

An Ethnobotanical Study of Antidote Medicinal Plants in Kalkulam Taluk, Kanyakumari District

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ABSTRACT

Ethnobotany is the field of science that deals with the association between plants and humans, the term implies the study of indigenous or traditional knowledge of plants. This ethnobotanical survey focused on prevalence of antidote medicinal plants and the traditional knowledge of that plants among the local people of Kalkulam taluk, Kanyakumari district. The information was collected from local communities. The antidote plant species that used for different types of poisons in the study area, were documented on the basis of identification of antidote plants. A total of 45 antidote medicinal plants, belonging to 25 families were collected and identified. Plant family with the highest antidote plants in the study area used for various types of poisons was Fabaceae (17%). The result of growth form analysis showed that Shrub constituted the highest proportion of antidote plants (34%), Roots (39%) were the most frequently utilized plant parts for preparation of traditional antidote remedies. Most of the antidote plants in the study area used for animal poison with the proportion of (92%). Decoction was a widely used method of preparation of traditional antidote remedies where oral administration 92% was the dominant route. The study revealed people of the Kalkulam area are well known about the

antidote plants and mostly used for poisoning and post poisoning symptoms and also used as first aid therapy in poisoning cases.

Keywords: Ethnobotany, Antidote, Medicinal plants, Poisons, Traditional remedies

INTRODUCTION

Ethnobotany is the field of science that deals with the associations between plants and humans, however current use of the term implies the study of indigenous or traditional knowledge of plants. An ethnobotanical survey encompasses discussion with local natives, use of accessible data in the literature, and the folklore of each area.

Antidote as a therapeutic agent that counteracts the toxic action of a drug or toxin. Antidote mediate its effect either by preventing the absorption of the toxin by binding and neutralizing the poison. The use of antidote depends on the clinical indication and the availability of the product.

Nanju Maruthuvam (Toxicology) is one of the divisions of Siddha Medicine that is dealt with in depth by Siddhar the founding fathers of Siddha Medicine. In Siddha Toxicology the antidotes against different kinds of poisons are found vastly dispersed in Siddha texts. Herbs, Minerals, Metals, Animal materials are used in the preparation of Siddha drugs from ancient period. Antidotes

include plant, mineral and animal products which are easily available. Most of the antidotes mentioned in the text are plant products and animal products. Toxicology in Siddha deals mainly with the following poisons:

- Food poison
- Plant poison
- Chemical poison
- Animal poison

ANTIDOTE PLANTS:

In Siddha Toxicology many herbs are used as antidote against poisoning both internally and externally. Other than oral route they also used as externally like Kalikam, Nasiyam, Pugai etc. Plants are rich source of medicinal compounds. The secondary metabolites extracted from plants are capable of reducing the toxic effects of the venom. A variety of plant species are found to be suitable as antidotes in India. The WHO estimates that about 80% of the world population in developing countries depends on plant for the management of diseases. Indian people also have a healthy awareness of traditional medicine especially herbal and folk medicine for the treatment of poisons and poisonous bites.

Kalkulam is a small taluk in Kanyakumari district of Tamil Nadu state. It abodes mainly evergreen type of forest with closed canopy. The people in these areas are making use of the biodiversity as medicine through the traditional medical system to cure their ailments. Traditionally people in Kalkulam taluk, especially the local healer (Vaidyar) and other community possess considerable knowledge of the therapeutic properties of local plant species. Local knowledge on ethnomedicine is revolutionary way to recast our conventional knowledge.

The present field study has been done on the prevalence of antidote medicinal plants and the traditional knowledge of that plants, widely used as antidote against poisoning among the local peoples of Kalkulam taluk. The survey was conducted in kalkulam taluk, Kanyakumari district, and the information were collected from local communities. The

antidote plant species were documented on the basis of identification of plants and communicated to the people of Kalkulam taluk.

MATERIALS AND METHOD

PRIMARY OBJECTIVE

To explore the antidote plants prevailing in Kalkulam taluk, Kanyakumari district.

SECONDARY OBJECTIVE

To know the Family, Botanical name, Morphology, Part used, Mode of administration and Method of preparation of the antidote medicinal plants.

STUDY PERIOD

4 Months

STUDY AREA

Study place is Kalkulam which is one of the taluk of Kanyakumari district, Tamil Nadu state. There are about 24 villages in it. On the basis of the survey, collection and study made in different regions of the taluk, enumeration of plants used as antidote were made. The total geographical area of village is 2349.25 hectares.

STUDY DESIGN

Ethnographic study

METHOD OF APPROACH

The information was collected from local communities of Kalkulam taluk by several field trips of different villages and localities of that taluk. The antidote plants were identified and photographs were taken. information on indigenous use of antidote plants, part used, mode and of administration, Method of preparation were collected.

RESULTS AND DISCUSSION

Field survey undertaken in 21 villages of Kalkulam taluk, Kanyakumari district revealed the occurrence of 45 medicinal plants especially used as antidote against different type of poisons. The data presented in Table:1 confirm the prevalence of the

following families of antidote medicinal plants.

Fabaceae-8, Asclepiadaceae-5, Acanthaceae-4, Lamiaceae-3, Mimosaceae-2, Euphorbiaceae-2, Menispermaceae-2, Rubiaceae-2, Piperaceae-2, Musaceae-1, Cactaceae-1, Apocynaceae-1, Moringaceae-1, Poaceae-1, Malvaceae-1, Solanaceae-1, Lilliaceae-1, Alangiaceae-1, verbinaceae-1,

Salvadoraceae-1, Amaranthaceae-1, Plumbaginaceae-1, caesalpinaceae-1, Aristalochiaceae-1, Arecaceae-1 The total of 45 antidote medicinal plant species belonging to 24 families were identified. Fabaceae was the leading family with 8 species, used to treat different types of poisons.

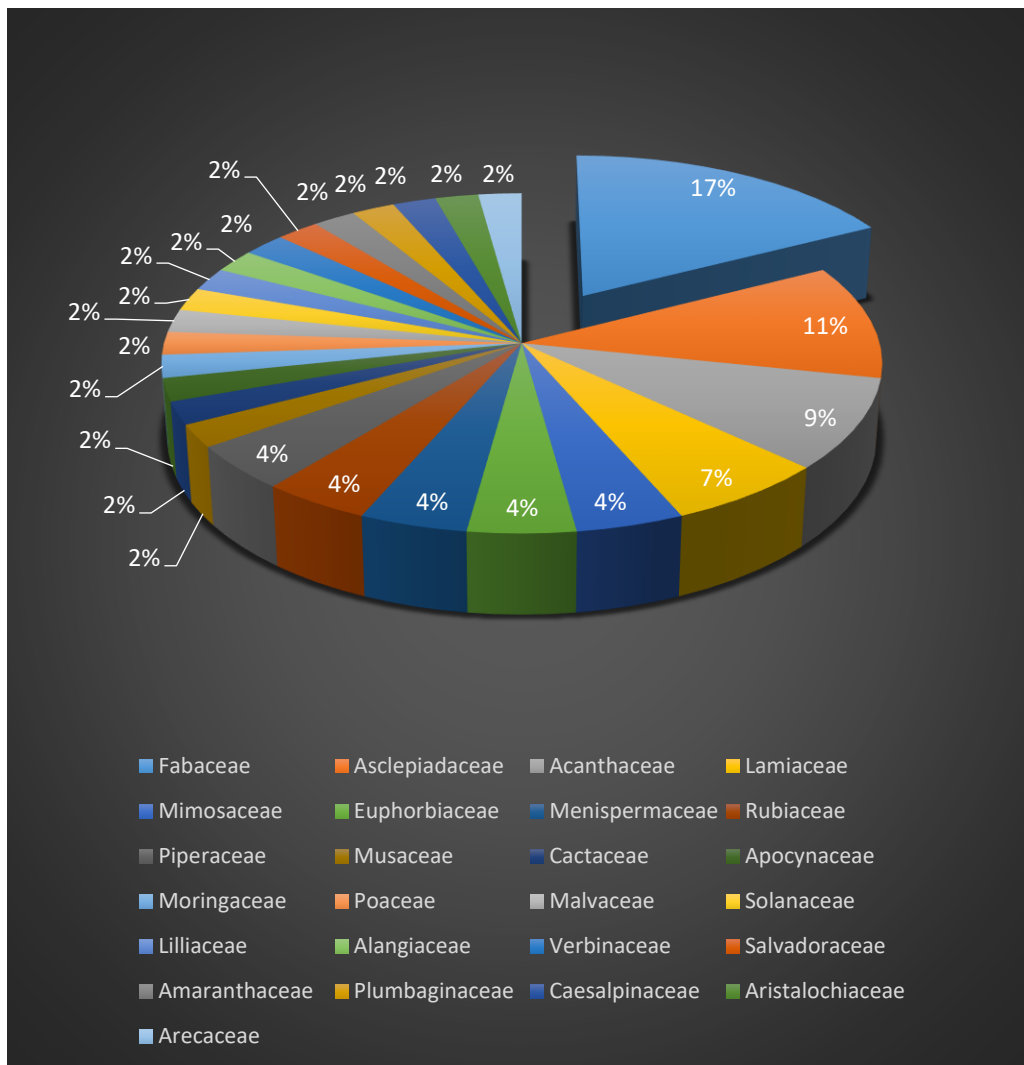


Fig.1.Family distribution of antidote plants

GROWTH FORM OF ANTIDOTE MEDICINAL PLANTS

The growth form analysis of medicinal plants revealed that Shrubs constitute the highest proportion being represented by 16 species,

Herbs represented by 8 species, Trees represented by 10 species, Climbers represented by 5 species and Twiner represented by 4 species, while there were 2 species of Creepers.

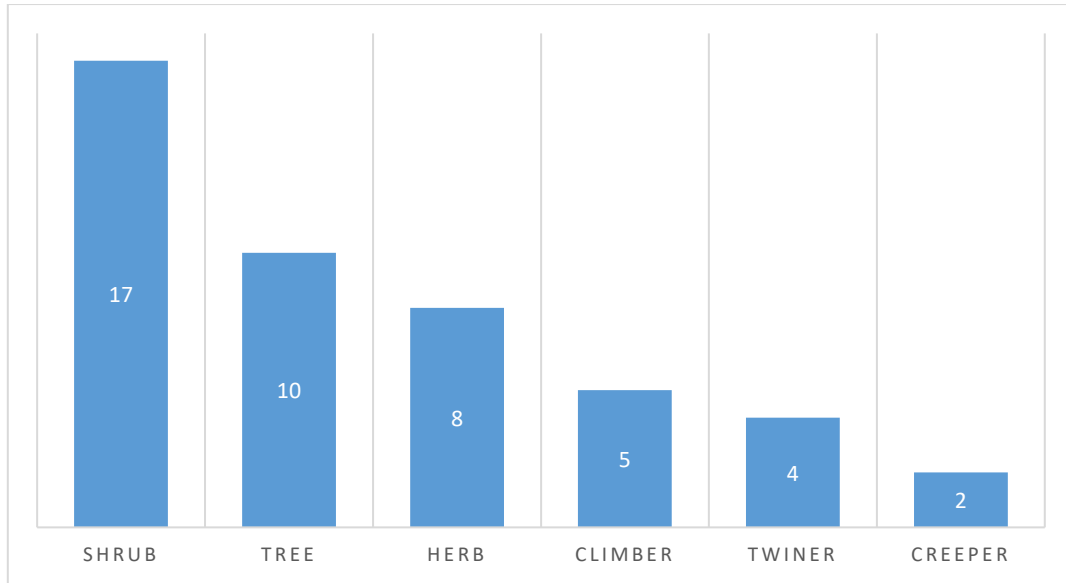


Fig.2. Growth form of antidote medicinal plants

Table: 1 Taxonomic position & Taste of the Antidote Plants

S.No	Botanical Name	Family	Tamil name	Taste	Morphology
1.	<i>Indigofera tinctoria</i>	Fabaceae	Avuri	Bitter	Small bushy shrub
2.	<i>Aristolochia indica</i>	Aristolochiaceae	Karudakodi	Bitter	Twiner
3.	<i>Tylophora indica</i>	Asclepiadaceae	Nanjaruppan	Bitter	Climber
4.	<i>Gymnema sylvestre</i>	Asclepiadaceae	Sirukurinjan	Bitter	Climber
5.	<i>Clinacanthus nutans</i>	Acanthaceae	Vishanarayani	Bitter	Short shrub
6.	<i>Clerodendrum inerme</i>	Verbenaceae	Esangu	Bitter	Shrub
7.	<i>Azima tetracantha</i>	Salvadoraceae	Sangan	Bitter	Shrub
8.	<i>Indigofera aspalathoides</i>	Fabaceae	Sivanarvembu	Bitter	Low growing shrub
9.	<i>Rhinacanthus nasuta</i>	Acanthaceae	Nagamalli	Bitter	Shrub
10.	<i>Hemidesmus indicus</i>	Asclepiadaceae	Nannari	Sweet & Bitter	Twiner
11.	<i>Andrographis paniculata</i>	Acanthaceae	Nilavembu	Bitter	Herb
12.	<i>Alangium salvifolium</i>	Alangiaceae	Azhinjil	Bitter	Tree
13.	<i>Gloriosa superba</i>	Liliaceae	Kalapai kizhangu	Bitter	Twining branched herb with tuberous root
14.	<i>Acalypha fruticosa</i>	Euphorbiaceae	Chinni	Bitter	Shrub
15.	<i>Abrus precatorius</i>	Fabaceae	Kuntrimani (white)	Bitter	Tree
16.	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Astringent & Bitter	Tree
17.	<i>Achyranthes aspera</i>	Amaranthaceae	Nayuruvi	Bitter, Astringent & Pungent	Herb
18.	<i>Leucas aspera</i>	Lamiaceae	Thumbai	Sweet, Pungent	Herb
19.	<i>Clitoria ternata</i>	Fabaceae	Kakkanam	Bitter, Astringent & Sweet	Creeper
20.	<i>Dichrostachys cinerea</i>	Mimosaceae	Vidather	Astringent	Tree
21.	<i>Ruelia tuberosa</i>	Acanthaceae	Kiranthi nayagam	Bitter	Herb
22.	<i>Datura Innoxia</i>	Solanaceae	Umathai (black)	Bitter	Shrub
23.	<i>Oldenlandia umbellata</i>	Rubiaceae	Impooral (or) chay root	Sweet	Herb
24.	<i>Mimosa pudica</i>	Mimosaceae	Thottal chinungi	Sweet, Astringent, Bitter	Herb
25.	<i>Plumbago zeylanica</i>	Plumbaginaceae	Kodiveli	Pungent	Shrub
26.	<i>Tinospora cordifolia</i>	Menispermaceae	Seenthil	Bitter	Climbing shrub
27.	<i>Ocimum sanctum</i>	Lamiaceae	Tulsi	Pungent	Sub-shrub
28.	<i>Piper nigrum</i>	Piperaceae	Milagu	Pungent	Climbing shrub
29.	<i>Piper betle</i>	Piperaceae	Vetrilai	Pungent	Creeper
30.	<i>Thespesia populnea</i>	Malvaceae	Poovarasu	Bitter, Astringent	Tree
31.	<i>Cynodon dactylon</i>	Poaceae	Arugampul	Sweet	Herb
32.	<i>Acalypha indica</i>	Euphorbiaceae	Kuppaimeni	Bitter, Pungent	Herb
33.	<i>Percularia extensa</i>	Asclepiadaceae	Veliparuthi	Bitter	Twiner
34.	<i>Sesbania grandiflora</i>	Fabaceae	Agathi	Mild Bitter	Deciduous tree
35.	<i>Calotropis gigantea</i>	Asclepiadaceae	Erukku	Bitter, Pungent, Sweet	Large shrub
36.	<i>Vitex negundo</i>	Lamiaceae	Notchi	Bitter, Astringent, Pungent	Small tree
37.	<i>Moringa oleifera</i>	Moringaceae	Murungai	Bitter, Astringent, Sweet	Softwood tree

38	<i>Cassia alata</i>	Caesalpinaceae	Seemai agathi		Shrub
39	<i>Musa paradisiaca</i>	Musaceae	Vazhai	Astringent	Stem
40	<i>Opuntia dilleni</i>	Cactaceae	Nagathazhi	Sweet	Shrub
41	<i>Rauwolfia serpentina</i>	Apocynaceae	Pampukazha	Bitter	Small shrub
42	<i>Cissampelos pareria</i>	Menispermaceae	Malaithangi or Pommusuttai	Bitter	Climber
43	<i>Cassia auriculata</i>	Caesalpinaceae	Ponnavarai	Astringent	Shrub
44	<i>Cocos nucifera</i>	Arecaceae	Thennai	Sweet	Tree
45	<i>Tamarindus indica</i>	Fabaceae	Puzhi	Sour	Tree

The list of antidote plants utilizing in the management of different types of poisons in which part used, method of preparation, mode of administration and the poisons treated are given in following table (Table:2)

Table: 2 Antidote plants which are utilizing in the management of different types of poisons

S.No	Botanical Name	Part used	Antidote for	Method of Preparation & Mode of Administration
1.	<i>Indigofera tinctoria</i>	Root	Common bite	Decoction internally
2.	<i>Aristolochia indica</i>	Root	Common bite	Root powder internally
3.	<i>Tylophora indica</i>	Leaves	Snake bite (cobra's king cobra)	Leaf juice internally
4.	<i>Gymnema sylvestre</i>	Whole plant	Snake bite	Leaf & root powder internally
5.	<i>Clinacanthus nutans</i>	Whole plant	Insect, snake bite, scorpion venom (swelling)	Leaf paste externally
6.	<i>Clerodendrum inerme</i>	Leaves, Root	Snake bite, bite wound, rashes	Root powder, Leaf juice internally
7.	<i>Azima tetracantha</i>	Root bark	Spider poison and poisonous beetle	Root bark decoction on powder with black pepper internally
8.	<i>Indigofera aspalathoides</i>	Whole plant	Common bite	Decoction internally
9.	<i>Rhinacanthus nasuta</i>	Leaves	Cobra bite Beetle bite	Leaf powder 15g internally Leaf karkam internally
10	<i>Hemidesmus indicus</i>	Root & root bark	Snake bite, rat bite Beetle poison	Root karkam Root bark karkam
11	<i>Andrographis paniculata</i>	Whole plant	Common bite	Decoction internally
12	<i>Alangium salvifolium</i>	Root bark	Snake bite	Root bark powder
13	<i>Gloriosa superba</i>	Root	Snake bite	Root paste externally
14	<i>Acalypha fruticosa</i>	Roots & Leaves	Snake bite	Leaves & karkam internally
15	<i>Abrus precatorius</i>	Roots & Leaves	Bite of lizard Food poisoning	Leaves & Root paste externally and internally
16	<i>Cassia fistula</i>	Root & root bark	Snake bite Beetle poison	Root bark with black pepper decoction internally Root karkam internally
17	<i>Achyranthes aspera</i>	Whole plant	Dog bite Rat bite Snake bite	Leaves paste externally whole plant karkam internally Root decoction with pepper internally
18	<i>Leucas aspera</i>	Whole plant	Snake bite	Flower extract Nasiyam, Leaf juice- Internally and externally
19	<i>Clitoria ternata</i>	Root	Snake bite, Rat bite	Root extract with sarpakantha, Root powder with honey
20	<i>Dichrostachys cinerea</i>	Roots & Leaves	Snake bite, Scorpion stings	karkam, Internally and Externally apply it
21	<i>Ruelia tuberosa</i>	Leaves	Snake bite, Scorpion stings	Leaf juice internally Leaf juice internally
22	<i>Datura Innoxia</i>	Leaves & Root	Dog bite Snake bite	Leaf juice internally Root bark karkam internally
23	<i>Oldenlandia umbellata</i>	Leaves & root	Snake bite & other poisonous bite	Decoction external wash
24	<i>Mimosa pudica</i>	Leaves	Snake bite	Leaf extract internally
25	<i>Plumbago zeylanica</i>	Root	Snake bite, spider bite	Root decoction internally
26	<i>Tinospora cordifolia</i>	Whole plant	Snake bite	Plant extract mixed with black pepper made into decoction internally
27	<i>Ocimum sanctum</i>	Whole plant	Insect bite, spider bite	Leaf extraction (or) decoction Internally
28	<i>Piper nigrum</i>	Seed & Root	All poisonous bites Food poisoning	Seed powder with butter internally Flower paste with ghee

			Snake bite, Scorpion stings	Seed with piper betle karkam internally
29	<i>Piper betle</i>	Leaves	Snake bite, Scorpion stings	Karkam (vetrilai with milagu) Internally
30	<i>Thespesia populnea</i>	Bark	Snake bite, Emperor scorpion sting (Nattuvakali)	Bark juice with ginger juice internally Bark karkam internally
31	<i>Cynodon dactylon</i>	Whole plant	Snake bite, Rat bite	Whole plant juice or karkam internally
32	<i>Acalypha indica</i>	Whole plant	Snake bite	Leaf powder internally
			Dog bite	Leaf juice internally
			Centipede bite	Leaf karkam internally and externally
33	<i>Percularia extensa</i>	Leaves	Snake bite	Leaves karkam with milk internally
35	<i>Calotropis gigantea</i>	Root & leaves	Snake bite (cobra bite) Scorpion stings	Leaves paste-15gm(more than this quantity cause unconsciousnes) Leaf fumigation for snake bite Root extract extremally
36	<i>Vitex negundo</i>	Root& Leaves	Snake bite and Rat bite	Root extract-internally, Leaf paste-externally
37	<i>Moringa oleifera</i>	Root bark	Snake bite and all poisonous bites	Bark karkam-internally, Tincture of bark & root-externally
38	<i>Cassia alata</i>	Bark& Leaf	Beetle poison snake bite	Bark karkam-internally and externally Leaf karkam
39	<i>Musa paradisiaca</i>	Tree like Herb	Snake bite	Stem extract internally
40	<i>Opuntia dilleni</i>	Root	Centipede bite	Root powder internally
41	<i>Rauwolfia serpentina</i>	Root&Leaves	Snake bite	Root & leaf buds crushed with milk made a paste internally& externally
42	<i>Cissampelos pareira</i>	Leaves	Common bite	Decoction internally
43	<i>Cassia auriculata</i>	Root and leaves	Common bite	Decoction internally Root paste applied externally
44	<i>Cocos nucifera</i>	Fruit	Plant poison	Excess intake of coconut milk which induce vomiting
45	<i>Tamarindus indica</i>	Fruit	Plant poison	Fruit extract with soap water to induce vomiting

TASTE OF ANTIDOTE PLANTS:

Among the all collected antidote plants depends on taste, Bitter taste is dominant. Secondly Astringent taste is predominant one. Other taste are seen in small percentage. In some plants combined taste are seen. They

are (sweet with bitter, astringent with bitter, sweet with pungent, bitter with pungent, bitter with astringent & pungent, bitter with astringent and sweet, bitter with pungent & sweet).

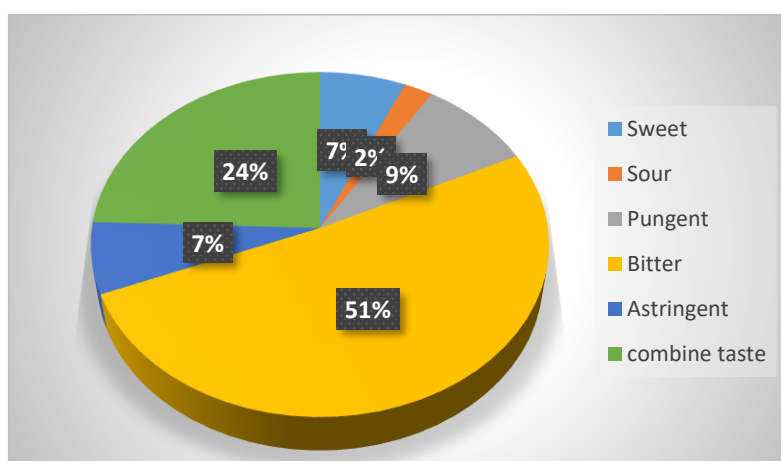


Fig.2. Taste of antidote plants

PARTS USED OF ANTIDOTE PLANTS TO TREAT DIFFERENT TYPES OF POISONS:

People of the study area harvest different plant parts for the preparation of traditional remedies against different type of poisons

(eg: leaves, roots, seeds, barks and fruit etc....) In the study area, 22 species were harvested for their roots (Figure:3). This is because it is believed that roots contain more concentration of the active ingredients.

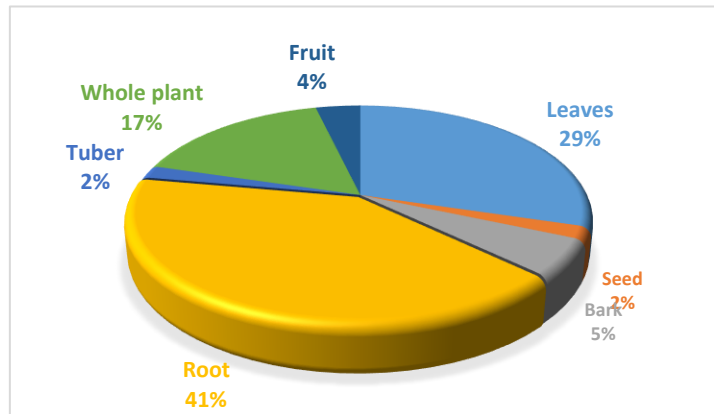


Fig.3.Part used of antidote plants to treat different types of poisons

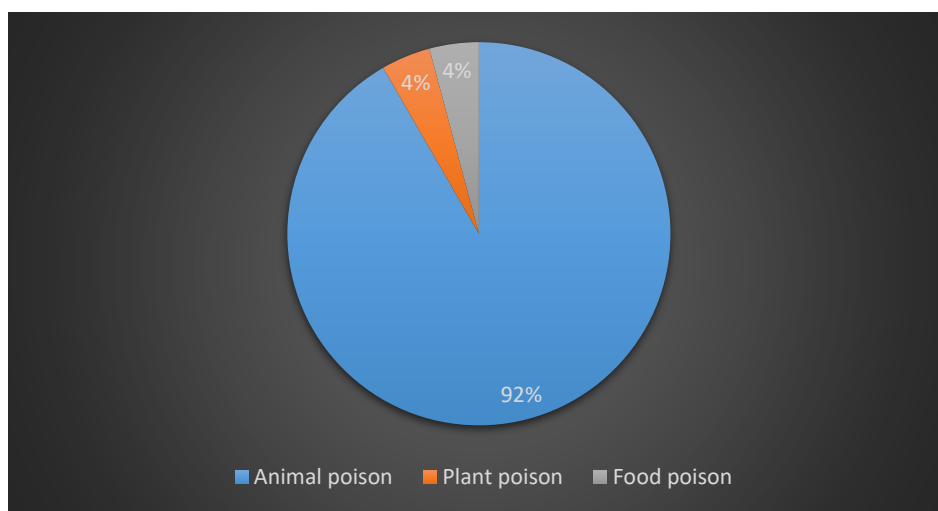


Fig.4.Number of plants used for different types of poisons

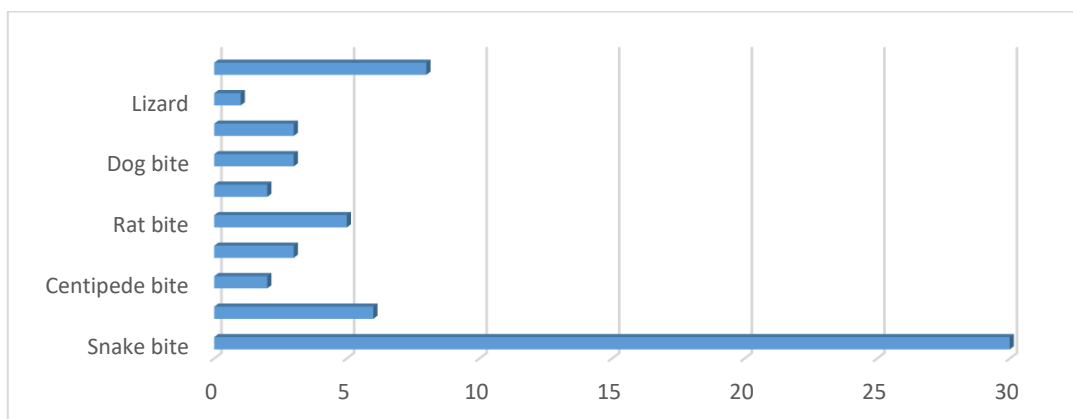


Fig.5. Number of plants used for different type of animal poison

SUMMARY

The study resulted in documenting 45 antidote medicinal plant species where Fabaceae is the leading family with the highest proportion of antidote medicinal plants. Most of antidote plants in the study area were harvested from wild. Shrubs were

found to be the dominant growth form of antidote plants. Bitter taste is seen predominantly in most of the antidote plants. Roots were found to be the most frequently used plant parts for the preparation of traditional remedies for different type of poisons. Most of the antidote plants of this

study area used for animal poisons (poisonous bites). Preparation of antidote medicine mostly in the form of decoction for oral administration. Depletion of indigenous knowledge among the people of the study area was serious due to de interest of young generation to gain the knowledge. Although Kalkulam taluk was found to be rich in medicinal plant diversity, the effort to conserve the plants and associated indigenous knowledge was observed to be very poor. Thus conservation of medicinal plants by local communities and responsible bodies is vital to avoid further loss and also hopeful this document will helps to aware of prevalence of antidote medicinal plants and useful for improve the indigenous knowledge of the antidote plants among the peoples.

CONCLUSION

In this study, it was revealed that people of this Kalkulam area are well known about the antidote plants but the usage of antidote plants in poisoning case is very low and mostly used for pre and post poisoning symptoms like rashes, wounds, swelling and other symptoms associated it and also used as first aid therapy in poisoning cases.

This document will helps to aware of prevalence of antidote plants and also useful for improve the indigenous knowledge of the antidote plants among the peoples. This will raise awareness about the importance of conserving the antidote medicinal plants. This will provide lead to further extensive studies of biochemical, chemical, phytochemical and preclinical analysis on antidote medicinal plants.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

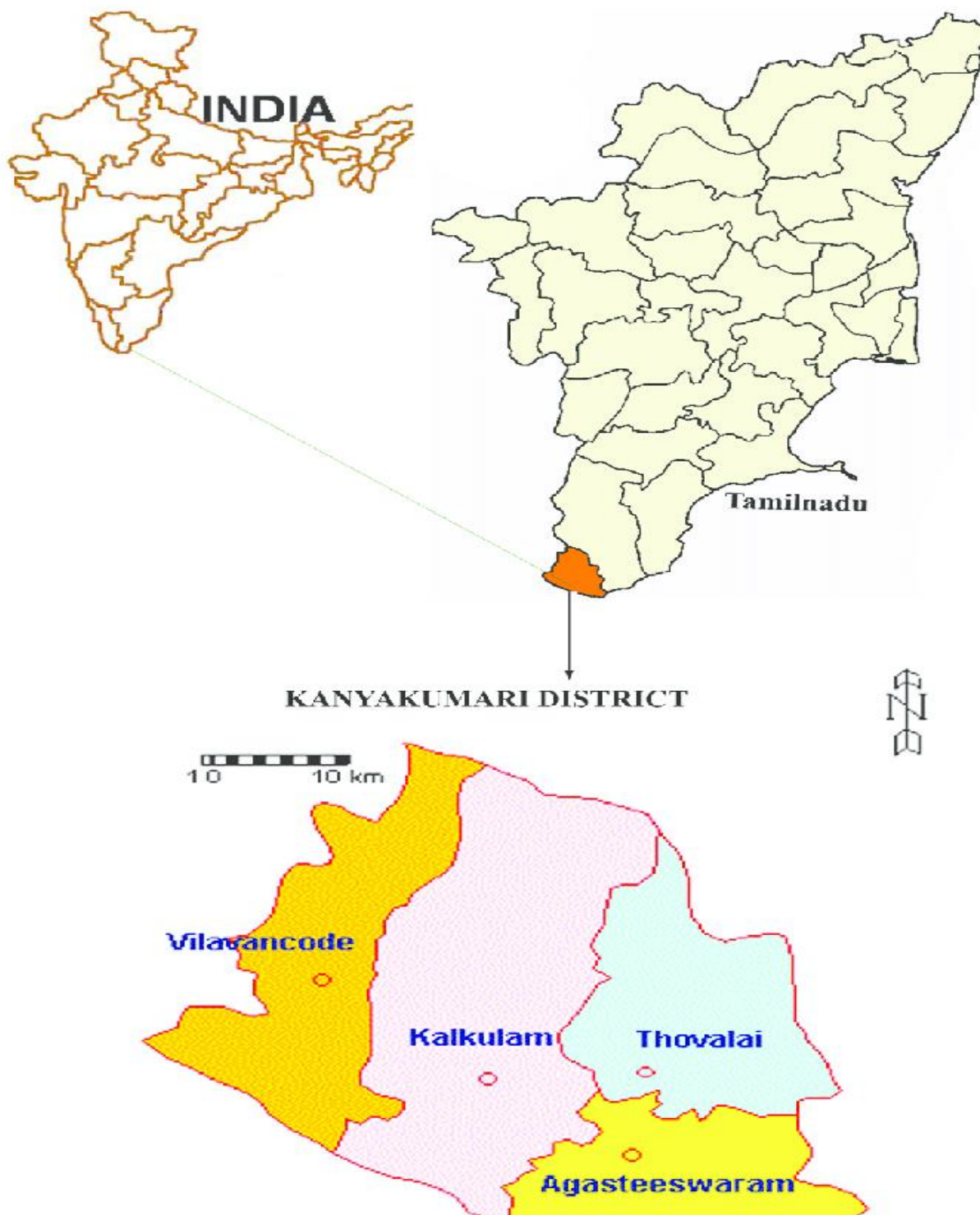
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ANNEXURE



ANTIDOTE PLANTS



Rhinacanthus nasuta
(Nagamalli)



Clitoria ternata
(Kakkanam)



Indigofera aspalathoides
(Sivanarvembu)



Clinacanthus nutans
(Vishanarayani)



Dichrostachys cinerea
(Vidather)



Indigofera tinctoria
(Avuri)



Datura Innoxia
(karu umathai)



Sesbania grandiflora
(Agathi)



Abrus precatorius
(Kuntrimani)
