Review of Literature:

1. William P. J. et al., [2008] have studied biologically active natural products of the genus *callicarpa* author has stated that about 20 species from *Callicarpa* have reported ethnobotanical and ethnomedical uses, and several members of this genus are well known in the traditional medical systems of China and South Asia. Ethnomedical reports indicate their use in the treatment of hepatitis, rheumatism, fever, headache, indigestion, and other ailments. Several species of *Callicarpa* have been reported to be used against cancer. Extracts from about 14 species in this genus have been evaluated for biological activity, including antibacterial, antifungal, anti-insect growth, cytotoxic, and phytotoxic activities. In addition to amino acids, benzenoids, simple carbohydrates, and lipids, numerous diterpenes, flavonoids, phenylpropanoids, phytosterols, sesquiterpenes, and triterpenes have been detected in or isolated from the genus *Callicarpa*. Further author stated that The essential oils of *Callicarpa americana* have recently been reported to have antialgal and phytotoxic activities, and several isolates from this species (and *C. japonica*) were identified as contributing to the mosquito bite-deterrent activity that was first indicated by folkloric usage.

2. Qadrie Z. et al., [2013] have evaluated the safety of the Callicarpa Linata leaf extract through acute and sub-acute toxicity study in rats. In the present study For acute toxicity study 50-2000mg/kg ethanol extract and chloroform extract were administered orally and obvious toxic symptoms and mortality was studied up to 72hrs. In sub-acute study, effect of multiple weekly dosing of 100, 400 and 800mg/kg of ethanol extract and chloroform extract was investigated in rats for six weeks and the evaluation was done by the studies of hematological parameters, biochemical estimations of hepato-renal parameters, histological studies of the tissue. Both the extracts were found to be well tolerated up to 2g/kg in acute toxicity study. The sub-acute toxicity studies showed no significant alteration on any of the parameters. Hence the results suggest that ethanol extract and chloroform extract is safe and can be used in the treatment of diseases without any toxicity.

3. Amin M. et al., [2015] have done Preliminary phytochemical and HPLC screening of triterpenoids fraction from bark extract of callicarpa arborea Roxb. In this study
Triterpenoids was extracted and preliminary identified from raw bark extract of Callicarpa arborea Roxb by applying phytochemical screening test and high performance liquid chromatography (HPLC) identification have been done. Triterpenoids found that contained in the extract have a semi-polar polarity direction. One dominant triterpenoid compounds were observed in the observation by HPLC. Application for the use of preparative HPLC can be suggested for the next stage of structure elucidation.

4. Cantrell C. et al., [2005] have performed the Isolation and Identification of Mosquito Bite Deterrent Terpenoids from Leaves of American (Callicarpa americana) and Japanese (Callicarpa japonica) Beautyberry. In this study author have investigated the essential oil extracts from Callicarpa americana and Callicarpa japonica. Bioassay guided fractionation of C. americana extracts using the yellow fever mosquito, Aedes aegypti, led to the isolation of R-humulene, humulene epoxide II, and intermedeol and a newly isolated terpenoid (callicarpenal). Similar work involving C. japonica resulted in the isolation of an additional compound, spathulenol, as well as the four compounds isolated from C. americana. Structure elucidation was performed on all isolated compounds using a combination of gas chromatography-mass spectrometry electron ionization, high-resolution liquid chromatography-MS-electrospray ionization, and one- and two-dimensional NMR experiments. Heretofore, 13,14,15,16-tetranorclerodane, callicarpenal, has never been identified from natural sources. Complete 1H and 13C NMR assignment data are provided for this compound. In bite deterrent studies, spathulenol, intermedeol, and callicarpenal showed significant repellent activity against A. aegypti and Anopheles stephensi.

5. William P. J. et al., [2007] have collected Cytotoxic Constituents from the Fruiting Branches of Callicarpa americana in Southern Florida. Bioassay-guided fractionation of the combined fruits, leaves, and twigs (fruiting branches) of Callicarpa americana, collected from a plot in a forested area in southern Florida, led to the isolation of six new clerodane diterpenes and eight known compounds. The structures were elucidated by interpretation of spectroscopic data and chemical methods. The cytotoxicity of all isolates was tested against a panel of human cancer cell lines.

6. Tu Y. et al., [2013] have reviewed the medicinal uses of Callicarpa L. in traditional Chinese medicine. An ethnopharmacological, phytochemical and pharmacological review
has been done. Author has aimed to assess the scientific evidence for therapeutic Callicarpa in TCM and to identify future research needs. A variety of ethnomedical use of Callicarpa has been recorded in many ancient Chinese books. Phytochemical investigation of this genus has resulted in identification of more than 200 chemical constituents, among which diterpenes, triterpenoids and flavonoids are the predominant groups. The isolates and crude extract have exhibited a wide spectrum of in vitro and in vivo pharmacological effects involving anti-inflammatory, hemostatic, neuroprotective, anti-amnesic, antitubercular, antioxidant, antimicrobial and analgesic activities. Preparations containing Callicarpa species exerted good efficacy on clinical applications of gynecological inflammation, internal and external hemorrhage as well as acne vulgaris and chronic pharyngitis, etc. From the toxicity perspective, only three Callicarpa species have been assessed. Pharmacological results have validated the use of Callicarpa species in the traditional medicine. As literature demonstrated, terpenoids and flavonoids are perhaps responsible for most of the activities shown by the plants of this genus. However, the detailed active compounds and the underlying mechanisms remain a work in progress. In addition, more attention should be paid to C. nudiflora as well as the domain of rheumatism.

7. **Yung A. K. et al., [2005]** have performed the In Vitro studies of Neuroprotective Activities of Phenyl ethanoid Glycosides from *Callicarpa dichotoma*. Author have isolated Ten phenylethananoid glycosides, forsythoside B, acleoside, 2’- acetylacleoside, poliumoside, brandioside, echinacoside, isoac- leoside, cislanoside H and E-lubuloside E as well as a new compound, Z-lubuloside E isolated from the n-BuOH fraction of Callicarpa dichotoma Raesuchel (Verbenaceae) by bioactivity-guided fractionation using glutamate-injured primary cultures of rat cortical cells as a screening system. These phenylethanoid glycosides significantly attenuated glutamate-induced neurotoxicity at concentrations ranging from 0.1 to 10 μM.

8. **Verma V. K. et al., [2012]** have isolated a new Kaurane Diterpene from the leaves of *Callicarpa Macrophylla* Vahl. A chloroform extract of leaves of *Callicarpa Macrophylla* Vahl., yielded a new compound 16 α- hydroxyl-17-isopropylidino-3-oxo-phyllocladane along with calliterpenone and its monoacetate.
9. Qadrie Z. et al., [2013] have performed Antioxidant Activity of Ethanolic Extracts of *Callicarpa Linata* Leaf. Author further mentioned that the antioxidants are our first line of defense against free radical damage, and are critical for maintaining optimum health and wellbeing. Catalase (CAT), superoxide dismutase (SOD), and thiobarbituric acid reactive Substances (TBARS) estimated using liver homogenate. Dose dependent antioxidant activity was obtained against DPPH radical. Levels of serum markers AST, ALT, ALP, TB and total protein were significantly increased in CCl₄ treated rats. Increase in antioxidant enzymes CAT and SOD and a decrease in the level of TBARS was observed.

10. Chung P.Y. et al., [2014] have studied the Potential targets by entacyclic triterpenoids from *Callicarpa farinosa* against methicillin-resistant and sensitive Staphylococcus aureus. In the present study the have mentioned that the evolution of antibiotic resistance in Staphylococcus aureus showed that there is no long lasting remedy against this pathogen. The limited number of antibacterial classes and the common occurrence of cross-resistance within and between classes reinforce the urgent need to discover new compounds targeting novel cellular functions not yet targeted by currently used drugs. Author have further mentioned about the experimental approaches used to discover novel antibacterials and their in vitro targets is natural product screening. Three known pentacyclic triterpenoids were isolated for the first time from the bark of Callicarpa farinosa Roxb. (Verbenaceae) and identified as α-amyrin [3β-hydroxy-urs-12-en-3-ol], betulinic acid [3β-hydroxy-20(29)-lupene-28-oic acid], and betulinaldehyde [3β-hydroxy-20(29)-lupen-28-al]. These compounds exhibited antimicrobial activities against reference and clinical strains of methicillin-resistant (MRSA) and methicillin-sensitive S. aureus (MSSA), with minimum inhibitory concentration (MIC) ranging from 2 to 512 μg/mL. From the genome-wide transcriptomic analysis to elucidate the antimicrobial effects of these compounds, multiple novel cellular targets in cell division, two-component system, ABC transporters, fatty acid biosynthesis, peptidoglycan biosynthesis, aminoacyl-tRNA synthetases, ribosomes and β-lactam resistance pathways are affected, resulting in destabilization of the bacterial cell membrane, halt in protein synthesis, and inhibition of cell growth that eventually lead to cell death. The novel targets in these essential pathways could be further explored in the development of therapeutic compounds for the treatment of S. aureus infections and help mitigate resistance development due to target alterations.
11. Lallianchhunga M.C. et al., [2016] have studied the *in vitro* antioxidant activity of methanolic extract of *callicarpa arborea* leaves. Further author have mentioned that *Callicarpa arborea* is a commonly known as Beautyberry Tree belongs to Verbenaceae family. It is widely used in traditional medicine for treatment of jaundice, fever, headache, stomachache, skin and scorpion bites diseases. The fresh leaves of the plant were washed, air dried in shade, ground to powder and subjected to cold maceration using methanol as per the standard procedure, condensed by subjecting to a rotary evaporator and lyophilized. In this study author have used the methanolic extract for antioxidant activity by three different *in vitro* methods; namely (1) DPPH free radical scavenging activity, (2) Ferric reducing antioxidant potential (FRAP) assay and (3) Total phenolic contents by spectrophotometric method. In the radical scavenging measurement method of DPPH and ferric iron reducing ability assay, the antioxidant activities were 9.78±0.12 mg and 12.81±0.64 mg Trolox equivalent respectively per gram of dried leaves.

12. Munir A. A., [1982] have presented the taxonomic revision of the genus *Callicarpa* L. (Verbenaceae) in Australia. Seven species are recognized of which C. brevistyla (Northern Territory) and C. thozetfi phylla (Queensland) are described as new. C. caudata and C. macro- are recorded from Australia for the first time, and C. pedunculata is typified. C. viridis is regarded as a new synonym of C. pedunculata. The affinities and distribution are considered for the genus and each species. A key to the species is provided and a detailed description of each is supplemented by a habit sketch of a flowering branch and analytical drawings of the flower.

13. Harshitha K. et al., [2013] have carried out the Pharmacognostical and Preliminary Phytochemical Investigations on Different Parts of *Bulbophyllum Neilgherrense* Wight. In this work the author has mentioned that the *Bulbophyllum Neilgherrense* Wight. is an epiphyte belonging to the family Orchidaceae found growing on medium to large sized host trees endemic to the forests of Western ghats which is yet to be scientifically explored. Further author mentioned that a few published reports are available with regards to its medicinal uses and scientific studies. In the present study, systematic pharmacognostic evaluation of leaf, stem and root of the plant were carried out with respect to macroscopy, microscopy and preliminary phytochemical screening. Macroscopic study detailed the
structure of leaf, stem and root. Microscopic study demonstrated the presence of mucilage cells and calcium oxalate crystals in leaf; oil globules, tannin and mucilage cells in stem; velamen tissue, passage cells and lignified parenchyma cells in root. Qualitative phytochemical investigations showed the presence of alkaloids, tannin and phenol in methanol extract of stem and root whereas in leaf, constituents like alkaloids, saponin glycosides, tannin, phenols and reducing sugar were observed. The morphological, histological and phytochemical investigations reported in the paper may become supportive to establish the authenticity of the plant simultaneously giving a wide scope for further pharmacological and clinical researches.

14. Devi P. M. and Siril E.A., [2013] have performed the Pharmacognostic Studies on Indian Madder (Rubia cordifolia L.). in this study author have mentioned that the Indian Madder’ (Rubia cordifolia L.) has wide range of pharmacological properties. In the present study, author made an attempt was made to identify the pharmacognostic features of various parts of R. cordifolia to differentiate it from adulterants. The organoleptic characters, proximate analysis, physio-chemical behavior of powders were recorded. The stomatal index, palisade ratio and ash value were shown to be characteristic under standard conditions. Optical activity of various R. cordifolia extracts under visible and UV light (254 nm and 366 nm) were recorded. Phytochemical studies revealed the presence of anthraquinone and other metabolites in different plant parts. Powder analysis showed trace red colour in root powder under most of the standard test conditions. Phytochemical and pharmacognostic records evolved in the present study can be used for framing standard parameters for the proper identification of raw materials of R. cordifolia.

15. Suresh kumar C.A. et al., [2009] have performed the Pharmacognostic and Preliminary Phytochemical Investigations on the stem of Saccharum spontaneum. In this study author have mentioned that the genus “Saccharum” includes about 150 species under the family “Poaceae”. This occurs throughout India along the sides of the river and tropics of old world, it is widely distributed in Andhra Pradesh, Vellore district in Tamilnadu. Scientific information on their pharmacognosy, Phytochemistry and pharmacology are very scant. In this study the samples for research were collected from Vellore, Tamil Nadu, India and authenticated and then subjected for morphological, microscopical and physicochemical
analysis. The parameters from the above were recorded with an objective of drawing an attention on those populations as well as a reference for further scientific investigations.

16. Rajendran R. et al., [2009] have studied the hepatoprotective activity of the methanolic extract of leaves of Mimosa pudica at the dose of 200mg/kg body weight per oral against Carbontetrachloride induced liver damage in wistar albino rats. Author have mentioned that the methanolic extract showed significant (p<0.05) hepatoprotective effect by lowering the serum levels of various biochemical parameters such as serum glutamic oxaloacetate transaminase (SGOT), serum glutamic pyruvates transaminase (SGPT), alkaline phospatase (ALP), total bilirubin (TBL), total cholesterol (CHL) and by increasing the levels of total protein (TPTN) and albumin (ALB), in the selected model. These biochemical observations were in turn confirmed by histopathological examinations of liver sections and are comparable with the standard hepatoprotective drug Silymarin (100mg/kg body weight i.p.) which served as a positive control. The overall experimental results suggests that the biologically active phytoconstituents such as flavonoids, glycosides alkaloids present in the methanolic extract of plant Mimosa pudica, may be responsible for the significant hepatoprotective activity and the results justify the use of Mimosa pudica as a hepatoprotective agent.

17. Roy C. K. et al., [2010] have studied the Effect of Psidium Guajava Linn. Methanolic Leaf Extract on Hepatoprotection. The study was designed to evaluate the hepatoprotective activity of P. guajava in acute experimental liver injury induced by carbon tetrachloride and paracetamol. The effects observed were compared with a known hepatoprotective agent, silymarin. In the acute liver damage induced by different hepatotoxins, P. guajava methanolic leaf extracts (250 and 500mg/kg, p.o) significantly reduced the elevated serum levels of aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase and bilirubin. The higher dose of the methanolic extract (500 mg/kg, p.o) prevented the increase in liver weight when compared to hepatoxin treated control, while the lower dose was ineffective except in the paracetamol induced liver damage. Histological examination of the liver tissues supported the hepatoprotection. It is concluded that the methanolic extract of leaves of guava plant possesses good hepatoprotective activity.

18. Panchal C.V. et al., [2013] have performed the Hepatoprotective activity of lagena siceraria (molina) standley fruits against paracetamol induced hapatotoxicity in mice. In this
author have mentioned that Fruit juice of *Lagenaria siceraria* (LS) belonging to Cucurbitaceae family, has been used traditionally to treat jaundice and to cure certain liver disorders. Antioxidants are well known for their hepatoprotective effect and in curing liver disorders. In this study, hepatoprotective and antioxidant effects of fruits were investigated. The author have used the coarsely powdered plant material was extracted successively with petroleum ether (PE) and ethanol (ETH) using soxhlet. PE & ETH, were then evaluated for their hepatoprotective and antioxidant activities against paracetamol induced hepatotoxicity and different *in vitro* assays respectively. Hepatoprotective activity was evaluated at three oral dose levels of 250, 500 and 1000 mg/kg. Both extracts, PE and ETH exhibited a significant hepatoprotective and antioxidant activity. The ETH (1000 mg/kg) showed maximum hepato-protection. ETH also showed better antioxidant activity, in comparison to PE, in all the antioxidant assays. Author have concluded that the ETH has shown better hepatoprotective activity than PE, which could be due to its better antioxidant activity. Moreover, better activity can also be attributed to the presence of phenolic compounds as these were absent in the PE.

19. **Hurkadale P.J. et al. [2012]** have studied the hepatoprotective activity of methanol and aqueous extracts of Amorphophallus paeoniifolius tubers against paracetamol induced liver damage in rats. In this study hepatotoxicity was induced by paracetamol and the biochemical parameters such as serum glutamic pyruvic transaminase (sGPT), serum glutamic oxaloacetic transaminase (sGOT) and serum alkaline phosphatase (sALP), serum bilirubin (SB) and histopathological changes in liver were studied along with silymarin and Liv-52 as standard hepatoprotective agents. Further author have mentioned that the phytochemical investigation of the extracts showed presence of carbohydrates, proteins, steroids and flavonoids. Pretreatment of the rats with methanol and aqueous extract prior to paracetamol administration caused a significant reduction in the values of sGOT, sGPT, sALP and sB (P<0.01) almost comparable to the silymarin and Liv-52. The hepatoprotective was confirmed by histopathological examination of the liver tissue of control and treated animals. Author have concluded that Amorphophallus paeoniifolius possesses hepatoprotective effect against paracetamol-induced liver damage in rats.

20. **Nwala C. O. et al., [2013]** have done the Phytochemical Screening and wound healing activities of Extracts of Jatropha Curcas leaf formulated in a Simple ointment Base. This
study investigated a herbal ointment containing Jatropha curcas leaf extract for wound healing activity. The ointment batches containing different concentrations (0.5, 1.0 and 1.5g/10g) of J. curcas extract was applied topically on the wounds inflicted on rats and the rate of wound closure assessed by wound area measurement. These ointments formulated from extracts of J. curcas caused significantly (p<0.05) higher rate of wound healing in a dose related manner in rats. Application of the ointment batch containing the highest concentration of the sample extract (1.5g/10g ointment) showed the highest rate of wound healing and closure when compared to the blank ointment treated group. Phytochemical studies revealed that the methanol extract of J. curcas leaf contains flavonoids, saponins, tannins, alkaloids and glycosides. The ability of extract of J. curcas in wound care and healing suggests that its potentials can be harnessed in production of commercial ointments for wound healing and skin infections.

21. Shafiuddin M. et al., [2009] have studied the Wound Healing Activity of Traditional Herbal Formulation. It was an indigenous herbal formulation containing, comphora officinarum (Kafoor), Shorea robusta (Raal), Beeswax (Apis mellifera), Acacia catechu (Katha safeed), Sesamum indicum (Til oil), and Azadirachta indica (Neem oil) was evaluated for wound healing activity in excision and incision wound models in albino rats. The activity was compared with that of the control and framycetin sulfate cream 1% w/w as standard drug. The formulation showed a significantly higher contraction rate and shortened epithelization period in both the models. In excision model, the healing was 99% (p < 0.001) on 16th day compared to 85 % and 75% of healing with framycetin sulfate cream and control, respectively. In incision wound model, there was significant increase in tensile strength (p < 0.001). Thus, it is concluded that the formulation has got potential wound healing activity for both the types of wounds; justifying its use in the traditional practice.

22. Vijendren S. et al. [2012] have performed the Of In-vitro Wound Healing Activity of the inospora crispa Extracts. In this author have mentioned that the Wound healing is a complex and dynamic process which follows the normal physiology trajectory through the phases of homeostasis, inflammation, granulation and maturation. Malaysia has a rich collection of plant based healing. A large number of plants are used for the treatment of cuts and wounds by folklore traditions in Malaysia. Tinospora crispa Miers. (Menispermaceae) is popular in Asian countries for its miracle of curing diseases. T.crispa differs slightly from T.cordifolia
which is well distributed in India. Considerable researches have reported the activity of this plant possessing anti-malarial, diabetes treatment etc. In Malaysia, it is used traditionally for wound healing. Hence, the present study was aimed to evaluate its scientific validity. Stems of the plant were air dried after reduced into smaller size. Dried stems were then crushed into coarse powder. Then it was introduced into methanol for extraction by cold maceration technique. The extract was filtered after 7 days and fractionated with addition of chloroform. The methanol and chloroform fractions were made to evaporate until concentrated and formulated into ointments. Albino rats were separated into four groups of six rats in each group. All four groups were divided and served as a control, methanol fraction, chloroform fraction and standard drug (Betadine) respectively. The methanol extract and chloroform extract were investigated for the evaluation of its healing efficiency on excision wound model in Albino rats. Wound closure in percentage was used to evaluate the effect on wound healing. The methanol fraction and chloroform fraction showed a significant wound healing activity which was well comparable with the standard drug used. Methanol fraction ointment showed greater activity than chloroform fraction. This study indicated that the methanol fraction ointment possesses wound healing property which substantiates the folklore claim.

23. Abdulla M. A. et al., [2010] have studied the Role of Ficus deltoidea extract in the enhancement of wound healing in experimental rats. In this author have used the aqueous extract of *Ficus deltoidea* whole plant was investigated to evaluate the rate of wound healing enclosure and the histology of healed wounds in rats. Five groups of adult male *Sprague Dawley* rats were experimentally wounded in the posterior neck area. Group 1 animals were treated with sterile deionized water as a negative control. Thin layer of blank placebo was applied topically to the wounds of Group 2 rats. Group 3 and 4 rats were dressed topically with thin layer of placebo containing 5% and 10% *F. deltoidea* extracts, respectively. Thin layer of Intrasite gel was applied topically to wounds of Group 5 as a positive control. Grossly, wounds treated with placebo containing 5%, 10% *F. deltoidea* extract or Intrasite gel significantly accelerated the rate of wound healing compared to wounds treated with sterile deionized water or dressed with blank placebo. Histological analyses of healed wounds were consistent with the results of gross evaluations. Healed wounds dressed with placebo containing 5%, 10% *F. deltoidea* extracts or Intrasite gel showed significantly lesser
scar width at the wound enclosure and more fibroblast proliferation, collagen fibers accompanied with angiogenesis in the granulation tissue than blank placebo-treated wounds. Additionally, no macrophages were seen in the extract-treated wounds compared to the wounds dressed with sterile demonized water or blank placebo. These results strongly document the beneficial and significant effects of *F. deltoidea* extract to accelerate the rate of wound healing enclosure in the experimentally-induced wounds in rats.

24. **Govindam S. et al., [2011]** have performed the Screening of Wound Healing Effect of Bark of *Barringtonia Asiatica*. In this study author have mentioned that the *Barringtonia asiatica* is used in folklore medicine in fomenting, sealing of secondary infection, healing of wounds and skin eruptions. There was no scientific evidence justifying the use of bark of *Barringtonia asiatica*, therefore the present study was aimed at evaluation of wound healing activity of the plant. In the present study the bark of *Barringtonia asiatica* were studied for wound healing activity by incorporating extract in simple ointment base B.P. in concentration of 2% (w/w) and 4% (w/w). Wound healing activity was studied in three types of model in rats viz. excision, incision and burn wound model. The results were also comparable to those of a standard drug, nitrofurazone in terms of wound contracting ability, wound closure time, tensile strength. The statistical data indicated that the wound with ointment containing 4% w/w alcoholic extract exhibited significant (P < 0.001) wound contracting ability and period of epithelization. Significant tensile strength was observed with both the ointment formulations 2% w/w and 4% w/w. The results of histopathological examination supported the outcome of both excision and burn wound models. The experimental data demonstrated that *Barringtonia asiatica* displayed remarkable wound healing activity.

25. **Sarkar M. et al., [2013]** have evaluated the In Vivo Wound Healing and In Vitro Antibacterial Activities of The Different Extract of *Leucas Indica* Linn. In this study the preliminary phytochemical screening and acute toxicity studies were performed for both methanolic and aqueous fraction. The excision wound model was employed for wound healing activity on Wistar albino rats. The inflicted wounds were treated by ointment containing methanolic and aqueous fraction (10% and 15% w/w, topically). The antibacterial screening (zone of inhibition) was performed against six pathogenic bacteria using disc diffusion technique for petroleum ether, chloroform, ethyl acetate, methanol and aqueous fraction at different concentration (200, 100 and 50 mg/ml) and compared to
reference drug Gentamycin (10 mg/ml). The minimum inhibitory concentration (MIC) was evaluated for both methanolic and aqueous fraction against Staphylococcus aureus ML191, Bacillus subtilis 6633, Salmonella typhi 74 and Pseudomonas aeruginosa 25619 in descending order of concentrations (200 to 1.56 mg/ml). Author have found that Both the methanolic and aqueous fraction increased percentage of wound contraction when compared with reference drug Povidone iodine (10% w/w). The chloroform and methanolic fraction showed enough sensitivity against Staphylococcus aureus ML191, Bacillus subtilis 6633, Salmonella typhi 74, Pseudomonas aeruginosa 25619 and Escherichia coli 55/10HD whereas the aqueous fraction inhibited the growth of Staphylococcus aureus ML191, Bacillus subtilis 6633 and Salmonella typhi 74. There was a significant dose dependent zone of inhibition against Staphylococcus aureus ML191, Bacillus subtilis 6633 and Salmonella typhi 74 by all fractions. Author have concluded that the methanolic fraction showed better wound healing and antibacterial properties than aqueous one.

26. **Ekpo M. et al. [2011]** have studied the Antimicrobial and Wound Healing Activities of Centrosema Pubescens (Leguminosae). In this author have used the ethanolic extract of this plant showed significant antibacterial and antifungal effect against most of the pathogenic organisms: Bacillus subtilis, Proteus mirabilis, Staphylococcus aureus, Escherichia coli, shigella dysentriae, Proteus mirabilis, Salmonella typhi, and two fungi Candida albicans, Tinea capitis, with especially good activity against the dermatophyte (Tinea capitis) and some infectious bacteria (Escherichia coli, Tinea capitis, Proteus mirabilis and Staphylococcus aureus) with an MIC of 2.5 μg/disc. Phytochemical screening of the extracts showed the presence of a number of bioactive constituents such as saponins, tannins, terpenes etc. wound healing activity test on albino rats with the crude ointment of the plant showed a certain degree of wound healing which is evident from wound contraction and increased tensile strength.

27. **Jothy S. L. et al [2013]** have done the Chromatographic and Spectral Fingerprinting of Polyalthia longifolia, which is a Source of Phytochemicals. In this author have mentioned that Medicinal plants, such as Polyalthia longifolia (Indian mast tree), are important therapeutic sources for curing human diseases. In this work P. longifolia leaf extract was characterized by chromatographic and spectral fingerprinting techniques, phytochemical
and heavy metal analyses, and microscopy. Light microscopy of a transverse section of the leaf of P. longifolia revealed the presence of various plant cells. Phytochemical screening results revealed the presence of alkaloids, triterpenoids, tannins, saponin, anthraquinones, and glycosides in the extract. The concentrations of heavy metals determined in the extract were well below the permissible limit. Nine peaks observed in the HPLC spectra showed the presence of various compounds in the extract. The GCMS method used for quantification of (3β,4α,5α,9β)-4,14-dimethyl-9,19- cycloergost-24(28)-en-3-yl acetate (i.e., cycloeucalenol acetate) in the extract was rapid, accurate, precise, linear (R2 = 0.8752), and robust. The HPTLC analysis showed ten specific peaks for the methanolic extract of P. longifolia leaf. Twelve major peaks in the range of 4,000 to 500 cm-1 were observed in the FTIR spectra, which represented various specific functional groups in the extract.

28. Nwala C. O. et al. [2013] have studied the use of Extracts of Jatropha Curcas Leaf Formulated in A Simple Ointment Base in Wound Healing Activities. Author have mentioned that the safety of the use of leaf extract of Jatropha curcas plant in different groups of wistar albino rats at different doses was investigated. Excision wound of about 21mm diameter size was inflicted on one side of the central trunk of the different groups of the albino rats, and different doses of the leaf extracts formulated into ointments were topically applied on the wound of the different groups for 21 days for wound healing and closure. The animals were sacrificed and the effect of the leaf extract on blood biochemistry and histopathological examination of the kidney and liver tissues were assessed using standard techniques. There were no statistical significant differences (p>0.05) in the result of the biochemical parameters: total protein, albumin, globulin aspartate amino transferase (AST) and alanine amino transferase (ALT), between the control and the experimental animals. Histopathological examination of the kidney and liver tissues showed that the animal had normal histological feature. The findings of this study showed that the leaf extract of J. curcas has no harmful effects.