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Ethnoveterinary Practices and Phytochemical Analysis of Some Selected Medicinal Plants From North Coastal Andhra Pradesh, India

KEYWORDS: Ethnoveterinary Practices, Phytochemical Analysis, Medicinal plants, North Coastal Andhra Pradesh.

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ABSTRACT *The present investigation enlightens the knowledge of ethno medicinal plants which are having many more important phytocompounds. The Phytochemical analysis was carried out to determine the possible important bioactive compounds by using standard procedures; such as alkaloids, flavonoids, glycosides, saponins, steroids, tannins, terpenoids and phenolic compounds. Purpose and use of these plants vary considerably; thereby the present paper is providing additional base line data for ethnoveterinary practices and phytochemical analysis.*

Introduction

The term ***Ethno-Veterinary*** was coined by MC Corkle[1] (1986). Though, there is no authentic evidence of when and how plants came into usage for curing the domestic animals, the rural people seems to be aware of it through generations. Ethnoveterinary medicine refers to holistic and interdisciplinary study of traditional knowledge, beliefs, practices, skills and methods pertaining to the health care of animal ailments. Andhra Pradesh in particular, very few authors,[2-6] studied the ethnoveterinary practices. In remote areas, no organized veterinary medicinal aid is available. Therefore, these people treat their domestic animals with herbal medicines on the basis of their empiric knowledge.

Phytochemicals that have ubiquitous distribution in all the species, genera, and families are classified as either primary and secondary metabolites based on the difference between compounds and such different phytochemicals are restricted in specific taxonomic groups and phylogenetically closely related to group of families (Harborne, 2001; Verporte and Memelink, 2002). During the course of evolution, millions of secondary products have been synthesized from time to time by different plant species, perhaps to encounter infection caused by a variety of viruses, microorganisms like bacteria, fungi and parasites. They are expected to synthesize a variety of secondary metabolites are capable of providing them protection against these infections. Bell (1978) has suggested that plants synthesize a greater array of secondary compounds than animals, because the plants cannot move to escape their predators and therefore, evolved a chemical defence against such predators. Many of these compounds that come under secondary metabolites can be defined as "those substances that are not essential for the survival of the plant. They are removed as metabolic by-products during the primary or central pathways of the cell" (Fowler, 1984).

Study Area

North coastal Andhra Pradesh is situated on the East Coast known as the Coromandal coast and it lies approximately between $17^0\ 10^1$ to $19^0\ 10^1$ N latitudes and $81^0\ 53^1$ to $84^0\ 50^1$E longitudes. It is bounded on the north by Odissa state, on the south by East Godavari district, on the east by Bay of Bengal and on the west by East Godavari district and part of Odissa state. The region extends an area of 23,48,612 ha which constitutes 8.5% of the geographical area of the state of Andhra Pradesh. This region comprises the three districts, viz., Srikakulam, Vizianagaram and Visakhapatnam in which Visakhapatnam is the largest district occupying nearly 47% of the area in the region.

Materials and Methods

The methodology and mode of approach for ethnoveterinary medicinal plants is adopted from the classical works of Jain and others[11]. In the present investigation, an attempt has been made to gather the data as methodology adoptated by the tribal people completely devoted to acquaintance with the local chiefs, priests, vaidyas, herbal doctors and headman's, elderly people and educated students to control the various ailments in livestock. Each medicinal practice was cross checked with at least 6 to 8 informants and those specimens were identified by referring to standard Flora of the Presidency of Madras[12] and other local floras of Andhra Pradesh and these plants were preserved in the form of herbarium. Different medicinal plants parts of such as leaves, bark, seeds, fruits, rhizomes or sometimes the whole plant having active constituents in them are collected carefully and shade and dried them. Then the dried plant material is granulated or size reduced by using a blender and sieved to get uniform particles by using sieve No. 60 and final powder is used for the extraction of active contents present in them.

After extracting powder from the crude drugs, solvent extraction with various polar solvents in Soxhlet is carried out to regulate various chemical contents. These solvent extracts are extracted and were used for preliminary Phytochemical screening studies. All the solvents, chemicals and glassware used were of GR grade and were obtained from 'MERCK' India. On the basis of scarce distribution and potential therapeutic properties of plant drugs, 30 plant samples belonging to 30 genera and 21 families were selected tor preliminary phytochemical studied. Fresh parts of each plant species viz., bark, leaf, root, rhizome, seeds, and whole plants were collected in bulk quantity during the exploration trips and thoroughly washed with running tap water followed by sterile distilled water, chopped into small fragments and shade dried. The dried samples were to coarse powder (each 100g) and stored in polythene containers at room temperature. The samples were used for the chemical analysis to detect the different classes of secondary metabolites.

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Preliminary phytochemical screening of plants was done following the standard procedures/tests adopted/pioneered by Chhabra *et al.,* (1984), and Harborne, (1984). For qualitative detection of the constituents, 60 grams of each sample was extracted with 250 ml of hexane, chloroform and methanol successively using Soxhlet apparatus and the residue was collected after evaporation at reduced pressure at minimum temperature to enable to restore the heat sensitive natural compounds. The rationale for adopting such a sequential extraction procedure was based on the polarity of solvents that could leach out compounds soluble in that particular solvent. One gram each of the concentrated hexane, chloroform and methanol extracts of thirty plants were dissolved in 100 ml of its own mother solvents to obtain a stock of concentration 1% (v/v). The extracts thus obtained were subjected to preliminary phytochemical screening procedures such as test for alkaloids (Dragendroff's test), test for flavonoids (Shinoda test), test for glycosides (Legal test), test for phenolic compounds (Ferric chloride test), test for saponins (Foam test), test for steroids (Liebermann Burchard's test), test for tannins (Lead acetate test), test for terpenoids (Salkowski test).

Results and Discussion

In the present investigation a total of 30 species have been selected for preliminary phytochemical analysis. The preliminary phytochemical analysis was conducted on the crude extracts, obtained from different polar solvents like hexane, chloroform and methanol. The extracts were subjected for different qualitative tests and recorded for observations. Based on the wide usage by the local tribal and rare distribution, 30 plant species belongs to 21 families were selected for experimental analysis. The crude extracts were screened to evaluate the composition and distribution of different 8 major groups of secondary metabolites and the most common ailments were depicted in Table-1.

In the present study, the stem bark of *Abrus precatorius* is used in curing anthrax, whereas the root is for dysentery and wounds,[3,4] leaves for insect bite[6] and retained placenta[5] and seeds for yoke gall[3,6] ; *Chloroxylon swietenia,* leaf and stem bark used for wounds and yoke gall, whereas leaf used to treat ephemeral fever[4,6] ; *Cocculus hirsutus,* leaf for diarrhoea. Leaf is used for removal of external parasite,[3]; *Dillenia pentagyna* leaf and rhizome for anthrax and impaction, root is used for sores[6] ; Leaf of *Euphorbia hirta* used for sore and ranikhet, leaf for wounds[2] ; *Gloriosa superb* leaf is used for foot and mouth diseases, leaf for ectoparasites[5] ; Leaf of *Holoptelea integrifolia,* used for bronchial disorders, whereas leaf is to treat musculair pain and ophthalmic diseases,[3] for ephemeral fever and tympany[4,6] and for fever[3]; *Morinda pubescens* roots are used for renderpest where as leaf paste for wounds,[2,6]; Entire plant of *Pergularia daemia* used for gout/inflammation while leaf for fractures and anthrax,[5] bark juice for anthelmintic,[3]; Leaf of *Schleichera oleosa* to treat for Maggot-wounds where as leaf for rheumatism and arthritis,[3] for ephemeral fever[5,6]; *Smilax zeylanica* root and leaf for dysentery while flower is used for wounds[2]; the whole plant of *Trichosanthes tricuspidata* as remedy as bloat, ephemeral fever; Leaf of *Wattakaka volubilis* is to treat yoke galls, galactagogue whereas stem bark for ephemeral fever.

Conclusion

India has great traditional background in the field of Ethno-Veterinary Medicine (EVM) and practices. Animals and plants are integral part of their culture, religion, magico-religion and traditional pharmacopoeia. Traditional practices still remain prevalent in villages. This is a clear indication of their faith in the folk medicine, but in the process of modernization, this knowledge is vanishing very rapidly. Advanced research on plants of excessive medicinal values may lead to new source of drugs which are really beneficial for health care of mankind and other important domestic animals. There is an urgent need for biochemical analysis and pharmaceutical investigations of plant species used by the people of this region to formulate and standardize the medicine for sustainable uses, progress and development of new avenues.

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Table-1: Phytochemical Constituents used for Different Ailments

S.No	Botanical name	Ailment	Screened Plant/Part	Constituent
1	*Abrus precatorius* Linn.	Maggot-wounds	Root, stem	Alk;Ste;Fla;Ter.
2	*Abutilon indicum* (Linn.) Sw.	Dysentery	Whole plant	Alk;Ste;Gly;Fla.
3	*Acacia chundra* (Roxb. Ex. Rottl)	Trypanosomiasis	Gum	Sap.
4	*Achyranthes aspera* Linn.	Retained placenta	Root, bark, fruit	Alk; Gly; Sap.
5	*Ailanthus excelsa* Roxb.	Anorexia, lice	Root& stem bark	Alk; Ste; Ter.
6	*Argemone mexicana* Linn.	Lactation, yoke gall	Root, stem, leaf	Alk; Gly; Tan; Phe.
7	*Bauhinia vahlii* W. & A	Fractures	Leaf	Ste; Gly; Fla; Tan.
8	*Chloroxylon swietenia* DC.	Ephemeral fever	Stem bark, leaf	Alk; Tan.
9	*Cipadessa baccifera* (Roth.) Miq.	Dysentery	Root	Alk; Gly.
10	*Cissampelos pareira* Linn.	Cold and cough	Root bark, leaf	Alk; Ste; Sap.
11	*Cocculus hirsutus* (Linn.) Diels	Urinary disorders	Stem, root, leaf	Alk; Ste; Ter.
12	Curculigo orchioides	Ophthalmic disease	Rhizome	Alk; Gly;
13	*Cynodon dactylon* (Linn.) Pers.	Mastitis	Whole plant, leaf	Alk;Ste;Gly;Fla;Ter.
14	*Dillenia pentagyna* Linn.	Anthrax	Stem bark	Gly.
15	*Elephantopus scaber* Linn.	Diarrhoea, wounds	Plant, root	Ste; Ter.
16	*Entada pursaetha* DC.	Diarrhoea	Kernel, seed	Gly; Sap.
17	*Euphorbia hirta* Linn.	Galactogoque	Whole plant	Alk;Gly;Tan;Ter;Phe
18	*Gloriosa superba* Linn.	Anthrax, FMD	Root, flower, seed	Alk; Ste; Gly.
19	*Holoptelea integrifolia*(Roxb.)	Bronchial disorders	wood, bark, leaf	Ste; Gly.
20	*Macaranga peltata*(Roxb)	Sores, wounds	Heart wood, leaf	Gly; Ter.
21	*Mallotus philippinesis* (Lamk.)	Diarrhoea, worms	wood, bark, leaf	Gly; Tan.
22	*Morinda pubescens* Sm.	Renderpest	Root	Gly.
23	*Murraya paniculata* (Linn.) Jack.	Rheumatism	Whole plant	Alk; Fla.

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24	*Pergularia daemia* (Forssk.) Choiv.	Gout/inflammation	Plant, root, seed	Ste; Gly.
25	*Schleichera oleosa* (Lour.) Oken	Maggot-wounds	Seed,leaf, seed oil	Ste; Gly; Phe.
26	*Sesbania grandiflora* (Linn.) Poir.	Dysentery	Flower, seed	Gly; Sap.
27	*Smilax zeylanica* Linn.	Dysentery	Root, leaf	Gly.
28	*Thespesia lampas* (Linn.) Correa.	Ophthalmic disease	Bark, leaf, fruit	Ste; Gly; Fla; Ter.
29	*Trichosanthes tricuspidata* Lour.	Ephemeral fever	Whole plant	Gly; Sap.
30	*Wattakaka volubilis* (Linn.) Stapf.	Yoke galls, galactagogue	Stem bark, leaf	Gly.

Alk: Alkaloids; Gly: Glycosides; Fla: Flavonoids; Phe: Phenolic Compounds; Sap: Saponins; Ste: Steroids; Tan: Tanins and Ter: Terpenoids.

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