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Ethnoveterinary uses of Medicinal Plants by the Aborigines of Purulia District, West Bengal, India

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Abstract: The westernmost district of West Bengal, Purulia is inhabited by a large number of tribals. A study on the ethnoveterinary practices of medicinal plants was carried out in this area. Through questionnaire, personal interviews and conversation, a total number of 25 plant species used by the aborigines were enumerated. The major ethnic groups present in the studied area include Santhali, Bhumijis, Mundas, Oraon, Birhor, Mal Pahariya, Kharia and Ho. During the investigation, a well developed system of ethnoveterinary practices was found among these tribals.

Key words: Ethnoveterinary, medicinal plants, Tribals, Purulia, West Bengal

INTRODUCTION

From prehistoric ages human culture has, either directly or indirectly, been influenced by the vegetational world (De, 1968). Over 17,500 species of higher plants, 64 gymnosperms, 1,200 pteridophytes, 2,850 bryophytes, 2,021 lichens, 15,500 fungi and 6,500 algae are reported from India. India is rich in its endemic flora, too (5,725 angiosperms, 10 gymnosperms, 193 pteridophytes, 678 bryophytes, 260 liverworts, 466 lichens, 3,500 fungi and 1,924 algae) (Sanjappa, 2005). India, with 3029 million hectares of land mass and 17 million hectares of forest cover is a veritable nursery of different tribals belonging to over 550 tribal communities with 227 linguistic groups (Pushpangadan, 1994), which survived with their specific traits, beliefs and myths through the rigours of time.

Earlier, investigations were carried out on different ethnobotanical aspects of this district (Sur *et al.*, 1992a, b; Dey *et al.*, 2009). Vegetation based tribal life (De, 1980a), plant food (Jain and De, 1964), minor plant fibres (De, 1965), plants used for lac culture (Basu and Mukherjee, 1999), general ethnobotanical practices and ethnomedicines to treat human disorders (Jain and De, 1966; De, 1967, 1979, 1980a, b; Sur *et al.*, 1992a; Chakraborty *et al.*, 2003; Chakraborty and Bhattacharjee, 2006; Ghosh, 2008) by the aborigines of this district were reported. Food plants of the tribe, 'Paharias' of Purulia were reported by Basu and Mukherjee (1996). An inventory of medicinal plants of some sacred groves of Purulia was explored by Bhakat and Pandit (2004). Sacred

groves and taboos in this district were studied by Basu (2000a). Traditional utilization of plants in intestinal, malarial and sexual diseases by tribals of Purulia was reported by Basu (2005). Exotic American plants employed as ethnomedicine in the district were reported by Basu (2000b). Kuir *et al.* (2002) have reported the use of medicinal plants in rheumatism by the tribals of Baghmundi, Purulia. However, very little effort has been made to explore the ethnoveterinary practices carried out in this area apart from mentioning of certain plants as a part of an ethnomedical survey (De, 1968; 1979). A few reports are available on ethnoveterinary uses of medicinal plants in other parts or districts of West Bengal (Pal, 1980; Mukherjee and Namhata, 1988; Ghosh, 1999, 2002; Das and Tripathi, 2009) and other parts of India (Sebastine, 1984; Sebastine and Bhandari, 1984; Reddy and Sudersanam, 1987; Katewa and Chaudhary, 2000; Mistri *et al.*, 2003; Takhar and Chaudhary, 2004; Harsha *et al.*, 2005; Khuroo *et al.*, 2007; Saikia and Borthakur, 2010; Tiwari and Pande, 2010). This district has made very poor economic progress due to high proportion of uncultivated wasteland and lack of a flourished agricultural system. The tribals, in particular, prefer to depend on the surrounding forests for bare subsistence in terms of food, fodder, fibre, material culture, rituals and medicines to treat human and livestock diseases (De, 1965). In this present research study, we report on the information collected from traditional practitioners to cure various livestock diseases in Purulia district, West Bengal, India.

MATERIALS AND METHODS

Study area: Purulia, the westernmost district of West Bengal is situated between 22°51'N and 23°42'N and 85°51'E and 86°54'E, covering an area of 6529 km² with an altitudinal variation from 250 to 700 m above sea level. The range in temperature is from 7°C in winter to 45°C in summer and the total annual precipitation approximates between 1240 to 1400 mm. The dry deciduous forests accounts for 889 sq km of total area (Anonymous, 1985). The major tribal languages are Santhal (S); Bhumija (Bh); Bengali (B); Hindi (H); Munda (M); Oraon (O); Birhor (Bi); Mal Paharya (MP); Kharia (K); Kharwar (Kh); Gond (G) and Ho (Ho) (Jain and De, 1964), where the abbreviations are mentioned within parenthesis. A total number of 25 plant species were found to be used by the tribals to treat livestock diseases in Purulia district.

Survey: Several field investigations have been conducted by one of the authors to explore the ethnobotanical knowledge of the tribals of this area since 1960s. Several plants were found to be used to treat livestock diseases. The plants, their use in ethnoveterinary system, plant parts used, mode of preparation, locality of use and the particular group of tribals using the medicines were thoroughly studied, plant specimens were collected and documented in frequent field visits conducted from 2007-2009. The places of investigations were the rural and tribal areas of Kashipur, Baghmundi, Barabazar, Jaipur, Santuri, Raghunathpur, Kuilapal, Panchakot, Kalma, Arsha, Pancha, Ajodhya, Neturia, Jhalda, Khenna, Para, Ramkanali, Bundwan etc. The villages were visited in different seasons to avail the plant resources in their flowering condition. In the actual method of studies in the field, informants from different tribes who are familiar with the plants and the mode of utility of the plants by the members of their respective communities were selected by interview in previously arranged camp meetings. Questions and suggestions were put to them regarding the use of medicinal plants and their products in folk medicine. Mounted herbarium specimens known to grow in this area were shown to them and questions were asked about their utility. These were subsequently verified by taking the informants to the field to identify plants on the basis of local names previously recorded from them. Local names and the areas were noted. Prior consent was taken from the informants for recoding of the information. Photographs were taken reflecting the plants' habit in flowering condition. Common plants were taken to prepare herbarium sheets. Rare and less common plants were spared and photographed only. Different tribals have provided information regarding livestock healthcare. Herbarium and photographs were identified by experts and kept for future use.

RESULTS AND DISCUSSION

The plants studied are enumerated alphabetically with their botanical name, family name, Local name, ethnoveterinary uses and locality of report.

Abrus precatorius Linn.

- **Family:** Papilionaceae; Fabaceae
- **Tribal names:** Kanch (B); Gunja, Kawet (S); Karjain (Kh); Ara kead, Karjani, Kead (M); Gumchi (H)
- **Use:** The roots are crushed and applied in the eyes of cattle when they get whitened
- **Locality:** Dopahari, Kashipur; Chorda, Baghmundi

Ampelocissus tomentosa (Roth) Planch.

- **Family:** Vitaceae
- **Tribal names:** Dhotto-pako (O); Datrom bili (S); Ghora lat (B); Iotorong nari (M); Kumharlat (Bh)
- **Use:** The crushed roots are applied in pains of cattles
- **Locality:** Takriya, Barabazar; Mirdi, Jaipur

Atylosia scarabioides (L.) Benth

- **Family:** Papilionaceae; Fabaceae
- **Tribal names:** Birhare, Buruhore, Gaisani(M); Gaisani, Kando arsga(O), Bankurthi(Kh)
- **Use:** The leaves are boiled in water and given in dysentery of cattle
- **Locality:** Saspur, Santuri; Usir, Raghunathpur

Azadirachta indica A. Juss.

- **Synonym:** *Melia azadirachta* Linn.
- **Family:** Meliaceae
- **Tribal name:** Nim (S,Bh,M,O,B,H)
- **Use:** Oil extracted from the seeds is used to cure parasitic skin diseases of cattle
- **Locality:** Kuilapal; Inanpur, Panchakot.

Calotropis gigantea (Linn.) R.Br. ex.Ait.

- **Family:** Asclepiadaceae
- **Tribal names:** Akanda, Akaona(S); Madar, Akonda(Bh); Palati(M); Akaon(Kh)
- **Use:** The leaves specially the fresh and warm ones, are applied on body swellings of cattle as a cure
- **Locality:** Baraganta, Kalma

Calotropis procera (Ait.) R. Br.

- **Family:** Asclepiadaceae
- **Tribal names:** Akand (Bh), Sada akanda (B), Kula toa (M)

- **Use:** The leaves are warmed and applied on swollen cheeks (the symptom of a disease called by them sannipat said to be due to cold) of cattle. The root is also used in a preparation (Called as 'telmara') for the same purpose. The warm leaves are said to be useful for curing swellings at any place of the body
- **Locality:** Chototangri, Baghmundi; Baraganta, Kalma

***Carissa opaca* Stapf. Ex Haines.**

- **Synonym:** *C. spinarum* auct. non L
- **Family:** Apocynaceae
- **Tribal names:** Benchi (B); Hukapaka, Karonda, Karwak janum, Karwat (S); Karaunda (H); Kanuwan, Khunti (O); Gadasur, Garsul (M)
- **Use:** The crushed roots are given to cattle in Simla disease (Symptom: swollen mouth and ejection of tongue). The juice of the roots is applied for the expulsion or killing insects from the body of cattle
- **Locality:** Kalma; Deltanr, Arsha

***Cassia fistula* Linn.**

- **Family:** Caesalpiniaceae; Fabaceae
- **Synonym:** *C. rhombifolia* Roxb
- **Tribal names:** Sonali, Dhanbahera (B, Bh); Shondal, Bandorlati (B); Bandarlauri, Nuruni, Mirju baha nuru (S); Amaltas (H); Bonurlati, Sonarkhi (O); Dauranch (K); Hari (M)
- **Use:** The fruits are heated and applied on the neck of cattle to reduce swelling due to cold
- **Locality:** Badna tungri; Jambad, Puncha

***Cissus repanda* Vahl.**

- **Synonym:** *Vitis repanda* W and A
- **Family:** Vitaceae
- **Tribal names:** Bod nari, Bod lar nari(S); Panialata(Bh);Hatikana(M); Harjarwa(Kh)
- **Use:** The plant is crushed and given in Sannipat disease due to cold
- **Locality:** Ajothya; Deoli, Neturia

***Crinum latifolium* Linn.**

- **Family:** Amaryllidaceae
- **Tribal names:** Kanai, Sikiyam Baha(S); Kulae bo, Chanchara ba(M); Kana (O)
- **Use:** Root juice is given in diarrhoea of cattle
- **Locality:** Panch mahuli, Kashipur, Mirdi, Jaipur

***Crossandra infundibuliformis* (Linn.) Nees.**

- **Synonym:** *Justicia infundibuliformis* Linn. L. N
- **Family:** Acanthaceae
- **Tribal names:** Ote kujuri, Burilai ba (M).
- **Use:** The crushed plant is applied when a cattle is bitten by a dog
- **Locality:** Dumurhir, Neturia

***Eclipta alba* (Linn.) Hassk**

- **Synonym:** *E. prostrata* Roxb
- **Family:** Asteraceae
- **Tribal names:** Piri kesari, Bhengraj (M); Bhengraj (O); Bhengrati (S); Laokeshar, Laokehria (Bh); Babri, Bhangraj, Mochrand (H); Kesutti, Kesaraj (B)
- **Use:** The leaves are crushed in hand and black juice is applied to cure swelling in the ear of cattle
- **Locality:** Kudagara, Kalma; Parsiya, Arsha

***Erycibe paniculata* Roxb.**

- **Family:** Convolvulaceae
- **Tribal names:** Bara laokeshar (Bh), Karilata (S); Kari nanri (M), Urumin, Hurmi (O)
- **Use:** The leaves and stems are crushed and boiled in water to a thick syrupy liquid and applied on sprains of cattle, first cleaning the affected part with warm water
- **Locality:** Tola Kashidanga, Panchakot; Muradih, Santuri

***Erythrina indica* Lam.**

- **Synonym:** *E. variegata* Linn. var. *orientalis* (Linn.) Merril
- **Family:** Papilionaceae; Fabaceae
- **Tribal names:** Paldha (Bh); Marar, Karhal, Arhul (S); Pharar (Kh); Parida ba (M); Kanta mandfar, Palita mandar (B); Pangra, Pharad (H)
- **Use:** The crushed stem-bark is applied on sprains of cattle
- **Locality:** Kumaria, Jhalda; Aradenga, Panchakot

***Gloriosa superba* Linn.**

- **Family:** Liliaceae
- **Tribal names:** Dusatin, Dusatina (Bh); Jhagar, Sini samanom (S); Karihari (Kh); Kaliari, Kulhari, Languli (H); Jhagrahi (O); Bulung chukuru, Bunum ki chung, Bing ki chung (M); Ulatchandal, Bishalanguli (B)

- **Use:** The roots are given in small-pox (as also in other diseases locally known as 'galakatki', 'dangrapila') of cattle
- **Locality:** Darikuri, Jaipur; Dopahari, Kashipur

***Glossogyne bidens* (Retz.) Alston**

- **Family:** Asteraceae
- **Tribal names:** Tej raj, Nakdana (S); Mainthorib(Bh), Pakhal ret (O); Ringud ranu (M); Nakdana (B)
- **Use:** The crushed plant is applied to cure bone fracture for healing
- **Locality:** Jalam-bili, Kalma; Punura, Puncha

***Litsea monopetala* (Roxb.) Pers.**

- **Synonym:** *L. polyantha* Juss
- **Family:** Lauraceae
- **Tribal names:** Pojo (S, M), Kukur chita (Bh, B), Baglal (MP)
- **Use:** To cure bone fracture the crushed stem bark is used
- **Locality:** Hathinada, Khenna; Kherad, Santuri

***Mirabilis jalapa* Linn.**

- **Family:** Nyctaginaceae
- **Tribal names:** Jahain Jui(S, O), Sandhyamani (Bh), Gul abbas (H)
- **Use:** Crushed roots are applied to cure wormy wounds of cattles
- **Locality:** Bahara, Para; Achkoda, Neturia

***Peucedanum nagpureense* (C.B.Cl.) Prain.**

- **Family:** Apiaceae
- **Tribal names:** Banjira (B); Tejraj, Oponum (S); Oponom, Ependom (O); Bir samraj, Baghia rutu, Ependung, Turi, Epelom (M)
- **Use:** In diarrhoea and dysentery of cattle, the crushed roots are used
- **Locality:** Sutaibai, Kashipur; Palama, Puncha

***Schrebera swientenioides* Roxb.**

- **Family:** Oleaceae
- **Tribal names:** Eksira (S), Ghanto (Bh, B, O), Chapsing (Kh), Jargo, Sandapsing, Chabsing (M), Gae ka lundi (H).
- **Use:** The roots are crushed and applied to wounds to kill worms
- **Locality:** Ajodhya; Kalma; Dhabani, Bundwan

***Scoparia dulcis* Linn.**

- **Family:** Scrophulariaceae
- **Tribal names:** Ban dhoney (B); Tand dhaniya (Bh); Jastimadhu (S); Bichimandar (O); Madu kom, Ko ara, Ote kantara, Guru ara, Merom med, Chinibuta, Chinisakam (M)
- **Use:** The crushed plant is applied in gout-pains of cattle
- **Locality:** Baraganta hills, Ajodhya; Rautara, Para

***Semecarpus anacardium* Linn.f.**

- **Family:** Anacardiaceae
- **Tribal names:** Soso dare, Bhelwa(S); Kiro (O); Bhelai (Bh); Bhelwa (Kh); Soso daru (M); Bhilawa (H); Bhela (B)
- **Use:** The seeds are crushed with a corm of *Amorphophallus campunalatus*, a bulb of *Allium sativum* in a preparation and given in "Simla" disease of cattle
- **Locality:** Badgna-tungri, Kalma; Baliguma, Manbazar

***Thysanolaena agrostis* Nees.**

- **Synonym:** *T. maxima* (Roxb.) Kuntze
- **Family:** Poaceae
- **Tribal name:** Phuljharu(Bh, B)
- **Use:** A decoction of the crushed root is used to cure wormy sores of cattle
- **Locality:** Jalambili, Kalma; Kudna, Ajodhya

***Zehneria umbellata* Thw.**

- **Synonyms:** *Solena heterophylla* (Lour.) Cogn., *Melothria heterophylla* (Lour.) Cogn
- **Family:** Cucurbitaceae
- **Tribal names:** Bankundri, Kudari, Makal, Rakhalsasha (B); Makal, Tarali (H); Mahakal (Bh); At, Jungli kundri (S); Chengkor, Kaubutki, Chengorod sanga, Kokor jo karaka tasad, Bir kunduru, Marang kaubutki (M); Bankundri (O)
- **Use:** The leaf-juice is applied to cure cuts and bruises of cattle. The crushed root is applied on sores of small-pox in cattle
- **Locality:** Shalgram, Jhalda; Korang, Arsha

***Zingiber cassumunar* Roxb.**

- **Synonyms:** *Z. montanum* (Koen.) Link ex. A. Dietr., *Z. purpureum* Rosc
- **Family:** Zingiberaceae

- **Local names:** Ban ada (Bh), Ban adi (S, O), Paro, Birade (M)
- **Use:** The rhizomes are crushed and applied in Simla
- **Locality:** Jara, Kalma; Ramkanali

The treatment of diseased domestic animals as also cases like fracture of bones, dog bites etc. are performed with utmost care by the aboriginals. The knowledge regarding this has been developed either by following treatments as is done in similar human ailments or in rare cases, by observing the practice of rubbing wounds on a particular plant by an injured animal.

A total number of 25 species belonging to 24 genera and 19 families were documented. Out of 25 plant species, 4 belong to Fabaceae, 2 to Vitaceae, Asclepiadaceae and Asteraceae and 1 each to Meliaceae, Apocynaceae, Amaryllidaceae, Acanthaceae, Convolvulaceae, Liliaceae, Lauraceae, Nyctaginaceae, Apiaceae, Oleaceae, Scrophulariaceae, Anacardiaceae, Poaceae, Cucurbitaceae and Zingiberaceae. Out of 25 plants, the majority of the species are herbs (35%) followed by trees (26%), shrubs (22%) and climbers (17%) (Fig. 1). The mostly used medicines are derived from whole plant (17%), root/rhizome (37%), stem/bark (13%), fruit (4%), seed (8%) and leaf (21%) (Fig. 2).

Takhar and Chaudhary (2004) have reported the use of *Abrus precatorius* in cattle for expulsion of placenta by the folk people of southern Rajasthan. In this study the plant was found to be useful in eye disease of cattle. Use of *Ampelocissus latifolia* in cataract, snakebite, flatulence and tympany has been reported by Pande *et al.* (2007). Another species, *A. rugosa* was found to be useful in lactation of livestock (Pande *et al.*, 2007). In our study, the plant was found to cure body pain of cattle which is confirmed from a study by De (1968). Chakraborty and Bhattacharjee (2006) have reported the use of *Atylosia scarabaeoides* in dysentery of cattle by the tribals of Purulia supporting our study. *Azadirachta indica* has been found to be very useful in different ethnoveterinary practices in Uttaranchal, India, like retention of urine, in the treatment of broken horn, burn, mange, tympany, indigestion, snakebite, foot and mouth diseases and lockjaw (tetanus) (Pande *et al.*, 2007). Akhtar and Riffat (1985) had evaluated the fruits of this plant against *Ascaridia galli* infections in chickens. Acharya and Acharya (2010) have reported the use of *A. indica* as anthelmintic by the people of Sardikhola VDC, Kaski, Nepal to treat livestock diseases. Takhar and Chaudhary (2004) have mentioned the use of this plant in swellings and inflammations of cattle. In the present investigation, it was found that, oil extracted from the seeds of this plant is used to cure parasitic skin diseases of cattle.

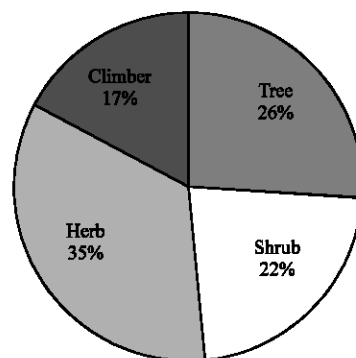


Fig. 1: Pie diagram showing different plant habit

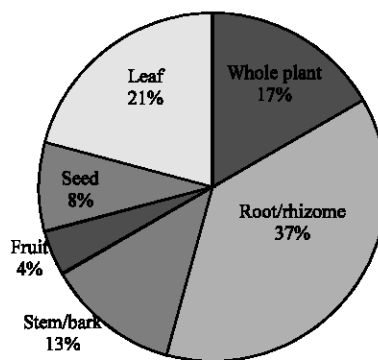


Fig. 2: Pie diagram showing different plant parts used

Calotropis gigantea has been reported to be useful to cure fever used by the Gond tribe andhra Pradesh, India (Reddy *et al.*, 2008). In our report, in the district of Purulia, as an ethnoveterinary medicine, this plant is used in body swelling of cattle and *C. procera* was found to be used in the livestock disease sannipat which occurs due to cold. Different parts of *C. procera* has been used by the tribes of Southern Rajasthan to hasten suppuration, to cure cracking of tears, to prevent infestation of worms in stomach, to heal wounds and to get rid of gastrointestinal worms (Takhar and Chaudhary, 2004). Khan (2009) has reported the ethnoveterinary use of *C. procera* in inflammation, snakebite, flatulence, anorexia, indigestion, intestinal worm infestation, rabid dog bite by the people living in Greater Cholistan desert, Pakistan. Use of *C. procera* in paraplegia and arthritis in cattle has been reported by Pande *et al.* (2007). In rural Sunderbans, West Bengal, India, at the appearance of swelling of throat region due to haemorrhagic septicaemia or worm infestation in cattle, *C. gigantea* is being used (Das and Tripathi, 2009). Fresh leaves and latex of *C. procera* is useful for arthritis, latex for scorpion sting and dry leaves are used in stomachache and as a tonic by the ethnoveterinary practitioners of Qassim Region, Saudi

Arabia (Abbas *et al.*, 2002). In Uttaranchal, India, different species of *Carissa* including *C. opaca* was reported to be used against foot and mouth disease of cattle (Pande *et al.*, 2007). In our investigation, the plant was found to be used in simla disease and to kill insects from the body of cattle. *Cassia fistula* is being used in constipation and food poisoning of cattle in Uttaranchal, India (Pande *et al.*, 2007), whereas the fruits are heated and applied on the neck of cattle to reduce swelling due to cold by the tribals of Purulia. *Cissus repanda* has already been reported to be used in "sannipat" disease of cattle (De, 1979). *Eclipta alba* has been used to treat wounds of livestock in Uttaranchal, India (Pande *et al.*, 2007). This species has been found to be used in pneumonia of cattle in some hilly regions of Pakistan (Sindhu *et al.*, 2010). Acharya and Acharya (2010) have reported the use of *E. alba* in mastitis of cattle by the people of Sardikhola VDC, Kaski, Nepal. In this present study, the tribal people use this plant to cure swelling in the ear of cattle. A species of *Erythrina*, *E. arborescens* is used to treat eye diseases of cattle by the tribes of Uttaranchal, India (Pande *et al.*, 2007). In our present study, *E. indica* has been found to be used in this part of the world to treat sprains of cattle. Use of *Litsea glutinosa* as an ethnomedicine in bone fracture (Chakraborty and Bhattacharjee, 2006) supports our report of using another species of the genus *L. monopetala* in the treatment of fractured bone in cattle. *L. monopetala* is being used to treat bone fracture in cattle in Uttaranchal, India (Pande *et al.*, 2007). *Mirabilis jalapa* is useful in neck sore of livestock in Uttaranchal, India (Pande *et al.*, 2007). Acharya and Acharya (2010) have reported the use of *M. jalapa* in urinary disorder by the people of Sardikhola VDC, Kaski, Nepal to treat livestock diseases. In this study the wormy wounds of cattle are cured by using this plant. De (1979) has reported *Peucedanum nagpurensis* to be used to treat livestock diseases. *Semecarpus anacardium* is being used in rheumatism and leprotic wounds as a folk remedy (Chakraborty and Bhattacharjee, 2006) whereas we have found it to be useful in simla disease of cattle. Acharya and Acharya (2010) have reported the use of *Zehmeria umbellata* (Syn: *Solena heterophylla*) in mastitis by the people of Sardikhola VDC, Kaski, Nepal to treat livestock diseases. Use of this plant in fever has previously been reported (De, 1979).

From the above discussion, it is evident that a plant which is used to cure a human ailment may be used to cure the same type or a completely different kind of livestock disease. The same plant may be used to treat different diseases or disorders by different tribes in their own ethnoveterinary practices at different parts

of the world. It is also evident that, sometimes, certain plants become more effective to treat certain livestock ailments when administered in combination with some other plants.

Regarding different diseases, the majority of the plants are used to treat skin diseases, cold, pains and sprains and stomach disorders. According to the informants, "sannipat" and "simla" are two very common problems in the study area and they had used traditional medicines to treat these diseases. Five species are used to treat skin diseases; two species each for small pox, pains, sprains, fractured bone, stomach problems, cold, sannipat and simla disorder and one species each for eye disease, swelling of ear and dog-bite.

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