EUROPEAN ACADEMIC RESEARCH
Vol. IX, Issue 5/ August 2021

Impact Factor: 3.4546 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Biological and phytochemicals studies on stem leaves and roots of Calotropis procera: A review

REHANA NAZ
M.Phil. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
MUHAMMAD ANWAR PANEZAI
Professor, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
JAHANGIR KHAN ACHAKZAI
Ph.D. Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
SHAZIA MANZOOR
M.Phil. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
ABDUL MANAN KAKAR
Ph.D. Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
NAZIMA YOUSAF KHAN
Ph.D. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
AJAB KHAN TAREEN
Ph.D. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
INAYT ULLAH
M.Phil. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
ZAHOOR AGHA
M.Phil. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan
NAHIDA TAREEN
M.Phil. Scholar, Institute of Biochemistry
University of Balochistan, Quetta, Pakistan

Abstract

The oldest form of healthcare known to mankind is medicinal plants. The greater and economical substitutes from plant origin and search for new drugs is a natural choice. Calotropis Procera exhibited significant biological activities such as anti-bacterial, insecticidal,, anti-fungal, anti-parasitic activities, lenitive, carminative, spasmogenic potentials, antimicrobial, antioxidant, abortifacient,

mullusccide, diaphoretic, treatment of leprosy, bronchial asthma, antidysentric, antisyphilitic, antirheumatic, skin infection, nematocidal, proteolytic, antinflammatory, larvacidial, anticancer activities, ulcer, abdomen, dyspepsia, Hansen's disease, diarrhea, indigestion, cold, fever, vomiting, nausea, dental problems, rat bite, swellings, gonococcal arthritis and other rheumatic complaints, analgesic, pharmacological, antifertility, antihyperglycemic, anthelmintic, hepatoprotective, anticonvulsant and antimalarial. GC-MS and other techniques identified the phytochemicals for instance alkaloids, flavanoids, terpenoids, saponins, cardiac glycosides, tannis, 2, 6, 10-trimethyl, 14-ethylene-14- pentadecne, 2- tert-butyl-4-(1,1,3,3-tetramethylbutyl) , Glutamic acid, 1-Hexadecyne, butane, T-butyl dimethyl butane, Phenol-3-isoproxy5-methyl Z-1,6-Tridecadiene, Hexadecane, β-Sitosterol, Azulene, Cisvaccenic acid, β-Tocopherol, Levomenol, ergost-5-en-3-ol, octadecenoic acid, fatty acids ester derivatives, phthalate derivative, pentacyclic triterpenes derivatives, azocompounds, chlorocarbon, aromatic hydrogen, fatty acids and aromatic carboxylic acids.

Keywords: Calotropis procera, Biological, phytochemicals

INTRODUCTION

In recent years mankind shows great interest in the use of medicinal plants especially in the developing countries because they find herbal medicines to be safe for use and have less or no adverse effects especially compare with synthetic drugs. All over the world, one of the important filed of traditional medicines was represented by Herbal medicines to encourage the utilization of herbal medicine and to find out their potential as a source of new drugs. It is important to study medicinal plants which have tradition stature in a more compound technique. For centuries Homo sapiens have used plants for medicinal purposes [1]. Curing by using medicinal plant is as old as mankind itself. From the far past there is a connection between man and his drug search in nature and there is sufficient conformation from several sources: preserved monuments, original plant medicines and

even written papers. Due to many years of struggles man learned to trace drugs from fruit bodies, bark, seeds, and other parts of the plant and uses it against illness and he provide awareness about medicinal plant. Modern science has address their mobile activity and it has involved in latest pharmacotherapy. The development of ideas knowledge related to the utilization of medicinal plants as well as the advancement of recognition has grown the potential of pharmacists and physicians to acknowledge the challenges that have appeared with the spreading of professional solution in assistance of man's life. Historically plants with known remedies have been used to heal a huge range of diseases causing infections. The utilization of ayurvedic plants might be essential for their uses as medicinal herbs. Thus the greater and economical substitutes from plant origin and search for new drugs is a natural choice.

The oldest form of healthcare known to mankind are medicinal plants. Before chemical medicines introduction, people use to depend on the curing properties of medicinal plants. Due to an ancient saying that these medicinal plants are made to supply medical treatment, food, and other purpose that's why most of the people give importance to these plants. WHO estimated that about 80% of the 2.5 billion people depend totally on these traditional medicines of their basic medical care needs and live in the less developed countries. For the making of traditional medicines medicinal plants are acting as a "backbone" so these traditional medicines are utilized on regular basis by the people of less developed countries. In the world among groups there are almost 2000 racial groups and each group has its own experience and traditional medical knowledge [2, 3]. In the modern era on plant sources a lot of research have been done and now in medicine use it became the main supply of drugs. The importance of herbs that are used as medicinal remedies are because of a large number of medicinal plants. To cure diseases plant extracts are much effective and are of low cost. In Pakistan the plant species is not being cultured in a proper way because of less development resourses and now the specie is come to an extent. Thousands of years for the preparation of conventional medicines across the world the medicinal plants have been the ground and it also help to serve humanity with new and better medicines. On

the other hand while depending on factitious drugs green medicines are considered to be more safer. Now a lot of work has been focusing on valuing knowledge about the changing biological and antimicrobial activity of medicinal plants and then apply them to different disease causing microbes it seems to be an effective solution against chemically synthesized medicines because of several microbes that are resistant to to the activity of such medicines.

Origin of Calotropis Procera

Calotropis Procera is a flowering plant species belongs from the family of Apocynaceae and it is found in north Africa, south Asia, western Asia, tropical Africa, and Indonesia. It contain green milky latex in green fruit which is extremly toxic and turn into coating in the form of gluey which is soap resistant.

Calotropis Procera

Calotropis is a persisting plant and belong to family Apocynaceae. Calotropis is a sub familiy of flowering plant .The two common species of calotropis are Calotropis procera and Calotropis gigantean. Both species are used as replacement for one another and have homogenous effects. Calotropis grow as wild shrub in plains and sandy areas in all over of Pakistan [4]. It is root in mainly in drier part of hot and rain forest regions as well as in desiccated inland and semi-dry areas. It is found in all parts of world with climate that is sandy, warm, dry soil, and alkaline.. It grows as herb in farmland and found in misspend land. It grows along the road sides and in sand piles [5]. Calotropis is a hard, large, tall, highly branched and ever green shrub that has 5.4 meter height and contain toxic milky latex. By means of insects they are pollinated. By means of stem cutting and seeds Calotropis gigantean can be cultivated. By water and wind seeds of the plant are dispersed. Based on location Calotropis procera is known by many different names. It is called Ak in pakistan. it is called as milkweed, rubber bush, Sodom apple and swallows worth in English language. The common names used for calotropis in India are sufed aak and akavan. In Telugu calotropis is named as Mandran and it is known as Erukku in Tamil. Aakand (Bengali), Ak (Punjabi), Ushar (Arab name), Kharak (Pharsi), faftan (Senegal), calotropo

(Italy), and Ekka (Canada) these all are other names of Calotropis procers [5].

Figure 1 Calotropis Procera

The organic solvents extract are ethanol, water, and chloroform of this plant and it have anti-bacterial, insecticidal [6], anti-fungal and anti-parasitic activities. "Hay" has been made by using Calotropis procera as it contain highly digestible components and high level of protein so it has been regarded as a good animal food. This plant can also use as a lenitive and substance cause vomiting. It also contains carminative and spasmogenic potentials. From the various aromatic plants essential oils can be extracted and due to their unique antimicrobial and antioxidant activity they can be used for many purposes in numerous industries [7-10]. The leaves and stem that contain essential oil were examined by GC/MS examination. In leaf of calotropis nine components are present and in stem 10 components are present. In leaf oil tyranton, 1- pentadecene and 1-heptadecenare presente [11]. For abortifacient, spasmogenic and carminative properties, mullusccide, diaphoretic and for the treatment of leprosy, bronchial asthma, antidysentric, antisyphilitic, antirheumatic, antifungal, and skin infection the milky latex is used. Every part of plant has different number of biological activities such as antimicrobial, nematocidal, proteolytic, antinflammatory, larvacidial and anticancer activities.

History

Calotrope is local to very hot and semi-tropical Asia and Africa. The species are present in California, Central and South America (Brazil),

the Seychelles, Mexico, Thailand, Australia and many Pacific Islands, including Hawaii. Calotropis procera is native to Nepal, Pakistan, Iran, Iraq, United Arab Emirates, Yemen, Kuwait, Oman, Saudi Arabia, Niger, Nigeria, Israel, India, Algeria, Afghanistan and Zimbabwe. Calotropis is salt tolerant, dry-proof to high degree and seed are dispersed through wind and animal. Its grow as weed along lagoon edges, roadsides and overgrazed and local grasslands. It often influential in area of scarp cultivation, sandy soils in area of low rainfall are said to be indicator of over farming [5]. Calotropis gigantea is local to South East Asia and Asia and also in pacific islands, Australia, Central and northern South America and Africa as an decorative near townlet and shrines as a herb. It is set down in Africa from Sudan, Kenya, Tanzania, and Gabon as well as from Mauritius. Calotropis procera is basically from India and Persia and it is popularly known as jealously cotton, milk, and flower silk. From Asklepios scientific name of family asclepiadaecae is taken, The Greek God of medicine, with toxic milky latex and serous its leaves, stem, fruits and branches are covered which come out when tissue is broken. This plant development was welcomed by Brazil. Sometimes it is known as quickly spreading plant as they are able to establish themselves under unfavorable conditions in most unlikely places. This plant can be used in folk medicine. The plant leaves are used in worship. In people beliefs Calotropis is used in very early period and also as drug of choice for different disease. In Vedic book of India its different formulas are found, “Sushruta Samhita”. In old days period of ved Hindus utilize it at time of worship of sun. Because of this reason this plant was given name Arka prana which means shining leaf. In Indian traditional system of medicine different parts of plant have been used for treatment of tumors, ulcer, abdomen and liver [12]. The plant, is not only native in Palestine but also in West Indies as it is known to occur tropical belt (e.g. Jamaica), where the local people are familiar with it as "pillow cotton".

Location:

It naturally grows on a variety of lands and in different climate but best cultivated on sandy soil and mostly prefer dry climate. Calotropis grows best in saline and alkaline soil [13]. In semi dry conditions

calotropis grows commonly on deep sandy soils, rubbish heaps, and waste lands, from sea level up to 1300m altitude in sub-tropical climate. It is salt resistant and also a It is indicator of debilitated soil. It prefer dry habitat with annual rain fall ranges of 300-400mm. [14]. Temperature influenced the rate and percentage of germination throughout seed inhibition of Calotropis preocera. Since 1860, seed can germinate over a range of temperature three types of temperature are identified i-e base temperature, optimum temperature and maximum temperature. Crop grows in cardinal temperature which is lowest temperature. Up to 10 months only Calotropis can bear dry season and low rainfall. Plant growth is fast in wet season and obtuse in dry climate. First age of flowering is 2 years. For 12 days each flower opens. During first year plant growth can be up to 1m. It is generated by root, seed, root cutting and stem cutting. Per plant produces seeds about 100 to 1000.

Morphology

Calotropis gigantean is the botanical name of calotropis of family Apocynaceae. Asclepiadoideae is the genus of calotropis and specie is C. gigantea .Calotropis order is Gentain ales and belongs to kingdom Plantae. It occur soft single woody shrub and tree length of 6m. when cut into pieces it's all parts give off white milky latex. Following parts of plant are involved in the botanical. Calotropis bark contain yellow brown colour and is corky and thick; shoots are soft and green and have white fur like hairs. Leaves are simple; contain oval line and narrow ends with 6 pair of nerves present on surface, acute apex, and pale green colour. Calotropis flowers contain 5 dirty white sepals, 5 petals which are purple at tips and white in base with 5 stamens that surround a white lobed stigma. Fruits are spongy and green in colour. From March to Octobe will be the main flowering period. The two most common species of the genus are Calotropis procera and Calotropis gigantean. The height of Calotropis gigantea is 8 to 10 ft while the height of Calotropis procera is 3 to 6 ft.

Figure 2 showing leaves, flower, seed, and fruit of Calotropis procera.

Chemical composition

Latex is the main constituent of stem and leaves is that comprises of protease enzyme, calotropain FI, calotropain F11, calotropsin D1 and D11, ascorbic acid, calotoxin, calactin and also nitrogen and sulphur containing fish poison and gigatin. Alpha and beta calotropeols, amyrins and glycosides are present in root barks and stem. Fatty acids, glycolipids and waxes are present in leaves. Many cardiac glycosides that contain calotropin are examined in roots. In root bark calotropterpenyl, mundarol isovalerate and rutinoside are present. Plant is responsible for the isolation of Sitosterol. In trace amounts chromium and lead are present whereas, tannins and glycosides are present except steroids. Bark and leaves contain highest calcium amount. Cyclisadol and terpenes retinoside, calactin, calotoxin, calotropin, glucose and L-rhamnose are present in flowers of calotropis and leaves contain Amyrin, amyrin acetate, calotropin, and calotropagenin furthermore, latex contain calotropin, calotoxin, uscharin, trypsin, uzarigenin and also proceroside [15]. The chemical components of flower of calotropis are giganteol, actucery, acetate lupeol, and gigantin,traditionally usefull oil of calotropis procera has the following chemical composition. Tyranton (54.4%), 1- pentadecene (9.5%) is occupied by leaf oil. and 1-heptadecene (8.2%). Most important compounds of stem oil are Z-13-docosenamide (31.8%), isobutyl nonane (13.7%) [16].

Phytochemistry

For plants Phyto is Greek word. Human beings are helped in many ways by the families of phytochemicals. Phytochemical are basically defined as non-nutritive plant chemicals that have protective and disease preventive properties. These chemicals are produce by plants to protect theirselves but latest research shows that these chemicals also protect human beings to protect them against infectious diseases.[17]. Proceragenin is present in plant and benzoylinesolone in bark. Calotropin is present in stem and active component of leaves is mudarine along with 3 toxic glycosides, calotoxin, calotropin, uscharin, bitter yellow acid, and resins whereas, flower contain calotropenyl acetate and terpenol ester is present in latex. [5]. Calotropoleanyl ester, cardiac glycosides, cylotoxin and calactin show their presence in plant through chemical investigation. Calotropis also conatin anthocyanins, wax, gigantin, and giganteol . Power full enzymes are present in latex as well as a poisonous calactin glycosides and a non-toxic enzyme calotropin and compare to papain this enzyme is more proteolytic.[18]. Presence of protein, steroids, and flavonoids are determined by result of phytochemical screening of calotropis leaf extract and these compounds are the indication that they may have some medicinal properties. Flowers, leaves, root bark and root are plant parts used in medicines. For the treatment of hepatic problems, digestion, rapid wounds healing, and skin disorders powdered leaves are used. Leaves of calotropis were used by central India tribes as curative agent for jaundice. Furthermore, leaves are also used to treat joint pain and reduce. Homeopathic medicine uses calotropis and are also used by traditional medicine for treating ringworm.

Uses

Calotropis are used for improving soil holding capacity and soil fertility. The powder of root is used for the treatment in dyspepsia, asthma and bronchitis. Full dried plant of calotropis full dried plant is best tonic and depurative. For enormous floral arrangements in Thailand calotropis flower is used as it is long lasting. Hawaiian Queen believes that their flowers are symbol of royality that's why they are most popular. In Cambodia the flowers of calotropis are used in interior of house holding funerals and also used in funerals to

decorate urn. Calotropis uses in Ayurvedic medicine are huge they are used for different purposes; the powdered leaves are helpful in healing wounds and are good for treatment of liver disorders, digestion, constipation, intestinal worms and skin disorder. The dry fruit of this plant is derived from a single carpel that open from one side when release seeds only and latex is used as a disinfectant. [19]

General Uses

General uses include culinary uses, traditional medicine uses and ritualistic uses.

Ritualistic uses

calotropis plant is worship by Hindus. Lord Hanuman poja is incomplete unless offering of crown made with leaves of arka. On festival of sun god leaves of calotropis are used for bathing.. Arka is refered as plant that heals. Ratha Saptami is active by first taking a solemn ceremony bath. Calotropis gigantean plant leaves are used in ritualistic bath as it is the main feature of the ceremony. The plant is called arka in Sanskrit language. One of the main uses of the plant leaves is that in India each and every village, young married girls in afternoon move in form of groups to complete the forth night that start from mauna and collect a variety of green leaves of calotropis that are used after the forth night in the next day puja. calotropis is also famous among Queen of Hawaiian as royality symbol. [5].

Culinary uses

In Java, sweetmeat is made from the central part of calotropis. For flavouring purpose inner part of flower is used. For treating cough, cold and asthama the flower of calotropis is used as drink along with milk. One of the interesting use of the plant is that the young shoots and leaves are cooked as a vegetable. For making tea fruits of the plant are infused. In Nigeria and Benin calotropis extract is used in making of traditional cheese.

Traditional medical uses

For traditional practice of healing ayurvedic medicine are used and for this purpose different plants are used [20].calotropis plant is used

to treat Hansen's disease in India. For curing diarrhea madar root is used. Calotropis with its unique properties is used as medicinal plant. Conventionally for healing common diseases like indigestion, cold, fever, vomiting, nausea, and asthama calotropis is used with other medicines or alone. The flowers are bitter and tonic [8]. In case of insect bite the root are grind well and applied on bitten area by rubbing frimly. For curing dental problems, rat bite, swellings, gonococcal arthritis and other rheumatic complaints latex of plant is used and for bbronchial asthma flower is used. [21].

Literature review

Calotropis is a persisting plant and belong to family Apocynaceae. Calotropis is a sub familiy of flowering plant .The two common species of calotropis are Calotropis procera and Calotropis gigantean. Both species are used as replacement for one another and have homogenous effects. Calotropis grow as wild shrub in plains and sandy areas in all over of Pakistan. . The species are present in California, Central and South America (Brazil), the Seychelles, Mexico, Thailand, Australia and many Pacific Islands, including Hawaii. Because of calotropis procera natural biological activities it is the center of attention for many research institutes and pharmaceutical companies.Conducted past studies reported plenty of biological activities found in the plant. Some biological activities of plant include, anticancer activity, antimicrobial activity, antifungal and hepato protective activities.

It is studied that pharmacological activity of plant Calotropis Procera wound healing activity was shown by using bark and leaves it shows anti-cancer activity, Anti pyretic, anti-Hyperglycemic effect, Analgesic, Anti pyretic, Antioxidant, Anti diabetic, and neuromuscular blocking activity.in addition , all these biological activities are examined by using disc Diffusion, agar Difussion and incision and excision method. The results of the study showed that remarkable wound curing and bilirubin lowering property in Wistar rats. Furthermore, the extracts at low concentration are active against bacteria. The study concluded that the leaves of *calotropis procera* shows positive results for biological activies and is capable for use in preparation of ayurvedic drugs [22].

It is reported in the study about the Ayurvedic and pharmacological activities of plant *Calotropis Procera Linn*. The whole plant was examined for analgesic, pharmacological, antitumor, antifertility, antihyperglycemic, anthelmintic, hepatoprotective, antiinflammatory, antidiarrhoeal, anticonvulsant, antimalarial and antimicrobial activities. In addition, these all biological properties were examined using different techniques. The results of the study showed that this plant exhibit an exceptional variety of biological compounds. This plant showed significant activity in reducing the effect of all the factors determined in the study. Furthermore, the study concluded that this whole plant is capable for use in preparing ayurvedic medicines [5].

It is studied that biochemical effects the plant *Calotropis procera* on hepatotoxicity. The study includes, 42 male albino rats divided in six groups. Each group received different extract of leaves prepared in water, ethanol and chloroform and determined their effect on liver. Carbon tertrachloride was used to produce hepatotoxicity. Moreover, the results indicated that all the three extracts produced remarkable reduction in total protein, alanine, aspartate, alkaline phosphatise, albumin and total bilirubin levels compared to CCL_4. The study further concluded that, C. procera showed hepatoprotective activity which may be due to the presence of huge quantum of phytochemical compounds present in the same [23].

It is analysed that phytochemical constituents of chloroform and ethanolic extracts of *Calotropis procera* using Gas chromatography mass spectroscopic technique (GC-MS). The leaves of the plant in ethanol and chloroform were examined for phytochemical analysis. The results of qualitative analysis showed that this plant contain alkaloids, flavanoids, terpenoids, saponins, cardiac glycosides and tannis. GC-MS studies of the plant showed that the highest peak was obtained by octadecenoic acid and methyl ester. However, lowest peak was obtained by cyclohexanol-3-methyl in ethanolic leaves extract. On the other hand highest peak was obtained by 2, 6, 10-trimethyl, 14-ethylene-14- pentadecne and lowest peak was obtained by 2- tert-butyl-4-(1,1,3,3-tetramethylbutyl) in chloroform extract of leaves. The study concluded as the presence of these natural

compounds in the studied plant is responsible for the pharmacological activities [24].

It is examined that comparative GC-MS analysis of biological compounds in methanolic leaf extract of Calotropis gigantea and latex. The investigation of the plant showed the presence of 46 total bioactive compounds among them 22 from discovered from latex and 24 from leaves. These compounds were extracted from the studied plant via GC-MS analysis. These include; Glutamic acid, 1-Hexadecyne, butane, T-butyl dimethyl butane, Phenol-3-isoproxy5-methyl Z-1,6-Tridecadiene, Hexadecane and Trocosane from latex. Whereas, ß-Sitosterol, Azulene, Cisvaccenic acid, ß-Tocopherol, Levomenol etc were obtained from leaves. On the other hand the other compounds obtained were similar in both latex and leave. The study did not include Calotropis Procera plant. However it was concluded that C. gigantean and latex contain a huge variety of biochemical compounds [25].

It is reported that presence of phytochemical constituents by GC-MS analysis and HPTLC of Calotropis Procera plant. Moreover, the phyto-constituents were examined quantitatively and qualitatively via GC-MS technique. The extract of leaves in hexane was prepared and analysed. The results of GC-MS showed the highest peak area of 25.22% obtained by ergost-5-en-3-ol and lowest peak area of 0.24% obtained by 9 octadecenoic acid. HPLC analysis results showed seven bands under UV light and were observed at different R_f values. The study concludes that, these phyto-constituents are active molecules responsible for different therapeutic effects. The present study might give different results as per variant climatic conditions of the study area [26].

It is studied that antibacterial and Phytochemical screening of *Calotropis procera* Leaf Extracts against methicillin resistance and vancomycin obtained from the wounds of patients in hospital. The bacterial pathogens used in the study involved; pseudomonas aeruginosa, escherichia coli, streptococcus pyogenes, staphylococcus aureus and Proteus mirabilis. The method used to analyze antibacterial activity was agar well diffusion method. The results of the study showed the highest inhibition against Escherichia coli and staphylococcus aureus. The lowest zone of inhibition was recorded

against pseudomonas aeruginosa and klebsiella pnuemoniae. Moreover, streptococcus pyogenes and proteus mirabilis has shown no inhibitory action against n-hexane extract [27].

It is determined in this study about various chemical constituents from Calotropis procera plant extract in chloroform through gas chromatography mass spectrometry (GC-MS). The results of the study involved the identification of 25 compounds classified in to three categories; eight fatty acids ester derivatives, one phthalate derivative and sixteen pentacyclic triterpenes derivatives. The study concludes that these might be the compounds present in Calotropis procera responsible for its antipathogenic activities [22].

It is analyzed that biopesticidal activity of the plant Calotropis Procera against macrophomina phaseonlina. The study involved various concentrations of extracts in leaves. They include n-butanol, chloroform, ethyl acetate, and n-hexane. The effect of different extracts was tested against antifungal activities. The results of the study showed that the maximum zone of inhibition against the macrophomina phaseonlina was obtained from methanolic extract. The n-hexane fraction was analyzed for seven compounds namely azocompounds, chlorocarbon, aromatic hydrogen, fatty acids and aromatic carboxylic acids via GC-MS technique. However the study further concludes that the outstanding antifungal activity against the methanolic extract was due to presence of these identified compounds obtained in hexane fraction [28].

It is reported that this plant contain various phyto-chemicals which shows diverse ethno-medicinal and pharmaceutical properties. Caloropis procera and Calotropis gigantea, both contain number of disease curing properties against infection causing agents such as worms, viruses and bacteria; and they are used for treating physiological disorders and diseases. The study involves the use of Calotropis latex in both concentrated and preserved forms shows many pharmaceutical applications and is more affective in interventional therapies, different types of cancers can be cure by using alternative and complementary medicine. Furthermore its Latex can be used for preparing different herbal drugs that might be non-steroidal and in patients shows huge huge cancer suppressing

effeciency. The study conclude that for ayurvedic drugs, industrial products and pesticides Plant can become a best future source [23].

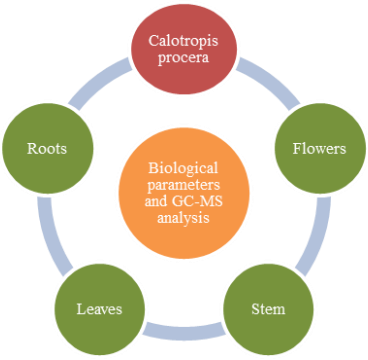

Figure- showing the utilization of Calotropis procera plant

It is examined that hepatoprotective activity of *calotropis procera.* Male albinp rats were used in the study. In calorimetric enzymetic method biochemical parameters were determind by using commercial kits. Acute toxicity and hepatoprotective methods were used in the study. All groups are treated with ethanol, aqueous and chloroform. Phytochemical screening showed that the plant contain vanoids, glycosides, terpenes and alkaloids. The results of the study reveal that leaves and latex of plant exhibit significant decrease in the serum marker enzyme level and also observed effective hepatoprotective effect. The study shows that ethanol, chloroform and aqueous all 3 extacts of leaves and latex show positive results towards hepatoprotective activity and in future can b used for the synthesis of useful drugs [23].

The above literature can be concluded as, the use of medicinal plants a cost effective way of obtaining new drugs. At present, medicinal plants is gaining a lot of attention as a result of increased pathogenic resistance. According to the report published by World Health Organization (WHO) in 2018 more than 50% of the countries are recognising the importance of medicinal plants in controlling the uprising pathogenic resistance. The study shall involve the use of whole plant in exploring various compounds. The study also investigates the effect of different extracts on various biological parameters. This is the cost effective way of getting benefits from the

plant and this will in turn help the entire humanity to protect them from various diseases.

REFERENCES

1. Said O, Khalil K, Fulder S, Azaizeh H, Ethnopharmacological survey of medicinal herbs in Israel, the Golan Heights and the West bank region. Journal of Ethnopharmacology. 2002; 83:251-265.
2. Al-Snafi AE. Central nervous and endocrine effects of Myristica fragrans. 4th Arabic Conf. of Medicinal plants, Thamar Univ. Yemen 1999, 111-121.
3. Al-Snafi AE, Al-Trikrity AH. Ahmad RH. Hypoglycemic effect of Teucrium polium and Cyperus rotundus in normal and diabetic rabbits. Med J Tikrit Univer, 9(2), 2003, 1-10.
4. M.F. Azhar, M.T. Siddiqui, M. Ishaque, A. Tanveer. (2014). Study of ethnobotany and indigenous use of Calotropis procera (Ait.) in cholistan desert, Punjab, Pakistan. J Agric Res. 52(1): 117-126
5. A.K. Meena, A. Yadav, M. Rao. (2011). Ayurvedic uses and pharmacological activities of Calotropis procera Linn. Asian Journal of Traditional Medicines. 6(2): 45-53.
6. L. Moursy. (1997). Insecticidal activity of Calotropis procera extracts of the flesh fly, Sarcophaga haemorrhoidalis fallen. Journal of the Egyptian Society of Parasitology. 27(2): 505-514.
7. E.M. Abdallah, A.E. Khalid. (2012). A preliminary evaluation of the antibacterial effects of Commiphora molmol and Boswellia papyrifera oleo-gum resins vapor. International Journal of Chemical and Biochemical Sciences. 1: 1-15.
8. Z. Arshad, M.A. Hanif, R.W.K. Qadri, M.M. Khan. (2014). Role of essential oils in plant diseases protection: a review. International Journal of Chemical and Biochemical Sciences. 6: 11-17.
9. M.A. Hanif, H.N. Bhatti, M.S. Jamil, R.S. Anjum, A. Jamil, M.M. Khan. (2010). Antibacterial and antifungal activities of essential oils extracted from medicinal plants using CO2 supercritical fluid extraction technology. Asian journal of chemistry. 22(10): 7787
10. M.M. Khan, M. Iqbal, M.A. Hanif, M.S. Mahmood, S.A. Naqvi, M. Shahid, M.J. Jaskani. (2012). Antioxidant and antipathogenic activities of citrus peel oils. Journal of Essential Oil Bearing Plants. 15(6): 972-979.
11. SD. Moronkola, C. Ogukwe, K. Awokoya. (2011). Chemical compositions of leaf and stem essential oils of Calotropis procera Ait R. Br [Asclepiadaceae]. Der Chemica Sinica. 2(2): 255260.
12. S.J. Chundattu, V.K. Agrawal, N. Ganesh. (2011). Phytochemical investigation of Calotropis procera. Arabian Journal of Chemistry.
13. M. Adak, J. Gupta. (2006). Evaluation of antiinflammatory activity of Calotropis gigantea (AKANDA) in various biological system. Nepal Medical College journal: NMCJ. 8(3): 156-161.

14. H.R. Chitme, R. Chandra, S. Kaushik. (2004). Studies on anti-diarrhoeal activity of Calotropis gigantea R. Br. in experimental animals. J Pharm Pharm Sci. 7(1): 70-75.
15. A. GUPTA, R. SINGH, C. PURWAR, D. CHAUHAN, J. Singh. (2003). Two pentacyclic triterpenes from the stem of Calotropis procera. Indian journal of chemistry. Sect. B: Organic chemistry, including medical chemistry. 42(8): 2030-2033.
16. S. Sarkar, R. Chakraverty, A. Ghosh. (2014). Calotropis gigantea Linn.-A Complete Busket Of Indian Traditional Medicine. Int. J. Pharm. Res. Sci. 2(1): 7-17.
17. A. Tiwari, S. Singh, S. Singh. (2014). Chemical Analysis of Leaf Extracts of Calotropis procera. International Journal of Scientific and Research Publications. 4(1): 1-3.
18. S. Quazi, K. Mathur, S. Arora. (2013). Calotropis procera: an overview of its phytochemistry and pharmacology. Indian Journal of Drugs. 1(2): 6369
19. R. Padmadhas, R. Ragunathan. (2009). The effect of lead nanoparticle present in the leaf of Calotrphis gigantea which result in the loss of the Painted Grass Hopper of the western ghats species in India. Int. J. Nanotechn and Appl., India. 3(2): 89-96.
20. I. Ahmad, M.A. Hanif, R. Nadeem, M.S. Jamil, M.S. Zafar. (2008). Nutritive evaluation of medicinal plants being used as condiments in South Asian Region. JOURNAL OF THE CHEMICAL SOCIETY OF PAKISTAN. 30(3): 400-405
21. G. Kumar, L. Karthik, K.V.B. Rao. (2011). A review on Pharmacological and phytochemical profile of Calotropis gigantea Linn. Parmacologyonline Newsletter. 1: 1-8. [28] M.A. Alam, M.R. Habib, F. Nikkon, M. Khalequzzaman, M.R. Karim. (2009). Insecticidal activity of root bark of Calotropis gigantea L. against Tribolium castaneum (Herbst). World Journal of Zoology. 4(2): 90-95.
22. Adam, I. A., & Hagr, T. E. (2019). GC-MS Analysis of Chemical Constituents from Chloroform Extracts of Calotropis procera (Ait.) R. Br (Asclepiadaceae) Roots Collected in Sudan. *Open Science Journal of Analytical Chemistry*, *4*(2), 20
23. Abd Alrheam, A. I. A. (2015). Biochemical effects of Calotropis procera on hepatotoxicity. *Biomedical Research and Therapy*, *12*(2), 1-8.
24. Verma, R., Satsangi, G. P., & Shrivastava, J. N. (2013). Analysis of phytochemical constituents of the ethanolic and chloroform extracts of Calotropis procera using gas chromatography-mass spectroscopy (GC-MS) technique. *Journal of Medicinal Plants Research*, *7*(40), 2986-2991.
25. Sharma, S., Kumari, A., & Sharma, M. (2016). Comparative GC-MS Analysis of Bioactive Compounds in Methanolic Extract of Calotropis gigantea (L) WT Aiton Leaf and Latex. *International Journal of Pharmacognosy and Phytochemical Research*, *8*(11), 1823-1827.
26. Dwivedi, B., Singh, A., Mishra, S., Singh, R., Pant, P., Thakur, L. K., & Padhi, M. M. (2014). Evaluation of phytochemical constituents by gas

chromatography-mass spectroscopy & HPTLC of Calotropis procera. *World Journal of Pharmaceutical Research*, *3*(7), 708-715.

27. Akpuaka, A., Ekwenchi, M. M., Dashak, D. A., & Dildar, A. (2013). Biological activities of characterized isolates of n-hexane extract of Azadirachta indica A. Juss (Neem) leaves. *Nature and Science*, *11*(5), 141-147.
28. Waheed, N., Jabeen, K., Iqbal, S., & Javaid, A. (2016). Biopesticidal activity of Calotropis procera L. against Macrophomina phaseolina. *African Journal of Traditional, Complementary and Alternative Medicines*, *13*(6), 163-167