



Full Length Article

Ethno-Veterinary Practices in District Upper Dir Khyber Pakhtunkhwa, Pakistan

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Abstract

Ethno-veterinary practices (EVPs) are traditional wisdom, practices and skills rooted in cultural beliefs to heal and uphold animal health. Our study focused on investigating and documenting EVPs applied to treat specific ruminant species and cattle, within the remote hilly region of District Upper Dir, Khyber Pakhtunkhwa, Pakistan. Through this comprehensive assessment of the EVPs the study fills an important gap in the scientific understanding of the ethno-veterinary medicine (EVM) wealth of this understudied region of Pakistan. Valuable insights were gathered through structured questionnaires and guided dialogue techniques in interviews with pastoralists, traditional healers, farmers, cattle owners, and veterinary assistants. The study revealed 43 distinct ailments reported by the respondents in this area, with 65 various plants commonly utilized in diverse remedies to address these ailments. The highest plant usage for remedies was noted in gastrointestinal conditions ($n = 22$), followed by parasitic ($n = 20$), skeleto-muscular ($n = 14$), infectious and respiratory ($n = 13$) and reproductive ($n = 9$) diseases. Gastrointestinal diseases comprised a significant portion (26%) of the total reported livestock ailments in District Upper Dir, according to respondents. The main four preparation methods for remedies and medicine included crushing and squeezing (28%), decoction and boiling (21%), powder form (17%) and grinding and paste preparation (14%). Study findings affirmed that the primary plant parts are leaves utilized in traditional medicine, followed by fruits, flowers, seeds, and roots. Additionally, respondents noted the costliness and potential side effects of allopathic treatments. Veterinary officers and assistants acknowledged the widespread use of EVPs in the studied area. Ensuring the transmission of indigenous knowledge from the older generation to the youth is crucial to preserve invaluable ethno-veterinary expertise.

Keywords: Ethno-veterinary practices; Ailments; Traditional medicine; Upper Dir

Introduction

Nomadic as well as sedentary livestock raisers, both use ethno-veterinary practices (EVP), known as "ethno-veterinary medicine" (EVM), rooted in empirical evidence passed down orally across generations (McCorkle *et al.* 1996; Ahmad *et al.* 2015). Hence, EVM stands as a customary method developed through local experimentation, aiming to maintain the health and productivity of animals. Pakistan boasts an impressive array of natural resources across various ecological landscapes and regions (Arshad *et al.* 1999). Ethno-veterinary Knowledge (EVK) is an ancient way of seeking and applying including concepts of encompassing, practices, skills, traditional knowledge, methods, local information and folk believe that to use nature *i.e.*, medicinal plants to treat numerous animal diseases especially livestock are a vital fraction of human culture since past period (Mathias-Mundy and McCorkle 1989).

Cattles are considered an important section with

agriculture in South Asia countries especially in Pakistan. This section contributes nearly 56% of agriculture value and about 10.5% to the products gained from agricultural domestics which are called AGDP value (Agricultural Gross Domestic Product). In these countries this section important products are milk and meat which reduce poverty and it is also used for easy cash or quickly developed. For development and economically growth Pakistan need to give preferences on this section. The herd of Pakistan includes 0.9 million camels, 30 million cows, 27 million buffaloes, 27 million sheep, 53 million goats approximately (according to national economic survey of Pakistan 2010). During last three decades in Pakistan the livestock sector about 36 million populations has only an average growth of three percent experienced which is very low production rate for this high populated country, due to lack of strong policies of economic which leads to poor attention about cattle health (Simon 1980; Quddus *et al.* 1997; Delgado 2005; Hasnain and Usmani 2006; Pakistan Economic Survey 2010).

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In Pakistan, there has been minimal focus on this aspect in recent research, with limited efforts to advocate for the indigenous and traditional practices and knowledge held by local therapists, healers, and farmers passed down through generations (Akhtar *et al.* 2000; Martin *et al.* 2001). It is only now that Pakistan is showing interest in enhancing and advancing this traditional knowledge. There's ongoing work dedicated to compiling EVP and documenting the local traditional medicinal plants for preservation in published literature (Iqbal *et al.* 2002; Lateef *et al.* 2003; Jabbar *et al.* 2006; Farooq *et al.* 2008). However, despite the wealth of knowledge within the country, there remains a scarcity of collected information especially in the backward areas.

Involving local communities in ethno-veterinary research (EVR) empowers them to actively participate in the documentation and validation of their traditional practices. This engagement promotes community-led initiatives for animal health (Pushpangadan *et al.* 2002). EVR provides educational opportunities for researchers, practitioners, and communities (Martin *et al.* 2001; Somvanshi 2006). It facilitates the exchange of knowledge and encourages collaborative learning between traditional practices and modern scientific approaches (Anjaria 1996). It contributes to a holistic understanding of the complex relationships between humans, animals, and the environment.

This research was conducted in District Upper Dir, in the west northern part of Khyber Pakhtunkhwa Pakistan, considering that the EVPs are used for control of various diseases/conditions.

Materials and Methods

Study area

The study was conducted from December 2022 to July 2023 in District Dir Upper, which lies between 35°12'24"N latitude and 71°52'36"E longitude, at an elevation ranging from 1300 to 1500 meters above sea level having an area of approximately 3,699 square kilometers. It shares its borders with District Chitral and Afghanistan to the North and northwest, while it's adjacent to District Swat in the east. To the south, it connects with District Lower Dir (Fig. 1).

Administrative division: Administratively the study area is divided into seven Tehsils. According to the census 2023, its population is 1072782 individuals. The livestock population of the area is about 232013 cattle, 4964 buffaloes, 91229 sheep, 352488 goats, 640 horses, 2919 mules, 4311 asses and 713500 poultry (Livestock Population Census 2006).

Selection of the respondents for documentation of EVPs: For identification of traditional veterinary healers (TVHs), a survey was performed using rapid rural appraisal (RRA) technique. Then an exploratory survey and investigation were carried out to select specific key respondents. The key respondents were individuals having a deeper understanding of ethno-veterinary remedies compared to the broader

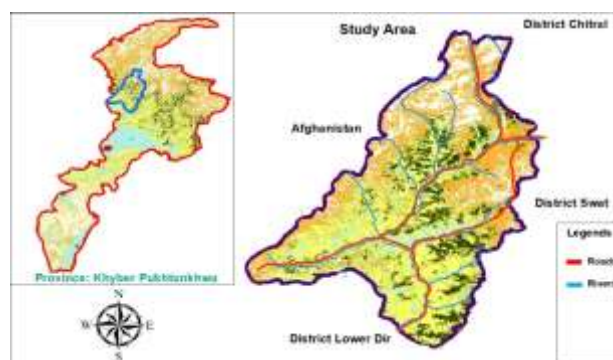


Fig. 1: Map of study area (Muhammad *et al.* 2021)

population. Engaging with local communities provided valuable insights into livestock production practices, encompassing feed management, product handling and production constraints.

Documentation of EVPs: Data related to EVP were collected from the selected respondents through questionnaire and interviews. The interviews were conducted in local language “Pushto”. A total of 150 key respondents were selected comprised of livestock raisers, local pastoralists, traditional farmers and veterinary officers/veterinary assistants belonging to hilly regions of the study area. Mostly the age of these respondents were above 50 years.

Data analysis

Data was analyzed by using Microsoft excel and SPSS as per the information collected from the respondents.

Results

This study aimed to document the EVM practices employed in the remote mountainous areas of Upper Dir Khyber Pakhtunkhwa Pakistan. The participants of the study were livestock farmers, healers offering traditional veterinary services, assistants and veterinary officers participating in administration of contemporary veterinary healthcare and identify diseases and conditions.

Out of the total 150 respondents, 70 individuals (46.6%) fell within the age range of 66–80 years. A significant majority ($n = 80$; 53.33%) acquired their knowledge of EVM through intergenerational transmission, primarily from father to son. Additionally, a considerable portion ($n = 70$; 46.6%) had accumulated 51–60 years of experience in practicing EVM. Among these practitioners, 60 (40%), 20 (13.33%), 40 (26.66%) and 30 (20%) catered to the needs of cattle, buffalo owners, caprine and sheep, respectively. A larger portion of the respondents ($n = 122$; 81.33%) indicated that practicing EVM was not their exclusive income source. A significant number of EVM practitioners ($n = 128$; 85.33%) affirmed that free of charge services would be offered by them to livestock owners, per

owners, and breeding enthusiasts. Among them, 70 individuals (46%) reported attending to 40–50 cases per month. Additionally, a substantial portion (85 individuals, accounting for 56.66%) mentioned providing healthcare services to both their local community and neighboring villages. Practitioners refrained from discussing their perspectives on EVM with other healers in the area. Most of the respondents ($n = 116$; 77.3%) believed that the usage of EVM maintained its current position, indicating that modern veterinary practices (allopathic) had not significantly infiltrated the system of EVM and EVPs. Among the 80 practitioners surveyed, all expressed their belief that EVM was more effective than modern medicines.

In the current study, a total of 350 remedies were recorded for managing livestock diseases. This extensive number of remedies underscores the rich history and effectiveness of EVM practices. Respondents demonstrated comprehensive knowledge in preventing, controlling, and treating various animal ailments and their reliance on EVM was notable. Among the 350 medications noted in this study, a great majority (290) were based on plant-derived formulations. These plant-based solutions drew from a pool of 65 distinct plants (Table 1). These findings suggest an overlap in the use of multiple plants across different remedies, reflecting varied forms, doses, preparation modes, and administration methods.

Respondents considered the animal size and the severity of the disease when determining various treatments. Smaller animals (such as sheep and goats) typically receive about half the dose administered to larger animals (like buffalo and cow). The application and management of the recorded ethno-veterinary medications were tailored to the precise condition being treated. For helminthiasis, plants were given orally mixed with various carriers such as yogurt, wheat flour, black salt, common salt, jaggery and milk whey. To control infestation of lice and plant parts (seed oil, aerial parts and leaves *etc.*) were naturally simmered in water or added with kerosene oil or milk whey and then topically applied (Table 1).

The study revealed that the method of preparing EVM varies based on the specific active ingredients being extracted. In preparing the remedies, respondents primarily utilized various parts of the plant, including seeds, bulbs, buds, grains, latex, resins, fruits, flowers and leaves. The typical method used to extract the remedy involved grinding, soaking, brewing, or boiling various parts of plants or the entire plant. The healers create herbal preparations, sometimes adjusting the potency of the drug by adding arbitrary amounts of carrier, often diluting the juice with water. Additionally, when administering remedies wheat flour, milk fat, butter and jaggery were commonly employed. Respondents mentioned their preferred methods of administering remedies to animals, primarily through oral means such as decoctions liquid solutions produced by steeping plants. They also utilized fumigation, topical application, or external washes. The dosages varied

significantly, with farmers lacking precise knowledge about the appropriate amounts. They believed that the dosage of the remedy relied on the animal size or the availability of plants used for treatment. Respondents showed inconsistency regarding the doses of certain remedies. The units used, such as a handful of leaves or a few leaves to measure the quantity of plant parts for most remedies. The dosages were frequently estimated as a bit (around 50–60 g), a bottle (about 250 mL), or occasionally using traditional weighing scales. Veterinarians criticized the imprecise and non-standardized dosages. In EVPs, the treatment duration for a specific disease varies widely and is largely determined by the animal owner. Generally, the disappearance of symptoms and a return to normal health in affected animals are considered to indicate the successful resolution of the disease (Table 1).

According to the respondents appraised, the ailments were treated with EVPs only or in mixture with allopathic remedies or exclusively with allopathic treatments, key respondents ($n = 150$) reporting usage of ethno-veterinary /allopathic medicine or combination of them for the treatment of the animal's ailments in remote hilly areas (Table 3). Farmers almost use EVPs and seldom pursue government run veterinary services for common diseases. Modern veterinary medicine is slowly becoming part of the animal health handling when epidemic conditions occur particularly foot-and-mouth illness and hemorrhagic septicemia. EVP is generally combined with allopathic treatment when the previous is ineffective.

Contribution of different diseases and remedies

Gastrointestinal diseases accounted for a significant portion (26%) of the total livestock ailments according to the respondents (Fig. 2). Among all the EVM practices detailed by the respondents, gastrointestinal remedies represented the highest percentage (Fig. 3). Significant variations were observed in the dosage, form, preparation methods, and administration or application modes. There was a considerable diversity in using combinations of different plants for treating various diseases. The largest usage of plants as remedies was for gastrointestinal ailments ($n = 22$), followed by parasitic issues ($n = 20$), skeleto-muscular conditions ($n = 14$), as well as respiratory and infectious diseases ($n = 13$). Reproductive diseases were addressed using plants to a lesser extent ($n = 9$) (Fig. 3). In the treatment of various livestock diseases, a total of 65 plant species was utilized in EVM.

Parts of plants used

Around 65 plant species are recognized for their relevance in EVP. A majority (81.1%) of these medicinal plants are typically found growing in the wild, mainly in hilly areas, while a small percentage is cultivated in home gardens or near home steads.

Table 1: Remedies used by the key respondents, traditional healers, local pastoralists for the treatment of different ailments of some ruminant species in remote hilly areas of district Upper Dir

Sr. No.	Taxan name of Plant	Vernacular name and Common name	Part of plant administered	Route of administration	Medicinal point of view/Category	Remedy procedure and Veterinary Uses	Diseases/Conditions	Animal Species
1.	<i>Acacia modesta</i>	Phaloosah/ Phulai	Out Gums (1) Leaf (2),	Oral	Skeleto-muscular ailments Stimulants	Gums, when combined with corn flour, are administered orally. They are also utilized to regulate body temperature and employed as a massage substance with mustard oil for alleviating muscle pain (1), also used to increase production of milk after parturition (2)	Pyrexia, Agalactia, Enhance lactation, Cramp	Goat, Sheep, Cow
2.	<i>Buxus wallichiana</i>	Shamshahad/ Himalayan box tree	Leaves, Small stems	Topical	Dermatological	Leaves are dried and then their powder spread on out skin for treatment of bacterial infections. May be used orally but in very low amount.	External parasites, Mastitis, Myiasis, Streptothricosis	Cow, Buffalo, Steer
3.	<i>Prunus brahuica</i>	Ghwarghosthai /No common name	Leaves (1), Gums (2)	Oral (2), Topical (1)	Multisystem (1) Skeleto-muscular (2)	Some branches having leaves are kept beneath animal feet for foot and mouth infections (1). Gums mixed with yeast for skeleton-muscular problems (2)	Measles, Cramp, Streptothricosis	Ruminant, Dog, Goat, Sheep
4.	<i>Mentha longifolia</i>	Enalay or Shamshubai / Wild mint	Leaves	Oral	Gastrointestinal	Fresh or dried leave powder given for pain in abdominal region and for treatment of swelling and flatulence.	Abdominal ache, Acute meteorism, Flatulence, Inflammation	Cow, Buffalo
5.	<i>Curcuma longa</i>	Kurkamaan/ Turmeric	Rhizome	Oral	Skeleto-muscular (1) Liver (2)	Powdered from dried rhizome are mixed with water and egg after cooking given for skeleton-muscular (1) Directly during ailments (to cattle) to camels during jaundice (2)	Myalgia, Hyperbilirubinemia	Equine, Ruminant, Dog
6.	<i>Listea monopetala</i>	Zyarlargay/ Gray mango	Leaves (1) Bark (2)	Topical	Liver, jaundice	Dry leaves powdered decoction for jaundice (1) Bark powdered use externally against pains (2)	Cramp, Hyperbilirubinemia	Cow, Buffalo, Goat, Sheep
7.	<i>Withania coagulans</i>	Khamazoor/ Vegetable rennet	Fruit (1) Leaves (2)	Oral (1) Topical (2)	Gastrointestinal, Liver, Dermatological, Skeleto-muscular, Respiratory	Fruit decoction used for pain in abdominal region, also used for lowering temperature, to digest easily, leaves powder on wounds, young fruits for skeleton-muscular ailments ,	Abdominal ache, Indigestion, Acute meteorism, Cramp, Diarrhoea, Pyrexia, Wheeze, Bruise, Helminthiasis, Hyperbilirubinemia	Cow, Steer, Sheep, Goat
8.	<i>Rumex dentatus</i>	Shalkhay / Tooth dock	Roots	Oral	Skeleto-muscular (1), Gastrointestinal (2) , Liver (3)	For muscular inflammation (1) , worms in intestines (2), liver problems (3), juice of roots is given	Dysentery, Myalgia, Helminthiasis, Hyperbilirubinemia	Cow, Buffalo, Goat
9.	<i>Spiraea canescens</i>	Srawanakai/ Grey stem spirea	Stem bark	Oral	Respiratory (1), Gastrointestinal (2)	Decoction of stem white part given during cough (1), during diarrhea against it (2)	Diarrhoea, Wheeze	Goat, Sheep
10.	<i>Punica granatum</i>	Anaar/ pomegranate	Fruit (1) Root (2)	Oral	Gastrointestinal (1), Medicinal syrups (1), Liver (1), Respiratory tract	Fruits extract given for worms in intestines and for pain in abdomen (1), fruits bark used against diarrhea and chest infection (1), juice for general body weakness, dried roots bark boiled and also used for cough (2)	Abdominal ache, Acute meteorism, Diarrhoea, Anorexia, Wheeze, Myiasis, Helminthiasis, Hyperbilirubinemia	Cow, Buffalo, Goat, Sheep
11.	<i>Pinus geradiana</i>	Zunghoozai/ Chilghoza pine	Stem bark (1) Wood oil (2) Resin (3)	Oral (1) Topical (2)	Skeleto-muscular, Gastrointestinal, Dermatological, Ritual, Medicinal food, Respiratory	Stem bark is around from broken bone (2), stem bark extraction is given for pain in abdomen (1), resin placed on wounds (2), against cough (1), for livestock to protect from hot summer effects (1),	Abdominal ache, Myiasis, Myalgia, Wheeze, Bone fractures, External bruise	Equine, Cow, Buffalo, Sheep, Goat, Dog
12.	<i>Salix tetrasperma</i>	Thoraiwala/ White willow	Leaves	Oral (1), Topical (2)	Respiratory (1), Hind limbs inflammation (2)	Small amount of leaves decoction is given for pleuropneumonia, foot, udder and mouth diseases (1), leaves are spread on feet during feet problems (2),	Mastitis, Laminitis, Wheeze, Pleuropneumonia	Goat, Sheep, Dog
13.	<i>Peganum harmala</i>	Spundai/ Wild rue	Leaves	Topical	Dermatological (1), Parasitic infections (2),	Leaves are boiled and use for wound/fur cutting (1), Used against ectoparasite infections (2),	Mastitis, External bruise, Streptothricosis	Cow, Buffalo, Donkey, Sheep
14.	<i>Nannorrhops ritchiana</i>	Mazaraighana / Mazari palm	Leaves	Topical	Dermatological, Ectoparasitic infections	Leaves are soften in water and around foot, tail and neck diseases	Streptothricosis	Equine, Donkey, Ruminant
15.	<i>Capparis deciduas</i>	Kareera /Caper berry	Wood	Oral	Skeleto-muscular	Stem bark and wood after grinding given for bone fractures	Bone fractures	Goat, Sheep, Dog
16.	<i>Pinus wallichiana</i>	Nakhtar / Blue pine	Stem bark Wood oil Resin	Oral (1), Topical (2),	Skeleto-muscular (1), Dermatological (2),	Stem bark extraction or decoction is used for abdomen and intestinal pain (1), skeleton-muscular problem (1), Resins are spread on wound (2), Wood oil spread on skin against skin infection (2), Used for mouth and limbs infections (2), For treatment of abscesses (2),	Abdominal ache, Cramp, Abscesses, Myiasis, External bruise, Streptothricosis	Equine, Donkey, Cow, Buffalo, Oxen, Goat, Sheep
17.	<i>Olea ferruginea</i>	Shawawun / Wild olive	Leaves (1), Stem bark (2),	Oral (1), Topical (2),	Gastrointestinal (1), Skeleto-muscular (2), Medicinal syrups (1), Liver	Small leaf fragments administered for abdominal issues (1), stem bark bound around fractured bones (2), and a leaf decoction used for general body pain (1).	Abdominal ache, Acute meteorism, Myalgia, Bone fractures	Ruminant, Goat, Sheep
18.	<i>Ephedra geradiana</i>	Omaan / Ephedra	Wood	Oral	Skeleto-muscular	A wood decoction is administered to address liver issues or jaundice	Hyperbilirubinemia	Goat, Sheep
19.	<i>Berberis calliobotrys</i>	Thoorkwarai/ Beautiful raceme barberry	Root	Oral	Skeleto-muscular	Root and flour paste is given without touching teeth, also used for skeleto-muscular ailments.	Cramp	Oxen. Cow, Steer
20.	<i>Valeriana jatamansi</i>	Dasthoobotay / Musk root	Leaves	Oral	Gastrointestinal	Extract and decoction of leaves used against diarrhea	Diarrhoea	Dog, Goat, Sheep

Table 1: Continued

Table 1: Continued

21. <i>Ribes alpestre</i>	Shen kwaray / Hedge gooseberry	Root	Oral	Liver (1), Skeleto-muscular (2)	Root paste is given for jaundice (1), Paste against muscular pain (2),	Myalgia, Hyperbilirubinemia	Equine, Cow, Buffalo, Sheep
22. <i>Daphne papyracea</i>	Malghwanai / Indian paper plant	Stem bark	Oral (1), Topical (2),	Gastrointestinal (1), Dermatological (2),	Stem bark or leaves decoction is spread out on skin against skin infections (2), stem decoction is used orally against diarrhea (1), Used for intestinal worms (1), For lack of appetite (1),	Indigestion, Diarrhoea, Dysentery, Anorexia, Myiasis, Helminthiasis	Cow, Buffalo, Sheep Goat
23. <i>Aerva javanica</i>	Kharmalooch/ kapok bush	Leaf Stem Root	Topical (1), Oral (2),	Dermatological (1), Muscular (2), Multisystem	Used to treat headache (2), roots powder used against reproductive organ infection (2), For wounds treatment, for treatment of udder infections (1), A decoction made from leaves and powdered seed is employed for fever. Additionally, crushed leaves are blended with mustard oil and administered to enhance digestion.	Mastitis, Myalgia, External bruise, Streptothricosis	Cow, Buffalo, Goat
24. <i>Amaranthus viridis</i>	Shnathalah/ slender amaranth	Leaves Seeds	Oral			Acute meteorism, Indigestion, Dysentery	Cow, Sheep, Goat
25. <i>Angelica glauca</i>	Ghatadhanya/ garden angelica	Stem Seeds	Oral	Multisystem	Seeds and leaves decoction is used in cold shivering	Anti-cold	Cow, Goat
26. <i>Bergenia ciliata</i>	Sramalkhwaza/ Hairy bergenia	Rhizome	Oral	Gastrointestinal	Rhizome decoction used in diarrhea and against intestinal infections	Indigestion, Diarrhoea, Anorexia, Coccidiosis	Cow, Goat, Sheep
27. <i>Sophora mollis</i>	Ghwazera/ Soft sophora	Leaf Flower	Oral	Liver Gastrointestinal	Powdered of flower decoction used for jaundice and to clear dysentery	Diarrhoea, Dysentery, Hyperbilirubinemia	Dog, Goat, Sheep
28. <i>Skimmia lauroleola</i>	Nazarphanra/ No common name	Leaf	Oral	Gastrointestinal	Used during dysentery and against intestinal worms	Indigestion, Dysentery, Helminthiasis	Cow, Oxen, Goat
29. <i>Salvia moorcroftiana</i>	Khwarakhwatai/ Shangrila sage	Leaves (1), Roots (2)	Topical (1), Oral (2),	Dermatological	Leaves are rounded fasten from external wounds (1), Roots are boiled and used for internal wounds (2),	External bruise, Myiasis, Internal trauma	Cow, Sheep, Goat
30. <i>Rumex hastatus</i>	Tarookay/ curly dock	Whole plant	Oral	Multisystem	Stem and roots are boiled and decoction used for hepatitis, malarial fever and red urination	Pyrexia, Hematuria, Jaundice	Donkey, Sheep, Goat
31. <i>Quercus baloot</i>	Ghwaraserai / holly oak	Seed (1), Leaf (2)	Oral	Urinary tract, Respiratory	The seed internal part use in urinary infections (1), leaves extract used for diuretic, asthma and astringent (2),	Asthma, Diuretic	Oxen, Cow, Goat, Sheep
32. <i>Prunus persica</i>	Shaltaloo/ Peach	Leaf	Topical	Dermatological	Fresh or dried leaves after proper grinding its paste is placed on wounds and used for its treatment. Also used for its inflammatory properties,	External bruise, External inflammation	Equine, Donkey, Goat, Sheep
33. <i>Malva neglecta</i>	Paneeray / Dwarf mallow	Leaf	Oral	Respiratory Digestive	Leaf and flower extraction and decoction used for the treatment of respiratory diseases and for digestive tract inflammation	Wheeze, Crohn's disease	Goat, Sheep
34. <i>Juniperus macropoda</i>	Obakhta/ Juniper	Leaf	Oral	Gastrointestinal	Dried leave powdered used against intestinal worms	Dysentery, Helminthiasis	Goat, Sheep
35. <i>Harrisonia abyssinica</i>	PleewanPhanray / No common name	Fruit	Oral	Endoparasite Gastrointestinal	Fruit is converted into small pieces and given for intestinal worms and also for abscesses.	Helminthiasis, Abscesses	Cow, Goat, Dog
36. <i>Galium aparine</i>	Thooramalkhu azah/ Cleavers	Leaf Seed	Oral	Anti-bacterial infection	Fresh and dried leaf decoction is used for when some part burn and for inflammation. Seed powder use when there is bacterial infection around mammary gland	Mastitis, Streptothricosis, External burning and inflammation	Cow, Steer, Goat, Sheep
37. <i>Ficus palmate</i>	Enzar/ Fig	Leaf (1), Fruit (2),	Oral	Gastrointestinal Dermatological	Small pieces of leaves are used against intestinal worms and parasites (1), Dried fruits used against scabies (2),	Mastitis, Scabies, Indigestion, Dysentery, Helminthiasis	Cow, Buffalo, Goat
38. <i>Eucalyptus camaldulensis</i>	Laachee/ River red gum	Flower Leaf	Oral	Multisystem	Dried and fresh leaves are given in fever, also given in the start of spring or summer	Pyrexia	Cow, Goat
39. <i>Capsicum annum</i>	Nangaramarch akay/ chilli	Fruit	Oral	Gastrointestinal	Fruits powder fill in capsule and given in helminthiasis, used against dysentery,	Acute meteorism, Dysentery, Helminthiasis, Indigestion,	Cow, Buffalo, Sheep, Goat
40. <i>Aesculus indica</i>	Bandkhoor/ horse chestnut	Fruit	Oral	Multisystem	Dried fruits powder use against general weakness or lack of appetite as stimulant.	Cramp, Anorexia	Cow, Donkey, Goat
41. <i>Adiantum venustum</i>	Abaisanra/ Evergreen maidenhair	Leaf	Topical	Dermatological	Small pieces of leaves crushed into paste and use for wound healing and also used for its inflammatory properties	External bruise, Myiasis, External inflammation	Equine, Donkey, Cow, Goat
42. <i>Cannabis sativa</i>	Bung/ Marijuana	Leaf	Oral Topical	Dermatological	The juice extracted from fresh leaves is employed for alleviating abdominal pain, while a leaf paste is utilized to relieve itching and measles. This same leaf paste is also applied in the treatment of wounds.	Abdominal ache, External bruise, Measles	Equine, Donkey, Cow, Sheep, Goat
43. <i>Melia azedarach</i>	Wataneehandia/ China berry	Seed (1), Leaf (2),	Oral (1), Topical (2),	Gastrointestinal Multisystem	The seeds are ground and mixed with milk, administered to cattle to manage fever, cough, and address general weakness. Additionally, this mixture is used to eliminate intestinal parasites. (1), Paste of leaves are applied on head, forehead and neck region to down temperature. (2),	Dysentery, Anorexia, Pyrexia, Helminthiasis	Ruminant, Equine, Donkey, Cow, Goat
44. <i>Trichodesma indica</i>	Krachay/ Indian borage	Leaf	Oral	Multisystem Parasites and inflammation	Decoction of leave used as anti-venom, also used for inflammation and swelling of skin and mammary gland, used as pain killer,	Cramp, Mastitis, Anti-venom, External inflammation	Cow, Goat, Sheep
45. <i>Sorghum halepense</i>	Gadun/ Johnsongrass	Roots	Topical	Anti-bacterial inflammation	Roots are boiled and mix with mud and used on teats of cattle to stop swelling and inflammation.	Mastitis, External parasites, External inflammation	Sheep, Goat
46. <i>Taraxacum officinale</i>	Zyargwalay/ dandelion	Whole plant	Oral	Skeleto-muscular Multisystem	Animals are fed the entire plant with grass to alleviate general weakness, muscle weakness, and enhance milk production.	Cramp, Agalactia, Anorexia	Ruminant, Cow, Goat

Table 1: Continued

Table 1: Continued

47. <i>Morusnigra</i>	Shahthoot/ mulberry	Leaf	Oral	Reproduction Gastrointestinal	Small leaf segments mixed with salt are provided to cattle to stimulate sexual desire and enhance fertility. This mixture is also employed to stabilize pregnancy. Additionally, a leaf decoction is utilized for treating diarrhea in cattle.	Diarrhoea, Infertility	Cow, Buffalo, Ruminant
48. <i>Ajuga bracteosa</i>	Speeraboote/ Bugle	Whole plant	Oral	Excretory Gastrointestinal	Whole plant decoction used in seasonal fever, digestion problems, yellowing of urine.	Relieving flatulence, Acute meteorism, Indigestion, Pyrexia, Diarrhoea, Urochrome	Cow, Goat, Buffalo
49. <i>Brassica campestris</i>	Sharsham / Mustard	Seed	Topical Oral	Skeleto-muscular Stimulants	Oil of seed is for neck massage of oxen performing farming services and seed cake given to cow to increase milk production, seed oil also used for massaging legs of oxen during muscular pain.	Cramp, Enhance lactation, Agalactia	Oxen, Cow, Buffalo
50. <i>Trachysper mum ammi</i>	Kagaenalay/ ajwain	Leaf Seeds	Oral	Gastrointestinal Reproductive	Fresh leaves are given when there is digestive problems, Decoction of seeds used for intestinal helminths and to remove placenta when holding,	Acute meteorism, Indigestion, Diarrhoea, Helminthiasis, Placenta retention	Buffalo, Cow, Donkey, Equine, Goat
51. <i>Berberis lyceum</i>	Kwaray/ boxthorn barberry	Roots	Oral	Liver Multisystem	The roots are powdered and are given in liver problem or jaundice. Also used with water for internal body wounds or injuries, also used with water for lowering body temperature.	Pyrexia, Hyperbilirubinemia, Internal trauma	Buffalo, Cow, Sheep, Goat, Oxen
52. <i>Ammi visnaga</i>	Speerkai / bisnaga	Fruits	Oral	Abdominal pain	Fruits are boiled added with low amount of sugar and given as painkiller of abdominal pain as well as in very cold/hilly areas to raise body temperature of cattle.	Abdominal ache, Cramp, Anti-cold	Ruminant, Cow, Buffalo
53. <i>Myrtus communis</i>	Manwaan/ myrtle	Leaves	Oral	Gastrointestinal Respiratory	The decoction of leaves given to cattle in cough/cold also given against diarrhea	Indigestion, Wheeze, Anti-cold, Diarrhoea	Sheep, Goat
54. <i>Paeonia emodi</i>	Maameekh/ garden peony	Roots	Oral	Wounds healing Excretory.	Powder of dried roots is given for treatment of internal body injuries, for general body weakness and for uterine problems.	Anorexia, Wheeze, Internal trauma, Uterine infection	Cow, Sheep, Goat
55. <i>Juglans regia</i>	Ghooz/ Walnut	Leaves	Topical (1), Oral (2),	Dermatological (1) Reproductive (2)	The leaves are mixed in water used for skin inflammation, eyelid swelling (1), fresh leaves fed to cattle for expulsion and removal of placenta after travail (2).	Streptothricosis, Myiasis, Placental holding	Cow, Sheep, Goat
56. <i>Dodonaea viscose</i>	Ghwaraskay/ Hopbush	Leaves	Topical	Wounds healing	The dried leaves are crushed and powder use in early stage of injury to relief from pain and for healing.	Abdominal ache, External bruise	Cow, Buffalo, Equine, Sheep, Goat, Ruminant Cow, Buffalo
57. <i>Acorus calamus</i>	Skhawajah/ Sweet flag	Rhizome	Oral	Stimulant Homeostasis	The rhizome is dried then crushed and powder and given to all type of cattle in start or mid of winter season to increase body temperature and prevent animals from a disease locally called (Charmaikh) in which cattle metabolic activities slowdown.	Anti-cold, Pyrexia	Cow, Buffalo
58. <i>Zanthoxylu m armatum</i>	Dambarah/ Winged prickly ash	Fruits Leaf	Oral	Temperature regulating Gastrointestinal	The fried fruits powder mixed with corn flour and given to cattle to maintain heat for early stage of pregnancy. Decoction of fresh leaves used as anti-helminthes.	Dysentery, Anti- cold, Helminthiasis	Cow, Buffalo
59. <i>Allium sativum</i>	Woga/ Garlic	Rhizome	Oral	Reproductive Stimulants	The crushed rhizome, when mixed with corn flour and table salt, is administered to cows and buffaloes to induce heat and promote fertility. During extreme cold it is mixed with elaichi to treat fever of young steers.	Infertility, Pyrexia, Anti-cold	Buffalo, Cow, Steers
60. <i>Cynodon dactylon</i>	Kabhal/ Couch grass	Stem	Topical	Dermatological	Fresh stems are crushed and their paste use for wounds healing, also used against scabies.	Mastitis, Scabies, Myiasis, External bruise	Cow, Oxen, Goat
61. <i>Calotropis procera</i>	Spalmai / Calotrope	Leaf	Topical	Arthritis Dermatological	Warm leaves are applied to joints for 24 hours to alleviate inflammation and pain associated with arthritis. The crushed leaves are boiled to create a paste, which is used alongside a leaf decoction to eliminate skin parasites.	Mastitis, External parasites, Myiasis, Arthritis, Streptothricosis	Goat, Sheep
62. <i>Fagonia cretica</i>	Azghagonay/ No common name	Whole plant	Oral	Digestive	Whole plant kept to sunlight for drying then their powder use for general body weakness or when there is lack of appetite, to enhance digestion process, fresh plant use in diarrhea.	Acute meteorism, Indigestion, Anorexia, Diarrhoea	Equine, Donkey, Cow, Goat
63. <i>Mentha arvensis</i>	Pudeena/ Mint	Whole plant	Oral	Skeleto-muscular Digestive	Fresh plant used for general body and muscular weakness, to improve digestion, dry leaves in powder form used when newborn healthy offspring crying.	Cramp, Indigestion, Anorexia	Cow, Steer, Goat, Sheep
64. <i>Cedrus deodara</i>	Deyaar/ Deodar	Wood stem	Topical Oral	Dermatological Temperature control	Centre of wood is cut then dried and oil extracted used externally on skin against skin infections and due to its strong smell also used to prevent from fly and other insects sitting on legs. Orally oil given in the start of summer to prevent from high temperature effects.	Mastitis, Myiasis, Pyrexia, Streptothricosis	Cow, Buffalo, Oxen
65. <i>Artemisia scoparia</i>	Jhawakay/ Capillary wormwood	Stem	Topical	Dermatological	Fresh stems are rubbed on skin after sting biting and its paste use for treatment of wounds.	External bruise, Myiasis, Sting bites	Equine, Cow, Buffalo

Key: The number from 4th to 7th column, indicate the use reports of specific parts of the plant used

Leaves emerged as the most commonly utilized plant part in traditional medicine, followed by fruits, flowers, seeds, and roots. Fig. 4 depicts the diverse applications of other plant parts. Respondents highlighted that utilizing

leaves aids in the sustainable harvesting of plants in contrast to using other medicinal plant parts. The participants emphasized that most medications are organized using newly harvested plants, often as concoctions as well as

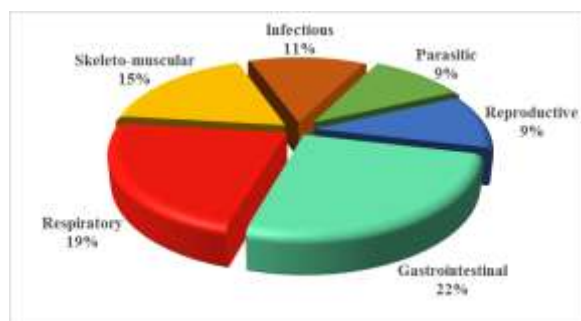


Fig. 2: Per cent contribution of different diseases of livestock to the total reported by the respondents.

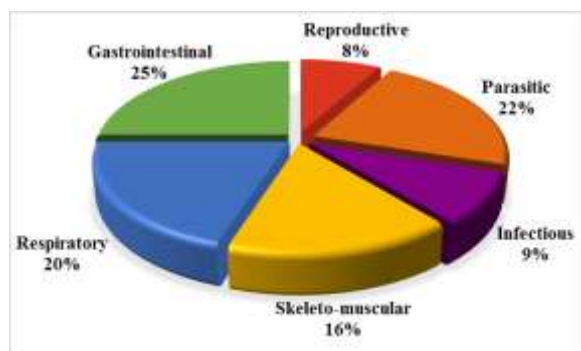


Fig. 3: Percent contribution of different remedies for diseases of livestock to the total reported by respondents

decoctions that incorporate diluents or solvents. Common solvent used was water, while mustard oil and milk were also mentioned as additional ingredients in the remedy preparations.

Mode of preparation of plants remedies

Participants mentioned that the primary methods of preparing medicine included crushing and squeezing (28%), decoction and boiling (21%), powder formulation (17%), and grinding and paste creation (14%), as outlined in Fig. 5. The most common method involved preparing liquid remedies using either a sole plant or a grouping of different plants, either as a concoction or decoction.

Discussion

The current study was aimed at to document EVPs employed for the first time, with no previous proper documentation or publication in the remote hilly areas of District Upper Dir in Khyber Pakhtunkhwa, Pakistan. In current investigation, most people having livestock had animals between 1 and 5. This suggests that small-scale livestock production is prevalent in the area. Traditional healers and herdsman were particularly practiced at symptom-based diagnoses of various ailments, a perspective endorsed by the veterinarian within the survey team. A

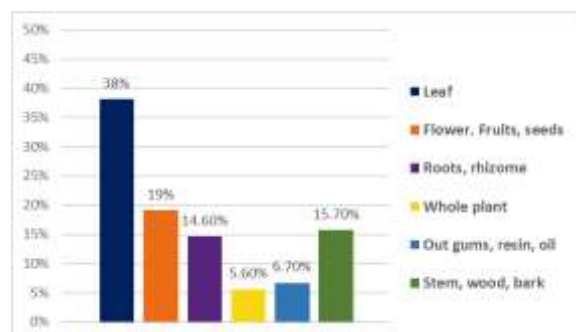


Fig. 4: Parts of plants used for traditional medicines

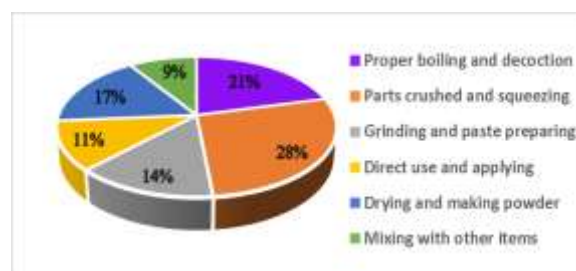


Fig. 5: Preparation methods of traditional medicines in the study area

thorough compilation of EVPs employed for livestock and pet animals in the study area suggested that owners rely on traditional veterinary medicine for primary healthcare. Plants are a foundation of EVM, and the majority of the medications documented in current investigation are derived from plants.

The respondents shared various EVPs for both preventing and treating mastitis. Within this study, 11 plants (including *Buxus wallichiana*, *Sa. tetrasperma*, *Peganum harmala*, *Aerva javanica*, *Galium aparine*, *Ficus palmate*, *Trichodesma indica*, *Sorghum halepense*, *Cynodon dactylon*, *Calotropis procera* and *Cedrus deodara*) were identified to treat and prevent mastitis in cattle, buffaloes and small ruminants (Table 2). In their study, Bullitta *et al.* (2007) documented several of these plants for their known vermifuge as well as antiseptic properties. Ten plants (*Artem scoparia*, *Ce. deodara*, *Ca. procera*, *Cy. dactylon*, *Juglans regia*, *Adiantum venustum*, *Salvia moorcroftiana*, *Pinus wallichiana*, *Pi. geradiana* and *Bu. wallichiana*) were used for myiasis disease treatment reported by cattle owners. Three plants reported by respondents (*Acacia modesta*, *Taraxacum officinale* and *Brassica campestris*) used in agalactia condition (Table 2). In Saudi Arabia, to treat mastitis in camels, similar practices involving different plant species have also been documented (Abbas *et al.* 2002).

In this study, participants reported the utilization of EVPs for addressing reproductive disorders. For treatment of infertility and stimulation to become pregnant they used *Morus nigra*, *Allium sativum* mixed with salt and butter. *Ju. regia* and *Trachyspermum ammi* were used for the removing of placenta in placenta retained condition (Table 2).

Table 2: Frequency of plant usage by key respondents (n =150) for different animal's ailments in remote hilly areas of district Upper Dir

Sr. No.	Scientific name of plants	Ailment/ condition	Number of respondents reporting usage	Frequency of usage (%)
1)	<i>Punica granatum</i> <i>Daphne papyracea</i> <i>Bergenia ciliata</i> <i>Aesculus indica</i> <i>Melia azedarach</i> <i>Taraxacum officinale</i> <i>Paonia emodi</i> <i>Fagonia cretica</i> <i>Mentha arvensis</i>	Anorexia	65	2.22
2)	<i>Mentha longifolia</i> <i>Withania coagulans</i> <i>Punica granatum</i> <i>Pinus geradiana</i> <i>Pinus wallichiana</i> <i>Olea ferruginea</i> <i>Cannabis sativa</i> <i>Ammi visnaga</i> <i>Dodonaea viscosa</i>	Abdominal ache	70	2.39
3)	<i>Pinus wallichiana</i> <i>Harrisonia abyssinica</i>	Abscesses,	40	1.36
4)	<i>Mentha longifolia</i> <i>Withania coagulans</i> <i>Punica granatum</i> <i>Olea ferruginea</i> <i>Amaranthus viridis</i> <i>Capsicum annum</i> <i>Ajuga bracteosa</i> <i>Trachyspermum ammi</i> <i>Fagonia cretica</i>	Acute meteorism	56	1.91
5)	<i>Angelica glauca</i> <i>Ammi visnaga</i> <i>Myrtus communis</i> <i>Acorus calamus</i> <i>Zanthoxylum armatum</i> <i>Allium sativum</i>	Anti-cold	70	2.39
6)	<i>Trichodesma indica</i>	Anti-venom	35	1.19
7)	<i>Calotropis procera</i>	Arthritis,	33	1.13
8)	<i>Acacia modesta</i> <i>Taraxacum officinale</i> <i>Brassica campestris</i>	Agalactia	85	2.91
9)	<i>Quercus baloot</i>	Asthma	57	1.95
10)	<i>Pinus geradiana</i> <i>Capparis decidua</i> <i>Olea ferruginea</i>	Bone fractures,	110	3.76
11)	<i>Withania coagulans</i>	Bruise	73	2.5
12)	<i>Bergenia ciliata</i>	Coccidiosis	30	1.02
13)	<i>Acacia modesta</i> <i>Prunus brahuica</i> <i>Listea monopetala</i> <i>Withania coagulans</i> <i>Pinus wallichiana</i> <i>Berberis calliobotrys</i> <i>Aesculus indica</i> <i>Trichodesma indica</i> <i>Taraxacum officinale</i> <i>Brassica campestris</i> <i>Ammi visnaga</i> <i>Mentha arvensis</i>	Cramp	92	3.1
14)	<i>Malva neglecta</i>	Crohn's disease	24	0.82
15)	<i>Withania coagulans</i> <i>Spiraea canescens</i> <i>Punica granatum</i> <i>Valeriana jatamansi</i> <i>Daphne papyracea</i> <i>Bergenia ciliata</i> <i>Sophora mollis</i> <i>Morus nigra</i> <i>Ajuga bracteosa</i> <i>Trachyspermum ammi</i> <i>Myrtus communis</i> <i>Fagonia cretica</i>	Dianthoea	115	3.93

Table 2: Continued

Table 2: Continued

16)	<i>Quercus baloot</i>	Diuretic	44	1.50
17)	<i>Rumex dentatus</i>	Dysentery	97	3.32
	<i>Daphne papyracea</i>			
	<i>Amaranthus viridis</i>			
	<i>Sophora mollis</i>			
	<i>Juniperus macropoda</i>			
	<i>Skimmia laureola</i>			
	<i>Ficus palmate</i>			
	<i>Capsicum annum</i>			
	<i>Melia azedarach</i>			
	<i>Zanthoxylum armatum</i>			
18)	<i>Pinus geradiana</i>	External bruise	71	2.43
	<i>Peganum harmala</i>			
	<i>Pinus wallichiana</i>			
	<i>Aerva javanica</i>			
	<i>Salvia moorcroftiana</i>			
	<i>Prunus persica</i>			
	<i>Adiantum venustum</i>			
	<i>Cannabis sativa</i>			
	<i>Dodonaea viscosa</i>			
	<i>Cynodon dactylon</i>			
	<i>Artemisia scoparia</i>			
19)	<i>Buxus wallichiana</i>	External parasites	84	2.87
	<i>Sorghum halepense</i>			
	<i>Calotropis procera</i>			
20)	<i>Prunus persica</i>	External inflammation	95	3.25
	<i>Galium parine</i>			
	<i>Adiantum venustum</i>			
	<i>Trichodesma indica</i>			
	<i>Sorghum halepense</i>			
21)	<i>Mentha longifolia</i>	Flatulence,	44	1.50
	<i>Ajuga bracteosa</i>			
22)	<i>Rumex hastatus</i>	Hematuria	69	2.36
23)	<i>Withania coagulans</i>	Helminthiasis	121	4.14
	<i>Rumex dentatus</i>			
	<i>Punica granatum</i>			
	<i>Daphne papyracea</i>			
	<i>Skimmia laureola</i>			
	<i>Juniperus macropoda</i>			
	<i>Harrisonia abyssinica</i>			
	<i>Ficus palmate</i>			
	<i>Capsicum annum</i>			
	<i>Melia azedarach</i>			
	<i>Trachyspermum ammi</i>			
	<i>Zanthoxylum armatum</i>			
24)	<i>Curcuma longa</i>	Hyperbilirubinemia	64	2.19
	<i>Listea monopetala</i>			
	<i>Withania coagulans</i>			
	<i>Rumex dentatus</i>			
	<i>Punica granatum</i>			
	<i>Ephedra gerardiana</i>			
	<i>Ribes alpestre</i>			
	<i>Sophora mollis</i>			
	<i>Berberis lyceum</i>			
25)	<i>Mentha longifolia</i>	Inflammation	51	1.74
26)	<i>Withania coagulans</i>	Indigestion,	108	3.69
	<i>Daphne papyracea</i>			
	<i>Amaranthus viridis</i>			
	<i>Bergenia ciliata</i>			
	<i>Skimmia laureola</i>			
	<i>Ficus palmate</i>			
	<i>Capsicum annum</i>			
	<i>Ajuga bracteosa</i>			
	<i>Trachyspermum ammi</i>			
	<i>Myrtus communis</i>			
	<i>Fagonia cretica</i>			
	<i>Mentha arvensis</i>			
27)	<i>Salvia moorcroftiana</i>	Internal trauma	46	1.57
	<i>Berberis lyceum</i>			
	<i>Paeonia emodi</i>			

Table 2: Continued

Table 2: Continued

28)	<i>Morus nigra</i>	Infertility	67	2.29
	<i>Allium sativum</i>			
29)	<i>Rumex hastatus</i>	Jaundice	48	1.64
30)	<i>Salix tetrasperma</i>	Laminitis	33	1.13
31)	<i>Prunus brahuica</i>	Measles	38	1.30
	<i>Cannabis sativa</i>			
32)	<i>Artemisia scoparia</i>	Myiasis	83	1.30
	<i>Cedrus deodara</i>			
	<i>Calotropis procera</i>			
	<i>Cynodon dactylon</i>			
	<i>Juglans regia</i>			
	<i>Adiantum venustum</i>			
	<i>Salvia moorcroftiana</i>			
	<i>Pinus wallichiana</i>			
	<i>Pinus geradiana</i>			
	<i>Buxus wallichiana</i>			
33)	<i>Buxus wallichiana</i>	Mastitis	101	3.45
	<i>Salix tetrasperma</i>			
	<i>Peganum harmala</i>			
	<i>Aerva javanica</i>			
	<i>Galium aparine</i>			
	<i>Ficus palmate</i>			
	<i>Trichodesma indica</i>			
	<i>Sorghum halepense</i>			
	<i>Cynodon dactylon</i>			
	<i>Calotropis procera</i>			
	<i>Cedrus deodara</i>			
34)	<i>Curcuma longa</i>	Myalgia	77	2.63
	<i>Rumex dentatus</i>			
	<i>Pinus geradiana</i>			
	<i>Olea ferruginea</i>			
	<i>Ribes alpestre</i>			
	<i>Aerva javanica</i>			
35)	<i>Juglans regia</i>	Placenta retained	89	3.04
	<i>Trachyspermum ammi</i>			
36)	<i>Salix tetrasperma</i>	Pleuropneumonia	45	1.54
37)	<i>Acacia modesta</i>	Pyrexia	98	3.35
	<i>Rumex hastatus</i>			
	<i>Withania coagulans</i>			
	<i>Eucalyptus camaldulensis</i>			
	<i>Melia azedarach</i>			
	<i>Ajuga bracteosa</i>			
	<i>Berberis lyceum</i>			
	<i>Acorus calamus</i>			
	<i>Allium sativum</i>			
	<i>Cedrus deodara</i>			
38)	<i>Artemisia scoparia</i>	Sting bites	37	1.26
39)	<i>Ficus palmate</i>	Scabies	64	2.19
	<i>Cynodon dactylon</i>			
40)	<i>Buxus wallichiana</i>	Streptothricosis	90	3.08
	<i>Prunus brahuica</i>			
	<i>Peganum harmala</i>			
	<i>Nannorrhops ritchiana</i>			
	<i>Pinus wallichiana</i>			
	<i>Aerva javanica</i>			
	<i>Galium aparine</i>			
	<i>Juglans regia</i>			
	<i>Calotropis procera</i>			
	<i>Cedrus deodara</i>			
41)	<i>Ajuga bracteosa</i>	Urochrome	43	1.47
42)	<i>Paeonia emodi</i>	Uterine infection	52	1.78
43)	<i>Withania coagulans</i>	Wheeze,	106	3.69
	<i>Spiraea canescens</i>			
	<i>Punica granatum</i>			
	<i>Pinus geradiana</i>			
	<i>Salix tetrasperma</i>			
	<i>Malva neglecta</i>			
	<i>Myrtus communis</i>			
	<i>Paeonia emodi</i>			

Similarly, these plants were also reported by Dilshad et al. (2008).

In this study, animal owners shared numerous data. Twelve plants (*Withania coagulans*, *Rumex dentatus*, *Punica granatum*, *Daphne papyracea*, *Skimmia laureola*, *Juniperus*

macropoda, *Harrisonia abyssinica*, *Fi. palmate*, *Capsicum annum*, *Melia azedarach*, *Tr. ammi* and *Zanthoxylum armatum*) were employed to treat helminthiasis given to animals and 3 plants (*Bu. wallichiana*, *So. halepense* and *Ca. procera*) were used against external parasites (Table 2).

Table 3: Key respondents (n = 150) reporting usage of ethno-veterinary/allopathic medicine or combination of them for the treatment of the animal's ailments in remote hilly area of district Upper Dir

Sr. No.	Ailments/conditions	Total respondents	No. of respondents reporting usage of ethno-veterinary remedies	No. of respondents reporting usage of allopathic remedies	No. of respondents combined usage of ethno veterinary & allopathic remedies
1)	Anorexia	85	65	11	09
2)	Abdominal ache	93	70	13	10
3)	Abscesses,	54	40	08	06
4)	Acute meteorism	71	56	10	05
5)	Anti-cold	92	70	14	08
6)	Anti-venom	47	35	07	05
7)	Arthritis	62	33	18	11
8)	Agalactia	103	85	15	03
9)	Asthma	87	57	18	12
10)	Bone fractures	133	110	13	10
11)	Bruise	89	73	10	06
12)	Coccidiosis	48	30	08	10
13)	Cramp	113	92	14	07
14)	Crohn's disease	44	24	12	08
15)	Diarrhoea	138	115	14	09
16)	Diuretic	61	44	11	06
17)	Dysentery	122	97	15	10
18)	External bruise	96	71	18	07
19)	External parasites	106	84	09	13
20)	External inflammation	113	95	09	09
21)	Flatulence	71	44	16	11
22)	Hematuria	97	69	15	13
23)	Helminthiasis	141	121	10	10
24)	Hyperbilirubinemia	84	64	07	13
25)	Inflammation	71	51	08	12
26)	Indigestion	134	108	09	17
27)	Internal trauma	56	46	06	04
28)	Infertility	97	67	17	13
29)	Jaundice	60	48	06	06
30)	Laminitis	55	33	12	10
31)	Measles	70	38	18	14
32)	Myiasis	109	83	15	11
33)	Mastitis	127	101	13	13
34)	Myalgia	94	77	10	07
35)	Placenta retained	117	89	20	08
36)	Pleuropneumonia	65	45	14	06
37)	Pyrexia	118	98	21	09
38)	Sting bites	54	37	12	05
39)	Scabies	84	64	16	04
40)	Streptothricosis	102	90	09	03
41)	Urochrome	64	43	14	07
42)	Uterine infection	75	52	15	08
43)	Wheeze	127	106	16	05

In the current study area, the prevalence of EVP for digestive system disorders is noteworthy. Numerous plants, in combination with other materials, were documented for addressing these conditions, also identified by (Leonard 1894; Swaleh 1999). For indigestion 12 plants (*Wi. coagulans*, *Da. papyracea*, *Amaranthus viridis*, *Bergenia ciliata*, *Sk. laureola*, *Fi. palmate*, *Ca. annum*, *Ajuga bracteosa*, *Tr. ammi*, *Myrtus communis*, *Fagonia cretica* and *Mentha arvensis*), for diarrhoea 12 plants (*Wi. coagulans*, *Spiraea canescens*, *Pu. granatum*, *Valeriana jatamansi*, *Da. papyracea*, *Be. ciliata*, *Sophora mollis*, *Moru snigra*, *Aj. bracteosa*, *Tr. ammi*, *My. communis* and *Fa. cretica*) also documented for likewise purpose (Islam and Kashem 1999; Viegli *et al.* 2003; Muhammad *et al.* 2005) and for dysentery 10 plants (*Ru. dentatus*, *Da. papyracea*, *Am. viridis*, *So. mollis*, *Ju.*

macropoda, *Sk. laureola*, *Fi. palmate*, *Ca. annum*, *Me. azedarach* and *Za. armatum*) were used as reported by the respondents (Table 2). In the current study, utilization of materials beyond plants, such as common salt, black salt, and ammonium chloride, has also been documented in existing literature (Leonard 1894; Muhammad *et al.* 2005).

Ten plants (*Ac. modesta*, *Ru. hastatus*, *Wi. coagulans*, *Eucalyptus camaldulensis*, *Me. azedarach*, *Aj. bracteosa*, *Berberis lyceum*, *Acorus calamus*, *Al. sativum* and *Ce. deodara*) were used for pyrexia and six plants (*Angelica glauca*, *Ammi visnaga*, *My. communis*, *Ac. calamus*, *Za. armatum* and *Al. sativum*) were used for cough and as anti-cold (Table 2).

One plant, *Quercus baloot*, was used for Asthma, 8 plants (*Wi. coagulans*, *Sp. canescens*, *Pu. granatum*, *Pi.*

geradiana, *Sa. tetrasperma*, *Malvaneglecta*, *My. communis* and *Paeonia emodi*) were used from wheeze recovery and one plant *Sa. tetrasperma* for Pleuropneumonia as told by respondents. 1 plant *Ru. hastatus* was given for jaundice and liver related problems (Table 2). Likewise, EVP for addressing systemic conditions in their animals (Manganelli et al. 2001; Tabuti et al. 2003; Ole-Miaron 2003).

Twelve plants (*Ac. modesta*, *Prunus brahuica*, *Listea monopetala*, *Wi. coagulans*, *Pi. wallichiana*, *Be. calliobotrys*, *Aesculus indica*, *Tr. indica*, *Ta. officinale*, *Br. campestris*, *Am. visnaga* and *Me. arvensis*) were used for cramp during skeleto-muscular treatment, one plant *Ca. procera* for Arthritis, nine plants (*Me. longifolia*, *Wi. coagulans*, *Pu. granatum*, *Pi. geradiana*, *Pi. wallichiana*, *Olea ferruginea*, *Cannabis sativa*, *Am. visnaga* and *Dodonaea viscosa*) for abdominal pain and three plants (*Pi. geradiana*, *Capparis decidua* and *Ol. ferruginea*) were used for bone fractures during skeleto-muscular diseases/conditions treatment reported by cattle owners. Two plants (*Pi. wallichiana* and *Ha. abyssinica*) were used for abscesses treatment, 10 plants (*Pi. geradiana*, *Pe. harmala*, *Pi. wallichiana*, *Ae. javanica*, *Sa. moorcroftiana*, *Pr. persica*, *Ad. venustum*, *Ca. sativa*, *Do. viscosa*, *Cy. dactylon* and *Artemisia scoparia*) for external bruise treatment, five plants (*Pr. persica*, *Ga. aparine*, *Ad. venustum*, *Tr. indica* and *So. halepense*) for external inflammation treatment, two plants (*Pr. brahuica* and *Ca. sativa*) for measles treatment, and two plants (*Fi. palmate* and *Cy. dactylon*) for scabies treatment were reported by respondents (Table 2). The same has been defined by (Raziq et al. 2010).

One plant, *Q. baloot*, was used for diuretic problems, one plant *Ru. hastatus* used during hematuria, one plant *Aj. bracteosa* for Urochrome treatment of urine and one plant *Paeonia emodi* for Uterine infection. One plant *Tr. indica* was used as Anti-venom, one plant *Ar. scoparia* was used for sting bites treatment by the respondents (Table 2). The same has been described by Sher and Alyemeni (2011).

Conclusion

This is an initial systematic documentation of EVPs linked to specific diseases in livestock, various ruminant species, and companion animals within the secluded, hilly regions of study area. The investigation unraveled a wide array of EVPs tailored for livestock and pets, centering on phytotherapy. Several plants mentioned in this study have been agreed by existing works, representing chemical characters that support their usage. Throughout our research, for common livestock ailments like pyrexia, mastitis, myiasis, cough, diarrhea, dysentery and skeletal or dermatological issues, EVM remains the primary choice. However, during outbreaks such as foot-and-mouth disease and hemorrhagic septicemia, there's a preference for a combined approach using EVM and allopathic treatments. Pastoralists' reliance on their own expertise in animal healthcare stems from their nomadic lifestyle and a prevailing distrust of governmental institutions

and veterinarians. There was a discrepancy between veterinarians and the pastoral groups they serve, reflecting different values and cultural backgrounds. Our collaborative efforts with traditional healers, cattle owners and pastoralists helped identify 43 distinct ailments in the ruminant population in the area. We explored treatments for these ailments using 65 plants, both indigenous and exotic, leveraging various treatment methods.

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Author Contributions

Abdus Salam: Data gathering and data presentation, writing the draft. Muhammad Younas: Data assessment, refining results and final draft preparation. Iftikhar Ahmad: Proof reading and furnishing of the draft.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data presented in this study will be available on a fair request to the corresponding author.

Ethics Approval

All participants provided oral prior informed consent.

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