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Antivenom Activity of Ethnobotanical Plants

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Abstract

Snakebites have been the reason for the high morbidity and mortality rate in rural areas for many years. Snake venoms consist of certain toxins that directly attach the nervous system, blood circulation, and neurons leading to paralysis, respiratory distress, decrease in blood pressure, and death of the victim. An anti-venom therapy currently available does not grant promising benefits due to their less availability and costly production. To overcome these lacks in the anti-venom therapy investigating the anti-venom activity in naturally feasible sources is required. This review article reveals certain medicinal plant that has anti-venom activity against many deadly snake venoms. Analysis on the neutralizing the effect on snakes venom by *in vitro* and *in vivo* Assays of various plants parts provides a way to develop drug from naturally available materials at low cost.

Keywords: Snakebite; Venom; Toxins; Hemorrhage; Procoagulant

Introduction

Snakebite is one of the important health threats, leading to high mortality rate in India. The common poisonous snakes found in India are *Ophiophagus hannah, Bungarus caeruleus, Daboia russelli* and *Echiscarinatu* [1]. In India almost 50,000 people die due to snakebite in a year. *Najakaouthia* and *Viperarusselli* are widely present in India and huge number of deaths takes place due to envenomation by these two snakes [2]. Snakebite mainly affects person's lives in the sub-tropical and tropical regions in world. Venomous snakes live in every continent, majority of the deaths occur in Southeast Asia and sub-Saharan Africa [3]. Predominantly males are bitten and bites are common in adults and children in the rural impoverished areas of the tropics [4].

Snake Venom

Snake venoms consist of proteinaceous components and it's commonly known as toxins. These toxins are thought to be evolved from several non-toxic genes by various processes like mutations in a gene [5-8]. The presence of variable toxins in venom is responsible for their functions. Snake venoms can be categorized in to 3 groups, such as Cytotoxin, Neurotoxin, and Hemotoxin according to effect in the human body. Neurotoxin targets the central nervous system causing heart failure and breathing problems. Hemotoxins affect the cardiovascular function and blood circulation. Cytotoxic venoms generally target explicit cellular and muscles sites. Phospholipase A_2, a venom enzymatic property is identified to be responsible for various toxic effects such as Cardiac arrest, deformations, kidney failure and amputations [9]. The presence of toxicity in the snake venoms also consist of certain enzymes and few chemical components such as Lipids, Peptides, Carbohydrates, Nucleosides, Amino acids, metal ions and biogenic amines. These enzymes are present in modified

parotid glands of the snakes saliva stored in structures called alveoli behind the animal's eyes and it will be ejected through its hollow tubular fangs. Snake venom is neutral and weak acidic, freshly and spontaneous released. It turns to alkaline form when kept for longer periods. The venom changes the foam when it is exposed to air for a longer time and sometimes it may become non-venomous [10].

Classification of Snake Venom

Snake venom is classified in to hemolytic and neuropathic types. Based on toxicity present in venom they are classified; [10].

1. Blood circulation toxins: These types of toxins causes symptoms like rapid swelling, bleeding, pain, changing of color of bite region to purplish and black and may also cause death due to heart failure, if left untreated for 4 hours.
2. Nerve toxins: It include symptoms such as swelling, bleeding, anxiety, slight fever, respiratory muscle paralysis, pain in the swallowing, breathing suffocation and finally leads to death.

Functions of the Snake Venom

Neurotoxins

The major contribution of toxins responsible for neurotoxic venom effects are group of the phospholipases A_2 (PLA_2) and 3-finger toxin (3FTX) groups [5,11]. These toxins can act on the pre/postsynaptic junction where they have multiple actions from blocking potassium and sodium channels to acting like nicotinic or muscarinic receptor antagonists [5,8,11]. Snakes with various neurotoxins in their venom concentration leads to neurotransmission at the neuromuscular junctions showed in paralysis [12].

Cytotoxins

Certain hydrolytic enzymes such as Snake Venom Metalloproteins (SVMPs), PLA_2, and non-enzymatic cytotoxic 3FTXs have been involved as the causative agents found in snake venoms [13,14]. Demolition of local tissue leads to developed by snake venom inducing the formation of neutrophil extracellular traps; it creates turned block blood vessels and contains the venom toxins to the bite site, through developing cytotoxic pathology [15].

Hemotoxins

Hemotoxins has cardiovascular, haemostatic effects. Cardiovascular effects are best identified by a sudden fall in blood pressure, caused by different venom toxins. Precedent with the SVMPs concomitantly contribution to the hypotension by increasing vascular permeability through the reducing the capillary basement membranes, leads in leakage and decrease in blood pressure Haemostatic effects caused in snake venoms are defined by systemic haemorrhage [12,16]

Anti-Venom Therapy

The most common therapy available for treating snakebite is anti-venom. Anti-venom is the polyclonal antibodies that are generated by immunizing animals with a small amount of snake venom. They showed the antibodies are purified from serum or plasma and it formulated to intact with IgG of Fab-fragments therapy, which are in administered intravenously following snake bites. The antibodies present in any anti-venom are specified to the particular venoms that are used for immunization. These antibodies may cross-react neutralize same venom toxins present in various species used for immunization. There is a limit to their cross-efficacy and this is often limited to the same genus of snakes [17,18]. The unavailability of snake venom has resulted in the underproduction of Anti-Snake Venom (ASV). Furthermore, lyophilization is a costly process and there are possibilities for physiochemical changes in the lyophilized form. The liquid form of requires cold storage and can be stored only for up to 2 years [19]. Also anti-venom serum is causes many side effects like anaphylaxis, pyrogen reactions, serum sickness and it may induce early or late adverse reactions [20].

Ethnobotanical Plants Showing Anti-venom Activity

The lack of snake venom for anti-venom therapy and its side effect turns the focus to more sustainable source ethnobotanical plants. These are used as an alternative to immune therapy.

Aegle marmelos

A. marmelos is a common medicinal tree that is found all over India, leaves, stem bark and roots are used as an anti-

venom effect in rural areas. Anti-hemolytic activity, inhibition of *Ophiophagus hannah* venom induced anti-acetylcholinesterase activity and anti-proteolytic activity were carried out in-vitro. Plant parts were collected from the local field and extract was prepared using different solvents like hexane, methanol, and ethanol. Lyophilized venom of the *Ophiophagus hannah* was taken as a standard reference. The ethanolic extract of root bark has high inhibitory activity of about 31.45% and the methanolic extract of stem bark has moderate inhibitory activity of about 25.71% [21].

Inhibition of *ophiophagus hannah* venom-induced anti-acetylcholinesterase activity: *Ophiophagus hannah* venom inhibits the activity of Ach-E inhibition was prevented using the plant extracts w in different concentrations. The methanolic extract of leaf of *A.marmelos* showed the highest inhibitory effect of about 77.7% on venom-induced anti-Ach-E activity. The effectiveness of plant extracts on the activity of Ach-blockers or inhibitors in *Ophiophagus hannah* venom has a significant effect on the victim. Mostly, instantaneous death due to *Ophiophagus hannah* bite is through inhibition of muscle concentration of the intercostal muscles in association with ribs and chest, thereby preventing respiration.

Anti-proteolytic activity: *Ophiophagus hannah* venom-induced 33% elevation in Cathepsin D assay. In- vitro assay the *Aegle marmelos* leaves ethanolic extract showed significant result in elevating the proteolytic activity by *Ophiophagus hannah* venom.

***Azima tetracantha* plant leaves**

Azima tetracantha is an ornamental plant in the Salvodoraceae family; it is commonly called Bee Sting Bush. In Indian *Azima tetracantha* plant leaves are used as herbal medicine to treat the snake bites [22]. Various phytochemicals reported from these plants include dimeric piperidine carpine, alkaloids azimine, triterpenoids, isorhamnetin 3-rutinoside, glucosinolates, neoascorbinogen and azacarpaine, these phytochemicals are thought to act as anti-venom against snake bite [23-27]. Using different solvents like petroleum ether, hexane, chloroform, ethylacetate, methanol, and water plant extract are prepared by using leaves of *A.tetracantha.* Inhibition activity of enzyme protease, 5'nucleotidase, phosphodiesterase, phosphomonoesterase, acetylcholinesterase, L-amino acid oxidase, hyaluronidase, and phospholipase A_2 used in-vitro study by plant extract at different concentrations. Ethylacetate extract of the plant resulted inhibition of enzymes such as phosphodiesterase, phosphomonoesterase, acetylcholinesterase, 5' nucleotidase, phospholipase A_2, and hyaluronidase, the extract showed maximum activity. L-amino acid and Protease oxidase enzymes resulted in nil inhibition activity in plant extracts [28].

***Citrullus colocynthis* Schrad (Cucurbitaceae)**

C.colocynthis plant is mostly used in Pakistan as a remedy for snakebite poisoning. It is a spiny shrub found sufficiently in arid calcareous rock areas in Pakistan [29]. *Ophiophagus hannah* venom induces hemorrhagic conditions due to the presence of certain enzymes; hemorrhagic effects account for the degradation of fibrinogen which results in the inhibition of platelet aggregation [30]. The stem and fruit of *C. colocynthis* were collected and the extract was prepared using methanol as a solvent, the extract was then investigated for anti-hemorrhagic activity. Lyophilized venom of *Ophiophagus hannah* was used to carry out the study [31]. Before using venom was reconstituted using Phosphate buffered saline. Anti-hemorrhagic assay of plant extract was carried out using fertilized eggs [32]. Serum lyophilized polyvalent snake venom antiserum is used. Paper discs of 2mm diameter were prepared in various experimental samples [33]. A corona was observed of 2mm diameter when 2.9 µg of venom/1.5 µL of Phosphate buffered saline concentration was used, this concentration was then regarded as Reference Hemorrhagic Dose (RHD). Different concentrations of plant extract, as well as antiserum, were mixed with Rheumatic heart disease to eliminate haemorrhage and were then considered as lowest Effectual Neutralizing Dose (MEND).The hemorrhage effect of venom was dose-dependent, with the increase in dose there was a gradual increase in bleeding [34].

Mimosa pudica

Mimosa pudica is also known as touch-me-not or shy plant. Various in vivo and in vitro assays were carried out to

investigate the anti-venom effect of *Mimosa pudica* plant extract. The plant extract was prepared using distilled water as a solvent [35]. The mice vaccinated with *Ophiophagus hannah* and *Bungarus caeruleus* venoms showed an increase in footpad thickness. At a concentration of 7 µg of *Ophiophagus hannah* and 7 µg of *Bungarus caeruleus* venom-induced edema formation within 3 hours, this is considered as 100% activity. At 2.5 µg concentration of plant extract per mg of venom showed a reduction of about 30% in footpad thickness.

Lethal toxicity (LD_{50}): Lethal toxicity of *Ophiophagus hannah* and *Bungarus caeruleus* venom were evaluated using18g, BALB/c (*Mus musculus*) strain mice. About 10 µg of *Ophiophagus hannah* and 3 µg of *Bungarus caeruleus* venom was found to be destructive for 18g of mice. Varying concentrations of plant extract was mixed with a constant concentration of venom to investigate the neutralization of lethality 0.14 µg and 0.16 µg concentration of plant extract were found to completely neutralize the lethal dose of *Ophiophagus hannah* and *Bungarus caeruleus* venom.

Phospholipase A_2 and procoagulan activity: About 15 µg of *Ophiophagus hannah* and 10 µg of *Bungarus caeruleus* venom were able to produce 11mm diameter hemolytic halo in agarose-sheep erythrocytes gel, this shows that venom of Ophiophagus hannah and *Bungarus caeruleus* consists of enzyme phospholipase A_2 which can lyse sheep Red blood cells. 0.13 µg and 0.16 µg concentration of *M. pudica* extract were identified to completely inhibit phospholipase A_2 dependent hemolysis of sheep Red blood cells induced by *Ophiophagus hannah* and *Bungarus caeruleus* venom respectively. The highest Coagulant Dose (MCD) was identified as the venom dose inducing clotting of plasma within 60 seconds. 60 µg concentration of *Ophiophagus hannah* and *Bungarus caeruleus* venom clotted human citrated plasma in 60 seconds. 1.4 µg of plant extract was found to completely neutralize the coagulant activity of venom.

Fibrinolytic activity: The plant extract was able to counteract the fibrinolytic effect at a varying concentration of 0.7 µg and 0.9 µg for *Ophiophagus hannah* and *Bungarus caeruleus* respectively.

Vitex negundo

Vitex negundo is commonly called as a five-leaved chaste tree is an aromatic shrub with quadrangular. Southeast Asians widely used these Ethnobotanical plants in their folk medicine [2]. The leaves were traditionally documented to carry potent pharmacological effects like antibiotics, antioxidant, anti-convulsant, anti-androgen, anti-rheumatic, hepatoprotective, anti-allergic, anti-inflammatory and snake venom neutralization [36]. *V.negundo* leaves (blue and green color) are taken to evaluate their anti-venom properties against Daboia russelii and *Ophiophagus* hannah venom. Anti-venom activity and venom neutralization effect were established by investigating Proteolytic activity, Procoagulant activity, Phospholipase A_2 activity, and fibrinolytic activity. Both green and blue leaves were collected and the extract was formed using 50% ethanol, ethyl acetate, and water as a solvent. Preliminary screening of phytochemicals analysis showed the presence of carbohydrates, alkaloids, flavonoids, tannins, proteins, saponins, phenols, steroids, and glycosides in the leaf extracts [37].

Inhibition of venom-induced hemolysis by *V.negundo:* The most inhibitory effect against *Ophiophagus hannah* venom-induced *Red blood cells* lysis was about 54.2% and 61% for green and blue leaves respectively. 60% and 52.5% inhibition were identified against *Daboia russelii* venom-induced *Red blood cells* lysis when treated with green and blue leaves respectively at 100 µg/ml concentrations in plant extract. Blue leaves showed highest inhibition when compared to green leaves.

Inhibition of venom-induced proteolysis by leaves extract: Both green and blue leaves extract positively demonstrated an inhibitory effect against proteolysis induced *Ophiophagus hannah* and *Daboia russelii* venom. At 500 µg/ml concentration about 78% and 76.8% proteolysis inhibition was observed in blue and green plant extract respectively against *Ophiophagus hannah* venom. About 66.4% and 63.4% inhibition were found in both blue and green leaves at 500 µg/ml concentration against russell's *Daboia russelii* respectively.

Procoagulant activity: *Ophiophagus hannah* venom-showed clotting of human citrated plasma in 35 seconds and russell's viper venom-induced clotting in 32 seconds, so the lowest agglomeration dose (MCD) was identified to be 20 µl and 15 µl for *Ophiophagus Hannah* and *Daboia russelii* venom respectively. About 1.6 µg of blue leaf extract completely inhibited clotting induced by *Ophiophagus hannah* and russell's viper venom in human citrated plasma. Blue leaf was detected to be most effective in inhibited the blood clotting caused by snake venom compare to green leaves.

Inhibition of phospholipase A_2 activity: 10 µl concentrated *Ophiophagus hannah* and *Daboia russelii* venom is efficient to produce hemolytic halos of 11 mm in agarose-erythriocyted gel. This showed 100% hemolysis reaction of snake venom. At 1.0 µg and 1.2 µg concentration of blue and green leaves extract undoubtedly reduced the diameter of a hemolytic halo from 11 mm to 6 mm and 7 mm.

Inhibition of fibrinolytiv assay: Snake venoms dwell a coagulant that causing lysis of fibrinogen to fibrin monomers, this reaction is due to fibrinogen lysis which further leads to blood clotting in 1 seconds of snake bite. 10 µl of *Daboia russelii* and *Ophiophagus hannah* venom formed a fibrinolytic halo of 10 mm in agarose gel containing human plasma. At 1 µg concentration of blue leaves and 1.2 µg of green leaves extract undoubtedly reduced the diameter of a fibrinolytic halo from 10 mm to 6 mm and 7 mm.

Withania somnifera

W.somnifera is commonly called "Ashwagandha". It is a small, woody, shrub under the *Solanaceae* family. It is found in Africa, the Mediterranean, and India. All parts like roots, leaves, stem, fruits, seed, and bark can be used to treat different disease. Biologically active compounds found are alkaloids, steroids, and saponins. The root extract of *W.somnifera* was investigated for its anti-venom activity against *Echiscarinatus*venom using various in vitro and in vivo assays. Roots were collected and extracted using distilled water as a solvent. *E.carinatus*snake venom was used for the investigation [38].

In vivo neutralization assay

Neutralization of lethal dose: About 12 µg of snake venom was found to be lethal for 18 gm of Balb/c strain mice. The neutralization effect of plant extract was carried out by the pre-incubating constant amount of venom with different dilutions of plant extract before injection. About 0.16 µg of root extract was capable to completely neutralize the lethal activity of snake venom.

Edema forming activity: At 7 µg of concentration of venom, edema was observed within 3 hours which is considered as 100% activity. Edema was lowered about 20% when 400 µl concentration of plant extract/ µg of venom were given.

Hemorrhagic activity: At 8 µg concentration of venom, a hemorrhagic spot of 10mm diameter was formed. The root extract of *W.somnifera* was positively capable of neutralizing the hemorrhage induced by venom.

In vitro neutralization assay

Phospholipase A_2 activity: 11 mm hemolytic halo was produced when 10 µg of snake venom was used. Root extract was inhibiting PLA_2- depending on hemolysis of sheep RBCs prompt by *E.carunatus* venom in a dose-depending methodology.

Procoagulant activity: 120 µg of venom was found to be a Minimum Coagulant Dose (MCD) which shows clotting of human citrated plasma within 60 seconds. The root extract of *W.somnifera* positively showed neutralizing coagulant activity of snake venom.

Fibrinolytic activity: 0.8 µg concentration of plant extract was positively capable of neutralizing the fibrinolytic activity induced by snake venom.

Cordia macleodii

Cordia macleodii comes under the *Ehretiacae* family, it is commonly known as Dahiman in Hindi. It is a rare medicinal and timber plant found in moist, dry deciduous forests and successfully used for the treatment of snakebites by traditional healers in the Chhattisgarh State of India. The leaf of the plants showed properties for anti-inflammatory activity [39]. Anti-venom activity of bark of *C.macleodii* bark using Wistar albino rats weighing 180-250 g and Swiss albino rats about 20 g to 25 g was performed. The anti-

venom analysis of bark was checked against *Ophiophagus hannah* venom by various toxicity studies. *C.macleodii* bark was collected locally and was extracted using 70% ethanol [40].

Neutralization of lethal venom effect: After 24 hours of incubation of administration of venom at different concentrations in experimental mice, it was found that the lethal dose of *Ophiophagus hannah* venom is 120 µg/rat. Oral administration of the *C.macleodii* extract didn't produce any toxic reaction up to 2g/kg in rats even after the incubation in 72 hours. This indicates protection against *Ophiophagus hannah* venom by oral administration of plant extract in a dose-dependent manner. Considerable protection was observed at 200 and 400 µg/kg plant extract.

Neutralization of Haemorrhagic and Necrotizing activity: The Minimum Hemorrhagic Dose (MHD) is known as the least amount of toxicant which when injected intradermally into rats and results in a hemorrhagic lesion of 10 mm diameter in 24 hours. The lowest Necrotizing Dose (MND) is known as the minimum amount of toxicant which was injected intradermally into rats results showed in necrotic lesion of 5mm diameter in 3 days. The MND of venom injected intradermally into the rat's shaved dorsal skin causing necrotizing and hemorrhagic lesions. The *C.macleodii* extract at 200 µg/kg reduced the lesions to 6.18 mm and 3.16 mm in hemorrhagic and necrotizing lesions respectively. By maximising the concentration of plant extract the diameter of lesions was observed to decline.

Neutralization of coagulant assay: It was estimated by *C.macleodii* extract at different concentrations with a fixed amount of *Ophiophagus hannah* venom. Blood treated with snake toxicant at a concentration of 61.11 µg coagulated human citrated plasma in 60 seconds. *C.macleodii* extract at a concentration of 1.8 µg of the dose was capable of completely neutralizing the c coagulated analysis of snake venom.

Fibrinolytic Analysis: The lowest defibrinogenating dose is defined as the minimum amount of venom injected intravenously into mice and it caused coagulable blood in 1 hour later. The MDD of snake venom was found to be 75.32 µg/ml it was found that about 2.10 µg/ml dose of plant extract was capable to neutralize the fibrinolytic activity of snake venom.

Edema forming activity: The minimum edematic dose of venom is the least amount of venom injected by the intra planter route of rats and it produced inflammation in the paw. *Ophiophagus hannah* venom-induced notable edema in rat paw, maximum inflammation was seen after incubation of 1 hour after venom was injected. A concentration of 400 µg/ml dose of plant extract showed a reduction in the inflammation in the rat paw.

Acorus calamus

A.calamus is the scientific name of the plant which is more commonly known as *"Calamus"*. A.*calamus* is a monocot grass-like plant from the family of *Acoraceae.* It is been known for its beneficial and medicinal value in Asia fora long time [41]. Roots were collected and extracted using distilled water as a solvent. *E.carinatus*snake venom was used for the investigation [38].

In vivo neutralization assay

Neutralization of lethal dose: About 12 µg of snake venom was found to be lethal for 18gm of Balb/c strain mice. The neutralization effect of plant extract was carried out by the pre-incubating constant amount of venom with different dilutions of plant extract before injection. About 0.14 µg of root extract was capable to completely neutralize the lethal activity of snake venom.

Edema forming activity: At 7 µg of concentration of venom, edema was observed within 3 hours which is considered as 100% activity. Edema was lowered about 20% when 400 µl concentration of plant extract/ µg of venom were given.

Haemorrhagic activity: At 8 µg concentration of venom, a hemorrhagic spot of 10mm diameter was formed. The root extract of *A.calamus* was positively capable of neutralizing the hemorrhage induced by venom.

In vitro neutralization assay

Phospholipase A_2 activity: 11 mm hemolytic halo was produced when 10 µg of snake venom was used. Root extract was able to inhibit PLA_2- dependent hemolysis of sheep RBCs induced by *E.carunatus* venom in a dose-dependent manner.

Procoagulant activity: 120 µg of venom was found to be a Minimum Coagulant Dose (MCD) which shows clotting of human citrated plasma within 60 seconds. The root extract of *A.calamus* positively showed neutralizing coagulant activity of snake venom.

Fibrinolytic activity: 0.5 µg concentration of plant extract was positively capable of neutralizing the fibrinolytic activity induced by snake venom.

Aervalanata

A.lanata belongs to *Amaranthaceae* family which is commonly known as "bui". It is found throughout India as a common weed in fields and waste places [42]. Leaves of *A.lanata* were found to be high in carbohydrates, crude protein, and ash. And various minerals such as calcium, potassium, zinc, iron, magnesium, and manganese were found. Various bioactive compounds like alkaloids, flavonoids, and miscellaneous phytoconstituents like benzoic acid, lupeol, and tannic acid were isolated from this plant [43]. Various parts of pants when extracted using different solvents showed antimicrobial, antiparasitic, diuretic, and anti-urolithiasis, antiasthmatic, antifertility, antidiabetic, hypolipidemic, hepatoprotective, antitumor, and anti-diarrheal activity. Fresh leaves of *A.lanata*were collected and extracted using acetone as a solvent [44]. *Najanaja* snake venom was taken to investigate the antivenom activity of plant extract. *A.lanata* extract was used to investigate the neutralization of phospholipase, coagulant, and lytic effect of snake venom.

Phospholipase activity: It was carried out using Agarose-erythrocytes-egg yolk gel plate method [45]. The Minimum Indirect Haemolytic Dose (MIHD) of *Ophiophagus hannah* venom was found to be 4 µl where a hemolytic halo of 11 mm was observed. Inhibition of phospholipase activity can be calculated by 50% reduction hemolytic halo.10 µl concentration of plant extract reduced the hemolytic halo from 11mm to 5.5mm, this estimates the 50% reduction of phospholipase activity.

Procoagulant assay: The plant extract was used to procoagulant assay against Najanaja (Indian Ophiophagus hannah) venom. The Lowest Coagulant Dose (MCD) of *Ophiophagus hannah* venom was found to be 2 µl. Plant extract showed efficient neutralization of coagulant activity at 30 µl concentration.

Anti-hemolysis activity: Percentage hemolysis was carried out using a spectroscopic method [46-49]. 30 µl concentration of *A.lanata* leaf extract positively showed inhibition of 50% lysis.

Conclusion

Snakebites have become a major cause of mortality in rural areas due to the presence of more snakes and less knowledge of antivenom therapy. Field workers are at high risk due to snake bites. Anti-venom therapy does not provide promising effects against snake bite, due to various reasons like the polyvalent anti-venom antibodies produced will provide protection only for the venom it was immunized in the animal model, the antibody may also cause cross-reactivity in the host body. Also the lyophilized anti-venom powder available requires specific storage conditions and intensive care and the liquid formulated drugs also require special storage conditions. To overcome the disadvantages of the anti-venom therapy alternative sources of anti-venom activity from natural substances is on focus. In ancient times the use of certain medicinal plants helped people to cure certain diseases. Even today some rural areas are dependent on medicinal plants for their healing properties with minimal side effects. This study investigated various medicinal plants like *Aegle marmelos, Azima tetracantha, Citrullus Colocynthis, Mimosa pudica, Mucuna pruriens, Vitex negundo, Withania somnific, Cordia macleodii, and Aervalanata*for their antivenom activity against some deadly snake venoms. The biologically active components like alkaloids, flavonoids, and certain proteins are responsible for providing healing effects against certain disease. Different parts of the above-mentioned plant were extracted using different solvents. Using these plant extracts, various *in vivo* and *in vitro* assays were performed. The plant extracts were positively neutralizing the activity of different snake venom at different concentrations. Effects of Haemolytic, fibrinogenating, pro coagulant and edema forming are due to snake venom were positively neutralized by these plant extracts. This positive effect of plant extracts against various snake venoms provides us a new area for

research to formulating drugs using medicinal plants, which would be an easy procedure and cost-effective with fewer side effects.

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