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Ethnomedicinal Flora Deployed In The Therapeutic Intervenation Of Snakebite Within The Pachamalai Hills, Tiruchirappalli District, Tamil Nadu, India.

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Abstract

Snake bite is one of the neglected public health problems which could lead to acute iatrogenic effects including the nervous system leading to paralysis, drooping eyelids, tingling. The cardiovascular system causing bleeding disorders. The renal system resulting kidney failure. The local tissue causing damage and dysfunction. It also causes pain, swelling, redness, systemic effects like nausea, weakness, and respiratory distress**.** Plant-derived traditional herbal remedies have served as a prolific reservoir of therapeutic compounds, employed worldwide to forestall and manage a plethora of human maladies since the dawn of civilization, The present investigation, conducted within the Pachamalai hills of the Tiruchirappalli district, sought to explore the expansive potential of medicinal flora in the treatment of ophidian envenomation. Thorough surveys and inquiries -glycemic equilibrium documented a total of 95 plant species, representing 91 distinct families, utilized by local communities for the management of glycemic equilibrium. This study meticulously delineates these botanicals, furnishing their binomial nomenclature and vernacular appellations, alongside precise descriptions of the specific plant components employed in medicinal preparations for snakebites. Saliently, prominent families identified in the survey encompassed Fabaceae, Mimosaceae, Apocynaceae, Amaranthaceae, and Asteraceae.

Keywords: Snake bites, traditional medicine, indigenous groups, medicinal plants, Pachamalai.

Introduction

Snakebite envenomation constitutes a significant global health challenge, precipitating perennial mortality across numerous nations. While antivenom therapy remains the solitary recourse, its implementation is fraught with inherent limitations and economic impediments, rendering it inaccessible to a substantial Portion of the affected populace. Consequently, the utilization of phototherapeutic agents, integral to indigenous medical practices, presents a compelling alternative treatment paradigm. The World Health Organisation posits that a substantial 80% of the global populace depends on conventional herbal pharmacopoeia for their fundamental healthcare requisites. India, notably boasts a venerable tradition of employing medicinal botanicals within both conventional and tribal therapeutic modalities throughout its historical continuum.

Humanity has been inextricably linked to nature for its sustenance from the earliest epochs. This profound reliance engendered a unique compendium of knowledge among aboriginal populations, living symbiotically with nature, regarding plant resources; knowledge cultivated through methods of trial and refinement. Traditionally, this wealth of knowledge has been transmitted orally across generations, (Perumal Samy and Ignacimuthu, 1998, 2000), and continues to be preserved by diverse indigenous communities globally. Conventional human populations possess an expansive natural pharmacopoeia encompassing diverse flora and fauna. Botanical and zoological constituents are integral not only to traditional medical practices but are also increasingly esteemed as primary components in the formulation of contemporary pharmaceuticals and phytotherapeutic preparations. The World Health Organization delineates traditional medicines as an amalgamation of practices, epistemic repositories, and optimism systems., employing mineral, botanical, and zoological remedies, alongside spiritual and physical therapies, to preempt, manage, and sustain holistic wellbeing (WHO, 2003). Even in contemporary times, indigenous and localized communities continue to employ herbal medicine for the amelioration of manifold afflictions, with plants being particularly utilized within Traditional remedies for therapeutic intervention of ophidian envenomation (Siddiqui and Husain, 1990; Martz, 1992; Houghton and Osibogun, 1993). Ophidian envenomation constitutes a grave medical, social, and economic exigency in numerous global regions, particularly within tropical and subtropical latitudes.

The conventional therapeutic intervention for snakebite envenomation involves parenteral administration of polyclonal antivenoms, derived from equine or ovine sources, designed to neutralize venomous toxins. Notwithstanding the widespread efficacy of this therapeutic modality, the quest for alternative venom inhibitors, whether synthetic or naturally occurring, that may augment or supplant the function of antivenoms, remains paramount. Snakebite represents a globally neglected health hazard (Alirol et al., 2010). Epidemiological assessments reveal a global incidence of approximately 5,400,000 annual snakebite occurrences, resulting in over 2,500,000 envenomation and approximately 125,000 fatalities annually (Kasturiratne et al., 2008). Agricultural and tropical regions disproportionately bear the burden of snakebite incidents. In India alone, in excess of 200,000 cases are reported, with estimated mortality rates ranging from 35,000 to 50,000 individuals per annum. Antivenom remains the sole globally accessible therapeutic intervention for snake envenomation, constituted of deodorize enzyme-refined, and concentrated heterologous immunoglobulins. Within India, uniquely in its rural pastrol expanses, victims of snakebite often seek recourse in traditional medicine practitioners and healer's therapist, primarily due to the insufficient availability of antivenom. A survey of existing literature lore on ethnobotanical reveals substantive exploration into herbal antagonists of snake venom across diverse global regions (Meenatchisundaram et al.,2008; Gomes A.et al., 2010,2012; Pithayanukul P.et al., 2010; Basha SK.et al.,2012; Kumarappan C. et al.,2011).

Medicinal flora indigenous to India has been employed to mitigate specific maladies since antiquity. The utilization of plant-based remedies is largely predicated upon their perceived safety, efficacy, cultural resonance, cost-effectiveness, and widespread accessibility. These botanical agents are deployed either singularly or synergistically as antibodies against snake envenomation by rural communities in India and numerous other locales worldwide (Samy RP.et al., 2008). Currently, a number of medicinal plants possessing recognized therapeutic attributes in the context of snakebite treatment are garnering increasing scholarly interest. In recent times, owing to unsystematic developmental initiatives, the proliferation of contemporary healthcare infrastructure, and the pervasive influence of modern civilization, , elemental resources, ancestral cognizance, and autochthonous cultures are undergoing accelerated depletion at a concerning pace. Consequently, it is of paramount importance to investigate and meticulously document the distinctive and indigenous aboriginal epistemological inheritance held by tribal communities before it is irretrievably lost with the passing of its knowledgeable custodians. Antivenom persists as the exclusive globally accessible therapeutic recourse for snake envenomation, comprising purified, enzymatically refined, and concentrated heterologous immunoglobulins. Within India, most notably in its rural expanses,

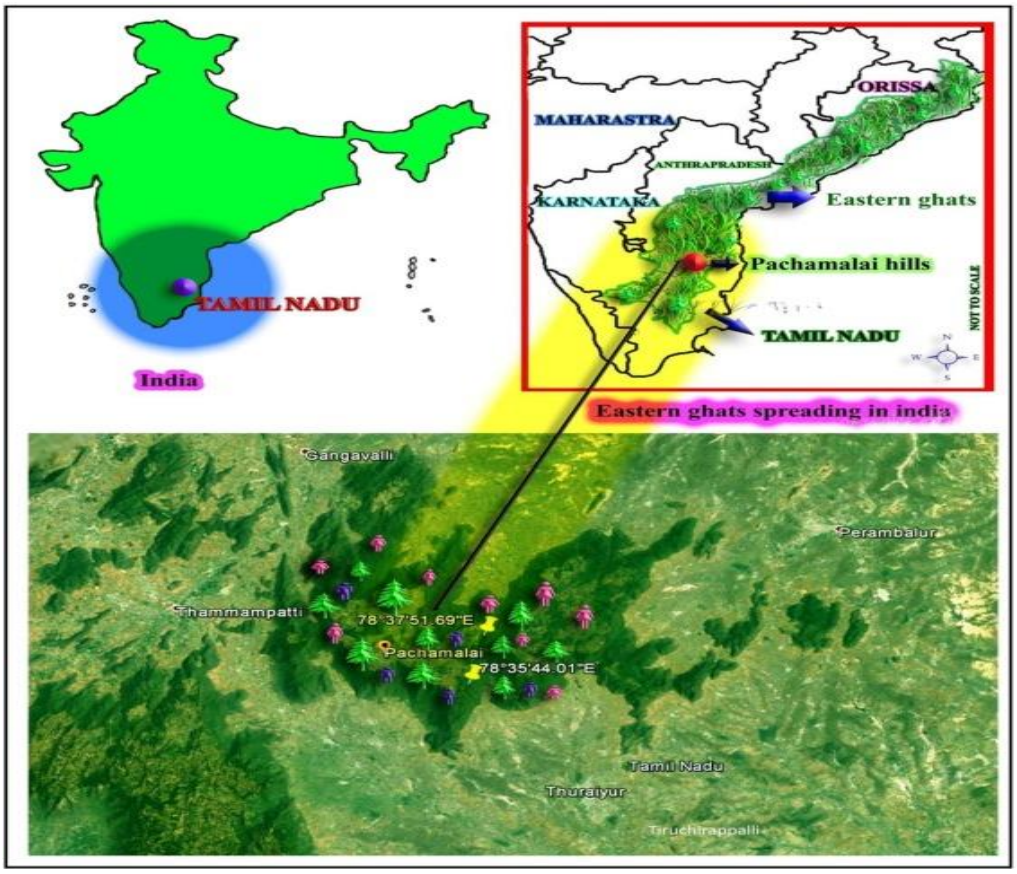
snakebite victims frequently seek succor from traditional medicine practitioners and healers, primarily attributable to antivenom's insufficient availability.

Nevertheless, the effectiveness of this conventional therapeutic protocol remains largely unsubstantiated. Consequently, the exploration of herbal antidotes for snake envenomation assumes paramount significance in the clinical management of snakebites. Scant survey reports allude to the utilization of herbal remedies by folk or indigenous societies (Bhandary et al., 1996; Harsha et al., 2002, 2003; Parinittha et al., 2005). To date, only a modicum of species has undergone rigorous scientific scrutiny, involving the isolation and comprehensive characterization of their active constituents, both structurally and functionally. Ergo, the present investigation is dedicated to a preliminary survey of medicinal flora employed therapeutically for snakebites, coupled with an extensive examination of their traditional usage among indigenous groups within a specific region of the Tiruchirappalli District in Tamil Nadu, India. It, therefore, behooves the scientific fraternity to elucidate and meticulously document this knowledge, ensuring its global accessibility for the betterment of humankind (Manoranjitham et al., 2016). Accordingly, the imperative to record the knowledge pertaining to numerous other plants from indigenous populations, veritable repositories of botanical wealth, is exigent. Within this context, the present study addresses the documentation of ethnomedicinal information concerning plants utilized by the Malayali tribes of the Pachamalai hills, with particular emphasis on wound treatment.

Materials Methods

Pachamalai Hills, range of hills in Tamil Nadu state, southern India constitute an eastward extension of the Eastern Ghats in the northern Tamil Nadu uplands. The Pachamalai Hills, together with the Javadi, Shevariy and Kalvarayan Hills, separate the Cauvery river basin in the south from the Palar river basin in the north. Extenting over an area about 5,200 sq mls (13,500 sq. k,), they form a discontinous line of highlands with a general elevation from 1,70 to 4,620 feet (540 to 1,400 meters). The hills are named for the Pachamalaiyali people who live in the region. The Shangam period in Tamil literature flourished in the area during the Chera, Chola and Pandiya dynasties.

The present investigation was carried out between “2023 and 2024 and the surveys were conducted using questionnaires in Tiruchirappalli District in Tamil Nādu which are in and around the reserved Forests (Fig. 1), which is one of the places with a rich biodiversity in Tamil Nadu. Traditional healers, called “Nattu vaidyars from indigenous group were targeted for documentation of the use of medicinal plants our main focus was to collect the oral information about the same traditional plants used by natives (different indigenous groups) for treatment of snake bites; we did not use any “statistical survey in this study.



S.No	**Botanical name**	Family	Vernacular Name (Tamil)	Parts Used	Mode of Preparation
1	*Abrus precatorius L*	Fabaceae	Kundumani	Seed	Paste
2	*Abutilon indicum(L)sweet,*	Malvaceae	Thuthi	Leaf & Fruits	Leaf Juice
3	*Acacia catecu Willd.*	Mimosaceae	Karanagalli	Bark	Paste
4	*Acacia sinuata Merr.*	Mimosaceae	Cikaikkai	Pod	Paste
5	*Acalypha indica L.*	Euphorbiaceae	Kupaimeni	Leaves	Juice
6	*Achyranthes aspera L*	Amaranthaceae	Nayuruvi	Roots	Decoction
7	*Acorus calamus L.*	Araceae	Vasambu	Rhizome	Paste
8	*Aegle marmelos (L.) Correa.*	Rutaceae	Vilvam	Fruit &leaf	Juice
9	*Ageratum conyzoides L.*	Asteraceae	Mukkuthipoo	Leaves	Juice
10	*Alangium salvifolium (Lf)Wang.*	Alangiaceae	Alangi	Bark	Decoction
11	*Albizia lebbeck (L.) Willd.*	Mimosaceae	Vagai maram	Bark	Decoction
12	*Albizia procera Benth.*	Mimosaceae	Kandaivagai	Pod	Paste
13	*Aloe vera L.*	Liliaceae	Kathallai	Whole plant	Juice
14	*Alstonia scholaris (L.) R.Br.*	Apocynaceae	Veppallai	Latex	Paste
15	*Alternanthera sessilis (L.) R. Br.*	Amaranthaceae	Ponnanganni	Roots	Paste
16	*Amaranthus blitum L.*	Amaranthaceae	Mulaikeerai	Root	Powder Orally
17	*Andrographis paniculata (Burn.f.) Wall.*	Acanthaceae	Nilavembu	Leaves	Paste

18	*Anisomeles malabarica (L.) R. Br.*	Lamiaceae	Peimeratti	Leaves	Juice
19	*Annona senegalensis Pers.*	Annonaceae	Seethapalam	Leaves & Stem	Decoction
20	*Aristolochia indica L.*	Aristolochiaceae	Karudakkodi	Leaves	Juice
21	*Aristolochia odoratissima L.*	Aristolochiaceae	Isvaramuli	Fruits	Juice
22	*Asparagus racemosus Willd.*	Asparagaceae	Thannirvittan kizhangu	Root & tuber	Paste
23	*Azadirachta indica A.Jass*	Meliaceae	Vembu	Flower	Decoction
24	*Bacopa monnieri (L.) Penn.*	Amaranthaceae	Nirbrahmi	Stem & leaves	Decoction
25	*Barringtonia acutangula (L.) Gaertn.*	Lecythidaceae	Samudrapazham	Seed	Paste
26	*Boerhavia diffusa L.*	Nyctaginaceae	Mukarattai	Leave	Decoction
27	*Boswellia delzielii (Hutch).*	Burseraceae	Kumancam	Stem bark	Paste
28	*Bridellia ferruginea*	Euphorbiaceae	Karambai	Leaves	Juice
29	*Buchanania lanzan Spreng.*	Anacardiaceae	Morai maram	Seed	Paste
30	*Butea monosperma (Lam.)*	Fabaceaee	Porasu	Leaves	Paste
31	*Calendula officinlis L*	Asteraceae	Marikollunthu	Leaves	Paste
32	*Calotropis gigantea (L.) R.Br.*	Asclepiadaceae	Erukku	Root	Paste
33	*Capparis zeylanica Linn.*	Capparidaceae	Adondai	Fruits	Juice
34	*Cardiospemum halicacabum L.*	Sapindaceae	Mudakathan	Leaves	Juice
35	*Carica papaya L.*	Caricaceae	Pappali	Leave	Juice
36	*Ceiba pentandra (L).*	Malvaceae	Elava maram	Flower, fruit, leaves	Paste
37	*Cissampelos pareira L.*	Menispermaceae	Urikkakodi	Leaves	Paste
38	*Cissus quadrangularis L.*	Vitaceae	Pirandai	Leaves	Paste
39	*Citrus limonL.*	Rutaceae	Elumichai	Fruits	Juice
40	*Clitoria ternatea Linn.*	Fabaceae	Sanku poo	Root	Paste
41	*Corallocarpus epigaeus (Rottl.) Hook.F.*	Cucurbitaceae	Akashagaruden	Roots	Decoction
42	*Crinum asiaticum L.*	Amarylliadaceae	Vishamungil	Bulb	Paste
43	*Curculigo orchioide Gaertn.*	Hypoxidaceae	Nilappanaikkilanku	Roots	Paste
44	*Curcuma angustifolia Roxb*	Zingiberaceae	Ararutkilangu	Rhizome	Paste
45	*Curcuma longa L.*	Zingiberaceae	Manjal	Rhizome	Paste
46	*Datura metal L*	Solanaceae	Umatai	Roots	Paste
47	*Dichrostachys cinerea (L.) Wight&Arn.*	Mimosaceae	Vedatalla	Root	Paste

48	*Eclipta prostrate(L.) Mant.*	Asteraceae	Karisalanganni	Leaves	Juice
49	*Euphorbia thymifolia L.*	Euphorbiaceae	Amman patcaruchi	Leaves	Paste
50	*Ficus exasperata Vahl*	Moraceae	Maramthinniathi	Leaves & stem bark	Decotions
51	*Gloriosa superba L.*	Liliaceae	Kalapakelangu	Tuber	Paste
52	*Guiera senegalensis J.F.Gmel.*	Combretaceae	Guiera	Leaves	Juice
53	*Gymnema sylvestre (Retz.) R.Br.*	Asclepiadaceae	Sarkaraikolli	Leaves	Raw
54	*Hemidesmus indicus (L.) R.Br.*	Asclepiadaceae	Nannari	Root	Paste
55	*Holarrhena antidysenterica*	Apocynaceae	Kudasappaalai	Leaves	Juice
56	*Laccosperma secundiflorum(P.Beauv.)Kuntze*	Arecaceae	Large rattan	Leaves & stem bark	Decotions
57	*Leucas aspera (Willd.) Link*	Lamiaceae	Tumbai	Leaves	Juice
58	*Mangifera indica L.*	Anacardiaceae	Mamaram	Stem bark	Paste
59	*Mimosa Pudica L*	Fabaceae	Totta Sinugi	Leaf	Paste
60	*Moringa oleifera Lam.*	Moringaeceae	murungai	Bark	Paste
61	*Mucuna pruriens*	Fabaceae	Poonai kaali	Seed	Juice
62	*Mangifera indica L*	Anacardiaceae	Mamaram	Stembark	Paste
63	*Murraya koenigii (L.) Spreng.*	Rutaceae	Karuvepillai	Leaves	Decoction
64	*Musa paradisiaca L.*	Musaceae	Vazhai	Bark	Juice
65	*Nerium oleander L.*	Apocynaceae	Arali	Seed	Paste
66	*Parinari curatellifolia*	Chrysobalanaceae	Fever tree	Root bark	Paste
67	*Parkia biglandulosa (Jacq.)R.Br. ex G.Don.*	Fabaceae	Badminton Ball Tree	Stem bark	Paste
68	*Pentapetes phoenicea L.*	Malvaceae	Nagappu	Root	Paste
69	*Pergularia daemia (Forsk.) Chiov.*	Asclepiadaceae	Velliparuthi	Leaves	Juice
70	*Pilistigma thonningil (Schum)Mine-Redh*	Fabaceae	Katti muruchan	Leaves & stem bark	Decotions
71	*Piper longum L.*	Piperaceae	Thippli	stem	Juice
72	*Piper nigrum L.*	Piperaceae	Milagu	Seeds	Juice
73	*Pluchea indica (L.) Less.*	Asteraceae	Kalapani	Root	Paste
74	*Pogostemon benghalense (Burm.f)*	Lamiaceae	Bengal pogostemon	Root	Paste
75	*Pouzolzia indica*	Urtricaceae	Nircinni	Aerial parts	Paste
76	*Punica granatum L.*	Punicaceae	Madhullai	Fruit bark	Paste
77	*Rauvolfia serpentina*	Apocynaceae	Sarabakaathi	Roots and	Paste

	(Linn.)			leaves	
78	*Ricinus communis L.*	Euphorbiaceae	Amannakku	Seed	Paste
79	*Sapindus saponaria L.*	Sapindaceae	Puchikotti	Callus	Paste
80	*Schleichera oleosa (Lour.) Oken*	Sapindaceae	Kumbadiri	Root	Paste
81	*Securidaca longipedunculata Fresen.*	Polygalaceae	Violet tree	Root	Paste
82	*Semecarpus anacardium L.f.*	Anacardiaceae	Cen- kottai	Root	Paste
83	*Solanum virginianum L.*	Solanaceae	Kandankathari	Fruits	Paste
84	*Strychnos nux-vomica L.*	Loganiaceae	Etti	Root	Juice
85	*Symplocos cochinensis Jacq.*	Simplocaceae	Kamblivetti	Leaves	Paste
86	*Tamarindus indicus L.*	Caesalpiniaceae	Puli	Fruits	Juice
87	*Tenospora cordifolia (Thunb.) Miers.*	Menispermaceae	Shindilakodi	Root	Decoction
88	*Tephrosia purpurea L.*	Fabaceae	Kollungi	Seeds	Paste
89	*Thunbergia alata Bojer ex Sims.*	Acanthaceae	Black eye	Leaves	Paste
90	*Tiliacora acuminata Colebr.*	Menispermaceae	Perunkattukoti	Root	Paste
91	*Tribulus terrestris L.*	Zygophyllaceae	Nerunji	Seeds	Juice
92	*Vitellaria Paradoxa*	Sapotaceae	Shea butter	Leaf & Stem bark	Decotion
93	*Vitex negundo L.*	Lamiaceae	Nocchi	Root	Paste
94	*Vitex trifolia L.f.*	Verbenaceae	Karunotchi	Leaves	Juice
95	*Withania somnifera (L.) Dunal.*	Solanaceae	Amukkara	Root	Decoction

RESULTS AND DISCUSSION

Despite its widespread application, a rigorous scientific documentation of information from these healers remains absent. Nevertheless, the present findings corroborate earlier reports indicating the use of a medicated stone, "Vishakallu" (poison stone), by the indigenous "Kani" group in Kerala, India, for snakebite treatment. Direct application of the stone to the bite site facilitates its adhesion, purportedly drawing out the venom until saturation, at which point it detaches. The Vishakallu's constituents include *Ocimum sanctum, Anisomeles malabarica, Leucas aspera, Piper betle, Santalum album* leaves, and river pebbles (Rajasekharan et al., 1992). Our investigation has documented the pervasive use of aqueous pastes and decoctions derived from *Andrographis paniculata* leaves among indigenous populations in southern India for snakebite management. Furthermore, the gustatory properties of certain leaves and roots are occasionally employed for prognostic purposes (Whitaker, 1978; Yunus, 1983; Selvanayagam et al., Al-Qura'n, 2005). A bitter taste in the plant material is interpreted as an indication of the patient's recovery, whereas a sweet taste necessitates immediate medical intervention. Dosage is repeated until gustatory normalcy is restored. In instances where a patient's oral aperture is impeded, the plant's extract is conveyed via nasal or ocular instillation, or generously applied to the cranium (Anandan and Veluchamy, 1986; Anuradha et al., 1986). A rigorous dietary regimen is subsequently implemented during convalescence to mitigate edema, emesis, pain, and ancillary sequelae, thereby expediting complete recuperation (Whitaker,

1978). Select communities espouse the daily use of *Tephrosia purpurea (*Jain and Tarafder, 1963) and *Azardirachta indica* (Maheshwari et al., 1986) twigs as dentifrice agents, positing their efficacy in fortifying the organism against the pulverized bark of Moringa oleifera is purported to possess anti-ophidian attributes, with its peri-domiciliary application believed to deter serpents.s (Chandra et al., 1989). ophidian envenomation -a belief corroborated by tribal accounts during our ethnobotanical survey.

Botanical authentication of the medicinal flora was executed employing the compendia, "Flora of the Presidency of Madras" (Gamble, 1935) and "Flora of Tamil Nadu Carnatic" (Mathew, 1983). Substantiation of the phytospecimens' veracity was achieved via comparative analysis with curated exsiccatae housed within the Herbarium of the Botanical Survey of India (BSI), Southern Circle, Coimbatore, India.

The present study meticulously documents an ethnobotanical survey, revealing the utilization of 95 plant species, encompassing 89 genera and 91 families, for medicinal purposes (Table 1). Predominantly, these plants are employed in the treatment of snake envenomation, addressing sequelae such as paralysis, fatal hemorrhage, renal insufficiency, localized tissue necrosis, and systemic dysfunction. Fabaceae constitutes the most abundant representation with 8 species, succeeded by Mimosaceae with 5 species. Amarathaceae, Apocynaceae, Anacardiaceae, Asclepialaceae, Asteraceae, and Euphorbiaceae each contribute 4 species, while Rutaceae, Sapindaceae, Solanaceae, Menispermaceae, and Malvaceae are represented by 3 species, Zingiberaceae, Acanthaceae, Liliaceae, Piperaceae, and Aristolochiaceae each contribute 2 species, with 29 additional families represented by a single species. It has been ascertained that indigenous populations employ 95 phytotherapeutic agents in the management of ophidian envenomation. Various botanical components, encompassing roots, stems, leaves, calluses, fruits, aerial structures, bark, pods, latex, tubers, and rhizomes, are utilized by these communities. Implementations of these plant-derived materials, formulated as decoctions, pastes, juices, and powders, serve as therapeutic interventions for snakebite.

Conclusion:

The present study elucidated the pivotal role of traditional medicine in the indigenous healing modalities prevalent within the Pachamalai hills of Tamil Nadu, where medicinal flora is extensively leveraged in the management of ophidian envenomation. The reliance on phototherapeutic interventions by traditional healers underscores the exigency of meticulously documenting ancestral pharmacopoeia. This documentation is invaluable in catalyzing prospective research and drug discovery paradigms aimed at synthesizing life-saving pharmaceuticals. Our investigations underscore the imperative for rigorous clinical trials to assess the therapeutic efficacy of diverse Phyto-remedies endemic to the Pachamalai hills. In the exploitation of botanical resources for medicinal applications, the current generation is obligated to safeguard and conserve these invaluable assets, thus ensuring a sustainable legacy against a plethora of maladies for both present and future generations. This research has expounded upon a plethora of medicinal plants, delineating their morphological characteristics, phytochemical constituents, and modes of application in the therapeutic management of ophidian envenomation. The exiguous compounds inherent within these botanicals, replete with sundry natural toxins, may operate independently to impinge upon the heterogeneity of venomous enzymes present in snake venoms. Furtherance of inquiries into the genesis of bioactive natural products remains paramount to sufficiently address the burgeoning requisites for novel antivenoms.

The prevalence of natural medicine is attributable to the limitations inherent within the biomedical health paradigm, further compounded by its economic advantages and cultural consonance. The assayed fractions derived from *Aristolochia indica*, *Hemidesmus indicus*, *Gloriosa superba*, Strychnos nux-*vomic*a, *Eclipta prostrata*, and *Andrographis paniculata* evinced neutralizing capabilities against serpent venom. The aforementioned isolated fractions demonstrated a more pronounced inhibitory effect on the toxicological impact of snake venoms in vitro as opposed to in vivo. These observations, predicated upon biological

assays, substantiated the protective attributes of *Aristolochia indica, Hemidesmus indicus, Gloriosa superba, Strychnos nux-vomica, Eclipta prostrata,* and *Andrographis paniculata* plants against the virulent action of ophidian venoms, thereby necessitating further inquiry.

REFERENCE:

1. AI-Qura'n, S., (2005). Ethnobotanical Survey of toxic plants in the southern part of Jordan. *Toxicon* 46,119 -129.
2. Alirol E, Sharma SK, Bawaskar HS, Kuch U, Chappuis F. (2010). Snakebite in South Asia: a review. *Plos Negl Trop Dis* 4; e603
3. Anandan, T., Veluchamy, G., (1986). Folk medical claims from Tamil naduNorth Arcot district. Bulletin for Medical Ethnopharmacology and BotanicalResearch 73, 99–109.
4. Anuradha, U., Kumbhojkar, M.S., Vartak, V.D., (1986). Observations on wildplants used in folk medicine in the rural areas of the Kolhapur district.Ancient Science of Life 6, 119–121.
5. Basha SK, Sundarsanam G (2012). Traditional use of plants against snake bite in Sugali tribes of yerramalsis of kurnool district, Andhra Pradesh, India *Asian Pac J Trop Biomed;* 2 (2); S575-S579.
6. Bhandary, M.J., Chandrashekhar,K.R., Kaveriappa, K.M., (1996). Ethobotany of Gowlis of Uttara Kannada District, Karnataka. *Journal of Ethanopharmacology*, 12,244-249.
7. Chandra, K., Pandey, B.N., Sinha, G.N., Pandey, P., (1989). Medicinal plantswealth of Rajgir, Bihar. Bulletin for Medical Ethnopharmacology and Botan-ical Research 10, 124–161.
8. Gamble JS, Fischer CEC. Flora of the Presidency of Madras. Adlard & Sons Ltd., London, 1915-1936, 1-3,
9. Gamble JS. The Flora of the Presidency of Madras. London: Adlard and Son's Ltd; 1935.
10. Gomes A , Das R, Sarkhel S, Mishra R, Mukherjee S, Bhattacharya S, et al. (2010). Herbs and herbal constituents are active against snake bites. *Indian J Exp Biol* 48;865-878.
11. Gomes A, Bhattacharya S, Mukherjee S,Tsai IH ,Gomes A.(2012). Inhibition of toxic actions of phospholipases A2 isolated & characterized from the Indian banded Krait (*Bungarus fasiatus*) venom by synthetic herbal compounds. *Indian J Med Res* ;136;40-45.
12. Harsha, V.H., Hebbar, S.S., Hedge, G.R., shripath, v., (2002). Ethnobotanical knowledge of plants used by the kunabi tribe of Karnataka in India. *Fitoterapia*, 73,281-287.
13. Harsha, V.H., Hebbar, S.S., Shripathi, V., Hedge, G.R., (2003). Ethnomedicobotany of Uttara Kannada District in Karnataka, India- plants in treatment of skin disease. *Journal of Ethanopharmacology* 84,37-40.
14. Houghton, P.J., Osibogun, I.M., (1993). Flowering plants used against snake bites. *Journal of Ethanopharmacology* 39,1-29.
15. Jain, S.K., Tarafder, C.R., (1963). Native plant remedies for snake bite among the Adivasis of central India. *Indian Medical journal* 57,307-309.
16. Kasturiratne. A, Wickremasinghe AR, de Silva N, Gunawardena NK, Pathmeswaren A, Premaratna R. et al. (2008). The global burden of snake bite: a literature analysis and modelling based on regional estimates of envenoming and deaths: review. *PloS Med* 5; e218
17. Kumarappan C, Jaswanth A, Kumarasunndari K. (2011) Antihaemolytic and snake venom neutralizing effect of some Indian medicinal plants. *Asian Pac J Trop Med* 4(9);743-747.
18. Maheshwari, J.K., Kakakoti, B.S., Lal, B (1986). Ethnomedicine of Bhil tribe of jhabua district, M.P. *Ancient science of life* 5,225-261.
19. Manoranjitham M, Kamaraj M. (2016). Study on usage of medicinal plants for human diseases by the Traditional Healers of Pachamalai Hills, Tamil Nadu, India. *Journal of Applied and Advanced Research.1(2);1-6.*
20. Matthew KM (1983). The Flora of Tamil Nadu Carnatic. Tiruchirapalli: The Rapinat Herbarium; Vols I–III.
21. Martz, W., (1992). Plants with a reputation against snake bites. *Toxicon* 30,1131-1142.
22. Meenatchisundaram. S,Parameswari G ,Subburaj T. ,Michael A (2008). Antivenom activity of medicinal plants – a mini review.Ethnobot leaflets 12;1218-1220.

23. Parinitha, M., Srinivasa, B.H., Shivanna, M.B., (2005). Medical Plant Wealth of local communities in some Villages in Shimoga Distinct of Karnataka, India. *Journal of Ethanopharmacology* 98,307-312.
24. Perumal Samy, R., Ignacimuthu, S., (1998). Screening of 34 Indian medicinal plants for antibacterial properties. *Journal of Ethanopharmacology* 62,173-182.
25. Perumal Samy, R., Ignacimuthu, S., (2000). Antibacterial activity of some of folklore medicinal plants used by tribals in western Ghats of India. *Journal of Ethanopharmacology* 69, 63-71.
26. Pithayanukul P, Leanpolchareanchai J, Bavovada R. (2010). Inhibitory effect of tea polyphenols on local tissue damage induced by snake venoms. *Phytother Res* Suppl 1; S56-S62.
27. Rajasekharan, S., Jawahar, C.R., Radhakrishnan, K., Kumar, P.K.R., Amma, L.S., Pushpangadan, P., (1992). Healing art of the kani tribe of Kerala. An absorbent technique for snake bite using "Vishakallu" (a kind of medicated stone charged with anti- poisonous properties). Aryavaidyan 5, 224-226
28. Samy RP, Thwin MM, Gopalkrishnakone P, Ignacimuthu S. (2008). Ethanobotanical survey of folk plants for treatment of snake bites in Southern parts of Tamil Nadu, *India. J Ethnoparmacol* 115(2);302-312.
29. Selvanayagam,Z.E., Gnavavendhan, S.G., Balakrishna, K., Bhima Rao ,R., Usman Ali , S., (1995). Survey of medicinal plants with antisnake venom activity in Chengalpattu district, Tamilnadu, India. *Fitoterapia* 66, 488- 494
30. Siddiqui, M.B.,Husain, W., (1990). Traditional antidotes of snake poison in Northern *India. Fitoterapia* 61, 41-44
31. Whitaker, R., (1978). Common Indian snakes: A Field Guide. Macmillan India Ltd., p. 154
32. World Health Organization (2003). Traditional Medicine. Geneva.
33. Yunus, M., (1983). A study of beliefs and customs in relation to animal bites, personal hygiene and installation of sanitary latrines in some Villages of Aligarh (U.P). Nagarjun 26, 116 - 122.