Chapter 5

Medicinal Plants of West Godavari

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Additional information is available at the end of the chapter

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Abstract

Medicinal plants are one of the nature's greatest gifts to the mankind. Each plant will have an exquisite deal of character, which can act as an antidote to various of diseases. Traditional medicine has become a vital alternative source of medicine all over the world today with some approximation of about 80% of the primary health care system in some developing countries. Medicinal plants are known to comprise of hundreds of active constituents that may be potentially useful for the development of therapeutic agents. The development of therapeutic agents involves the isolation and identification of bioactive compounds from plant materials which is crucial for drug discovery. Researchers from all around the globe have focused on drug discovery from the natures' wonder medicinal plants, forming an important group of complementary and alternative medicine (CAM) therapy. West Godavari is a part of Andhra Pradesh, India, which hosts several plants that have high therapeutic significance. Each of the plants has a unique feature which can be employed for healing of various lethal diseases. The present examination intends to review the therapeutic plant assets of West Godavari area Andhra Pradesh. This evaluation also offers the critical elements which include medicinal properties of various medicinal plants found in West Godavari district of Andhra Pradesh, India.

Keywords: drug discovery, traditional medicine, West Godavari district, nature, antidote

1. Introduction

The great thing that nature has given us is the medicinal plants. Each plant will have a great deal of character, which can act as an antidote against different types of diseases.

Traditional medicine has become a vital alternative source of medicine all over the world today with some approximation of about 80% of the primary health care system in some developing countries (e.g., Nigeria, Ghana, China, and India [1, 2]).

India has a recognized traditional system of medicine, that is, Ayurveda, Siddha, Unani, Homeopathy, Yoga, and Naturopathy which placed India in a unique position in the world [3].

As the growth of knowledge has increased, the number of new plant-derived drugs grow at an accelerated pace. India has an enormous wealth of medicinal plants, and often it has been referred to as the Medicinal Garden of the world [4].

Medicinal plants are known to comprise hundreds of active constituents that may be potentially useful for the development of therapeutic agents. The development of therapeutic agents involves Identification and segregation of bioactive compounds from plant materials that are crucial for drug discovery [5].

Researchers from all around the globe have focused on drug discovery from the nature's wonder medicinal plants, an important group of complementary and alternative medicine (CAM) therapy [5].

The man has acclimated himself with plants and utilized them in an assortment of courses all through the ages. Primitive man looking for nourishment and to adapt efficiently to human sufferings started to recognize those plants appropriate for restorative reason from others with complete pharmacological activity. This connection between plants and man has developed, and many plants came to be utilized as medicines. The development of information to cure infections proceeded at a quick pace and various new plant-derived drugs expanded in this manner.

Herbs employed in ancient medicines represent a tiny, low portion of present plants solely. With the advances in informative innovation and science, many bioactive concoction substances are distinguished in plants or foodstuffs through phytochemical and pharmacological studies.

The clinical utilization of plants portrayed in Indian Vedas for curing distinctive maladies. In the present setting, the conventional arrangement of pharmaceutical is broadly acknowledged and drilled by individuals around the world.

The natural solution is drilled around the world. For a considerable length of time, individuals have swung to natural solutions for basic cure illnesses, for example, colds, sensitivity, annoy stomachs, and toothaches, and the pattern is continually expanding. In this way, there has been a move in general pattern from manufactured to homegrown solutions.

The advancement of plant-derived drugs began when improvement of science. The homegrown drug is compelling, minor symptom, and moderate than the medications purchased from an allopathic pharmaceutical. Homegrown medications incorporate herbs, homegrown materials, natural arrangements, and homegrown items that contain diverse parts of plants or other plant materials as dynamic fixings.

As the worldwide utilization of homegrown therapeutic items keeps on developing and numerous, the newest items are brought into the market, general medical problems and concerns encompassing their well-being are likewise progressively perceived. Although some homegrown herbs have promising potential and are utilized, a considerable lot of them stay untested and their utilization likewise not observed.

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It has turned out to be fundamental, subsequently, to outfit the overall population incorporating human services experts with adequate data to encourage better comprehension of the dangers related to the utilization of these items and to guarantee that all solutions are protected and of reasonable quality. Discussion in this review is restricted to lethality-related issues, and significant well-being concerns are emerging from the utilization of homegrown drugs and additional factors advancing them. Some essential difficulties related to the successful checking of security of these homegrown cures are additionally featured to refocusing appropriate administrative offices on the requirement for viability and guaranteeing sufficient assurance of general well-being and advancing well-being.

The worldwide acknowledgment and utilization of natural medicines and related items keep on assuming exponential increment. Issues identifying with unfavorable responses as of late are additionally ending up more distinctive, expanding in common and no longer accessible to refute as a result of prior misguided judgment with regards to or classifying homegrown restorative items as "protected" because they are getting from "characteristic" source. In this manner, regulatory approaches on homegrown pharmaceuticals should be institutionalized and reinforced on a worldwide scale. Pertinent administrative experts in various nations of the world should be proactive and keep on putting proper set up measures to secure the general well-being by guaranteeing that every single natural prescription endorsed available to be purchased sheltered and of reasonable quality. Suppliers of pharmaceuticals, for example, doctors, attendants, and drug specialists, regularly have little preparing in and comprehension of how homegrown solutions influence the well-being of their patients. Satisfactory preparation is present extremely basic since most patients are regularly on different sorts of the solution or non-professionally prescribed drugs. Additionally, it is vital that all suppliers of natural solutions are adequately enabled to assume a part in observing well-being of homegrown prescriptions. This, be that as it may, ought to be in a joint effort with the traditional healers. For this to be successful, it is basic to make a climate of trust to encourage satisfactory sharing of information about the utilization and well-being of homegrown solutions. Truth be told to suppliers of homegrown solutions, and patients/shoppers are imperative for the version of possibly genuine dangers from misuse of natural medications. The supplier must demonstrate adequate responsibility toward understanding the utilization of homegrown drugs.

West Godavari is a part of Andhra Pradesh, India, which hosts several plants that have high medicinal importance. Each of the plants has a unique feature which can heal lethal diseases. Some researchers have drawn some plants into attention from lots of surveys. It also hosts traditional healers who can efficiently cure some of the deadly diseases.

The traditional plant healing has brought a significant breakthrough in curing diseases very efficiently. The nutraceutical companies have isolated plant compounds based on the knowledge provided by the traditional healers. An adequate amount of knowledge is still to be known from the traditional healers. There is a substantial increase in the use of Ayurvedic medicines and medicines derived from plant sources. The reason being its efficacy and lack of side effects, and there is an economic point of view as well. Based on the information given by the traditional healing system, several modern scientific studies are being conducted on the various medicinal plants.

Some of the medicinal plants have been perished because of urbanization. The ancient knowledge about medicinal plants had not been documented, and many of the valuable plants are

at the edge of extinction. The government and NGO should take necessary conservatory steps to avoid extinction of valuable medicinal plants.

Several bioactive compounds isolated from medicinal plants are in excess demand in nutraceutical companies.

The present study aims to review the medicinal plant resources of West Godavari district, Andhra Pradesh. This review also deals with the critical aspects such as medicinal properties of various medicinal plants present in West Godavari district of Andhra Pradesh, India. This article deals with the medicinal properties of plants which are implicated in various diseases such as jaundice, cardiac diseases, asthma, cancer, skin diseases, diarrhea, conjunctivitis, ulcers, diabetes, leprosy, syphilis, and neural diseases.

This article also deals with the scientific studies conducted by the researchers on numerous medicinal plants present in West Godavari.

2. Medicinal plants of West Godavari

2.1. *Annona reticulata* L.

Annona genus (Annonaceae) has about 119 species [6]. *Annona reticulata* belongs to the plant family Annonaceae and is a semi-evergreen and small deciduous tree [7]. *Annona* species are having a place in custard apple family and is cultivated everywhere in India for its fruit. All components of genus *Annona* are employed in natural medication within the tropics. It is thought to be a smart supply of natural antioxidants for various diseases.

It is being cultivated in Peru and Brazil and is grown mostly in the Bahamas and occasionally in southern Florida, Bermuda, the east coast of Malaysia, and throughout Southeast Asia and the Philippines [8, 9].

2.1.1. Scientific evidences

This plant is known to possess antioxidant activity [7], anticancer activity [10–13], anthelminthic activity [14], anti-inflammatory activity [6], analgesic, and CNS depressant activity [15].

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2.2. *Abutilon indicum*

Abutilon indicum (Linn.) belong to family Malvaceae and it is scattered throughout Andhra Pradesh, India, and it is being used for treating various diseases like diabetes, leprosy, ulcer, and jaundice [16].

In Siddha System of Medicine, it has been using as a remedy for jaundice, piles, ulcers, and leprosy [17].

2.2.1. Scientific studies on Abutilon indicum

This plant is proved to have diuretic activity [18], antimycotic activity [19], anti-arthritic activity [20], anti-inflammatory and anti-asthmatic activity [21], hypoglycemic activity [22], anticonvulsant activity [23], wound healing activity [24], antidiarrhoeal activity [25], antimalarial [26], and hepatoprotective activity [27].

2.3. *Abrus precatorius*

Abrus precatorius belongs to family Fabaceae. *Abras precatorius* is a plant originating from Southeast Asia. The name *Abrus*, means beautiful or graceful, is used to describe the appearance of the seed [28]. The seeds of *Abrus precatorius* have a history in a variety of roles because they have uniform size and weight. They were once called as Rati, and utilized as weights for measuring gold and silver [28].

2.3.1. Scientific studies on Abrus precatorius

This plant is demonstrated to have antibacterial activity [29], diuretic activity [30], nephroprotective activity [31], neuroprotective activity [32], bronchodilator activity [33], effect on neuromuscular antioxidant activity [34], anticonvulsant activity [35], antispasmodic activity [36].


2.4. *Acacia Arabica*

Acacia is the most remarkable variety of family: Leguminosae, as a matter of first importance, portrayed by Linnaeus in 1773. It is assessed that there are approximately 1380 types of Acacia around the world, and two-thirds of them local in Australia and rest of spread around tropical and subtropical districts of the world [37–39].

2.4.1. Scientific studies on Acacia Arabica

This plant is proved to have antidiabetic activity [40], antimutagenic activity [41], antimicrobial activity [42], antifungal activity [43], antidiarrhoeal activity [44], antiviral activity [45], nematicidal activity [46], antioxidant activity [47], and abortifacient activity [48].


2.5. *Bambusa arundinacea*

Bambusa arundinacea, belong to Gramineae family, is a highly reputed Ayurvedic tree commonly known as the Bamboo [49]. Bamboos contrast from alternate individuals from the grass family

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because of the nearness of branches at every node. A bamboo culm comprises of an internode (which is empty for most bamboo) and a node, which is robust and gives basic structural integrity to the plant. The buds on the node later develop into side branches [50].

2.5.1. Scientific evidences

This plant is demonstrated to have antifertility activity [51], anti-bacterial activity [52], anti-inflammatory [53], and anti-ulcer activity [54].

2.6. *Boerhavia diffusa* L.

Boerhaavia diffusa L. (Nyctaginaceae), generally known as "Punarnava" in the Indian arrangement of medicine, is a perennial creeping herb found all through the wastelands of India [55]. The roots are reputed to be diuretic and laxative and are given for the treatment of anasarca, ascites, and jaundice [56].

2.6.1. Scientific evidences

This plant is verified to have antidiabetic activity [57], antibacterial activity [58], hepatoprotective activity [56], analgesic/anti-inflammatory activity [59], antitumor activity [60], anticonvulsant activity [61], antiproliferative and antiestrogenic activity [62], cytological activity [63], bronchial asthma [64], and anti-fibrinolytic activity [65].

2.7. *Calotropis procera*

Calotropis procera belong to family Asclepiadaceae is a tropical plant growing wild in warm climate up to an altitude of about 1050 m. It is a native plant of North Africa, and it is well distributed throughout India, particularly it is abundantly found in Rajasthan. It also found in Pakistan, Africa, Mexico, Australia, Egypt, Central and South America, and Caribbean islands [66, 67].

2.7.1. Scientific evidences

This plant is verified to have hepatoprotective activity [68], antioxidant activity [69], antipyretic activity [70], anthelmintic activity [71], anti-inflammatory activity [72], antidiarrhoeal

activity [73], spasmolytic activity [74], antidiabetic activity [75], antiulcer activity [76], and wound healing activity [77].

2.8. *Momordica charantia*

Momordica charantia is a climber that have its place in family Cucurbitaceae, is commonly known as bitter gourd or bitter melon. This plant typically grows in tropical areas of Asia, Amazon, East Africa, and the Caribbean and it is being cultivated throughout the world for its use as a vegetable as well as medicine [78].

2.8.1. Scientific evidences

This plant is demonstrated to have antioxidant activity [79], antidiabetic activity [80], anticancer and antitumoral activity [81], antiviral activity [82], antifertility activity [83], and antineoplastic activity [78].

2.9. *Punica granatum*

Punica granutam is widely known as pomegranate. It belongs to Punicaceae family, which is a large deciduous shrub or small tree native to Asia. *Punica granutam* have been used in

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folk medicine for centuries in the Middle East, India, and China, and it has been used to treat disorders ranging from inflammation and rheumatism to the pain of a simple sore throat. The most famous usage worldwide has been as a vermifugal or taenicidal agent [84–87].

2.9.1. Scientific evidences

This plant is verified to have healing activity [88], anti-inflammatory activity [89], antidiabetic activity [90], and anticancer activity [91].

2.10. *Pongamia pinnata*

It is a medicinal plant native to the Western Ghats and is chiefly found in tidal forests of India. *Pongamia pinnata* also was known as *Derris indica*, is a monotypic genus and grows profusely along the coasts and riverbanks in Myanmar and it has multi-purpose benefits and as a potential source of biodiesel [92, 93].

2.10.1. Scientific evidences

This plant is proved to have antihyperglycemic and antilipidperoxidative effects [94], antihyperammonemic effect [95], anti-inflammatory activity [96], antiviral activity [97], antifilarial potential [98], ulceroprotective activity [99], nootropic activity [100], and antinociceptive activity [101].

2.11. *Piper longum*

Piper longum Linn. has been named under the family Piperaceae is a flowering plant in the *Piper* family. *Piper longum* commonly known as long Indian pepper, it is widely being used as a spice and flavoring agent in various foods and herbal formulations. It is widely cultivated in India, Nepal, Indonesia, Malaysia, Sri Lanka, Timor, and the Philippines. In India, it is extensively grown in the central Himalayas to Assam, Khasi and Mikir hills, lower hills of West Bengal and evergreen forests of the Western Ghats from Konkan to Kerala and also from Car Nicobar Islands because of its therapeutic potential [102–105].

2.11.1. Scientific evidences

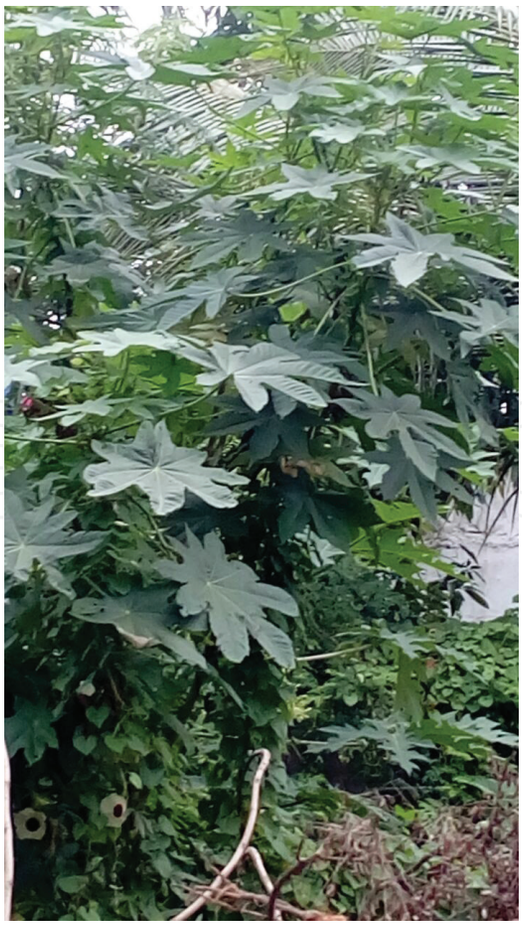
This plant is shown to have anti-apoptosis and antioxidant [106], analgesic activity [107], immunomodulatory activity [108], anticancer and antitumor activity [109], antidiabetic activity [110], antifertility activity [111], anti-snake venom activity [112], melanin-inhibiting activity [113], and antiulcer activity [114].

2.12. *Ricinus communis*

Ricinus communis, belong to a family Euphorbiaceae and it is most commonly known as castor oil plant. *Ricinus communis* as a tropical plant, known as castor bean, distributed widely across the world, and it is a local of India and developed all through the nation in greenery enclosures and fields and furthermore develops wild in squandering places [115, 116].

2.12.1. Scientific evidences

This plant is shown to have antimicrobial and antifungal [117], antioxidant activity [118], anti-implantation activity [119], anti-inflammatory and free radical scavenging activity [120], central analgesic activity [121], anti-tumor activity [122], larvicidal and adult emergence inhibition activity [123], antiulcer activity [124], molluscicidal, insecticidal and larvicidal activity [125], antidiabetic activity [126], cytotoxic activity [127], and antihistaminic activity [128].



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2.13. *Syzygium cumini* (L.)

Syzygium cumini Linn. is a huge evergreen tropical tree belongs to the family Myrtaceae, and this plant is also mentioned in literature as Jamun, synonym as black plum or jambolana, since ancient age this plant is very well-known for their pharmacological properties [129, 130].

2.13.1. Scientific evidences

This plant is revealed to have antiallergic activity [131], gastroprotective activity [132], antioxidant activity [133], CNS activity [134], anti-inflammatory activity [135], antihyperlipidemic activity [136], antidiarrhoeal activity [137], antipyretic activity [138], antispasmodic activity [139], and antiviral activity [140].

2.14. *Sida cordifolia*

Sida cordifolia L. belongs to family Malvaceae and commonly called as Country Mallow and Bala (Sanskrit). This herb is extensively spread throughout the tropical and subtropical regions of India [141].

In Ayurvedic practices, *Sida cordifolia* has three basic applications: Mashabaladi Kvatha, where the plant seeds are blended with different fixings to soothe relieve muscular pain; Balataila, a procedure for the treatment of sensory system grievances and stomach issues and as a heart tonic; and the squashed leaves of the plant as an astringent for the treatment and dressing of wounds or skin wounds [142].

2.14.1. Scientific evidences

This plant is shown for its antioxidant activity [143], anti-inflammatory activity [144], antiulcer activity [145], antidiabetic activity [146], nephroprotective activity [147], cytotoxicity [148], anti-hypercholestrolemic activity [149], hepatoprotectivity [150], cardiovascular activity [151], and anticancer activity [152].

2.15. *Sapindus mukorossi*

Sapindus mukorossi belongs to family Sapindaceae and has some common names such as soapnut, soapberry, washnut, reetha, aritha, dodan, and doadni. It is an attractive medium-sized deciduous tree found in diverse geographical provinces like Gangetic Plains, Western Ghats, and Deccan Plateau in India [153].

2.15.1. Scientific evidences

This plant is proved to have an anti-mosquito activity or larvicidal activity [154], cytotoxic activity [155], tyrosinase inhibition and free radical scavenging [156], antigonorrhoeal activity [157], antifungal activity [158], and molluscicidal activity [159].

2.16. *Tribulus terrestris* L.

Tribulus terrestris L. is a well-known plant that belongs to genus Tribulus. The genus *Tribulus*, having a place with family Zygophyllaceae, involves around 20 species on the world. Among them, *T. terrestris* is a well-practiced medicinal herb by Ayurvedic practitioners as well as by modern herbalists [160].

2.16.1. Scientific evidences

This plant is demonstrated to have diuretic activity [161], aphrodisiac activity [162], anti-urolithic activity [163], immunomodulatory activity [164], antidiabetic activity [165], hypolipidemic [166], central nervous system (CNS) activity [167], anticancer activity [168], and larvicidal activity [169].

2.17. *Terminalia chebula*

Terminalia chebula is a moderate plant which is being utilized as a part of conventional solutions. It has a place in the Combretaceae family. It is typically called as Black Myrobalan, Ink tree (or) Chebulic myrobalan and furthermore known as "Ruler of the drug." It is widely utilized as a part of Unani, Ayurveda, and homeopathic prescription. *Terminalia chebula* is a well-known conventional plant utilised in the pharmaceutical industry in India as well as in different countries of Asia and Africa [170]. It stimulates the liver and ensures it is promote by removing the excretory waste items from the digestion tracts. It is shown in protracted loose bowels with hematochezia and prolapse of rectum. It is a decent nervine, utilized as a part of anxious shortcoming, apprehensive crabbiness.

2.17.1. Scientific evidences

This plant is demonstrated to have antibacterial activity [171], antiamoebic and immunomodulatory activities [172], antianaphylactic and adaptogenic activities [173], antiviral activity [174], antimutagenic and anticarcinogenic activities [175], anti-arthritic activity [176], antidiabetic and retinoprotective activities [177], and hepatoprotective activity [178].

2.18. *Tephrosia purpurea*

Tephrosia purpurea or Sharpunkha has its place in the family Leguminosae (subfamily-Papilionaceae). The genus *Tephrosia* encompasses between 300 and 400 species of annual and perennial woody herb, scattered in the tropical and subtropical local of the world. This plant has excessive economic cost due to the presence of phytochemicals like flavonoids, sugars, gums tannins and phenols, alkaloids and glue, settled oils and fats, and saponins and lipids [179, 180]. As per Ayurveda writing, this plant has additionally given the name of "Sarwa Wranvishapaka" which implies that it has the property of mending a wide range of wounds. It is an imperative part of a few arrangements, for example, Tephroli and Yakrifitused for the liver issue. In the Ayurvedic arrangement of different pharmaceutical parts of this plant, they are utilized as a solution for impotency, asthma, diarrhea, gonorrhea, ailment, ulcer, and urinary issue.

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2.18.1. Scientific evidences

This plant is verified to have anticarcinogenic and anti-lipid peroxidative [181], anti-inflammatory and analgesic [182], in vitro antioxidant [183], anticancer activity [184], and in vitro anthelmintic activity [185].

2.19. *Tectona grandis*

T. grandis Linn. belongs to family Verbenaceae is one of the most well-known timbers in the world and is famous for its dimensional stability, extreme durability, and hardness which also resists decay even when unprotected by paints and preservatives. This plant is commonly called as teak. It is one of the most famous heartwood of the world. Timber value of teak has been well-known for decades [186, 187].

2.19.1. Scientific evidences

This plant is verified to have hair growth activity [188], cytotoxic activity [189], anti-hemolytic anemia activity [190], hypoglycemic activity [191], anti-inflammatory activity [192], diuretic activity [193], and gastroprotective activity [194].

2.20. *Tamarindus indica* L.

Tamarindus indica or tamarind regarded as a tropical fruit tree native to the African savannahs and it is found in numerous tropical nations. It is arranged as a monospecific class in the group of Leguminosae. The sweet and harsh taste of its natural product mash is utilized to add flavor to neighborhood cooking styles. Other than culinary, tamarind is likewise utilized as a part of the conventional drug as purgative, diuretic, antibacterial operators and also in the treatment of fever and malarial contaminations [195, 196].

2.20.1. Scientific evidences

This plant is verified to have antipyretic activity [197], laxative activity [195], anticancer activity [198], antiemetic activity [199], antimicrobial [200], hepatoprotective [201], and analgesic activity [202].

2.21. *Withania somnifera*

Withania somnifera (WS) belongs to the Solanaceae family, commonly known as Ashwagandha. Traditionally this plant was named for its potential to calm the mind, the capacity to improve learning ability, memory power, and to improve poor eyesight. It is also named for anti-inflammatory potential in the treatment of joint diseases and an appropriate remedy for asthma and bronchitis [203]. Ashwagandha is one among the vast assorted variety of the restorative plant, which is exploited well for its phytopharmacological impact. The restorative properties of *Withania somnifera* are accessible both in the composed and non-composed arrangement as conventional information since time immemorial. In the conventional framework, the plant

has been utilized as a calming, antitumor, antistress, cell reinforcement, immunomodulatory, and adaptogenic medicate. It likewise applies a positive effect on the endocrine, cardiopulmonary, and focal sensory systems with next to zero-related poisonous quality. It has the ability to battle growths by lessening tumor size and ended up being a decent regular wellspring of a sturdy and moderately safe radiosensitizer/chemo-remedial specialist.

2.21.1. Scientific evidences

This plant is proved to have anti-inflammatory activity [204], antioxidant property [205], anticancer properties [206], immunomodulatory potential [207], neuroprotective effects [208], cardioprotective and hypocholesteremic [209], and antimalarial potential [210].

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References

[1] World Health Organization Guidelines on Safety Monitoring of Herbal Medicines in Pharmacovigilance Systems. Geneva, Switzerland: World Health Organization; 2004

[2] Ekor M. The growing use of herbal medicines: Issues relating to adverse reactions and challenges in monitoring safety. Frontiers in Pharmacology. 2014;**4**;article 177. DOI: 10.3389/fphar.2013.00177

[3] Kumar N, Wani ZA, Dhyani S. Ethnobotanical study of the plants used by the local people of Gulmarg and its allied areas, Jammu & Kashmir, India. International Journal of Current Research in Bioscience and Plant Biology. 2015;**2**(9):16-23

[4] Shakya AK. Medicinal plants: Future source of new drugs. International Journal of Herbal Medicine. 2016;**4**(4):59-64

[5] Pan S-Y, Zhou S-F, Gao S-H, Yu Z-L, Zhang S-F, Tang M-K, Sun J-N, Ma D-L, Han Y-F, Fong W-F, Ko K-M. New perspectives on how to discover drugs from herbal medicines: CAM's outstanding contribution to modern therapeutics. Evidence-Based Complementary and Alternative Medicine. 2013;**2013**, Article ID 627375, 25 pages. DOI: 10.1155/2013/627375

[6] Thang TD, Kuo PC, Huang GJ, Hung NH, Huang BS, Yang ML. Chemical constituents from the leaves of *Annona reticulata* and their inhibitory effects on NO production. Molecules. 2013;**18**:4477-4486

[7] Baskar R, Rajeswari V, Kumar TS. In vitro antioxidant studies in leaves of *Annona species*. Indian Journal of Experimental Biology. 2007;**45**(5):480-485

[8] Available from: http://www.hort.purdue.edu/newcrop/nexus/Annona_reticulata_nex.html

[9] Chavan SS, Shamkuwar PB, Damale MG, Pawar DP. A comprehensive review on *Annona reticulata*. International Journal of Pharmaceutical Sciences and Research. 2014;**5**(1):45-50. DOI: 10.13040/IJPSR.0975-8232.5(1).45-50

[10] Chang FR, Wu YC, Duh CY, Wang SK. Studies on the acetogenins of Formosan annonaceous plants. II. Cytotoxic acetogenins from *Annona reticulata*. Journal of Natural Products. 1993;**56**(10):1688-1694

[11] Available from: http://www.hort.purdue.edu/newcrop/morton/wild_custard_apple_ars.html

[12] Yuan SS, Chang HL, Chen HW, Yeh YT, Kao YH, Lin KH, Wu YC, Su JH. Annonacin, a mono-tetrahydrofuran acetogenin, arrests cancer cells at the G1 phase and causes cytotoxicity in a Bax- and caspase-3-related pathway. Life Sciences. 2003;**72**(25):2853-2861

[13] Yuan SS, Chang HL, Chen HW, Kuo FC, Liaw CC, Su JH, Wu YC. Selective cytotoxicity of squamocin on T24 bladder cancer cells at the S-phase via a Bax-, Bad-, and caspase-3-related pathways. Life Sciences. 2006;**78**(8):869-874

[14] Kaleem M, Asif M, Ahmad QU, Bano B. Antidiabetic and antioxidant activity of *Annona squamosa* extract in streptozotocin induced diabetic rats. Singapore Medical Journal. 2006;**47**:670-675

[15] Bhalke RD, Chavan MJ. Analgesic and CNS depressant activities of extracts of *Annona reticulata* Linn. Bark. Phytopharmacology. 2011;**1**(5):160-165

[16] Chopra RN, Nayer SL, Chopra IC. Glossary of Indian Medicinal Plant. New Delhi, India: National Institute of Science and Communication. C.S.I.R Publications; 1956

[17] Yoganarasimhan SN. Medicinal Plants of India. Vol. II. Bangalore: Cyber Media; 2000. p. 10

[18] Gunasekaran B, Selvarajan S, Balakrishnan D, Muralidharan P. Journal of Herbal Medicine and Toxicology. 2010;**4**(1):49-52

[19] Vairavasundaram RP, Kalaiselvi S. Drug Invention Today. 2009;**1**(2):137-139

[20] Vallabh D, Jadhav Varsha M, Kadam VJ. Journal of Pharmacy Research. 2009;**2**(4):644-645

[21] Paranjape Archana N, Mehta Anita A. Global journal of Pharmacology. 2008;**2**(2):23-30

[22] Adisakwattana S, Pudhom K, Yibchokanun S. African Journal of Biotechnology. 2009; **8**(10):2011-2015

[23] Golwala Dharmesh K, Patel Laxman D, Vaidya Santosh K, Bothara Sunil B, Munesh M, Piyush P. International Journal of Pharmacy and Pharmaceutical Sciences. 2010;**2**(1):66-71

[24] Roshan S, Ali S, Khan A, Tazneem B, Purohit MG. Pharmacognosy Magazine. 2008;**4**(15): 85-88

[25] Chandrashekhar VM, Nagappa AN, Channes TS, Habbu PV, Rao KP. Journal of Natural Remedies. 2000;**4**(1):12-16

[26] Rahuman AA, Gopalakrishnan G, Venkatesan P, Kannappan G. Parasitology Research. 2008;**102**:981-988

[27] Dash GK, Samanta A, Kanungo SK, Shau SK, Suresh P, Ganpathy S. Indian Journal of Natural Products. 2000;**16**(2):25-27

[28] Meena Prabha P, Chendraya Perumal P, Praveen Kumar M, Soundarrajan S, Srinivasan M, Sampathkumar R. Pharmacological activities of *Abrus precatorius* (L.) seeds. International Journal of Medical Research and Pharmaceutical Sciences. 2015;**3**(2):195-200

[29] Wingard LB, Larner J, Schwartz A. Human Pharmacology, Molecular to Clinical. Mosby Year Book; 1991. pp. 767-774

[30] Ligha AE, Bnr J, Numere NF. Protective effect of *Abrus precatorius* seed extract following alcohol induced renal damage. European Journal of Scientific Research. 2009;**25**(3): 428-436

[31] Sohn SH, Lee H, Nam JY, Kim SH, Jung HJ, Kim Y, Shin M, Hong M, Bae H. Screening of herbal medicines for the recovery of Cisplatin induced nephrotoxicity. Environmental Toxicology and Pharmacology. 2009;**28**:206-212

[32] Wambebe C, Amosun S. Some neuromuscular effects of the crude extracts of the leaves of *Abrus Precatorius*. Journal of Ethnopharmacology. 1984;**11**:49-58

[33] Mensah AY, Bonsu AS, Fleischer TC. Investigation of the bronchodilator activity of *Abrus Precatorius*. International Journal of Pharmaceutical Sciences Review and Research. 2011;**6**(2):09-13

[34] Limmatvapirat C, Sirisopanaporn S, Kittakoop P. Antitubercular and antiplasmodial constituents of *A. Precatorius*. Planta Medica. 2004;**70**:276-278

[35] Adesina SK. Studies on some plants used as anticonvulsants in Amerindian and African traditional medicine. Fitoterapia. 1982;**53**:147-162

[36] OFC N, Botting JH. Uterotonic activity of extracts of the seeds of *Abrus precatorius*. Planta Medica. 1983;**47**(4):230-233

[37] Saurabh R, Nagori BP, Singh GK, Dubey BK, Desai P, Alok S, Jain S. A review on Acacia Arabica—An Indian medicinal plant. IJPSR. 2012;**3**(7):1995-2005

[38] Maslin BR, Miller JT, Seigle DS. Overview of the generic status of *Acacia* (Leguminosae: Mimosoideae). Australian Systematic Botany. 2003;**16**(1):1-18

[39] Orchard AE, Maslin BR. Proposal to conserve the name *Acacia* (Leguminosae: Mimosoideae) with a conserved type. Taxon. 2003;**52**(2):362-363

[40] Singh KN, Chandra V, Barthwal KC. Hypoglycaemic activity of *Acacia arabica*, *Acacia benthamii* and *Acacia modesta* leguminous seed diet in normal albino rats. Indian Journal of Physiology and Pharmacology. 1975;**19**:167-168

[41] Jain AK, Shimoi K, Nakamura Y, Tomita I, Kada T. Preliminary study on the desmutagenic and antimutagenic effect of some natural products. Current Science. 1987;**56**:1266-1269

[42] Chhabra S, Thakral J, Kamboj P, Paliwal Y. Comparative evaluation of antimicrobial potential of different extracts of *Cuscuta reflexa* growing on *Acacia Arabica* and *Zizyphus jujube*. Pharmacognosy Journal. 2010;**2**(9):293-296

[43] Sundrial RC. Fungitoxic properties of flower extract of some wild plants of Grahwal Himalaya. Advances in Plant Sciences. 1991;**4**:230-234

[44] Agunua A, Yusuf S, Andrewa GO, Zezi AU, Abdurahmana EM. Evaluation of five medicinal plants used in diarrhoea treatment in Nigeria. Journal of Ethnopharmacology. 2005;**101**:27-30

[45] Singh R, Singh R. Screening of some plant extract for antiviral properties. Technology (Sindri). 1972;**9**:415-416

[46] Sharma W, Trivedi PC. Nemeticial and Nematostatic response of aqueous extract of certain plants of semi-arid niche. Current Nematology. 1995;**6**:43-53

[47] Singh R, Singh B, Singh S, Kumar N, Kumar S, Arora S. Umbelliferone—An antioxidant isolated from *Acacia Nilotica* (L.) Willd. Ex. Del. Food Chemistry. 2010;**120**:825-830

[48] Nath D, Sethi N, Singh RK, Jain AK. Commonly used Indian abortifacient plants with special reference to their teratologic effects in rats. Journal of Ethnopharmacology. 1992;**36**:147-154

[49] Thamizharasan S, Umamaheswari S, Hari R, Ulagaratchagan V. Quantitative phytochemical analysis of *Bambusa arundinacea* seeds. International Journal of Pharmacognosy and Phytochemical Research. 2015;**7**(5):980-983

[50] Rathod Jaimik D, Pathak Nimish L, Patel Ritesh G, Jivani NP, Bhatt Nayna M. Phytopharmacological properties of *Bambusa arundinacea* as a potential medicinal tree: An overview. Journal of Applied Pharmaceutical Science. 2011;**01**(10):27-31

[51] Vanithakumari G, Manonayagi S, Padma S, Malini T. Antifertility effect of *Bambusa arundinacea* shoot extracts in male rats. Journal of Ethnopharmacology. 1989;**25**(2):173

[52] Zhang J, Gong J, Ding Y, Lu B, Wu X, Zhang Y. Antibacterial activity of water-phase extracts from bamboo shavings against food spoilage microorganisms. African Journal of Biotechnology. 2010;**9**(45):7710-7717

[53] Muniappan M, Sundararaj T. Antiinflammatory and antiulcer activities of *Bambusa arundinacea*. Journal of Ethnopharmacology. 2003;**88**:161-167

[54] Honga E-J, Junga E-M, Leea G-S, Kima JY, Naa K-J, Parkb M-J, Kangb H-Y, Seonga K-CCYH, Choic I-G, Jeunga E-B. Protective effects of the pyrolyzates derived from bamboo

against neuronal damage and hematoaggregation. Journal of Ethanopharmacology. 2010; **128**(3):594-599

[55] Mahesh AR, Kumar H, Ranganath MK, Devkar RA. Detail study on *Boerhaavia Diffusa* plant for its medicinal importance—A review research journal of pharmaceutical sciences res. Journal of Pharmaceutical Sciences. 2012;**1**(1):28-36

[56] Rawat AKS, Mehrotra S, Tripathi SC, Shome U. Hepatoprotective activity of *Boerhaavia diffusa* L. roots a popular Indian ethnomedicine. Journal of Ethnopharmacology. 1997; **56**:61-66

[57] Bhatia V, Kinja K, Bishnoi H. Antidiabetic activity of the alcoholic extract of the arial part of *Boerhaavia diffusa* in rats. In and Gnaneshwari D editors. Recent Research in Science and Technology. 2001;**3**(7):04-07

[58] Sharma M, Vohra S, Arnason JT, Hudson JB. Echinacea extracts contain significant and selective activities against human pathogenic bacteria. Pharmaceutical Biology. 2008;**46**:111-116

[59] Hiruma Lima CA, Gracioso JS, Bighetti EJB. Germonse'n Robineou L. and Souza Brito a.R.M., the juice of fresh leaves of *Boerhaavia diffusa* L. (Nyctaginaceae) markedly reduces pain in mice. Journal of Ethnopharmacology. 2000;**71**(1-2):267-274

[60] Bharali R, Azad MRH, Tabassum J. Chemopreventive action of *Boerhaavia diffusa* on DMBA-induced skin carcinogenesis in mice. Indian Journal of Physiology and Pharmacology. 2003;**47**(4):459-464

[61] Kaur M, Goel RK. Anti-convulsant activity of *Boerhaavia diffusa*: Plausible role of calcium channel antagonism. Evidence-Based Complementary and Alternative Medicine. 2011;**4**:1-7

[62] Sreeja S, Sreeja S. An in vitro study on antiproliferative and antiestrogenic effects of *Boerhaavia diffusa* L. extracts. Journal of Ethnopharmacology. 1923;**126**:221-225

[63] Nwakanma NMC, Okoli BE. Cytological effects of the root extracts of *Boerhaavia diffusa* on root tips of Crinum jagus. EurAsian Journal of BioSciences. 2010;**4**:105-111

[64] Sasikala M, Vijay SK, Gauthaman K. Relevance of the use of alternative medicine for bronchial asthma: A review. Journal of Young Pharmacists. 2009;**1**(2):184-189

[65] Barthwal M, Srivastava K. Histologic studies on endometrium of menstruating monkeys wearing IUDs: Comparative evaluation of drugs. Advances in Contraception. 1990;**6**:113-124

[66] Chaudhary P, Ahamad S, Khan NA. A review on medicinal utility of *Calotropis Procera*. WJPMR. 2017;**3**(1):335-342

[67] Pusapati MR, Eswara Rao G, Krishnapriya M, Nagalakshmi V, Silpa P, Anjali M. An overview of phytochemical and pharmacological activities of *Calotropis procera*. FS Journal of Pharmacy Research. 2012;**1**(2):17-25

[68] Setty SR, Quereshi AA, Viswanath Swamy AHM, Patil T, Prakash T, Prabhu K, Gouda Veeran A. Hepatoprotective activity of *Calotropis procera* flowers against paracetamol induced hepatic injury in rats. Fitoterapia. 2007;**78**(7):451-454

[69] Ahmad N, Anwar F, Hameed S, Boyce MC. Antioxidant and antimicrobial attributes of different solvent extracts from leaves and flowers of *Calotropis procera*. Journal of Medicinal Plants Research. 2011;**5**(19):4879-4887

[70] Dewan S, Kumar S, Kumar VL. Preliminary studies on the analgesic activity of latex of *Calotropris procera*. Journal of Ethnopharmacology. 2000;**32**:252-253

[71] Larhsini M, Bousaid M, Lazrek HB, Jana M. Evaluation of antifungal and molluscicidal properties of extracts of *Calotropis procera*. Fitotrapia. 1997;**68**:371-373

[72] Majumder PK, Kumar VL. Anti-inflammatory activity of fractions of latex of *Calotropis procera* in carrageenan induced rat paw oedema. Phytotherapy Research. 1997;**11**(2):166-167

[73] Kumar S, Dewan S, Sangraula H, Kumar VL. Antidiarrhoeal activity of the latex of *Calotropis procera*. Journal of Ethnopharmacology. 2001;**76**(1):115-118

[74] Kumar VL, Shivkar YM. In vivo and in vitro effect of latex of *Calotropis procera* on gastrointestinal smooth muscles. Journal of Ethnopharmacology. 2004;**93**(2-3):377-379

[75] Roy S, Sehgal R, Padhy BM, Kumar VL. Antioxidant and protective effect of latex of *Calotropis procera* against alloxan induced diabetes in rats. Journal of Ethnopharmacology. 2005;**102**(3):470-473

[76] Basu A, Sen T, Pal S, Mascolo N, Capasso F, Nag AK. Studies on the antiulcer activity of the chloroform fraction of *Calotropis procera* root extract. Phytotherapy Research. 1996;**11**(2):163-165

[77] Rasik AM, Raghubir R, Gupta A, Shukla A, Dubey MP, Srivastava S, Jain HK, Kulshrestha DK. Healing potential of *Calotropis procera* on dermal wounds in guinea pigs. Journal of Ethnopharmacology. 1999;**68**(3):261-266

[78] Grover JK, Yadav SP. Pharmacological actions and potential uses of *Momordica charantia*: A review. Journal of Ethnopharmacology. 2004;**93**(1):123-132

[79] Sathishsekar D, Subramanian S. Antioxidant properties of *Momordica Charantia* (bitter gourd) seeds on Streptozotocin induced diabetic rats. Asian Pacific the Journal of Clinical Nutrition. 2005;**14**(2):153-158

[80] Virdia J, Sivakamia S, Shahanib S, Sutharc AC, Banavalikar MM, Biyanic MK. Antihyperglycemic effects of three extracts from *Momordica charantia*. Journal of Ethnopharmacology. 2003;**88**(1):107-111

[81] Cunnick JE, Sakamoto K, Chapes SK, Fortner GW, Takemoio DJ. Induction of tumor cytotoxic immune cells using a protein from the bitter melon (*Momordica charantia*). Cellular Immunology. 1990;**126**(2):278

[82] Bourinbaiar AS, Lee-Huang S. The activity of plant derived antiretroviral proteins MAP30 and GAP31 against *Herpes simplex* virus in vitro. Biochemical and Biophysical Research Communications. 1996;**219**(3):923-929

[83] Stepka W, Wilson KE, Madge GE. Antifertility investigation on *Momordica*. Lloydia. 1974;**37**(4):645c

[84] Das AK, Mandal SC, Banerjee SK, Sinha S, Das J, Saha BP, Pal M. Studies on antidiarrheal activity of *Punica granatum* seed extract in rats. Journal of Ethnopharmacology. 1999;**68**:205-208

[85] Jafri MA, Aslam M, Javed K, Singh S. Effect of *Punica granatum* Linn. (flowers) on blood glucose level in normal and alloxan induced diabetic rats. Journal of Ethnopharmacology. 2000;**70**:309-314

[86] Zhicen L. Colour Atlas of Chinese Traditional Drugs. Vol. 1. Beijing, People's Republic of China: Science Press; 1987. pp. 75-76

[87] Kapoor LD. CRC Handbook of Ayurvedic Medicinal Plants. Boca Raton, Florida: CRC Press; 1990

[88] Murthy KN, Reddy VK, Veigas JM, Murthy UD. Study on wound healing activity of *Punica granatum* peel. Journal of Medicinal Food. 2004;**7**:256-259

[89] Nugteren DH, Christ-Hazelhof E. Naturally occurring conjugated octadecatrienoic acids are strong inhibitors of prostaglandin biosynthesis. Prostaglandins. 1987;**33**:403-417

[90] Esmaillzadeh A, Tahbaz F, Gaieni I, Alavi-Majd H, Azadbakht L. Cholesterol-lowering effect of concentrated pomegranate juice consumption in type II diabetic patients with hyperlipidemia. International Journal Vitamin Nutritional Resources. 2006;**76**(3):147-151

[91] Lansky EP, Newman RA. *Punica granatum* (pomegranate) and its potential for prevention and treatment of inflammation and cancer. Journal of Ethnopharmacology. 2007;**109**(2):177-206

[92] Krishnamurthi A. The Wealth of India. Vol. VIII. New Delhi, India: Publication and Information Directorate CSIR; 1969

[93] Naik M, Meher LC, Naik SN, Dasa LM. Production of biodiesel from high free fatty acid Karanja (*Pongamia pinnata*) oil. Biomass and Bioenergy. 2008;**32**:354-357

[94] Punitha R, Manohar S. Antihyperglycemic and anti-lipid peroxidative effects of *Pongamia pinnata* (Linn.) Pierre flowers in alloxan induced diabetic rats. Journal of Ethnopharmacology. 2006;**105**:39-46

[95] Essa MM, Subramanian P, Sudhakar G, Manivasagam T, Dakshayani KB. Protective influence of *Pongamia pinnata* (Karanja) on blood ammonia and urea levels in ammonium chloride induced hyperammonemia. Journal of Applied Biomedicine. 2005;**3**:133-138

[96] Singh RK, Joshi VK, Goel RK. Pharmacological actions of *Pongamia pinnata* seeds—A preliminary study. Indian Journal of Experimental Biology. 1996;**34**:1204-1207

[97] Rameshthangam P, Ramasamy P. Antiviral activity of bis (2-methylheptyl) phthalate isolated from *Pongamia pinnata* leaves against white spot syndrome virus of Penaeus monodon Fabricius. Virus Research. 2007;**126**(1-2):38-44

[98] Uddin Q, Parveen N, Khan NU, Singhal KC. Antifilarial potential of the fruits and leaves extracts of *Pongamia pinnata* on cattle filarial parasite. Phytotherapy Research. 2003;**17**(9):104-110

[99] Akhtar AH, Ahmad KD, Gilani SN, Nazir A. Antiulcer effects of aqueous extracts of Nigella sativa and *Pongamia pinnata* in rats. Fitoterapia. 1996;**67**(3):195-199

[100] Singh RK, Pandey BL. Anti-inflammatory potential of *Pongamia pinnata* root extracts in experimentally induced inflammation in rats. Journal Basic Applied Biomed. 1996; **4**:21-24

[101] Srinivasan K, Muruganandan S, Lal J, Chandra S, Tandan SK, Raviprakash V, Kumar D. Antinociceptive and antipyretic activities of *Pongamia pinnata* leaves. Phytotherapy Research. 2003;**17**:259-264

[102] Dorman HJ, Deans SG. Antimicrobial agents from plants: Antibacterial activity of plant volatile oils. Journal of Applied Microbiology. 2000;**88**:308-316

[103] El Hamss R, Idaomar M, Alonso-Moraga A, Muñoz Serrano A. Antimutagenic properties of bell and black pepper. Food and Chemical Toxicology. 2003;**41**:41-47

[104] Satyavati G, Gupta AK, Neeraj T. Medicinal Plants of India. Vol. 2. New Delhi: Indian Council of Medical Research; 1987

[105] Dhanalakshmi D, Umamaheswari S, Balaji D, Santhanalakshmi R, Kavimani S. Phytochemistry and pharmacology of *Piper longum*—A systematic review. World Journal of Pharmacy and Pharmaceutical Sciences. 2017;**6**(1):381-398. DOI: 10.20959/ Wjpps20171-8362

[106] Natarajan KS, Narasimhan M, Shanmugasundaram KR, Shanmugasundaram ER. Antioxidant activity of a salt/ spice/herbal mixture against free radical induction. Journal of Ethnopharmacology. 2006;**105**:76-83

[107] Vedhanayaki G, Shastri GV, Kuruvilla A. Analgesic activity of *Piper longum* Linn. root. Indian Journal of Experimental Biology. 2003;**41**:649-651

[108] Yende SR, Sannapuri VD, Vyawahare NS, et al. Antirheumatoid activity of aqueous extract of *Piper longum* on freunds adjuvant-induced arthritis in rats. IJPSR. 2010;**1**(9): 129-133

[109] Bezerra DP, Castro FO, Alves APNN, et al. In vivo growth-inhibition of Sarcoma180 by piplartine and piperine, two alkaloid amides from piper. Brazilian Journal of Medical and Biological Research. 2006;**39**:801-807

[110] Nabi SA, Kasetti RB, Sirasanagandla S, et al. Antidiabetic and antihyperlipidemic activity of *Piper longum* root aqueous extract in STZ induced diabetic rats. BMC Complementary and Alternative Medicine. 2013;**13**:37

[111] Lakshmi V, Kumar R, Agarwal SK, et al. Anti-fertility activity of *Piper longum* Linn. in female rats. Natural Product Research. 2006;**20**(3):235-239

[112] Shenoy PA, Nipate SS, Sonpetkar JM, et al. Anti-snake venom activities of ethanolic extract of fruits of *Piper longum* L. (Piperaceae) against *Russell's viper* venom: Characterization of piperine as active principle. Journal of Ethnopharmacology. 2013;**147**(2): 373-382

[113] Kim KS, Kim JA, Eom SY, Lee SH, Min KR, Kim Y. Inhibitory effect of piperlonguminine on melanin production in melanoma B16 cell line by downregulation of tyrosinase expression. Pigment Cell Research. 2006;**19**:90-98

[114] Bajad S, Bedi KL, Singla AK, Johri RK. Piperine inhibits gastric emptying and gastrointestinal transit in rats and mice. Planta Medica. 2001;**67**(2):176-179

[115] de Assis Junior EM, dos Santos Fernandes IM, Santos CS, de Mesquita LX, Pereira RA, Maracaja PB, Soto-Blanco B. Toxicity of castor bean (*Ricinus communis*) pollen to honeybees. Agriculture, Ecosystems and Environment. 2011;**141**:221-223

[116] Rana M, Dhamija H, Prashar B, Sharma S. *Ricinus communis* L.—A review. International Journal PharmTech, Research. 2012;**4**(4):1706-1711

[117] Panghal M et al. In vitro antimicrobial activity of ten medicinalplants against clinical isolates of oral cancercases. Annals of Clinical Microbiology and Antimicrobials. 2011;**10**:21

[118] Singh PP et al. Activity guided isolation of antioxidants from the leaves of *Ricinus communis* L. Food Chemistry. 2009;**114**(3):1069-1072

[119] Okwuasaba FK et al. Anticonceptive and estrogenic effects of a seedextract of *Ricinus communisvar*. minor. Journal of Ethnopharmacology. 1991;**34**:141-145

[120] Ilavarasan R et al. Anti-inflammatory and free radical scavengingactivity of *Ricinus communis* root extract. Journal of Ethnopharmacology. 2006;**103**:478-480

[121] Ferraz AC et al. Pharmacological evaluation of ricinine, a central nervous system stimulant isolated from *Ricinus communis*. Pharmacology Biochemistry and Behavior. 1999;**63**(3):367-375

[122] Lin JY et al. Studies on the antitumour lectins isolated from the seeds of *Ricinus communis* (castor bean). Toxicon. 1986;**24**(8):757-765

[123] Mandal S. Exploration of larvicidal and adult emergence inhibition activities of *Ricinus communis* seed extract against three potential mosquito vectors in Kolkata, India. Asian Pacific Journal of Tropical Medicine. 2010;**3**(8):605-609

[124] Rachhadiya RM, Prasad KM, Shete Rajkumar V. Evaluation of antiulcer activity of castor oil in rats. International Journal of Research in Ayurveda & Pharmacy. 2011;**2**(4):1349-1353

[125] Elimam AM, Elmalik KH, Ali FS. Larvicidal, adult emergence inhibition and oviposition deterrent effects of foliage extract from *Ricinus communis* L. against anopheles arabiensis and Culex Quinquefasciatus in Sudan. Tropical Biomedicine. 2009;**26**(2):130-139

[126] Islam T et al. Assessment of antibacterial potential of leaves of *Ricinus communis* against pathogenic and dermatophytic bacteria. International Journal of PharmaResearch and Development. 2010;**1**(12):1-7

[127] Shokeen P et al. Antidiabetic activity of 50% ethanolic extract of *Ricinus communis* and its purified fractions. Food and Chemical Toxicology. 2008, 2008;**46**:3458-3466

[128] Valderramas AC et al. Antiinflammatory activity of *Ricinus communis* derived polymer. Brazilian Journal of Oral Sciences. 2008;**7**(27):1666-1672

[129] Wealth of Indian. A Dictionary of Indian Raw materials and Industrial Products. National Institute of Science Communication, Council of Scientific and Industrial Research, New Delhi. Raw Material. 2002;**10**:100-107

[130] Sah AK, Verma VK. *Syzygium cumini* : An overview. Journal of Chemical and Pharmaceutical Research. 2011;**3**(3):108-113

[131] Brito FA, Lima LA, Ramos MF, Nakamura MJ, Cavalher Machados SC, Henrigues MG, Sampaino AL. Pharmacological study of anti-allergic activity of *Syzygium cumini* (L) Skeels. Brazillian Journal of Medical and Biological Research. 2007;**40**:105-115

[132] Chaturvedi A, Kumar MM, Bhawani G, Chaturvedi H. Effect of ethanolic extract of *Eugenia jambolana* seeds on gastric ulceration and secretion in rats. Indian Journal of Physiology and Pharmacology. 2007;**51**(2):131-140

[133] Dasgupta N. In vivo study of antioxidant activity of *S. cumini* fruit. Food Chemistry. 2005;**90**(4):727-733

[134] Kumar A, Padmanabhan N, Krishnan MRV. Central nervous system activity of *Syzygium cumini* seed. Pakistan Journal of Nutrition. 2007;**6**(6):698-700

[135] Muruganandan S, Srinivasan K, Chandra S, Tandan SK, Lal J, Raviprakash V. Anti-inflammatory activity of *Syzygium cumini* bark. Fitoterapia. 2001;**72**(4):369-375

[136] Kasiappan R, Subbaih R, Subramanian S. Antihyperlipidemic effect of *Eugenia jambolana* seed kernel on streptozotocin induced diabetes rats. Food and Chemistry Toxicology. 2005;**43**(9):1433-1439

[137] Namba TM, Tsunezuka NK, Dissanayake UP, Hattori M. Studies on dental caries prevention by traditional medicines part VII, screening of ayurvedic medicines for anti-plaque action. Shoyakugaku Zasshi. 1985;**39**(2):146

[138] Chaudhari AKN, Pal S, Gomes A, Bhattacharya S. Anti-inflammatory and related actions of *Syzygium cumini* seed extract. Phytotherapy Research. 1990;**4**(1):5-10

[139] Dhawan BN, Patnaik GK, Rastogi RP, Singh KK, Tandon JS. Screening of Indian plants for biological activity. Indian Journal of Experimental Biology. 1977;**15**:208-219

[140] Rana NS, Joshi MN. Investigation on the antiviral activity of ethanolic extracts of *Syzygium* species. Fitoterpia. 1992;**63**(3):542-544

[141] Srinithya B, Muthuraman MS. An overview on the biological perspectives of *Sida Cordifolia* Linn. International Journal of Pharmacy and Pharmaceutical Sciences. 2014;**6**(11):15-17

[142] Pawar RS, Kumar S, Toppo FA, Lakshmi PK, Suryavanshi P. *Sida cordifolia* Linn. Accelerates wound healing process in type 2 diabetic rats. Journal of Acute Medicine. 2016;**6**:82-89. DOI: 10.1016/j.jacme.2016.08.004

[143] Sutradhar RK, Rahman AKMM, Ahmad MU, Bachar SC. Bioactive flavones of *Sida cordifolia*. Phytochemistry Letters. 2011;**1**:179-182

[144] Franzotti EM, CVF S, Rodrigues HMSL, RHV M, Andrade MR, Antoniolli AR. Anti-inflammatory, analgesic activity and acute toxicity of *Sida cordifolia* L. (Malva-branca). Journal of Ethnopharmacology. 2000;**72**:273-278

[145] Akilandeswari S, Valarmathi R, Indulatha VN, Senthamarai R. Screening of gastric anti-ulcer activity of *Sida cordifolia*. International journal of pharmaceutical and chemical sciences. 2013;**2**(3):1288-1292

[146] Kanth VR, Diwan PV. Analgesic, anti-inflammatory and hypoglycaemic activities of *Sida cordifolia* L. Phytotherapy Research. 1999;**13**(1):75-77

[147] Lovkesh B, Vivek B, Manav G. Nephroprotective effect of fresh leaves extracts of *sida cordifolia* linn in gentamicin induced nephrotoxicity in rats. International Journal of Research in Pharmaceutical Sciences. 2012;**2**(2):151-158

[148] Joseph B, Ajisha AU, Kumari S, Sujatha S. Effect of bioactive compounds and its pharmaceutical activities of *Sida cordifolia* (Linn.). International Journal of Biological and Medical Research. 2011;**2**(4):1038-1042

[149] Kaur G, Kamboj P, Kalia AN. Antidiabetic and anti-hypercholesterolemic effects of aerial parts of *Sida cordifolia* L. on Streptozotocin induced diabetic rats. Indian Journal of Natural Products and Resources. 2011;**2**(4):428-434

[150] Rao KS, Mishra SH. Isolation and assessment of hepatoprotective activity of fumaric acid obtained for the first time from *Sida cordifolia* Linn. Indian Drugs. 1997;**34**(12):702-706

[151] Medeiros IA, Santos MRV, Nascimento NMS, Duarte JC. Cardiovascular effects of *Sida cordifolia* leaves extract in rats. Fitoterapia. 2006;**77**:19-27

[152] Mallikarjuna G, Jaya Sankar Reddy V, Prabhakaran V. Evaluation of anticancer activity of *Sida cordifolia* l. against aflatoxin b1 induced hepatocellular carcinoma. International Journal of Pharmaceutical Sciences Review and Research. 2013;**23**(2):126-132

[153] Sonawane SM, Sonawane H. A review of recent and current research studies on the biological and pharmalogical activities of *Sapindus Mukorossi*. International Journal of Interdisciplinary Research and Innovations. 2015;**3**(4):85-95

[154] Arora B, Bhadauria P, Tripathi D, Sharma A. *Sapindus Emarginatus*: Phytochemistry & various biological activities. Indo Global Journal oh Pharmaceutical Sciences. 2012;**2**(3):250-257

[155] Sharma A, Sati SC, Sati OP, Kothiyal SK. Chemical Constituents and Bioactivities of Genus Sapindus. IJRAP. 2011;**2**(2):403-409

[156] Upadhay A, Singh DK. "Pharmacological Effects of *Sapindus mukorossi*" DDU Gorakhpur University, Gorakhpur, U.P. India. Revista do Instituto de Medicina Tropical de São Paulo. 2012;**54**(5):273-280

[157] Bhargava D, Shivapuri JN, Kar S, Pandit BR, Sidhiqie A, Upadhyay A, Thakur S, Mondal KC. Evaluation of antigonorrhoeal activity of saponins extract of *Sapindus Mukorossi* Gaertn. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2012; **7**(2):459-470

[158] Moghimipouri E, Handali S. Saponin: Properties, Methods of evaluation and Applications. Annual Research & Review in Biology, Science Domain International; 2015;**5**(3):207-220

[159] Huang HC, Liao SC, Chang FR, Kuo YH, Wu YC. Molluscicidal saponins from *Sapindus mukorossi*, inhibitory agents of golden apple snails *Pomacea canaliculata*. Journal of Agricultural and Food Chemistry. 2003;**51**:4916-4919

[160] Gupta SK, Zafar R, Pathak D. Review of phytochemical and pharmacological aspects of steroidal saponins from *Tribulus terrestris*. Indian Drugs. 1997;**4**(8):422-426

[161] Chhatre S, Nesari T, Somani G, Kenjale R, Sathaye S. Comparative evaluation of diuretic activity of different extracts of *Tribulus terrestris* fruits in experimental animals. International Journal of Research in Phytochemistry and Pharmacology. 2012;**3**:129-133

[162] Singh S, Nair V, Gupta YK. Evaluation of the aphrodisiac activity of *Tribulus terrestris* Linn. in sexually sluggish male albino rats. Journal of Pharmacology and Pharmacotherapeutics. 2012;**3**:43 7

[163] Sangeeta D, Sidhu H, Thind SK, Nath R. Effect of *Tribulus terrestris* on oxalate metabolism in rats. Journal of Ethnopharmacology.1994;**44**:61-6

[164] Tilwari A, Shukla NP, Devi U. Effect of five medicinal plants used in Indian system of medicines on immune function in Wistar rats. African Journal of Biotechnology. 2011;**10**:16637-45

[165] Amin A, Lotfy M, Shafiullah M, Adeghate E. The protective effect of *Tribulus terrestris* in diabetes. Annals of the New York Academy of Sciences. 2006;**1084**:391-401

[166] Tuncer MA, Yaymaci B, Sati L, Cayli S, Acar G, Altug T, Demir R. Influence of *Tribulus terrestris* extract on lipid profile and endothelial structure in developing atherosclerotic lesions in the aorta of rabbits on a high cholesterol diet. Acta Histochemica. 2009;**111**: 488 500

[167] Deole YS, Chavan SS, Ashok BK, Ravishankar B, Thakar AB, Chandola HM. Evaluation of antidepressant and anxiolytic activity of Rasayana Ghana tablet (a compound Ayurvedic formulation) in albino mice. Ayu. 2011;**32**:375 9

[168] Kumar M, Panwar M, Samarth R, Kumar A. Evaluation of radiomodulatory influence of *Tribulus terrestris* root extract against gamma radiation: Hematological, biochemical and cytogenetic alterations in swiss albino mice. Pharmacology Online. 2009;**1**: 1214-28

[169] El Sheikh TM, Bosly HA, Shalaby NM. Insecticidal and repellent activities of methanolic extract of *Tribulus terrestris* L. (Zygophyllaceae) against the malarial vector Anopheles arabiensis (Diptera: Culicidae). Egyptian Academic Journal of Biological Sciences. 2012;**5**:13-22

[170] Dinesh MD, Soorya TM, Vismaya MR, Janardhanan D, Athira TP, Nidhin KB, Ajeesh PP. Terminalia chebula A traditional herbal drug—A short review. International Journal of Pharmaceutical Science Invention. 2047;**6**(2):39-40

[171] Kannan P, Ramadevi SR, Hopper W. Antibacterial activity of *Terminalia chebula* fruit extract. African Journal of Microbiology Research. 2009;**3**(4):180-184

[172] Sohni YR, Bhatt RM. Activity of a crude extract formulation in experimental hepatic amoebiasis and in immunomodulation studies. Journal of Ethnopharmacology. 1996; **54**(2-3):119-124

[173] Shin TY, Jeong HJ, Kim DK, Kim SH, Lee JK, Kim DK, Chae BS, Kim JH, Kang HW, Lee CM, Lee KC, Park ST, Lee EJ, Lim JP, Kim HM, Leen YM. Inhibitory action of water soluble fraction of *Terminalia chebula* on systemic and local anaphylaxis. Journal of Ethnopharmacology. 2001;**74**:133-140

[174] Lin LT, Chen TY, Chung CY, Noyce RS, Grindley TB, McCormick C, Lin TC, Wang GH, Lin CC, Richardson CD. Hydrolyzable tannins (chebulagic acid and punicalagin) target viral glycoprotein-glycosaminoglycan interactions to inhibit herpes simplex virus 1 entry and cell-to-cell spread. Journal of Virology. 2011;**85**(9):4386-4398

[175] Ponnusankar S, Pandit S, Babu R, Bandyopadhyay A, Mukherjee PK. Cytochrome P450 inhibitory potential of Triphala-A Rasayana from Ayurveda. Journal of Ethnopharmacology. 2011;**133**(1):120-125

[176] Nair V, Singh S, Gupta YK. Anti-arthritic and disease modifying activity of *Terminalia chebula* Retz. in experimental models. The Journal of Pharmacy and Pharmacology. 2010;**62**(12):1801-1806

[177] Murali YK, Anand P, Tandon V, Singh R, Chandra R, Murthy PS. Long-term effects of *Terminalia chebula* Retz. on hyperglycemia and associated hyperlipidemia, tissue glycogen content and in vitro release of insulin in streptozotocin induced diabetic rats. Experimental and Clinical Endocrinology & Diabetes. 2007;**115**(10):641-646

[178] Tasduq SA, Singh K, Satti NK, Gupta DK, Suri KA. *Terminalia chebula* (fruit) prevents liver toxicity caused by sub-chronic administration of rifampicin, isoniazid and pyrazinamide in combination. Human & Experimental Toxicology. 2006;**25**:111-118

[179] Akanksha B, Avijit M, Chakraborthy GS, Seema G. Phytopharmacological uses of *Tephrosia Purpurea*—A review. Pharmacophore. 2014;**5**(4):658-665

[180] Kumari S, Srivastava M, Abbasi P. Response of *Tephrosia purpurea* to salinity stress in relation to germination, carotenoid content and proline content. An International Quarterly Journal of Biology & Life Sciences. 2014;**2**:276-281

[181] Kavitha K, Manoharan S. Anticarcinogenic and antilipidperoxidative effects of *Tephrosia purpurea* (Linn.) Pers. (tpet) on 7, 12-dimethylbenz (a) anthracene (DMBA)-induced hamster buccal pouch carcinoma. Indian Journal of Pharmacology. 2006;**38**(3):185-189

[182] Gopalakrishnan S, Vadivel E, Dhanalakshmi K. Antiinflammatory and analgesic activities of *Tephrosia purpurea* Linn. aerial and root extracts. Journal of Pharmacy Research. 2010;**3**(5):1103-1106

[183] Shah R, Kathad H, Sheth R, Sheth N. In vitro antioxidant activity of roots of *Tephrosia purpurea* Linn. International Journal of Pharmacy and Pharmaceutical Sciences. 2010;**2**(3):30-33

[184] Gulecha V, Sivakuma T. Anticancer activity of *Tephrosia purpurea* and Ficus religiosa using MCF 7 cell lines. Asian Pacific Journal of Tropical Medicine. 2011;**4**(7):526-529

[185] Manjula RR, Spandana U, Joshi AT, Sudheer M. In vitro anthelmintic activity of aqueous and methanolic leaf extract of *Tephrosia purpurea* linn. International Journal of Research in Pharmacy and Chemistry. 2013;**3**(1):12-14

[186] Keiding H, Wellendorf H, Lauridsen EB. Evaluation of an International Series of Teak Rovenance Trials. Humlebaek, Denmark: Danida Forest Seed Center; 1986

[187] Kjaer ED, Lauridsen EB, Wellendorf H. Second Evaluation of an International Series of Teak Provenance Trials. Humlebaek, Denmark: Danida Forest Seed Centre; 1995

[188] Jaybhaye D, Varma S, Gagne N, Bonde V, Gite A, Bhosle D. Effect of *Tectona grandis* Linn. seeds on hair growth activity of albino mice. International Journal of Ayurveda Research. 2010;**1**(3):163-166

[189] Rafullah MK, Suleiman MM. 5-Hydroxylapachol: A cytotoxic agent from *Tectona grandis*. Phytochemistry. 1999;**50**:439-442

[190] Aboudoulatif D, Messanvi G, Ahoefa V, Kwashie EG, Kodjo A, Amegnona A, et al. Effect of *Tectona grandis* on phenylhydrazine-induced anaemia in rats. Fitoterapia. 2008;**79**:332-336

[191] Varma SB, Jaybhaye DL. Antihyperglycemic activity of *Tectona grandis* Linn. bark extract on alloxan induced diabetes in rats. Natural Product Research. 2010;**24**(11):1059-1068

[192] Ramachandran S, Rajinikanth B, Rajasekaran A, Manisenthil Kumar KT. Evaluation of anti-inflammatory and analgesic potential of methanol extract of *Tectona grandis* flowers. Asian Pacific Journal of Tropical Biomedicine. 2011;**1**(2):S155-S158

[193] Kore KJ, Jadhav PJ, Shete RV, Shetty SC. Diuretic activity of *Tectona grandis* leaves aqueous extract in wistar rats. International Journal of Pharmaceutical Research and Development. 2011;**3**(7):141-146

[194] Neetu S, Nivedita S, Pratibha S, Rolee S, Rajendran SM, Rakesh M, et al. Verbascoside isolated from *Tectona grandis* mediates gastric protection in rats via inhibiting proton pump activity. Fitoterapia. 2010;**81**:755-761

[195] Havinga RM, Hartl A, Putscher J, Prehsler S, Buchmann C, Vogl CR. *Tamarindus indica* L. (Fabaceae): Patterns of use in traditional African medicine. Journal of Ethnopharmacology. 2010;**127**(3):573-588

[196] Bhadoriya SS, Ganeshpurkar A, Narwaria J, Rai G, Jain AP. *Tamarindus indica*: Extent of explored potential. Pharmacognosy Reviews. 2011;**5**(9):73-81

[197] Izquierdo T, Gracia-Tamayo F, Soto C, Castrillon LEA. *Tamarindus indica* Linn pulp polysaccharide inhibits fever in-vivo and IL-1β release by murine peritoneal exudates cell. Pharmaceutical Biology. 2007;**45**:22-30

[198] AL-fatimi M, Wurster M, Schroder G, Lindeiquist U. Antioxidant antimicrobial and cytotoxic activities of selected medicinal plant from Yemen. Journal of Ethnopharmacology. 2007;**111**:657-666

[199] Khan RA, Siddiqui SA, Azhar I, Ahmed SP. Preliminary screening of methanol and butanol extract of *Tamarindus indica* for anti-emetic activity. Journal of Basic and Applied Sciences. 2005;**1**:51-54

[200] Nwodo UU, Obiiyeke GE, Chigor VN, Okoh A. Assessment of *Tamarindus indica* extracts for antibacterial activity. International Journal of Molecular Sciences. 2011;**12**:6385-6396

[201] Mahesh KM, Rao KM, Rajeswari G, Ravindra Reddy KR, Jyothi B. Hepatoprotective activity of ethanolic flower extract of *Tamarindus indica* in Wistar rats hepatotoxicity induced by isoniazide and rifampicin. IJAPR. 2010;**1**(1):17-20

[202] Khalid S, Shaik Mossadeq WM, Isaraf DA, Hashim P, Rajeb S, Shaberi AM, Mohamada AS, Zakaria ZA, Sulaiman MR. *In Vivo* analgesic effect of aqueous extract of *Tamarindus indica* Linn. fruits. International Journal of the Kuwait University, Health Science Centre. 2010;**19**(4):255-259

[203] John J. Therapeutic potential of *Withania somnifera*: A report on phyto-pharmacological properties. International Journal of Pharmaceutical Sciences and Research. 2014;**5**(6):2131-2148. DOI: 10.13040/IJPSR.0975-8232.5(6).2131-48

[204] Rasool M, Varalakshmi P. Immunomodulatory role of *Withania somnifera* root powder on experimental induced inflammation: An in vivo and in vitro study. Vascular Pharmacology. 2006;**44**(6):406-410

[205] Bhattacharya A, Ghosal S, Bhattacharya SK. Anti oxidant effect of *Withania somnifera* glycowithanolides in chronic footshock stress-induced perturbations of oxidative free radical scavenging enzymes and lipid peroxidation in rat frontal cortex and striatum. Journal of Ethnopharmacology. 2001;**74**(1):1-6

[206] Muralikrishnan G, Dinda AK, Shakeel F. Immunomodulatory effects of *Withania somnifera* on azoxymethane induced experimental colon cancer in mice. Immunological Investigations. 2010;**39**(7):688-698

[207] Ziauddin M, Phansalkar N, Patki P, et al. Studies on the immunomodulatory effects of Ashwagandha. Journal of Ethnopharmacology. 1996;**50**(2):69-76

[208] Jain S, Shukla SD, Sharma K, et al. Neuroprotective effects of *Withania somnifera* Dunn. in hippocampal subregions of female albino rat. Phytotherapy Research. 2001;**15**(6): 544-548

[209] Mohanty I, Arya DS, Dinda A, et al. Mechanisms of cardioprotective effect of *Withania somnifera* in experimentally induced myocardial infarction. Basic & Clinical Pharmacology & Toxicology. 2004;**94**(4):184-190

[210] Muregi FW, Ishih A, Miyase T, et al. Antimalarial activity of methanolic extracts from plants used in Kenyan ethnomedicine and their interactions with chloroquine (CQ) against a CQ- tolerant rodent parasite, in mice. Journal of Ethnopharmacology. 2007;**111**(1):190-195

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