.50±0.33^{bc})	6.20±0.62^{b} (5.00±0.00^{bc})	0.25±0.00^{b} (0.00±0.00^{bc})	7.00±0.33^{ab} (5.50±0.33^{bc})
***Pseudomonas aeruginosa*(*P. aeruginosa* NCIB950)**	5.00±0.33^{b} (4.50±0.33^{b})	5.50±0.33^{bc} (3.50±0.33^{a})	6.50±0.33^{a} (3.50±0.33^{a})	4.20±0.33^{a} (5.00±0.00^{b})	3.50±0.00^{b} (4.50±0.33^{a})	0.00±0.00^{ac}	5.50±0.62^{b} (6.00±0.33^{b})	2.00±0.33^{b} (0.00±0.00^{a})	5.00±0.33^{b} (4.50±0.33^{b})	1.00±0.57^{b} (2.00±0.33^{bc})	6.00±0.57^{bc} (5.00±0.62^{b})
***Escherichia coli*(*Escherichia coli* NCIB1023)**	6.50±0.33^{ab} (5.00±0.00^{b})	4.50±0.33^{b} (5.00±0.00^{b})	6.50±0.33^{bc} (4.00±0.33^{b})	7.00±0.00^{bc} (6.50±0.25^{b})	7.90±0.25^{b} (5.50±0.62^{b})	0.00±0.00^{a}	7.00±0.33^{ab} (4.50±0.33^{ab})	3.50±0.33^{bc} (2.00±0.33^{bc})	6.00±0.33^{bc} (5.90±0.33^{b})	2.00±0.33^{bc} (4.20±0.33^{a})	6.50±0.33^{bc} (5.00±0.00^{bc})
***Bacillus subtilis*(*Bacillus subtilis* NCIB3610)**	5.00±0.33^{bc} (3.50±0.00^{b})	5.50±0.33^{bc} (5.00±0.62^{b})	6.50±0.00^{bc} (4.50±0.33^{ab})	5.00±0.33^{bc} (2.35±0.33^{bc})	6.50±0.33^{bc} (3.50±0.33^{bc})	0.00±0.00^{bc}	6.00±0.33^{b} (5.50±0.6	2.50±0.33^{b} (5.00±0.00^{bc})	6.20±0.33^{ab} (5.00±0.00^{bc})	3.00±0.33^{a} (0.00±0.00^{bc})	4.00±0.33^{b} (3.50±0.33^{bc})
***Serratiamarcescens*(*S. marcescens* NCIB16640)**	4.50±0.33^{a} (5.00±0.62^{b})	5.00±0.00^{bc} (4.00±0.33^{b})	6.00±0.57^{bc} (5.00±0.62^{b})	5.00±0.00^{b} (5.50±0.62^{b})	3.50±0.57^{bc} (2.00±0.33^{b})	0.00±0.00^{ac}	7.00±0.00^{bc} (5.90±0.33^{b})	2.50±0.33^{bc} (2.00±0.33^{bc})	5.00±0.62^{b} (6.00±0.33^{b})	2.50±0.33^{bc} (4.00±0.33^{b})	6.20±0.33^{ab} (5.20±0.25^{b})
Fungi isolates											
***Saccharomyces cerevisiae*(*Saccharomyces cerevisiae* ATCC1022)**	3.00±0.33^{bc} (5.50±0.33^{bc})	3.50±0.33^{b} (5.20±0.33^{bc})	2.00±0.33^{bc} (0.50±0.33^{bc})	3.50±0.33^{b} (5.00±0.00^{bc})	2.00±0.33^{ab} (0.00±0.00^{a})	0.00±0.00^{a}	3.50±0.33^{bc} (2.35±0.33^{bc})	0.00±0.00^{b} (0.00±0.00^{a})	3.00±0.33^{ab} (2.00±0.33^{ab})	0.00±0.00^{b} (2.00±0.33^{ab})	2.50±0.33^{a} (4.00±0.33^{b})
***Candida albican*(*Candida albicans* ATCC10231)**	1.50±0.33^{a} (4.00±0.33^{b})	2.50±0.00^{bc} (3.50±0.62^{b})	3.50±0.33^{a} (2.00±0.33^{bc})	1.00±0.33^{ab} (0.00±0.00^{a})	0.52±0.62^{b} (3.00±0.33^{b})	0.00±0.00^{bc}	3.00±0.33^{b} (3.50±0.33^{bc})	0.50±0.33^{bc} (1.00±0.57^{b})	2.50±0.33^{b} (2.00±0.33^{bc})	0.00±0.00^{b} (1.00±0.57^{b})	4.20±0.33^{b} (2.00±0.33^{ab})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05).
Values in parenthesis represent effect of extracts on typed organism.

Table 10: Antimicrobial potency of 50% ethanolic extracts against clinical isolates and typed microbial culture.
(Zone of inhibition 'mm')

	J.curcas Extracts.						*N.tabacum* Extracts.				
Isolates	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**	**Control(20% Tween20)**	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**
Bacteria isolates											
Proteus vulgaris(*Proteus vulgaris* NCIB67)	10.50 ± 0.33^{bc} (8.00 ± 0.33^{b})	10.50 ± 0.00^{bc} (7.50 ± 0.33^{b})	9.50 ± 0.57^{b} (9.50 ± 0.62^{b})	4.00 ± 0.57^{a} (2.00 ± 0.00^{bc})	10.50 ± 0.25^{b} (8.00 ± 0.33^{b})	0.00 ± 0.00^{ab}	10.00 ± 0.25^{b} (9.52 ± 0.62^{b})	9.50 ± 0.00^{b} (5.00 ± 0.33^{a})	9.50 ± 0.33^{bc} (7.50 ± 0.33^{b})	5.00 ± 0.00^{b} (3.50 ± 0.33^{bc})	10.50 ± 0.62^{b} (10.00 ± 0.33^{ab})
Staphylococcus aureus(*Staphylococcus aureus* NCIB8588)	9.50 ± 0.62^{b} (6.50 ± 0.33^{a})	11.00 ± 0.62^{b} (9.50 ± 0.33^{a})	11.50 ± 0.33^{bc} (9.52 ± 0.62^{b})	5.00 ± 0.33^{bc} (6.52 ± 0.00^{b})	11.00 ± 0.62^{b} (10.00 ± 0.33^{ab})	0.00 ± 0.00^{a}	11.50 ± 0.62^{b} (7.50 ± 0.33^{b})	8.50 ± 0.62^{b} (5.00 ± 0.33^{a})	5.50 ± 0.33^{b} (5.00 ± 0.33^{a})	5.00 ± 0.33^{bc} (4.53 ± 0.62^{b})	8.00 ± 0.33^{a} (5.50 ± 0.33^{bc})
Pseudomonas aeruginosa(*Pseudomonas aeruginosa* NCIB950)	10.50 ± 0.33^{a} (6.00 ± 0.25^{b}	9.00 ± 0.33^{bc} (7.50 ± 0.33^{b})	7.50 ± 0.62^{b} (0.00 ± 0.33^{ab})	3.50 ± 0.62^{b} (6.20 ± 0.62^{b})	8.59 ± 0.33^{b} (8.00 ± 0.33^{b})	0.00 ± 0.00^{a}	8.50 ± 0.00^{b} (3.50 ± 0.33^{bc})	8.00 ± 0.33^{a} (7.80 ± 0.33^{ab})	7.00 ± 0.00^{bc} (6.00 ± 0.25^{b})	5.50 ± 0.25^{b} (4.25 ± 0.33^{b})	7.80 ± 0.33^{ab} (5.50 ± 0.33^{bc})
Escherichia coli(*Escherichia coli* NCIB1023)	11.00 ± 0.33^{b} (8.00 ± 0.33^{b})	10.50 ± 0.33^{a} (9.50 ± 0.33^{ab})	10.50 ± 0.33^{b} (3.50 ± 0.33^{ab})	6.00 ± 0.33^{a} (6.50 ± 0.33^{a})	12.00 ± 0.00^{bc} (10.00 ± 0.25^{b})	0.00 ± 0.00^{ac}	10.00 ± 0.33^{ab} (7.50 ± 0.33^{b})	6.52 ± 0.00^{b} (6.00 ± 0.25^{b})	11.00 ± 0.57^{bc} (9.50 ± 0.00^{bc})	5.00 ± 0.33^{bc} (6.50 ± 0.33^{a})	8.00 ± 0.33^{b} (6.50 ± 0.33^{a})
Bacillus subtilis(*Bacillus subtilis* NCIB3610)	9.50 ± 0.33^{ab} (8.00 ± 0.33^{b})	9.20 ± 0.00^{bc} (3.50 ± 0.33^{ab})	9.50 ± 0.33^{a} (7.50 ± 0.33^{b})	3.50 ± 0.33^{bc} (2.00 ± 0.33^{bc})	9.50 ± 0.62^{b} (6.50 ± 0.33^{a})	0.00 ± 0.00^{ab}	9.52 ± 0.62^{b} (4.53 ± 0.62^{b})	6.50 ± 0.33^{a} (3.50 ± 0.33^{ab})	6.20 ± 0.62^{b} (5.50 ± 0.33^{bc})	0.00 ± 0.33^{ab} (0.50 ± 0.33^{bc})	9.50 ± 0.00^{bc} (7.50 ± 0.33^{b})
Serratiamarcescens(*Serratiamarcescens* NCIB16640)	6.50 ± 0.33^{a} (5.50 ± 0.33^{b})	5.00 ± 0.33^{ab} (4.00 ± 0.57^{b})	5.50 ± 0.33^{bc} (7.50 ± 0.33^{b})	5.00 ± 0.33^{a} (3.50 ± 0.33^{ab})	6.00 ± 0.25^{b} (6.52 ± 0.00^{b})	0.00 ± 0.00^{ac}	7.50 ± 0.33^{b} (8.00 ± 0.33^{b})	8.00 ± 0.33^{b} (7.80 ± 0.33^{ab})	9.50 ± 0.33^{ab} (8.00 ± 0.33^{b})	3.50 ± 0.00^{b} (5.50 ± 0.33^{b})	10.00 ± 0.25^{b} (7.50 ± 0.33^{b})
Fungi isolates											
Saccharomyces cerevisiae(*Saccharomyces cerevisiae* ATCC1022)	3.50 ± 0.33^{ab} (4.00 ± 0.57^{b})	2.50 ± 0.33^{b} (0.00 ± 0.00^{a})	3.50 ± 0.33^{ab} (3.00 ± 0.33^{b})	2.00 ± 0.33^{bc} (0.00 ± 0.00^{a})	2.00 ± 0.33^{bc} (1.00 ± 0.00^{b})	0.00 ± 0.00^{bc}	3.50 ± 0.33^{ab} (3.50 ± 0.33^{ab})	3.50 ± 0.33^{ab} (5.00 ± 0.33^{ab})	4.53 ± 0.62^{b} (6.00 ± 0.25^{b})	0.50 ± 0.33^{bc} (0.00 ± 0.00^{a})	4.25 ± 0.33^{b} (3.50 ± 0.33^{ab})
Candida albican(*Candida albicans* ATCC10231)	5.00 ± 0.33^{b} (3.00 ± 0.33^{b})	4.00 ± 0.33^{ab} (3.50 ± 0.33^{ab})	2.00 ± 0.33^{bc} (0.00 ± 0.00^{a})	1.00 ± 0.33^{bc} (0.50 ± 0.00^{b})	2.50 ± 0.33^{a} (4.00 ± 0.62^{b})	0.00 ± 0.00^{b}	3.00 ± 0.33^{b} (3.50 ± 0.33^{ab})	4.00 ± 0.62^{b} (6.00 ± 0.25^{b})	4.00 ± 0.33^{a} (3.50 ± 0.00^{b})	1.00 ± 0.00^{b} (0.50 ± 0.33^{bc})	2.00 ± 0.00^{bc} (0.50 ± 0.33^{bc})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05).
Values in parenthesis represent effect of extracts on typed organism.

Table 11: Antimicrobial potency of 75% ethanolic extracts against clinical isolates and typed microbial culture.
(Zone of inhibition 'mm')

	J.curcas Extracts.						*N.tabacum* Extracts.				
Isolates	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**	**Control(20% Tween20)**	**Seed**	**Stem**	**Leaf**	**Shaft**	**Root**
Bacteria isolates											
Proteus vulgaris(*Proteus vulgaris* NCIB67)	12.00 ± 0.33^{bc} (12.50 ± 0.33^{bc})	7.50 ± 0.62^{b} (4.50 ± 0.62^{b})	11.00 ± 0.33^{bc} (10.00 ± 0.33^{ab})	6.00 ± 0.00^{b} (5.50 ± 0.33^{b})	12.50 ± 0.00^{b} (7.90 ± 0.33^{ab})	0.00 ± 0.00^{ab}	11.50 ± 0.62^{bc} (10.50 ± 0.57^{b})	10.50 ± 0.00^{b} (9.50 ± 0.00^{bc})	11.00 ± 0.00^{bc} (11.00 ± 0.00^{bc})	6.50 ± 0.33^{bc} (6.50 ± 0.33^{ab})	12.00 ± 0.00^{b} (9.50 ± 0.33^{a})
Staphylococcus aureus(*Staphylococcus aureus* NCIB8588)	9.50 ± 0.33^{b} (7.50 ± 0.33^{bc})	7.00 ± 0.33^{a} (5.50 ± 0.25^{b})	12.50 ± 0.33^{a} (9.00 ± 0.33^{bc})	6.00 ± 0.33^{bc} (5.50 ± 0.33^{b})	10.90 ± 0.33^{ab} (9.50 ± 0.33^{a})	0.00 ± 0.00^{a}	12.00 ± 0.00^{ab} (6.90 ± 0.33^{bc})	9.50 ± 0.33^{bc} (10.00 ± 0.33^{ab})	6.90 ± 0.33^{bc} (6.50 ± 0.33^{ab})	5.50 ± 0.00^{bc} (6.50 ± 0.33^{ab})	9.50 ± 0.33^{bc} (5.50 ± 0.33^{b})
Pseudomonas aeruginosa(*Pseudomonas aeruginosa* NCIB950)	10.50 ± 0.33^{ab} (8.00 ± 0.33^{bc})	8.00 ± 0.33^{bc} (11.00 ± 0.00^{bc})	9.00 ± 0.33^{bc} (9.50 ± 0.62^{b})	4.50 ± 0.62^{b} (2.00 ± 0.33^{ab})	10.00 ± 0.33^{b} (8.00 ± 0.33^{bc})	0.00 ± 0.00^{a}	10.00 ± 0.57^{bc} (7.50 ± 0.33^{bc})	9.50 ± 0.00^{bc} (5.50 ± 0.33^{b})	8.50 ± 0.00^{b} (7.50 ± 0.33^{b})	4.50 ± 0.57^{b} (0.50 ± 0.33^{ab})	8.50 ± 0.33^{b} (6.50 ± 0.33^{ab})
Escherichia coli(*Escherichia coli* NCIB1023)	12.50 ± 0.33^{bc} (9.50 ± 0.33^{a})	9.50 ± 0.33^{a} (6.90 ± 0.33^{bc})	12.00 ± 0.33^{b} (10.00 ± 0.33^{ab})	5.50 ± 0.25^{b} (4.50 ± 0.33^{b})	12.50 ± 0.33^{bc} (11.00 ± 0.00^{bc})	0.00 ± 0.00^{ac}	11.00 ± 0.33^{b} (9.50 ± 0.62^{b})	7.50 ± 0.33^{ab} (5.00 ± 0.33^{a})	11.50 ± 0.33^{a} (7.50 ± 0.62^{b})	6.00 ± 0.33^{a} (6.90 ± 0.33^{bc})	10.50 ± 0.33^{a} (11.00 ± 0.00^{bc})
Bacillus subtilis(*Bacillus subtilis* NCIB3610)	10.50 ± 0.33^{a} (10.00 ± 0.33^{ab})	11.00 ± 0.00^{bc} (9.50 ± 0.62^{b})	11.00 ± 0.57^{bc} (6.90 ± 0.33^{bc})	4.20 ± 0.33^{bc} (3.50 ± 0.33^{a})	10.50 ± 0.57^{b} (9.50 ± 0.00^{bc})	0.00 ± 0.00^{ab}	10.00 ± 0.33^{ab} (11.50 ± 0.33^{a})	7.50 ± 0.33^{b} (8.00 ± 0.33^{bc})	8.00 ± 0.33^{bc} (5.00 ± 0.33^{b})	0.50 ± 0.33^{ab} (2.00 ± 0.33^{b})	11.00 ± 0.33^{bc} (10.50 ± 0.33^{a})
Serratiamarcescens(*Serratiamarcescens* NCIB16640)	7.50 ± 0.62^{b} (6.90 ± 0.33^{bc})	9.50 ± 0.33^{a} (10.00 ± 0.33^{ab})	6.50 ± 0.33^{ab} (8.00 ± 0.33^{bc})	5.50 ± 0.33^{b} (9.50 ± 0.00^{bc})	6.90 ± 0.33^{bc} (4.50 ± 0.62^{b})	0.00 ± 0.00^{ac}	9.50 ± 0.62^{b} (7.50 ± 0.33^{b})	7.50 ± 0.33^{bc} (3.50 ± 0.33^{a})	10.00 ± 0.33^{a} (11.00 ± 0.57^{bc})	4.50 ± 0.33^{b} (6.50 ± 0.33^{ab})	7.90 ± 0.33^{ab} (8.00 ± 0.33^{bc})
Fungi isolates											
Saccharomyces cerevisiae(*Saccharomyces cerevisiae* ATCC1022)	4.00 ± 0.33^{a} (0.00 ± 0.00^{a})	5.00 ± 0.33^{b} (4.20 ± 0.33^{bc})	2.00 ± 0.33^{b} (3.00 ± 0.62^{b})	3.50 ± 0.33^{a} (0.00 ± 0.00^{a})	2.00 ± 0.62^{bc} (2.00 ± 0.33^{ab})	0.00 ± 0.00^{a}	4.00 ± 0.33^{a} (5.00 ± 0.33^{a})	5.00 ± 0.33^{a} (5.50 ± 0.33^{b})	5.20 ± 0.33^{bc} (5.50 ± 0.33^{b})	2.00 ± 0.33^{ab} (0.00 ± 0.00^{a})	3.20 ± 0.33^{a} (4.50 ± 0.62^{b})
Candida albican(*Candida albicans* ATCC10231)	3.50 ± 0.33^{b} (5.00 ± 0.33^{a})	3.50 ± 0.00^{b} (4.50 ± 0.62^{b})	4.50 ± 0.33^{a} (4.00 ± 0.33^{a})	3.00 ± 0.33^{a} (2.00 ± 0.33^{b})	3.50 ± 0.00^{ac} (4.20 ± 0.33^{bc})	0.00 ± 0.00^{ac}	3.50 ± 0.33^{ab} (5.50 ± 0.33^{b})	3.50 ± 0.33^{bc} (3.50 ± 0.33^{a})	3.00 ± 0.62^{b} (5.50 ± 0.33^{b})	1.50 ± 0.33^{a} (0.00 ± 0.00^{a})	4.00 ± 0.57^{ac} (3.50 ± 0.33^{a})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05).
Value in parenthesis represent effect of extracts on typed organism.

Table 12: Effect of commercial antibiotics on clinical and typed microbial isolates

(Zone of inhibition 'mm')

	Test Organisms (Bacteria)					**Test Organisms (Fungi)**		
Standard Antibiotics	*S. aureus* (*S. aureus* NCIB8588)	*Bacillus subtilis* (*B. subtilis* NCIB3610)	*Proteus vulgaris* (*P. vulgaris* NCIB67)	*Escherichia coli* (*E. coli* NCIB1023)	*S. marcescens* (*S. marcescens* NCIB16640)	*P. aeruginosa* (*P. aeruginosa* NCIB950)	*S. cerevisiae* (*S. cerevisiae* ATCC1022)	*Candida albicans* (*C. albicans* ATCC10231)
Augmentin(30µg)	8.69±0.25^{b} (9.50±0.33^{b})	7.50±0.33^{a} (8.00±0.00^{b})	8.00±0.25^{b} (11.00±0.33^{a})	9.00±0.57^{ac} (12.50±0.33^{b})	8.60±0.00^{ac} (9.50±0.33^{b})	7.50±0.00^{bc} (8.00±0.00^{b})	5.30±0.00^{ac} (7.50±0.33^{bc})	5.20±0.62^{b} (6.20±0.00^{bc})
Pefloxacin(30 µg)	6.00±0.62^{b} (10.50±0.00^{ac})	8.00±0.33^{ab} (8.35±0.57^{bc})	6.50±0.00^{b} (9.58±0.00^{ac})	8.20±0.00^{ab} (12.25±0.57^{ac})	6.50±0.00^{a} (8.00±0.00^{b})	7.20±0.57^{b} (9.56±0.57^{a})	5.00±0.62^{bc} (7.50±0.33^{a})	1.50±0.00^{b} (6.00±0.33^{bc})
Erithromycin(10µg)	8.00±0.33^{a} (12.25±0.57^{ac})	10.50±0.33^{b} (8.00±0.00^{b})	13.00±0.33^{ab} (12.25±0.57^{ac})	11.20±0.57^{ac} (11.50±0.33^{bc})	10.50±0.00^{ac} (12.25±0.57^{ac})	11.20±0.00^{b} (9.78±0.57^{b})	1.50±0.00^{a} (4.00±0.00^{b})	2.50±0.33^{bc} (7.00±0.00^{ab})
Streptomycin(30µg)	7.00±0.00^{b} (8.20±0.00^{ab})	12.50±0.00^{bc} (13.00±0.33^{ab})	9.50±0.33^{b} (7.50±0.33^{bc})	8.35±0.57^{bc} (12.25±0.57^{ac})	8.56±0.62^{ab} (13.5±0.33^{b})	8.50±0.33^{a} (8.00±0.00^{b})	2.50±0.00^{ac} (8.00±0.00^{b})	3.00±0.57^{b} (6.00±0.62^{b})
Ciproflaxin(10µg)	6.50±0.33^{bc} (8.00±0.00^{b})	6.50±0.33^{ab} (9.85±0.33^{a})	6.50±0.33^{ab} (8.00±0.00^{b})	6.57±0.00^{a} (8.50±0.33^{b})	6.00±0.57^{ac} (6.50±0.62^{b})	6.50±0.62^{b} (9.85±0.33^{a})	3.56±0.57^{a} (6.50±0.33^{bc})	4.20±0.33^{a} (5.00±0.33^{ab})
Zinnacef(20 µg)	6.00±0.33^{ab} (8.20±0.57^{bc})	6.00±0.62^{b} (9.56±0.57^{a})	7.50±0.33^{bc} (11.52±0.33^{ab})	6.00±0.62^{ab} (8.20±0.57^{bc})	7.00±0.00^{ab} (11.52±0.33^{ab})	8.00±0.00^{b} (10.59±0.00^{bc})	4.35±0.00^{ac} (6.50±0.62^{b})	4.00±0.33^{ab} (7.50±0.00^{ab})
Gentamycin(10µg)	9.78±0.57^{b} (10.59±0.00^{bc})	8.59±0.33^{b} (9.56±0.57^{a})	8.00±0.00^{b} (11.52±0.33^{ab})	9.58±0.00^{ac} (10.59±0.00^{bc})	12.25±0.57^{ac} (9.56±0.57^{a})	12.50±0.33^{b} (8.20±0.57^{bc})	4.52±0.62^{ab} (8.00±0.33^{a})	2.30±0.33^{a} (7.00±0.33^{a})
Ketoconazole(20mg)	5.00±0.33^{ab} (8.50±0.33^{ab})	5.00±0.00^{b} (6.59±0.33^{bc})	4.00±0.33^{a} (6.20±0.00^{bc})	4.00±0.00^{a} (9.85±0.33^{a})	3.00±0.00^{a} (6.50±0.33^{ab})	3.20±0.33^{bc} (7.50±0.33^{bc})	13.5±0.33^{b} (11.52±0.33^{ab})	10.59±0.00^{bc} (11.50±0.33^{bc})
Tarivid(10µg)	7.53±0.57^{bc} (8.50±0.33^{b})	6.50±0.33^{bc} (9.56±0.57^{a})	6.00±0.33^{bc} (6.59±0.33^{bc})	8.20±0.57^{bc} (13.00±0.00^{bc})	5.86±0.62^{a} (9.85±0.33^{a})	6.50±0.62^{b} (8.50±0.33^{b})	5.00±0.33^{bc} (6.59±0.33^{bc})	5.00±0.33^{a} (7.50±0.00^{ab})
Septrin(30µg)	6.00±0.57^{b} (8.50±0.00^{ab})	7.00±0.33^{a} (8.50±0.00^{ab})	7.50±0.33^{a} (11.52±0.33^{ab})	7.50±0.00^{ab} (9.85±0.33^{a})	7.50±0.00^{ab} (12.50±0.33^{b})	8.00±0.33^{a} (9.56±0.57^{a})	4.50±0.62^{b} (6.59±0.33^{bc})	4.20±0.33^{bc} (4.20±0.00^{b})
Ampiclox(30µg)	6.00±0.33^{ab} (8.50±0.33^{b})	8.50±0.33^{b} (9.56±0.57^{a})	6.20±0.00^{bc} (11.52±0.33^{ab})	9.56±0.57^{a} (7.50±0.33^{bc})	9.85±0.33^{a} (8.50±0.33^{ab})	6.50±0.33^{ab} (13.00±0.00^{bc})	4.00±0.57^{b} (7.56±0.33^{bc})	3.20±0.33^{a} (8.50±0.00^{ab})
Fluconazole(20mg)	3.00±0.00^{b} (4.20±0.00^{ab})	4.20±0.00^{b} (3.20±0.00^{b})	2.00±0.57^{bc} (5.00±0.00^{b})	2.50±0.57^{bc} (4.00±0.62^{b})	3.50±0.00^{b} (6.54±0.57^{a})	2.00±0.00^{b} (4.20±0.00^{ab})	11.52±0.33^{ab} (13.00±0.00^{bc})	11.50±0.33^{bc} (8.50±0.33^{ab})
Amoxacillin(30µg)	8.50±0.00^{ab} (7.50±0.33^{bc})	7.56±0.33^{bc} (7.50±0.33^{bc})	6.59±0.33^{bc} (9.56±0.57^{a})	9.56±0.57^{a} (8.00±0.33^{a})	8.50±0.33^{ab} (9.56±0.57^{a})	7.50±0.33^{bc} (9.56±0.57^{a})	5.00±0.00^{b} (8.20±0.57^{bc})	4.35±0.33^{a} (3.20±0.33^{a})
Voriconazole(20 µg)	4.50±0.57^{bc} (8.50±0.33^{b})	5.00±0.00^{b} (6.50±0.33^{bc})	3.20±0.00^{b} (4.20±0.00^{b})	4.20±0.00^{ab} (7.50±0.33^{bc})	4.00±0.62^{b} (7.50±0.00^{ab})	4.20±0.33^{a} (7.50±0.00^{ab})	12.50±0.33^{b} (13.00±0.00^{bc})	13.00±0.00^{bc} (11.50±0.33^{bc})
Roceptin(25µg)	6.89±0.62^{bc} (7.00±0.33^{a})	6.50±0.33^{bc} (6.59±0.33^{bc})	6.00±0.62^{b} (7.50±0.33^{a})	6.54±0.57^{a} (8.50±0.33^{ab})	8.50±0.33^{ab} (8.50±0.33^{ab})	7.50±0.00^{ac} (9.85±0.33^{a})	5.20±0.33^{a} (4.20±0.00^{ab})	4.50±0.00^{b} (6.59±0.33^{bc})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05). Values in parenthesis represent effect of extracts on typed organism.

IV. DISCUSSION

The phytochemical screening of the plant extracts shows the presence of different bioactive compounds inherent in the plant used for antimicrobial assay in this present study. The qualitative phytochemical screening of *J.curcas*and *N.tabacum*revealed the presence of phytochemicals which are: Saponins, Alkaloids, Cardiac glycoside, Carotenoids, Glycosides, Fatty acid, Flavonoids, Steroids, Triterpenoids, Tannins, Cholesterol, Proteins, Amino acids, Carbohydrates, Phenol and Terpenoid (Table 2 and 3). It was found that cholesterol and Phlobalannin were not detected in both plants.The quantitative phytochemical screening of *J.curcas*indicates the highest presence of xylate, Carotenoids, saponin and Alkaloids and least presence of Triterpenoids and Flavonoids with total absence of phytate. The stem, leaf and seed extracts of *J.curcas*shows significant presence of phytochemicals than the root and the shaft of the plant. Ethanolic and water extract of the plant presents better quantitative presence of the bioactive compounds than other extraction solvent (Table 4 &5).

The quantitative phytochemical screening of *N.tabacum*presents considerable amount of anti-oxidant and total phenol compared with *J. curcas.* The root parts of the *N.tabacum*extracts also indicates significants amounts of metabolites as others except the shaft with poor amount of phytochemical compounds that present (Table 5).The results of the phytochemical screening in both*J.curcas*and *N.tabacum*indicate useful bioactive compounds that can make both plants relevant and effective for antimicrobial activities. Phytochemicals were capable of inhibit microorganisms, interfere with some metabolic processes or may modulate gene expression and signal transduction pathways hence, used as chemotherapeutic or chemopreventive agents [Ali *et al* ,.2006][Amarowicz*et al* ,.2007]. Tannins have been reported to hinder the development of micro-organisms by their ability to precipitate and inactivate microbial adhesion enzymes and cell envelope proteins [Ali*et al* ,.2006].

The influential role of the bioactive compounds in the *J. curcas* and*N. tabacum* extracts suggested the possible treatment for the healing of the wound of diabetic patients, the metabolites played the role of inhibiting the growth of the isolates which could contributive positively to the possible removal of the delayed healing in the case of wounds.

The antimicrobial effects of the plant extracts were compared between *J.curcas*and *N.tabacum*at different medium of extraction solvent concentration and at different temperature against isolated clinical tested microorganism from the wounds of patients with diabetes and their respective typed culture.Sterile ordinary cold water extracts of *J.curcas*shows a reduced antimicrobial activities compared withHot water (90^{o}C) extracts with significant high zones of inhibition against the tested organism (Table 6&7), *Proteus vulgaris* and *Escherichia coli*were most suscestible to the *J. curcas*root extracts (75%w/v) with 12.50±0.00mm and 12.50±0.33mm scores respectively (Table 11). Each case of the respective typed culture of the clinical isolates shows little differences as they are more susceptible to the extracts than their respective clinical isolates (Table 10&11). *N.tabacum* water extract is not as effective as *J.curcas* but shows significant level of inhibition against

both clinical isolates and typed culture especially against fungi,*C.albicans* susceptible to the root extracts with 4.50±0.33mm zone of inhibition (Table 7).

*J.curcas*and *N.tabacum*extracts at 50% and 75% concentration shows low zone of inhibition against the tested microorganisms (Table 8 and 9), n-hexane solvent extracts at higher concentration of the extracts were found to show significant antimicrobial activities, 75% of root n-hexane extracts concentration significantly inhibit the growth of *Escherichia coli* at 11.50±0.57mm zone of inhibition while it was susceptible to the seed extracts of *N.tabacum* at the same concentration with 11.00±0.33mm zone of inhibition (Table 9).The control culture plate was treated with 20% Tween-20 which shows no antimicrobial effects against the tested microorganisms. *J.curcas*and *N.tabacum* in varying degree of extracts concentration (50% and 75%) using ethanol solvent for the extracts extraction shows an improved better antimicrobial performance against the tested microorganisms compared with n-hexane extracts solvent and hot water extracts (Table 10 and 11). Very high effective antimicrobial activities were significantly observed with high percentage of ethanolic extracts concentration i.e. 75% ethanolic extracts of *J.curcas* and *N.tabacum.Proteus vulgaris* and *Escherichia coli*were found most susceptible to 75% ethanolic root extracts of *J.curcas* 12.50±0.00mm and 12.50±0.33mm zone of inhibition respectively while with 75% ethanolic seed extracts of *N.tabacum*shows zone of inhibition of 11.50±0.62mm and 11.00±0.33mm (Table 11). The control culture plate was treated with 20% Tween-20 which shows no antimicrobial effects against the tested microorganisms. Both clinical isolates and typed culture were significantly susceptible to the conventional standard antibiotics treatment (Table 12). The use of standard antibiotics in this present research shows considerable relative antimicrobial activity against tested microorganism compared with 75% ethanolic extracts of the plant extracts but performed more effective in inhibiting the growth of tested microorganisms than n-hexane and hot water plant extracts used in this study.

The plant extracts (i.e. *J.curcas*and *N.tabacum*) antimicrobialsensitivity results at 75% ethanolic and hot water extracts concentration (been the most extraction solvents that indicates most useful inhibition among other varying degree of concentration of solvents against the tested organisms in*in-vitro* assay) shows significant inhibition against the tested microorganisms isolated both from the wounds swab of diabetic and non-diabetic patients. Ethanolic extracts (75%v/w) and hot water extracts shows a remarkable result with more significant inhibition however, favorably compared with the standard antibiotics. The isolates from wounds swab of non-diabetic patients is more susceptible to the antimicrobial potency of the plant extracts from *J.curcas*and *N.tabacum* used than that of the microbial isolates from the wounds swab of diabetic patients. The microbial isolates (i.e. both bacteria and fungi) isolated from wounds swab of diabetic patients indicates reduced / lower zone of inhibition compared with the corresponding isolates from the wounds swab of non-diabetic patients when were treated against the plant extracts used. However, the clinical isolates detected from the wounds swab of diabetic patients proven to be more resistance against the plant extracts from *J.curcas*and *N.tabacum* used including standard antibiotics that was used as positive control when compared with the antimicrobial sensitivity pattern of the respective clinical isolates obtained from the wounds swab of non-diabetic patients. Different parts of the plant used in this present research constitutes at varying concentration of antimicrobial phytochemical compounds has they show different antimicrobial activities against tested microorganisms. The effect of the solvents used for the extraction of the plant extracts were also observed to have relation with the effectiveness of the extract to exhibit antimicrobial activities against tested microorganisms.

Table 13: Antimicrobial potency of ethanolic extracts (75% concentration) against clinical isolates

	***J. curcas* Extract**					***N. tabacum*Extract**				
Isolates	Seed	Stem	Leaf	Shaft	Root	Seed	Stem	Leaf	Shaft	Root
Bacteria isolates	**(Zone of inhibition 'mm')**					**(Zone of inhibition 'mm')**				
P. vulgaris	6.50±0.33^{bc}	8.50±0.00^{bc}	5.50±0.57^{b}	7.00±0.57^{b}	8.50±0.25^{b}	8.00±0.25^{b}	7.50±0.00^{b}	8.50±0.33^{bc}	5.00±0.00^{b}	9.50±0.62^{b}
(*P. vulgaris*)	(5.00±0.33^{bc})	(8.50±0.00^{b})	(3.50±0.25^{b})	(7.80±0.33^{ab})	(7.50±0.33^{b})	(8.00±0.33^{b})	(6.52±0.00^{b})	(7.80±0.33^{ab})	(3.50±0.62^{b})	(6.50±0.33^{a})
S. aureus	9.50±0.62^{b}	7.00±0.62^{b}	9.50±0.33^{bc}	5.00±0.33^{bc}	9.00±0.62^{b}	10.50±0.62^{b}	8.50±0.62^{b}	6.50±0.33^{b}	5.00±0.33^{bc}	8.00±0.33^{a}
(*S. aureus*)	(7.50±0.33^{b})	(6.52±0.00^{b})	(8.00±0.33^{b})	(6.52±0.00^{b})	(7.50±0.33^{b})	(9.20±0.00^{bc})	(5.00±0.33^{a})	(0.00±0.33^{ab})	(6.52±0.00^{b})	(6.50±0.33^{a})
P. aeruginosa	8.50±0.33^{a}	9.00±0.33^{bc}	8.50±0.62^{b}	6.50±0.62^{b}	8.59±0.33^{b}	8.50±0.00^{b}	9.00±0.33^{a}	10.00±0.00^{bc}	5.50±0.25^{b}	7.80±0.33^{ab}
(*P. aeruginosa*)	(5.00±0.33^{ab})	(8.00±0.33^{b})	(6.20±0.62^{b})	(6.50±0.33^{a})	(5.50±0.33^{bc})	(6.00±0.25^{b})	(8.00±0.33^{b})	(6.00±0.25^{b})	(6.20±0.62^{b})	(4.25±0.33^{b})
E. coli	10.00±0.33^{b}	9.50±0.33^{a}	10.50±0.33^{b}	7.00±0.33^{a}	10.00±0.00^{bc}	8.00±0.33^{ab}	6.52±0.00^{b}	9.00±0.57^{bc}	7.00±0.33^{bc}	10.00±0.33^{b}
(*E. coli*)	(9.50±0.62^{b})	(5.50±0.33^{bc})	(8.00±0.33^{b})	(6.20±0.62^{b})	(7.50±0.33^{b})	(5.50±0.25^{b})	(8.00±0.33^{b})	(6.52±0.00^{b})	(5.00±0.33^{b})	(7.50±0.33^{b})
B. subtilis	9.50±0.33^{ab}	10.20±0.00^{bc}	8.50±0.33^{a}	6.50±0.33^{bc}	10.50±0.62^{b}	9.52±0.62^{b}	9.50±0.33^{a}	7.20±0.62^{b}	0.00±0.33^{ab}	10.50±0.00^{bc}
(*B. subtilis*)	(6.00±0.25^{b})	(7.50±0.33^{b})	(6.52±0.00^{b})	(8.00±0.33^{b})	(7.50±0.33^{b})	(6.50±0.33^{a})	(6.52±0.00^{b})	(8.50±0.00^{b})	(1.00±0.00^{b})	(9.00±0.33^{a})
S. marcescens	7.50±0.33^{a}	7.00±0.33^{ab}	5.50±0.33^{bc}	6.00±0.33^{a}	8.00±0.25^{b}	9.50±0.33^{b}	8.00±0.33^{b}	10.50±0.33^{ab}	3.50±0.00^{b}	8.00±0.25^{b}
(*S. marcescens*)	(4.53±0.62^{b})	(5.00±0.33^{bc})	(0.50±0.33^{bc})	(6.52±0.00^{b})	(7.50±0.33^{b})	(7.80±0.33^{ab})	(7.80±0.33^{ab})	(7.00±0.33^{bc})	(5.00±0.33^{b})	(5.50±0.33^{bc})
Fungi isolates										
S. cerevisiae	5.50±0.33^{ab}	2.50±0.33^{b}	6.50±0.33^{ab}	7.00±0.33^{bc}	5.00±0.33^{bc}	4.50±0.33^{ab}	6.50±0.33^{ab}	6.53±0.62^{b}	3.50±0.33^{bc}	4.25±0.33^{b}
(*S. cerevisiae*)	(6.20±0.62^{b})	(1.00±0.00^{b})	(4.53±0.62^{b})	(6.00±0.25^{b})	(6.50±0.62^{b})	(0.00±0.00^{a})	(5.50±0.57^{b})	(4.00±0.62^{b})	(3.00±0.33^{b})	(2.50±0.33^{a})
C. albicans	5.00±0.33^{b}	6.00±0.33^{ab}	4.00±0.33^{bc}	1.00±0.33^{bc}	3.50±0.33^{a}	6.00±0.33^{b}	5.00±0.62^{b}	7.00±0.33^{a}	5.00±0.00^{b}	3.00±0.00^{bc}
(*C. albicans*)	(5.00±0.33^{bc})	(5.00±0.33^{bc})	(6.50±0.33^{a})	(2.00±0.00^{bc})	(0.00±0.00^{a})	(2.50±0.33^{a})	(2.50±0.33^{a})	(5.50±0.33^{ab})	(3.50±0.00^{b})	(3.50±0.00^{b})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05).

NOTE: Values in parenthesis and non-parenthesis represent effect of extracts on clinical isolates from wound of non-diabetic patients and diabetic patients repectively.

Table 14: Antimicrobial potency of hot water extracts against clinical cultures.

	***J. curcas* extract**					***N. tabacum*extract**				
Isolates	Seed	Stem	Leaf	Shaft	Root	Seed	Stem	Leaf	Shaft	Root
Bacteria isolates	**(Zone of inhibition 'mm')**					**(Zone of inhibition 'mm')**				
P. vulgaris	9.50±0.62^{bc}	6.50±0.33^{a}	6.20±0.57^{b}	6.00±0.57^{b}	12.00±0.62^{a}	11.00±0.62^{a}	5.50±0.57^{bc}	6.80±0.00^{ab}	4.50±0.25^{b}	9.20±0.33^{bc}
(*P. vulgaris*)	(6.00±0.00^{bc})	(3.50±0.33^{bc})	(6.00±0.33^{b})	(5.50±0.00^{bc})	(11.50±0.57^{b})	(8.00±0.33^{ab})	(5.00±0.33^{a})	(6.00±0.00^{ab})	(4.00±0.33^{b})	(8.00±0.33^{ab})
S. aureus	8.00±0.00^{a}	6.00±0.00^{a}	8.40±0.00^{a}	5.00±0.57^{a}	4.60±0.57^{a}	9.50±0.00^{a}	7.00±0.57^{a}	8.90±0.00^{a}	5.00±0.00^{a}	10.00±0.00^{a}
(*S. aureus*)	(5.00±0.33^{a})	(4.00±0.33^{b})	(7.50±0.62^{a})	(6.00±0.33^{b})	(5.00±0.33^{a})	(7.50±0.57^{a})	(6.00±0.33^{a})	(8.00±0.33^{ab})	(4.20±0.33^{a})	(9.00±0.00^{bc})
P. aeruginosa	6.50±0.57^{ab}	5.00±0.33^{a}	5.20±0.33^{ab}	4.50±0.33^{bc}	2.00±0.00^{ab}	8.00±0.33^{ab}	6.00±0.00^{ab}	7.50±0.33^{a}	4.00±0.33^{a}	7.20±0.33^{bc}
(*P. aeruginosa*)	(8.00±0.33^{ab})	(6.00±0.33^{a})	(6.00±0.33^{a})	(2.00±0.00^{ab})	(5.00±0.57^{b})	(7.50±0.33^{bc})	(5.00±0.33^{a})	(5.00±0.33^{a})	(7.20±0.33^{bc})	(6.00±0.33^{b})
E. coli	7.20±0.33^{bc}	7.50±0.33^{bc}	6.00±0.33^{a}	6.00±0.33^{b}	11.50±0.57^{a}	11.00±0.33^{b}	6.00±0.00^{ac}	12.50±0.62^{b}	6.50±0.33^{bc}	11.00±0.33^{a}
(*E. coli*)	(6.50±0.57^{bc})	(6.50±0.57^{bc})	(6.00±0.33^{a})	(5.20±0.33^{ab})	(11.00±0.33^{b})	(8.40±0.00^{b})	(6.50±0.57^{bc})	(8.00±0.33^{ab})	(6.00±0.00^{ab})	(10.00±0.00^{b})
B. subtilis	7.50±0.57^{a}	5.00±0.33^{bc}	7.90±0.33^{bc}	5.00±0.33^{bc}	8.50±0.00^{ab}	7.50±0.62^{a}	5.50±0.62^{ab}	3.50±0.33^{ab}	4.20±0.33^{a}	6.50±0.33^{bc}
(*B. subtilis*)	(6.00±0.00^{b})	(6.00±0.00^{b})	(5.20±0.33^{ab})	(5.00±0.57^{b})	(7.50±0.33^{bc})	(7.50±0.33^{b})	(5.20±0.33^{ab})	(4.60±0.57^{b})	(4.00±0.33^{b})	(5.00±0.57^{b})
S. marcescens	5.00±0.57^{bc}	7.00±0.33^{c}	5.90±0.00^{b}	3.50±0.62^{b}	4.00±0.00^{bc}	8.00±0.57^{a}	5.00±0.62^{a}	6.00±0.00^{b}	5.00±0.00^{bc}	6.00±0.33^{a}
(*S. marcescens*)	(5.90±0.00^{b})	(6.00±0.00^{b})	(5.00±0.62^{a})	(4.00±0.57^{bc})	(3.50±0.00^{a})	(7.00±0.33^{b})	(4.50±0.00^{ab})	(5.90±0.00^{b})	(4.50±0.00^{ab})	(5.90±0.00^{b})
Fungi isolates										
S. cerevisiae	2.00±0.33^{ab}	3.50±0.00^{a}	5.00±0.33^{bc}	2.00±0.57^{ac}	3.50±0.00^{a}	3.20±0.00^{ab}	3.00±0.00^{bc}	4.50±0.00^{b}	2.00±0.33^{ab}	3.00±0.00^{a}
(*S. cerevisiae*)	(2.50±0.00^{a})	(4.50±0.00^{ab})	(3.50±0.33^{a})	(2.50±0.00^{a})	(2.00±0.33^{ab})	(3.50±0.33^{a})	(3.50±0.33^{a})	(2.50±0.00^{bc})	(0.00±0.00^{a})	(2.00±0.33^{ab})
C. albicans	1.50±0.33^{a}	4.50±0.00^{ab}	5.20±0.00^{a}	3.50±0.33^{a}	4.50±0.00^{ab}	4.00±0.57^{ac}	2.50±0.00^{a}	4.00±0.33^{a}	3.20±0.00^{a}	2.50±0.00^{ac}
(*C. albicans*)	(0.00±0.00^{a})	(2.00±0.33^{ab})	(3.50±0.33^{a})	(2.50±0.00^{a})	(4.50±0.00^{ab})	(5.00±0.33^{bc})	(1.50±0.33^{b})	(3.20±0.00^{b})	(2.50±0.00^{a})	(1.50±0.33^{b})

Data are presented as Mean±S.E. Value with the same superscript along the column are not significantly different (P≤0.05).
NOTE: Values in parenthesis and non-parenthesis represent effect of extracts on clinical isolates from wound of non-diabetic patients and diabetic patients repectively.

The plant extracts (i.e. *J. curcas*and *N. tabacum*) antimicrobial sensitivity results shown on table 13 and 14 of ethanolic (75% v/w) and hot water extracts concentration (been the most extraction solvents that indicates most useful inhibition among other varying degree of concentration of solvents against the tested organisms during invitro assay) shows significant inhibition against the tested microorganisms isolated both from the wounds swab of diabetic and non-diabetic patients. Ethanolic extracts (75% w/v concentration) and hot water extracts shows a remarkable result with more significant inhibition which stand to favourably compared with the standard antibiotics. The isolates from wounds swab of non-diabetic patients is more susceptible to the antimicrobial potency of the plant extracts from *J. curcas*and *N. tabacum* used than that of the microbial isolates from the wounds swab of diabetic patients. The microbial isolates (i.e. both bacteria and fungi) isolated from wounds swab of diabetic patients indicates reduced / lower zone of inhibition compared with the counterparts/corresponding isolates from the wounds swab of non-diabetic patients when were treated against the plant extracts used. However, the clinical isolates detected from the wounds swab of diabetic patients proven to be more resistance against the plant extracts from *J. curcas*and *N. tabacum* used including standard antibiotics that was used as positive control when compared with the antimicrobial sensitivity pattern of the counterparts clinical isolates obtained from the wounds swab of non-diabetic patients. Invariably, despite the fact that both modern standard antibiotics disc and the *J. curcas* and*N. tabacum* extracts used shows the inhibitory effect on the test isolates. Compared with antibiotics, some resistant strain microorganisms cannot be effectively controlled by modern antibiotics but rather can do with the mushroom extracts as proven by this present study and especially to the bacterial isolates that are of gram negative which can easily developed drug resistant [Openshaw, *et al* ,.2000].

V. CONCLUSSION

The use of herbal medicine as alternative therapy is gaining acceptance throughout the world due to the growing resistance of pathogens to conventional antibiotics [Openshaw, *et al* ,.2000]. The need for more effective, safe and affordable drugs has led to intensified research into herbal drugs, the result of which is the introduction of new herbal preparation for therapeutic uses [Ali *et al* ,.2006]. Plants are rich in a wide variety of secondary metabolites [Ali *et al* ,.2006], such as tannins, terpenoids, alkaloids and flavonoids which have been found *invitro* to have antimicrobial properties. The regular and extensive use of modern antibiotics will lead to development of drug resistant [Susiarti*et al* ,1999].

This study reveals that the *J.curcas*Linnand *N.tabacum*Linnextracts can be used as a new biological remediation on the degenerated wounds of the diabetic patients expressing its pharmaceutical activity through the inherent metabolites that are of great antimicrobial effects on pathogenic organisms commonly invade compromised tissues in the cases of non-healing wounds of diabetic patients [Gübitz*et al* ,.1999.] [Muangman, *et al* ,.2005.] [Clinical and Laboratory Standards Institute, 2010]. Inherence active biological components that common to the *Jatrophacurcas*and *Nicotianatabacum*extracts investigated in this research could be a promising candidate in phytomedicine. Hence, preparation of a new biologically active compound and its introduction into clinical practice requires the cooperation of scientists from various scientific disciplines and years of clinical trials [Gardner *et al* ,.2009].

ACKNOWLEDGEMENT

The authors are gratefully thanks to the health officers and medical laboratory scientists in all the selected hospitals visited in Ondo State where samples were collected for the aid, support and cooperation received. Also appreciation goes to the admitted diabetic patients for the permission and for the consent statements that was favorably gratified. Special thanks to Department of microbiology, Federal University of Technology Akure, Department of Botany and Microbiology, University of Ibadan and International Institute of Tropical Agriculture, Ibadan, Oyo State for granting us permission to use their laboratory facilities.

ETHICAL APPROVAL

In conformity with the required protocol, standard written ethical approval was collected from Ministry of Health, Ondo State after the introductory letter from the Department of microbiology, Federal University of Technology Akure to seek necessary consent and permission from the Ministry. Also, respective approval and acknowledgement letter from Department of Medicine- Diabetic Unit, in each of the visited hospitals were collected and preserved by the authors.

COMPETING INTERETS

Authors have declared that no competing interests regarding the publication of this paper exist.

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APPENDIX 1

THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE
Department of Microbiology
P. M. B. 704, Akure,
Ondo State, NIGERIA.

30th December, 2015

Medical Director,
Gani Fawehinmi Specialist Medical Centre,
Ondo State.

LETTER OF INTRODUCTION

This is to confirm that Asha, Olufisayo Adeniyi with matriculation number MCB/07/2576 is a Ph.D. student in the Department of Microbiology, Federal University of Technology, Akure.

He needs your unflinching support while gathering materials for the execution of his research work titled: "Molecular Analysis and Gene-sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo State".

Kindly accord him the necessary assistance.

Thank you.

Prof. B. Boboye
Head of Department

P.M.B. 704,
Microbiology Department,
F. U. T. A., Ondo state.
29th Dec., 2015.

TO: The Chief Medical Director,
State Specialist Hospital, Akure,
Ondo state.

THROUGH: The Director,
Health Research Ethic Committee,
State Specialist Hospital, Akure,
Ondo state.

Sir,

REQUEST FOR ETHICAL APPROVAL

I, Asha Olufisayo A. here by requested from your institution to grant me an ethical approval for the clinical sample collection from the diabetic foot patients and access to the patient's consent, in the interest of the requirement for my research;

Student's Name: Asha Olufisayo Adeniyi.
Matric Number: MCB/07/2576.
Research Topic: 'Molecular Analysis and Gene-Sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo state'.
Type of sample: Wound's swab.
Type of programme: Ph.D.
Major supervisor: Prof. A. K. Onifade (Department of Microbiology, F. U. T. A., Ondo state).
Co-Supervisor: Dr. M. K. Oladunmoye (Department of Microbiology, F. U. T. A., Ondo state).

I attached herewith the copy of my introduction letter from the department and the brief research proposal as it may be necessary for your view.

Thanks in anticipation for your cooperation and prompt response in answer to my request.

Yours Faithfully,

Asha A. O.
GSM: 08034181021.

P.M.B. 704,
Microbiology Department,
F. U. T. A., Ondo state.
29th Dec., 2015.

TO: The Chief Medical Director,
Gani Fawehinmi Specialist Hospital, Ondo.
Ondo state.

THROUGH: The Director,
Health Research Ethic Committee,
Gani Fawehinmi Specialist Hospital, Ondo.
Ondo state.

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Asha A. O.
GSM: 08034181021.

THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE
Department of Microbiology
P. M. B. 704, Akure,
Ondo State, NIGERIA.

30th December, 2015

Medical Director,
General Hospital,
Idanre, Ondo State.

LETTER OF INTRODUCTION

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Thank you.

Prof. B. Boboye
Head of Department

P.M.B. 704,
Microbiology Department,
F. U. T. A., Ondo state.
29th Dec., 2015.

TO: The Chief Medical Director,
General Hospital, Idanre.
Ondo state.

THROUGH: The Director,
Health Research Ethic Committee,
General Hospital, Idanre.
Ondo state.

Sir,

REQUEST FOR ETHICAL APPROVAL

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Student's Name: Asha Olufisayo Adeniyi.
Matric Number: MCB/07/2576.
Research Topic: 'Molecular Analysis and Gene-Sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo state'.
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Major supervisor: Prof. A. K. Onifade (Department of Microbiology, F. U. T. A., Ondo state).
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Yours Faithfully,
Asha A. O.
GSM: 08034181021.

THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE
Department of Microbiology
P. M. B. 704, Akure,
Ondo State, NIGERIA.

30th December, 2015

THE CHAIRMAN,
STATE HEALTH RESEARCH ETHICS
COMMITTE MINISTRY OF HEALTH,
AKURE, NIGERIA.

LETTER OF INTRODUCTION

This is to confirm that Asha, Olufisayo Adeniyi with matriculation number MCB/07/2576 is a Ph.D. student in the Department of Microbiology, Federal University of Technology, Akure.

He needs your unflinching support while gathering materials for the execution of his research work titled: "Molecular Analysis and Gene-sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo State".

Kindly accord him the necessary assistance.

Thank you.

Boboye 30/12/2015
Prof. B. Boboye
Head of Department

14, Alekuwodo Street,
Osogbo, Osun state.
29th Dec., 2015.

THE CHAIRMAN,
STATE HEALTH RESEARCH ETHICS
COMMITTEE MINISTRY OF HEALTH,
AKURE, NIGERIA.

Through: The supervisor,
Microbiology Department,
Federal University of Technology, Akure,
Ondo state.

30/12/2015

Sir,

REQUEST FOR INTRODUCTION LETTER

I, Asha Olufisayo A. here by requested from the department for the introduction letter to grant me an ethical approval at the intended institutions to be visited for clinical sample collection, in the interest of the requirement for my research;

Student's Name: Asha Olufisayo Adeniyi.
Matric Number: MCB/07/2576.

Research Topic: 'Molecular Analysis and Gene-Sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo state'.
Type of sample: Wound's swab.
Type of programme: Ph.D.
Major supervisor: Prof. A. K. Onifade.
Co-Supervisor: Dr. M. K. Oladunmoye.

Thanks in anticipation for your cooperation and prompt response in answer to my request.

The photocopy of my admission letter is hereby attached with this letter.

Cc: Prof. A. K. Onifade
(Research supervisor)
Microbiology Department,
Federal University of Technology, Akure,
Ondo state.

Yours Faithfully,
Asha A. O.
GSM: 08034181021.

Department of Medicine,

22nd Sept., 2016.

Chief Medical Director,

State Specialist Hospital, Akure.

Sir,

Acceptance Letter.

Re: MR ASHA OLUFISAYO ADENIYI'S RESEARCH ACTIVITY.

This is to certify that Mr Asha O.A. doing his research on molecular analysis and gene-sequencing of some resistant strains isolated from wounds of diabetic patients in Ondo state, has been accepted in the department of Medicine to carry out his Ph.D research subject to approval by the ethics committee.

Yours Faithfully,

22/09/2016.

DR Enikomehin Adenike

PMCP, PWALP.

(Consultant Endocrinologist)

6

Appendix 2
INFORMED CONSENT FORM

I…….....OF…….……hereby agree to participate in study on 'Molecular Analysis and Gene-Sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo state'. I confirm that the details of the study have been explained to me. I have had opportunity to ask questions about the study and to receive satisfactory answers to my questions.
Participation in this study is voluntary and non-participation attracts no penalty. I am free to withdraw at any-time with no penalty or loss of benefit.
I understand that the data from this study will be secured against unauthorized use and that I will not be identifiable from published results.

……. ……

Signature/thumb print of participant Date

APPENDIX 2
Questionnaire

PERSONAL/BIO-DATA INFORMATION:
(a) Address/Location(Town/City)……..……
(b) Age……
(c) Gender……..
(d) Social/Literacystatus……
CLINICAL INFORMATION:
(a) Since when Diagnosed (Months/Years)…….
(b) Since when Complication noticed (Months/Years)……..
(c) Site of wound……...…
(d) Signs & Descriptions of infection……..
(e) Antibiotics therapies (Yes/No)……
(f) Types/Name of antibiotics……
(g) Mode of antibiotics administration…….
GENERAL INFORMATION/COMMENTS:
(a) Lifestyle……
(b) Other health challenges (Named if Yes)……
(c) Frequency on Medical-checkup (Regular/ Not-Regular)……
(d) Dietary recommendation/Status……..
REMARKS:……
……
……
……
……
…….

APPENDIX 3

P.M.B. 704,
Microbiology Department,
F. U. T. A., Ondo state.
9th Nov., 2016.

TO: The Chairman,
State Health Research Ethics Committee Ministry of Health,
Akure,
Nigeria.
THROUGH: The H. O. D.
Microbiology Department,
Federal University of Technology, Akure, Ondo state.
Nigeria.
Sir,

REQUEST FOR ETHICAL APPROVAL

I, Asha Olufisayo A. here by requested from your institution to grant me an ethical approval for the clinical sample collection from the diabetic foot patients and access to the patient's consent, in the interest of the requirement for this research;

Student's Name: Asha OlufisayoAdeniyi.
Matric Number: MCB/07/2576.
Research Topic: 'Molecular Analysis and Gene-Sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo state'.
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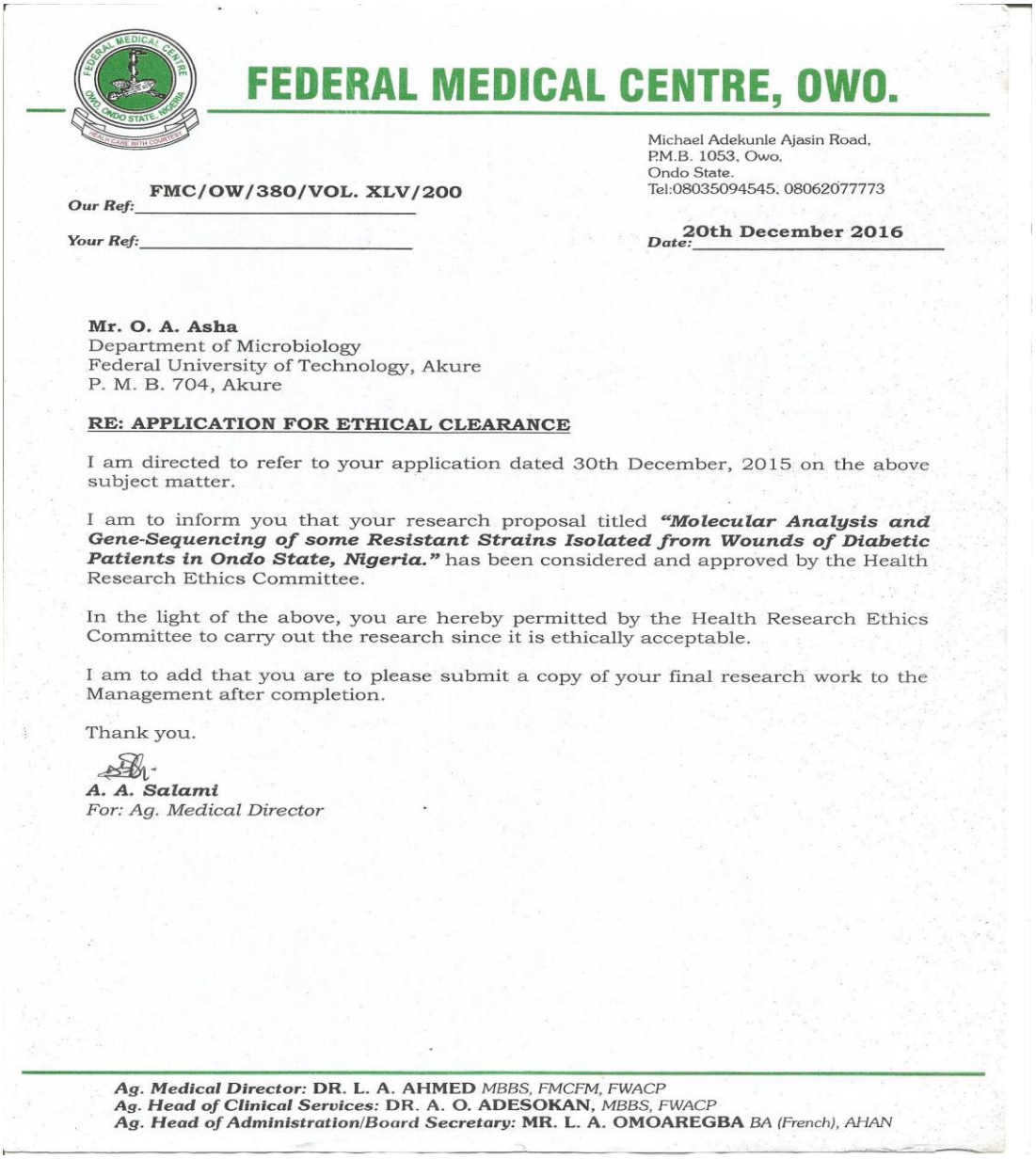
Co-Supervisor: Prof. M. K. Oladunmoye (Department of Microbiology, F. U. T. A., Ondo state).

I attached herewith the copy of my introduction letter from the department and the brief research proposal as it may be necessary for your view.

Thanks in anticipation for your cooperation and prompt response in answer to my request.

Yours Faithfully,
Asha A. O.
GSM: 08034181021.



FEDERAL MEDICAL CENTRE, OWO.

Michael Adekunle Ajasin Road,
P.M.B. 1053, Owo,
Ondo State.
Tel:08035094545, 08062077773

Our Ref: FMC/OW/380/VOL. XLV/200

Your Ref:

Date: 20th December 2016

Mr. O. A. Asha
Department of Microbiology
Federal University of Technology, Akure
P. M. B. 704, Akure

RE: APPLICATION FOR ETHICAL CLEARANCE

I am directed to refer to your application dated 30th December, 2015 on the above subject matter.

I am to inform you that your research proposal titled ***"Molecular Analysis and Gene-Sequencing of some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo State, Nigeria."*** has been considered and approved by the Health Research Ethics Committee.

In the light of the above, you are hereby permitted by the Health Research Ethics Committee to carry out the research since it is ethically acceptable.

I am to add that you are to please submit a copy of your final research work to the Management after completion.

Thank you.

A. A. Salami
For: Ag. Medical Director

Ag. Medical Director: **DR. L. A. AHMED** *MBBS, FMCFM, FWACP*
Ag. Head of Clinical Services: **DR. A. O. ADESOKAN,** *MBBS, FWACP*
Ag. Head of Administration/Board Secretary: **MR. L. A. OMOAREGBA** *BA (French), AHAN*

SSHA/592/2134 19th Dec, 2016

The Chairman,
State Health Research Ethics,
Committee Ministry of Health,
Akure, Nigeria.

Sir,

LETTER OF ACCEPTANCE

This is to inform you that the State Specialist Hospital, Akure have accepted **ASHA OLUFISAYO ADENIYI (MCB/07/2576),** a research student from Federal University of Technology, Akure to give monitoring and guide professionally on his proposed research activities within our custody.

Research Topic: Molecular Analysis and Gene-Sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo State.

Type of Sample: Wound's Swab.

Thanks in anticipated for your prompt response ans support in answer to his request at your end.

19/12/2016.

Dr. Enikuomehin Adenike
Consultant Endocriminologist
PMCP, PWAEP

PRIVATE MAIL BAG No. 603

STATE SPECIALIST HOSPITAL, AKURE

ONDO STATE OF NIGERIA

E-mail: statehospitalakure@yahoo.com Telephone: 08164919898, 07055063060

Your Ref: No:.....
All communications should be addressed to Chief Medical Director quoting

Our Ref. No:..... *Date:* 19th Dec, 2016

The Chairman,
State Health Research Ethics,
Committee Ministry of Health,
Akure, Nigeria.

Sir,

LETTER OF ACCEPTANCE

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Type of Sample: Wound's Swab.

Thanks in anticipated for your prompt response ans support in answer to his request at your end.

15/12/2016

Dr. Enikuomehin Adenike
Consultant Endocriminologist
PMCP, PWAEP

ONDO STATE GOVERNMENT
ONDO STATE HEALTH RESEARCH ETHICS COMMITTEE (OSHREC)
MINISTRY OF HEALTH

AD.4693 Vol. II/7

14th Dec. 2016

Asha A.O.,
The Department of Micro Biology,
The Federal University of Technology,
Akure.

ETHICAL APPROVAL

I am pleased to inform you that upon your request for ethical approval and the submission of your research protocol titled **"Molecular Analysis and Gene-Sequencing of some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo state".** The State Health Research Ethics Committee (SHREC) has considered your proposal and found it to be in compliance with international standards and best practices.

Therefore, I am pleased to convey to you the approval of the SHREC in line with the contents of your research protocols. However, the SHREC reserves the right to recall its approval if the conduct of the research deviates from the stated objectives, procedures and best practices.

Also, it is mandatory that the Ethics Committee be informed about the progress of the study, any revision in the protocol or extension of its duration. You are also required to disseminate your research outcome to the SHREC before your findings are made public.

Best Regards.

Dr. E.T.Oni,
Chairman, SHREC

State Secretariat, Alagbaka, Akure, Ondo State. www.oshrec@ondostatemoh.gov.ng

THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE
Department of Microbiology
P. M. B. 704, Akure,
Ondo State, NIGERIA.

30th December, 2015

THE CHAIRMAN,
STATE HEALTH RESEARCH ETHICS
COMMITTEE MINISTRY OF HEALTH,
AKURE, NIGERIA.

LETTER OF INTRODUCTION

This is to confirm that Asha, Olufisayo Adeniyi with matriculation number MCB/07/2576 is a Ph.D. student in the Department of Microbiology, Federal University of Technology, Akure.

He needs your unflinching support while gathering materials for the execution of his research work titled: "Molecular Analysis and Gene-sequencing of Some Resistant Strains Isolated from Wounds of Diabetic Patients in Ondo State".

Kindly accord him the necessary assistance.

Thank you.

Bobbye 30/12/15
Prof. B. Bobbye
Head of Department

IOSR Journal of Pharmacy (IOSR-PHR) is UGC approved Journal with Sl. No. 3365, Journal No-62875

Asha, A. O. "Assessment Of Phytochemical And Antimicrobial Screening Of Jatrophacurcas(Linn)And Nicotianatabacum(Linn)Against Microorganisms From Wounds Of Diabetic Patients..". IOSR Journal of Pharmacy (IOSRPHR), vol. 9, no. 8, 2019, pp. 57-86.