



Enumeration Of Botanical Ethnomedicines As Effective Formulations Along With Animal By-Products As Substitutive Ingredients

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Abstract: The Natural products are being used as medicaments in human ailments since from civilization or even earlier dates includes the plants, animals or inorganic substances. The use of animals and animal products along with medicinal plants as medicine is the basis of many traditional systems, known as Zootherapy. The present investigation deals with the therapeutic uses of animal products as ingredients which may act as carrier of active principle in folk medicine used by the tribal people of Rayalaseema region. Taxonomic analysis and systematic evaluation of the plant samples yielded 74 species of 67 genera belonging to 39 families. Part wise analysis of animal drugs as ingredients used in ethnomedicine revealed that cow products i.e. urine and milk are major ingredients, followed by goat products, honey and egg, mother milk. A few products might be used directly on the effective parts in case of knee pain or muscle pains. Disease wise analysis of drugs revealed the use of animal bye-products in poisonous bites, skin diseases, bone fractures, stomach problems, family planning and asthma etc., are common diseases in the study area, have been discussed.

Index Terms - Ethnomedicine, animal by-products as ingredients, botanical resources

I. INTRODUCTION

According to estimates from the World Health Organization (WHO), up to 80% of the world's six billion+ inhabitants primarily use medications derived from plants and animals. Wild plant and animal species make up the diverse natural pharmacopoeia of traditional human populations. In addition to being utilized in ancient treatments, ingredients derived from wild plants and animals are also becoming more and more regarded as raw materials for contemporary medications and herbal products (Alves and Rosa 2005).

Animal by-products such as organs, bones, blood, and glandular secretions are utilized in phytomedicine, especially within traditional medical practices like Traditional Chinese Medicine (TCM) and Ayurveda, to create healing, protective, and preventive remedies for multiple health issues. These by-products act as origins for hormones, enzymes, and other powerful chemical components that are utilized as active substances or for their restorative properties. Examples consist of liver and pituitary extracts for growth hormone and other hormones, dried thyroid from bovine sources for hypothyroidism, and heparin sourced from pig intestines for anti-coagulation.

Applications in Conventional Medicine

Ayurveda and TCM: Each system includes a considerable amount of substances derived from animals in their formulations.

Glandular Extracts: Extracts sourced from glands such as the liver, pituitary, and thyroid are utilized for their hormone content, offering insulin, growth hormone, thyroxine, and various other substances.

Blood and Bone: Blood, bones, and various entrails can be utilized to produce certain healing extracts.

Velvet Antler: This cartilaginous product from deer species is utilized for its tonic effects (Pham-Huy and Pham Huy (2022)).

In this context, the present investigation has focused on the study of ethnomedicines has being used with combination of plant along with certain animal products in the preparation. Hence, the authors enumerated these formulations which involves both phyto as well as animal by-products.

II. MATERIALS AND METHODS

Extensive and intensive ethnobotanical trips were conducted in the forest areas of Rayalaseema region to record firsthand information from the tribal people (Chenchus, Yanadis, Yerukalas and Sugalis) residing beside villages. The firsthand information recorded based on the personal interviews with the tribal healers/local Vaidya's who are formulating or advocating the therapeutic uses of plant drugs along with animal by-products to the local people. The detailed information regarding scientific name, local name, family, part used, mode of preparation/administration, dosimetry, etc., were recorded and systematically analyzed. The plants shown by the tribal people collected and the information was recorded in the field notebook. The collected information was cross-checked with the information from neighboring herbalists and also with available literature. The specimens were identified with the help of local/regional floras (Gamble, 1935; Pullaiah et al., 1995) and confirmed by comparing with the authenticated specimens housed at Sri Krishnadevaraya University Herbarium, Anantapur.

III. RESULTS

These by-products serve as sources of hormones, enzymes, and other potent chemical ingredients that are used as active ingredients or for their tonic effects. The resulted plants along with the combination of animal products were reported in the following table (1) and provided the mode of preparation, dosage and safety administration.

Table 1. Ethnomedicinal uses animal products in folk medicine

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
1.	<i>Abrus precatorius</i> L.	Fabaceae	Leaf Root Leaf	Antidote Dysentery Leucorrhoea	The leaf extract mixed in goat milk , given orally The root paste mixed with goat milk , given orally. The leaf paste mixed in curds , given orally.
2.	<i>Abutilon indicum</i> L.	Malvaceae	Leaf	Stomach ache	Leaf paste mixed in butter milk , given orally.
3.	<i>Acalypha indica</i>	Euphorbiaceae	Leaf	Constipation	The leaf paste mixed in cow milk , given orally.
4.	<i>Acanthospermum hispidum</i> -	Asteraceae	Leaf	Haematuria	Leaf paste mixed in cow milk , given orally.
5.	<i>Achyranthes aspera</i> -	Amaranthaceae	Seed	Gastric trouble	Seed paste boiled in goat milk , extract given orally.
6.	<i>Actinopteres radiata</i>	Actinopteridaceae	Whole Plant	Aphrodisiac	Whole plant powder mixed in cow milk , given orally
7.	<i>Aegle marmelos</i>	Rutaceae	Leaf	Bone fractures	Leaves along with black gram, turmeric, calcium & egg albumin ground, paste

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
					applied over fractured area & bandaged.
8.	<i>Alangium salvifolium</i>	Alangiaceae	Cotyledons	Aphrodisiac	Cotyledon powder & one spoon powder mixed with 2 spoons of honey , given orally once a day for 20 days
9.	<i>Albizia lebbek</i>	Mimosaceae	Stem bark Leaf	Neck & waist pain Rheumatism	Stem bark soaked in butter milk overnight, boiled and applied. Leaves along with those of <i>Azadirachta indica</i> , <i>Annona squamosa</i> , <i>Cassia auriculata</i> & <i>Vitex negundo</i> ground, mixed in castor oil & cow ghee , applied locally.
10.	<i>Andrographis paniculata</i>	Acanthaceae	Stem Leaf	Snake bite Acidity, ulcers, worms	Stem mixed with that of <i>Hollorhena pubescens</i> , ground in cow urine , juice given orally. Leaf extract given orally with honey once a day for 3 days.
11.	<i>Anisomeles malabarica</i>	Lamiaceae	Leaf	Wounds	Leaf ground and made into paste with egg albumin & applied externally.
12.	<i>Aristolochia bracteolata</i>	Aristolochiaceae	Aerial parts Leaf	Snake bite Indigestion	Aerial plant parts powdered and boiled. Decoction along with human urine taken orally. Leaf juice mixed in mother milk , given orally.
13.	<i>Aristolochia indica</i>	Aristolochiaceae	Leaf	Peptic ulcers Skin diseases	Leaf paste mixed in curds and given orally. Leaf paste mixed in goat urine , rubbed over the affected area.
14.	<i>Bombax ceiba</i>	Bombacaceae	Flower	Sterilization	Flower macerated with milk & given orally in empty stomach for a week (1-2 flowers makes one dose).
15.	<i>Butea monosperma</i>	Fabaceae	Stem bark	Jaundice	stem bark ground in goat milk and given orally.
16.	<i>Caesalpinia bonduc</i>		Seed Cotyledons	Asthma Hernia	Seed paste mixed in honey , given orally. Cotyledons ground in honey , paste given for licking.
17.	<i>Canthium parviflorum</i>	Rubiaceae	Fruit Stem bark	Dysentery Snake bite	The unripe fruit extract mixed in curd , given orally. Stem bark paste mixed in cow urine & the extract dropped into nostrils/given orally.
18.	<i>Capparis zeylanica-</i>	Capparidaceae	Leaf	Fertility in women	Leaf paste mixed in cow ghee, given orally
19.	<i>Cassia fistula</i>	Caesalpiniaceae	Fruit	Stomach ache	The fruit paste with ginger and honey , given orally.

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
			Leaf	Snake bite	Leaves along with stem bark, ground in goat milk and applied externally. Leaf juice mixed with cow milk and given orally. Matured leave ground, mixed with butter milk, given orally.
			Leaf	Mad dog bite	
			Leaf	Indigestion	
20.	<i>Cassia italica</i>	Caesalpinaceae	Aerial parts	Health tonic Gonorrhoea	10 gm of dry plant powder taken orally with goat milk once a day for 15 days. Aerial plant parts paste mixed in butter milk , given orally.
21.	<i>Cassia occidentalis</i> L.	Caesalpinaceae	Leaf Seed	Bone fractures Vermifuse	Leaf paste mixed in egg albumen and goat milk applied on fractured areas and bandaged. Seed paste mixed in goat milk , given orally.
22.	<i>Celosia argentia</i>	Amaranthaceae	Seed	Diarrhea	The seed paste mixed in mother milk , given orally.
23.	<i>Centella asiatica</i>	Apiaceae	Leaf Aerial parts	Memory Ring worm	One gram of leaf powder mixed with honey and given orally early in the morning. Aerial plant parts powder made into paste with honey and given orally.
24.	<i>Cissu vitiginea</i>	Vitaceae	Fruits	Asthma	Fruits along with stem bark of <i>Chloroxylon swietenia</i> ground, mixed in goat milk , given orally
25.	<i>Cleome felina</i>	Cleomaceae	Aerial parts	Blisters	Aerial parts paste mixed with cow milk , applied externally.
26.	<i>Coccinia grandis</i>	Cucurbitaceae	Leaf	Bone fractures Epitaxis Skin diseases Menorrhoea	Leaves along with black gram and egg albumen ground, paste applied over fractured area and bandaged. Leaf juice mixed in ghee as nasal drops. Leaves along with stem bark of <i>Pongamia pinnata</i> and cow urine ground, applied locally. Leaf juice mixed in curd given orally.
27.	<i>Corallocarpus epigaeus</i>	Cucurbitaceae	Tubers	Snake bite	The tuber made into paste with children's urine and given orally.
28.	<i>Curculigo orchioides-</i>	Hypoxidaceae	Tubers	Aphrodisiac	Dried tubers along with those of <i>Withania somnifera</i> and plant parts of <i>Euphorbia hirta</i> ground, given orally one spoon with one cup of cow milk daily once for 30 days.

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
29.	<i>Datura metel</i>	Solanaceae	Flowers	Rheumatism	Flowers powdered and mixed with honey , given orally at night times.
30.	<i>Decalepis hamiltonii</i>	Asclepiadaceae	Roots	Aphrodisiac Cooling	Roots along with those of <i>Hemidesmus indicus</i> , <i>Withania somnifera</i> and true date palm ground, warmed in cow ghee , the extract mixed in cow milk , given orally. Roots along with those of <i>Hemidesmus indicus</i> , <i>Curculigo orchoides</i> , and <i>Withania somnifera</i> ground, boiled in cow milk , decoction given orally.
31.	<i>Derris scandens</i>	Fabaceae	Leaf Seed	Dysentery Indigestion Diabetes mellitus	Leaf paste mixed in curds , given orally. Leaves and ginger ground, extract mixed in butter milk & given orally. Seeds dried, ground powder given orally with honey .
32.	<i>Erythroxylum monogynum</i>	Erythroxylaceae	Leaf	Bone fractures	Fresh leaves along with egg albumin , turmeric and a pinch of calcium ground, extract applied over the fractured area and bandaged.
33.	<i>Euphorbia hirta-</i>	Euphorbiaceae	Leaf	Promoting virility & potency	Leaves along with coconut, cashew nut & sugar candy ground, boiled in cow milk , extract given orally twice a day for ten days.
34.	<i>Evolvulus alsinoides-</i>	Convolvulaceae	Root	Constipation	Root powder mixed in goat milk and given orally.
35.	<i>Ficus racemosa-</i>	Moraceae	Fruit	Dysentery Menorrhoea	Fresh fruit paste mixed in curd , given orally. Fruit cut into pieces dried ground, powder given orally with honey for 20 days
36.	<i>Gossypium barbadens-</i>	Malvaceae	Flower Leaf	Snake bite Rat bite	Flower extract in cow milk given orally Leaf extract in cow milk given orally.
37.	<i>Grewia villosa</i>	Tiliaceae	Leaf	Diarrhea	Fresh leaf paste mixed in curds given orally.
38.	<i>Gymnema sylvestre-</i>	Asclepiadaceae	Leaf	Chronic fiver	Leaf paste mixed in mother milk , given orally (or) leaves along with pepper and garlic ground, paste given orally.
39.	<i>Hibiscus ovalifolius-</i>	Malvaceae	Leaf	Bone fractures	Leaf paste mixed in goat milk , applied over the fractured area & bandage.
40.	<i>Hibiscus vitifolius</i>	Malvaceae	Leaf	Bone fractures	Fresh leaves macerated with egg , lime, turmeric and pulp

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
					thoroughly mixed. Clean cloth dipped in the extract and dressed around the part. Fresh dressing is made every day for 5 days.
41.	<i>Holostemma ada-kodein-</i>	Asclepiadaceae	Root	Diabetes	Root paste mixed in milk given orally.
42.	<i>Hygrophylla auriculata-</i>	Acanthaceae	Stem	Aphrodisiac	Stem along with that of <i>Mucuna pruriens</i> , <i>Pedaliium murex</i> , and roots of <i>Curculigo orchioides</i> , <i>Stemona tuberosa</i> , ground, mixed in milk and sugar candy, given orally daily for 40 days.
			Root	Bladder stones, Ascites	Root powder along with goat milk given orally once a day for 15 days.
			Seed	Promotes sexual vigor, astringent	Seed soaked in water, infusion mixed with cow milk and given orally daily in the morning for 30 days.
43.	<i>Leucas aspera-</i>	Lamiaceae	Leaf	Fever, cold, cough	Tender leaves (5 to 6) ground with 10 gm of rice warmed along with honey given orally at night times.
44.	<i>Limonia acidissima-</i>	Rutaceae	Fruit	Digestive complaints	Fruit extract in cow milk given orally.
45.	<i>Mimosa pudica-</i>	Mimosaceae	Leaf Fruit	Piles	Leaf/root powder mixed with goat milk applied externally and given orally.
46.	<i>Mucuna pruriens-</i>	Fabaceae	Cotyledons	Aphrodisiac	Cotyledons boiled in cow milk , dried and powdered, powder fried in ghee, made into balls, soaked in honey , given orally.
47.	<i>Passiflora foetida-</i>	Passifloraceae	Leaf	Diarrhea	Fresh leaf paste mixed in goat milk , given orally.
48.	<i>Pedaliium murex</i>	Pedaliaceae	Seed	Aphrodisiac	Seed along with that of <i>Hygrophylla auriculata</i> , <i>Mucuna pruriens</i> , and roots of <i>Curculigo orchioides</i> , and <i>Stemona tuberosa</i> , ground, powder mixed in cow milk and sugar candy given orally daily for 40 days.
49.	<i>Peristrophe paniculata-</i>	Acanthaceae	Stem and Leaf	Bone fractures	Stem and leaves macerated with water. Pulp mixed with egg white and lime & applied on the fractures and bandage made around it. Two bandages required in a month.
50.	<i>Phyllanthus reticulatus-</i>	Euphorbiaceae	Leaf	Insect bite	Fresh leaf extract mixed in goat milk , given orally.

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
51.	<i>Plumbago zeylanica-</i>	Plumbaginaceae	Root	Back ache Antidiabetic	Root made into paste and mixed with cow milk , given orally. Root cut into pieces, boiled in water and decoction (10ml) with honey given orally twice a day. One dose with empty stomach in early morning and other before dinner for 60 days.
52.	<i>Pongamia pinnata-</i>	Fabaceae	Stem bark Root bark	Dysentery Fertility in women	Stem bark decoction mixed in butter milk & given orally. Root bark, garlic & curd ground, paste given orally.
53.	<i>Pouzolzia auriculata-</i>	Urticaceae	Leaf	Syphilis	Leaves along with seeds of <i>Semecarpus anacardium</i> , camphor, musk & gorojanam ground mixed with honey and given orally.
54.	<i>Prosopis cineraria-</i>	Mimosaceae	Leaf	Leucorrhoea Scorpion sting	Fresh leaves ground in sugar and garlic and mixed with butter milk given orally. Fresh leaves ground in cow milk and the paste applied over the bitten area.
55.	<i>Rhus mysorensis-</i>	Anacardiaceae	Leaf	Skin allergy	Fresh leaves ground cow milk and rubbed over the body.
56.	<i>Rubia cordifolia</i>	Rubiaceae	Root	Psoriasis	Root ground, mixed with cow urine and paste applied on affected parts.
57.	<i>Saraca indica</i>	Caesalpiniaceae	Seed	Menorrhoea	Seed decoction mixed with cow milk and given orally.
58.	<i>Securinega leucopyrus</i>	Euphorbiaceae	Leaf	Insect bite	Fresh leaf extract mixed in goat milk, given orally.
59.	<i>Semecarpus anacardium</i>	Anacardiaceae	Leaf	Leprosy	Fresh leaves along with stem bark of <i>Pongamia pinnata</i> and cow urine ground, applied locally.
60.	<i>Solanum anguivi</i>	Solanaceae	Tender Shoots	Asthma	Tender shoots powdered and mixed in honey , given orally.
61.	<i>Solanum surattense</i>	Solanaceae	Fruit	Asthma Epilepsy	Fruit paste mixed in goat milk , given orally. Roots along with gorojanam and saffron ground mixed in goat milk , given orally
62.	<i>Sphaeranthus indicus</i>	Asteraceae	Leaf	Skin diseases & Ring worms	Fresh leaf ground and infusion given orally twice a day along with cow milk .
63.	<i>Strychnos nux-vomica</i>	Loganiaceae	Seed	Blood pressure / Diabetes	Seeds immersed in cow urine for 40 days, shade dried, roasted with cow ghee , ground and infusion mixed

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
				Psoriasis Plantaris	with honey and made into pills. Two pills given (after dinner) for a week day. Seed ground in cow urine , paste applied on soles during night for 7 days.
64.	<i>Strychnos potatorum-</i>	Loganiaceae	Seed	Diarrhea Spermatorrhoea	Seed paste prepared with butter milk and given orally for 3 days. Seed soaked in leaf extract of <i>Eclipta prostrata</i> thrice, boiled in half quantity of milk , dried, ground and infusion given orally with honey daily once.
65.	<i>Syzigium cumini</i>	Myrtaceae	Stem bark Cotyledons	Dysentery Diabetes	Stem bark paste mixed in curd , given orally. Cotyledons ground, 2 spoons of powder boiled in a glass of water, one part of decoction and one part of cow milk with little sugar and given orally once daily for 20 days.
66.	<i>Terminalia bellirica-</i>	Combretaceae	Fruit	Asthma	Dry fruit ground, infusion mixed with honey and given orally.
67.	<i>Terminalia chebula</i>	Combretaceae	Fruit	Cough Dropsy	Dry fruit paste mixed in honey , given orally. Dry fruit along with that of <i>Terminalia bellirica</i> and <i>Phyllanthus emblica</i> dried, ground and infusion given orally with honey .
68.	<i>Tinospora cordifolia-</i>	Menispermaceae	Leaf	Jaundice	Fresh leaf ground, paste made into pills and given orally with butter milk .
69.	<i>Trianthema potulacastrum</i>	Aizoaceae	Leaf	Bone fractures	Leaves mixed with black gram, egg albumen and calcium, ground and the paste as poultice.
70.	<i>Tylophora indica-</i>	Asclepiadaceae	Leaf	Snake bite	Fresh leaves along with those of <i>Tinospora cordifolia</i> ground, mixed with cow urine and given orally.
71.	<i>Vernonia cinerea-</i>	Asteraceae	Whole plant	Fertility in women	Whole plant powder mixed with cow milk and given orally after menses for 3 days. Preparation of medicine on Sunday only. (Diet: Chicken, spices, garlic forbidden).
72.	<i>Vitex altissima-</i>	Verbenaceae	Leaves	Dysentery	Fresh leaves along with those of <i>Ocimum tenuiflorum</i>

S. No.	Botanical Name	Family	Part used	Purpose	Mode of Preparation
					ground, mixed in goat milk , given orally.
73.	<i>Withania somnifera</i> -	Solanaceae	Root	Vision problems	Root powder mixed with rice washed water and honey given orally.
74.	<i>Wrightia tinctoria</i> -	Apocynaceae	Seed	Impotency	Seed powder mixed with cow urine and given orally.

IV. DISCUSSION

Ethno-zoological field trips were conducted in the forests and rural areas of Rayalaseema region. The collected information such as plant botanical name, family, part used mode of preparation and animal derived products as ingredients were depicted (Table 1). The survey yielded 74 species belonging to 67 genera and 39 families. Part wise analysis of ethnobotanical revealed that leaf drugs are dominantly used drugs to prepare herbal formulations, followed by seed or cotyledons (15 samples), root or root tubers (11 samples), fruits (9 samples), stem or stem bark (8 samples) and etc. (Figure 1).

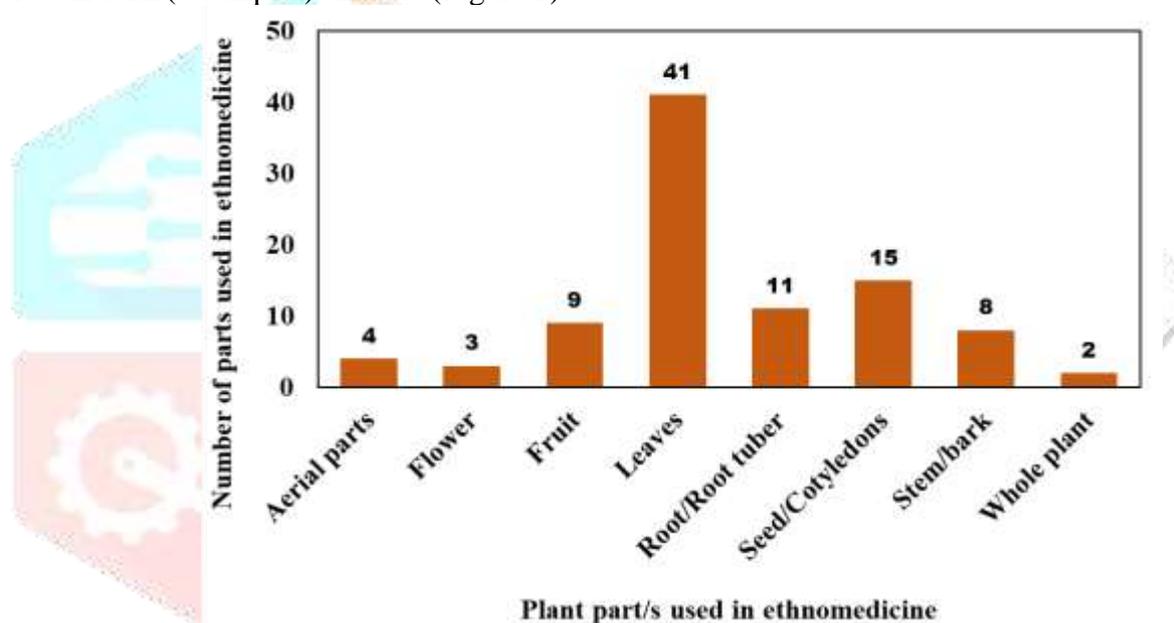


Figure 1 Partwise analysis of Ethnobotanicals of the study

Disease wise analysis of herbal drugs indicated that bone fractures (8 samples) are the common diseases, followed by aphrodisiac, dysentery, snake bite and asthma occupied top fives diseases in the present area (Figure 2).

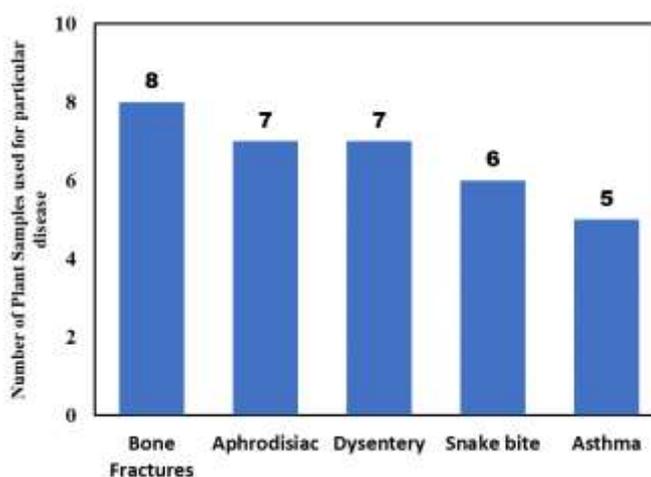


Figure : 2. Disease wise analysis of crude drugs

Family wise analysis of ethno-botanicals revealed that Leguminosae is the dominant family (12 samples) followed by Asclepiadaceae, Euphorbiaceae, Solanaceae and Malvaceae (4 species for each family), Acanthaceae and Asteraceae represented with 3 species and etc. (Table 2). About 13 animal products derived from 7 animals such as cow, honey bees, goat, chicken, human and musk animal using as ingredients in ethnomedicine. Among the animal products used in ethnomedicine cow products (butter milk, milk, curd, ghee, gorojanam and urine) occupied dominant position followed by goat products (milk and urine), honey, human products (mother milk and urine), egg, and musk (Figure 3).

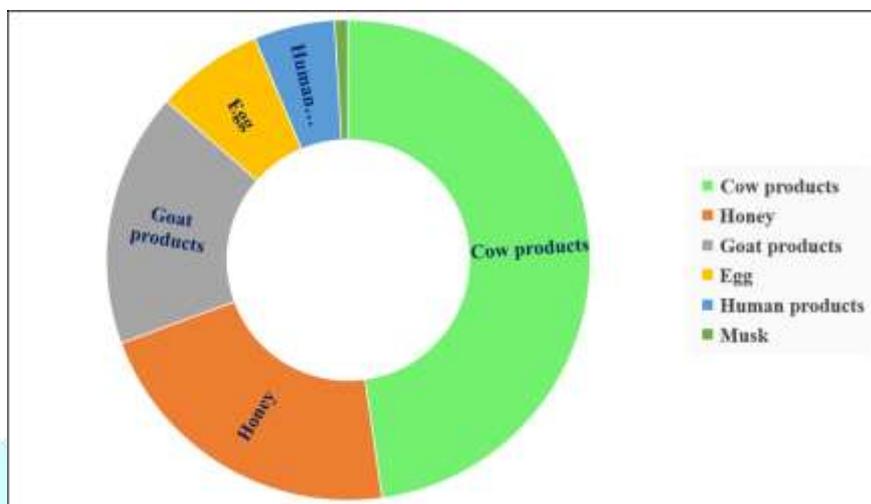


Figure 3: Animal derived drugs used as ingredients in ethnomedicine

These products have been using in folk medicine as ingredients in the preparation of more than 100 folk herbal formations. Statistical analysis of the collected animal products, cow products occupied dominant (54 samples) position as ingredients in folk medicine. Milk is an irreplaceable part of the human diet and has been considered a complete food. In terms of nutrition and health, milk is one of the most cost-effective sources of nutrients and provides uncountable health benefits (Thakur et al., 2024).

Cow milk (24 samples) is the most commonly used cow product in the preparation of folk herbal formulations (Figure 4). In India, a cow is called 'Gaumata' or 'Kamadhenu' due to its nourishing nature like a mother. Cow's milk is a healthy food consumed worldwide by individuals of all ages. It is characterized by a balanced composition of proteins and essential macro and micro nutrients such as calcium, phosphorus, and vitamin D. In folk/traditional medicine cow milk is highly valued for its nourishing, rejuvenating, and therapeutic properties, considered sacred and vital for health (Pratelli et al., 2024). Milk being an emulsion has the ability to incorporate water-soluble and lipid-soluble substances from the drugs to the human body.

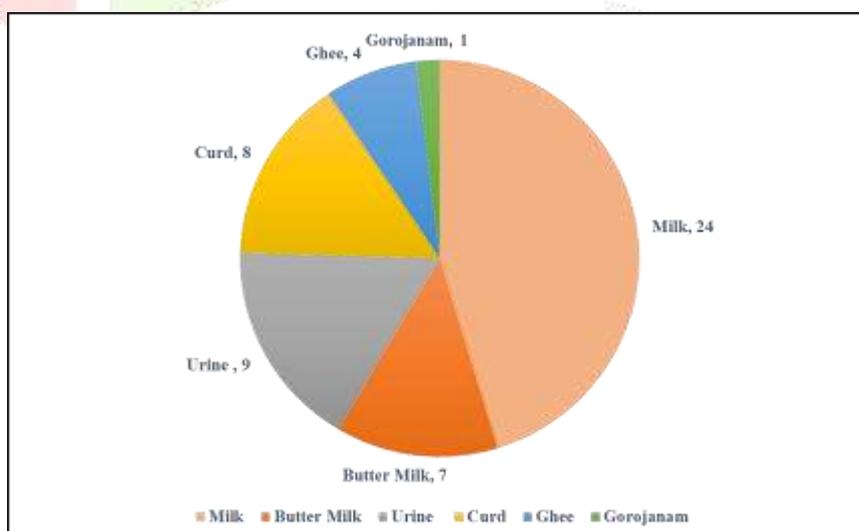


Figure 4: Cow derived drugs used as ingredients in ethnomedicine

In the present study, cow milk is used as ingredient to prepare 24 herbal formulations to treat poisonous bites, to improve sexual potency in male and gynec problems in women and diabetes. Curd is using to treat dysentery and diarrhea and gynec problems in women. Cow urine for snake bites and skin diseases. According to Charaka, the famous Indian scholar of Ayurveda, eight types of milk from animal origin are mentioned in

traditional medicinal systems, namely that from cow, buffalo, goat, camel, human, sheep, elephant and single hoofed animals (horse, etc.) (Charaka, 2000). Vagbhata states that, among all, that from cow's milk is considered best (Vagbhata, 2000). Preparation of herbal drugs in cow milk and milk products can enhance their therapeutic actions as well as increase palatability. Processing of herbal drugs in milk and milk products also reduce the toxicity of certain raw materials, mainly toxic drugs, metals and minerals. Several research studies also suggested that probiotic-rich milk and other dairy products are better in delivery and maintenance of probiotic bacteria of the human gut (Mana et al., 2021).

Another important animal drug used in folk medicine as ingredient is honey. It is a natural sweet liquid by-product of flower nectar, collected and stored by honey bees. The use of honey by human is traced to some 8000 years ago as depicted by Stone Age paintings. Due to its nutritional and medicinal benefits, honey has been utilized for centuries in a variety of ways, including as a sweetener and flavoring ingredient. The use of honey in folk medicine as ingredient is to reduce bitterness of the drug and to targeted therapeutic application. In the present investigation honey has been using as ingredient to prepare 24 herbal crude formulations (Figure 3) to cure cough, rheumatism, asthma, diabetes, dropsy, syphilis and etc. In modern medicine different materials such as collagen, gelatin, starch, cellulose, alginate or agarose have been impregnated into honey to create a variety of medical formulations (Kumar et al., 2024). Chemically honey is rich in sugars, amino acids, enzymes, polyphenols, and flavonoids that contribute to its antimicrobial, antioxidant, and immunomodulatory properties (Mohamed et al., 2025). Goats are important domesticated livestock and potential source of high-quality milk low- and middle-income countries of the world (Ranadheera et al., 2019). Goat milk is an excellent source of macro and micro nutrients such as protein, and minerals including calcium, potassium, phosphorous, magnesium, and vitamin A. Therapeutically goat milk is reported for pharmacological properties like immunomodulatory, probiotic nature, antioxidant, anticarcinogenic, anti-inflammatory, antidiabetic and etc. (Thakur et al., 2024). In the present study about 19 samples (goat milk 18 + goat urine 1 sample) to treat poisonous bites, dysentery, asthma, constipation, gastric problems and as health tonic. Egg is another source of animal product obtained from chicks, ducks and quails. It is known as a natural resource, rich in vitamins, essential minerals and high-quality class protein. In the present study about 8 samples are using to treat bone fractures and wounds (Table1).

Regarding to drug preparation and dosage forms, about 8 types of dosage forms such as paste, extract, powder, decoction, juices and etc. (Figure 5).

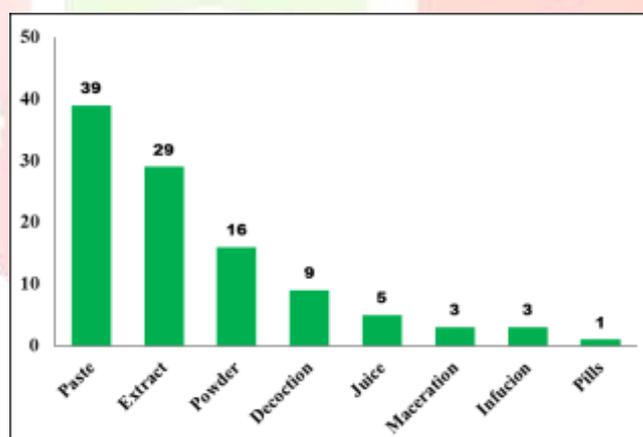


Figure 5: Dosage forms used in ethnomedicine for drug administration

Among the dosage forms paste is the most common dosage form used to prepare 39 drug formulations, followed by extract (29 samples), powder (16 samples), decoction (9 samples) and etc. Oral or internal (88 formulations) administration of drug formulations is common administration method in the study area followed by external application (18 formulations).

V. CONCLUSION

The present investigation has focused on the study of effective combinations along with the animal by-products. The ethnic people are living together with certain animals which are being fed on various herbals in the forest areas. Altogether the ethno-medicines are amazingly effective along with the said combinations. The ethnic information will provide basis for further pharmacological research in in-vitro as well as *in vivo* studies for the betterment of mankind to avoid the toxic effects of certain synthetic medicines.

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