



An Ethno-botanical Study of Plants Used for the Treatment of Livestock Diseases of Atrai Region, Bangladesh

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Abstract

In rural Bangladesh, traditionally people are used to treat their domestic animals with the help of medicinal plants. This traditional practice bears great importance because it could mean clues for noble products by conducting further research. Considering this, an ethno-botanical study of veterinary medicinal plants of Atrai region, Bangladesh was conducted from January to December 2016 in order to generate ethno-botanical data. From the survey it was revealed that the local people used as many as 51 plant species which were belong to 34 families. These plants were used in the treatment of common livestock's ailments such as Tympani, Foot and Mouth disease, Worm complaints, Hemorrhagic septicemia, Dermatitis, Swelling, Bleeding and Wound, Cold and Fever, Mastitis, etc. This survey recorded that local people utilized different plant parts such as leaves with other parts (55%) followed by root and underground parts (20%), whole plants (15%) and fruits and seeds (10%). They also used those plants in different ways to get cured from the ailments of their ruminants. Finally this study suggests that the effort should be taken to facilitate the availability of ethno-veterinary services in the remote areas where modern facilities are not adequate to treat domestic animals and this traditional knowledge should preserve and conserve medicinal plants for its sustainable uses.

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Introduction

The relationship between humans, plants and animals has been since time immemorial. Ancient man had discovered natural product to satisfy their needs including relief from their ailments as well as of their fellow domestic animals. Bangladesh is an agrarian country and about 75 percent of its population lives in rural areas and almost every family have domestic animals there. As a result a huge number of domestic animals are being reared in rural areas. These rural people use medicinal plants to treat their animals suffering from various diseases. A few numbers of research works have done on how people use herbal treatment in Bangladesh (Harun-Ur-Rashid *et al.*, 2010; Rahamatullah *et al.*, 2010; Alam *et al.*, 2013).

It is fact that medicinal plants serve as effective medicines for curing diseases of local people as well as domestic animals.

This practice, which is based on folk belief, traditional knowledge and skills used for curing diseases and maintaining health of animal is known as ethno-veterinary medicine (Panda and Dhal, 2014).

However, ethno-veterinary research and development needs a holistic, interdisciplinary study of traditional knowledge associated skills and belief system of a defined area.

It has emerged as an important field for the researchers and might provide a sustainable veterinary alternative to the people of the least developed countries where modern facilities are much lacking (De Haan and Bekure, 1991; Schillhorn, 1991; Daniel *et al.*, 1993).

Atrai region of Bangladesh lies between 24°32' and 24°42' North Latitude and 88°52' and 89°06' East Longitude and encompasses an area of 851 Sq. Km. This area comprises the low lying area between the Barind Tract and the Ganges floodplain. It includes the part of Chalan *beel* area. Due to the ecological realities local people of this area earn their livelihoods from diversified modes such as agriculture, fishing,

cattle rearing, petty business, etc. Every year, many domestic animals suffer from various diseases but experienced veterinary doctors are rarely available in the locality. Due to this limitation, alternative treatment has emerged in the locality.

Thus investigation needs to address the aspect of animal husbandry, prevailing diseases and the treatment of those diseases geared towards proper understanding. Basing upon these backgrounds, an attempt was made to collect, validate and code the information pertaining to the practices of traditional veterinary medicines among the people of Atrai region.

Materials and methods

The fieldwork for this study was conducted over 12 months (January to December, 2016) in 6 villages (Bandaikhara, Bhabanipur, Mirjapur, Balaram Chak, Kasiabari and Chapra) of Atrai Upazila and mainly based on structured and semi-structured interviews, field observation (Mukherjee, 1993; Martin, 1995). Preferential ranking of plants and common diseases were done by matrix scoring system (Drinkwater, 1993).

In this ethno-botanical study, 24 knowledgeable elders (4 from each village) between the age of 30 to 60, 6 women of 30 to 45 years and 6 traditional healers were involved who served as key informants.

Besides these, 90 informants (15 from each village) age ranges from 20 to 60 years who served as general informants. During the course of fieldwork, the key informants were visited several times in order to collect, crosscheck the information. A representative sample of each plant was collected, tagged and stored for subsequent identification. Botanical identification was done with help of existing literature (Huq, 1986; Ghani, 2003).

Results and discussion

From the study area, 51 plants species had been documented those were used in ethno-veterinary treatment (Table 1).

Table 1. List of plants used by the local people for the treatment of their domestic animals.

| Local name | Botanical name | Family | Habitat | Short description |
|-------------|--|-----------------|---------|--|
| Kalomegh | <i>Andrographis paniculata</i> (Burn. F.) Wall | Acanthaceae | Herb | Leaves are used in cold and fever. |
| Chotchota | <i>Ruellia prostrate</i> Poir. | Acanthaceae | Herb | Roots are used in fever. |
| Hargoza | <i>Acanthus ilicifolius</i> Linn. | Acanthaceae | Herb | Leaves and roots are used in bone fracture. |
| Katanote | <i>Amaranthus spinosus</i> Linn. | Amaranthaceae | Herb | Roots are used in bone fracture and hemorrhagic septicemia. |
| Nishinda | <i>Vitex negunda</i> Linn. | Verbenaceae | Tree | Leaves and barks are used in pneumonia and fungal infection of ear. |
| Thankuni | <i>Centella asiatica</i> (Linn.) Urban. | Apiaceae | Herb | Whole plant is used in foot and mouth disease. |
| Kachu | <i>Colocasia esculenta</i> (Linn.) Schott. | Araceae | Herb | Stem and leaves are used in in-appetite. |
| Mankochu | <i>Allocasia indica</i> (Roxb.) Schott. | Araceae | Herb | Roots and leaves are used in bottle jaw disease. |
| Bet | <i>Calamus tenuis</i> Roxb. | Arecaceae | Climber | Roots are used in foot and mouth disease. |
| Akanda | <i>Calotropis gigantea</i> (Linn.) Ait. f. | Asclepidaceae | Shrub | Leaves and roots are used in bottle jaw and Swelling of foot and neck. |
| Hatisur | <i>Heliotropium indicum</i> Linn. | Boraginaceae | Herb | Roots are used in hemorrhagic septicemia. |
| Shorisha | <i>Brassica campestris</i> Linn. | Brassicaceae | Herb | Seeds are used in cold and fever. |
| Anarash | <i>Ananas sativus</i> Schult. f. | Bromeliaceae | Herb | Leaves and roots are used in worm complaints. |
| Tantul | <i>Tamarindus indica</i> Linn | Caesalpiniaceae | Tree | Leaves and fruits are used in bottle jaw disease. |
| Ashamlata | <i>Eupatorium odoratum</i> Linn. | Caesalpiniaceae | Climber | Whole plant is used in foot and mouth disease. |
| Pepe | <i>Carica papaya</i> Linn. | Caricaceae | Shrub | Roots are used in mastitis. |
| Sonalu | <i>Cassia fistula</i> Linn. | Cesalpiniaceae | Tree | Leaves are used in swelling of foot disease. |
| Swarnalata | <i>Cuscuta reflexa</i> Roxb. | Convolvulaceae | Climber | Whole plant is used in diarrhoea. |
| Kalmishak | <i>Ipomoea aquatic</i> Forsk. | Convolvulaceae | Herb | Leaves are used in gid disease, urinary trouble and in small pox. |
| Mutha ghas | <i>Cyperus rotundus</i> Linn. | Cyperaceae | Herb | Rhizomatous tubers are used in diarrhoea, worm complaints and swelling diseases. |
| Gub | <i>Diospyros peregrina</i> (Gertn.) Gurke. | Ebenaceae | Tree | Leaves and fruits are used in diarrhoea and small pox. |
| Dudh shagar | <i>Euphorbia antiquorum</i> Linn. | Euphorbiaceae | Shrub | Whole plant is used in mastitis. |
| Shitki | <i>Phyllanthus freternus</i> Wab. | Euphorbiaceae | Herb | Roots are used in abscess. |
| Varenda | <i>Ricinus communis</i> Linn. | Euphorbiaceae | Shrub | seeds are used in constipation, worm complaints and urinary trouble. |
| Lazzabati | <i>Mimosa pudica</i> Linn. | Mimosaceae | Herb | Leaves and fruits are used in worm complaints, in-appetite and gid disease. |
| Joyanti | <i>Sesbania sesban</i> (Linn.) Merr. | Papilionaceae | Shrub | Leaves are used in worm complaints and stomach problem. |
| Shetdrone | <i>Leucas aspera</i> (Willd.) Link. | Lamiaceae | Herb | Leaves are used in urinary trouble. |
| Peayaj | <i>Allium cepa</i> Linn. | Liliaceae | Herb | Bulbs are used in cold and fever. |
| Satomuli | <i>Asparagus racemosus</i> Willd. | Liliaceae | Climber | Tuberous bulbs are used in diarrhoea. |
| Tula | <i>Gossypium herbaceum</i> Linn. | Malvaceae | Herb | Leaves are used in mastitis. |
| Berela | <i>Sida cordifolia</i> Linn. | Malvaceae | Herb | Leaves are used in small pox and hemorrhagic septicemia. |
| Neem | <i>Azadirachta indica</i> A. Juss. | Meliaceae | Tree | Leaves and bark are used in hemorrhagic septicemia and wounds. |
| Gulanacha | <i>Tinospora cordifolia</i> (Willd.) Miers. | Menispermaceae | Climber | Leaves and stem are used in hemorrhagic septicemia and foot and mouth disease. |
| Babla | <i>Acacia nilotica</i> (Linn.) Bel. | Mimosaceae | Tree | Leaves and roots are used in diarrhoea. |
| Jagdumur | <i>Ficus racemosa</i> Linn. | Moraceae | Tree | Leaves and fruits are used in diarrhoea and small pox. |

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|---------------|---|----------------|---------|---|
| Khoksha dumur | <i>Ficus hispida</i> Linn. f. | Moraceae | Tree | Leaves are used in hemorrhagic septicemia. |
| Aittakola | <i>Musa paradisiaca</i> Linn. | Musaceae | Herb | Fruits are used in gastritis and diarrhea. |
| Amrul | <i>Oxalis corniculata</i> Linn | Oxaliadaceae | Herb | Whole plant is used in treatment of poisoning. |
| Pan | <i>Piper betle</i> Linn. | Piperaceae | Climber | Leaves are used in tympani. |
| Bash | <i>Bambusa arundinacea</i> (Retz.) Willd. | Poaceae | Herb | Leaves and roots are used in hemorrhagic septicemia. |
| Durba | <i>Cynodon dactylon</i> Pers. | Poaceae | Herb | Whole plant is used to stop bleeding. |
| Kul/ boro | <i>Zizyphus mauritiana</i> Lamk. | Rhamnaceae | Tree | Leaves and fruits are used in diarrhoea, tympani, swelling disease and small pox. |
| Kadam | <i>Anthocephalus chinensis</i> (Lamk.) A. Rich. | Rubiaceae | Tree | Leaves are used in gastritis problem. |
| Gandhabadali | <i>Paederia foetida</i> Linn. | Rubiaceae | Climber | Leaves are used worm complaints, diarrhoea and in-appetite. |
| Atissor | <i>Glycosmis pentaphylla</i> Corr. | Rutaceae | Shurb | Roots are used in worm complaints. |
| Bel | <i>Aegle marmelos</i> (Linn.) Corr. | Rutaceae | Tree | Leaves and unripe fruits are used in stomach trouble and diarrhoea. |
| Labu | <i>Citrus aurantifolia</i> (Chist.) Sw. | Rutaceae | Shrub | Leaves and fruits are used in worm complaint, in-appetite and swelling disease. |
| Shibjuli | <i>Cardiospermum helicacabum</i> Linn. | Sapindaceae | Climber | Fruits are used in pain and swelling of foot and neck diseases. |
| Jongli begun | <i>Solanum violaceum</i> Cortega. | Solanaceaea | Shurb | Fruits are used in dermatitis. |
| Halud | <i>Curcuma longa</i> Linn. | Zingiberaceae | herb | Rhizomes are used in swelling of foot and neck, worm complaints foot and mouth and bottle jaw diseases. |
| Ada | <i>Zingiber officinale</i> Rosc. | Zingiberaceaea | Herb | Rhizome is used in cold and fever. |

The plants were grouped into 34 families and the dominated families were Acantheceae, Ceasalpiniaceae, Euphorbiaceous and Rutaceae -

containing 3 species each. 2 species were found in 9 families and the rest 21 families had single species (Figure 1).

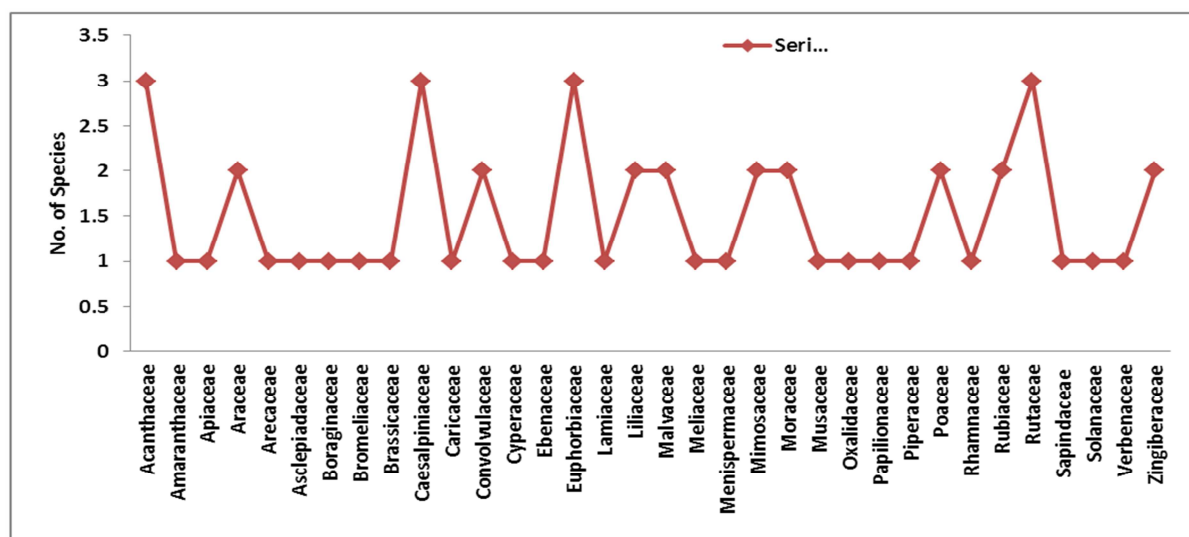


Fig. 1. List of documented families with respective species.

By habit 47 percent were herbaceous, 16 percent were shrubs, 21 percent were trees and 16 percent were climbers (Figure 2).

From the collected information it was found that

those plants were used to prevent or cure as many as 20 diseases (Figure 3). Among these, 10 diseases were commonly occurred in the study area (Figure 4). Different plants parts had been used in the traditional health care practices.

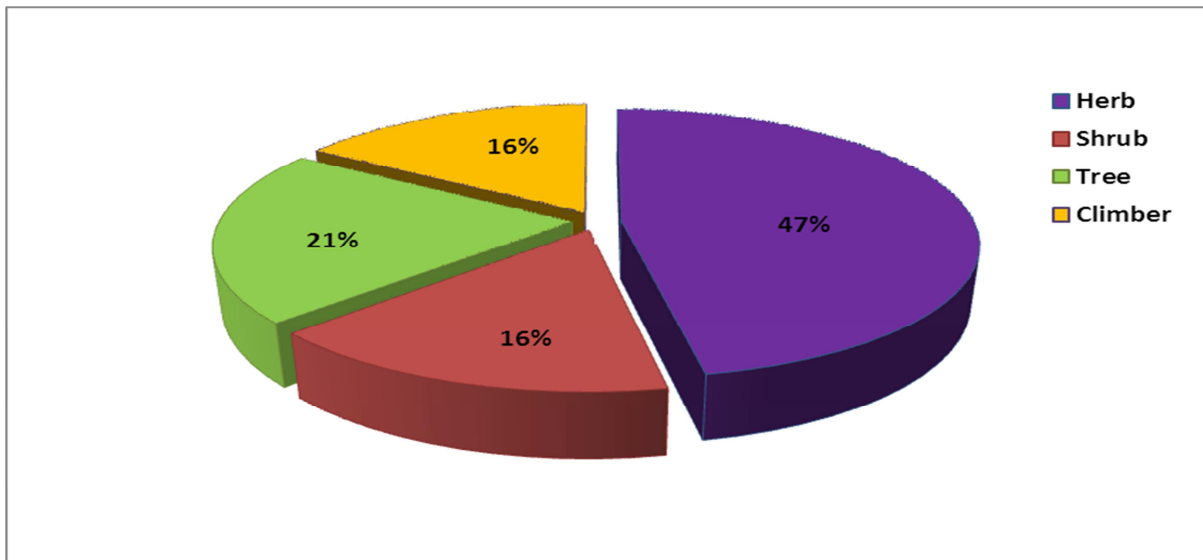


Fig. 2. Habit of plants used in traditional healthcare for domestic animals.

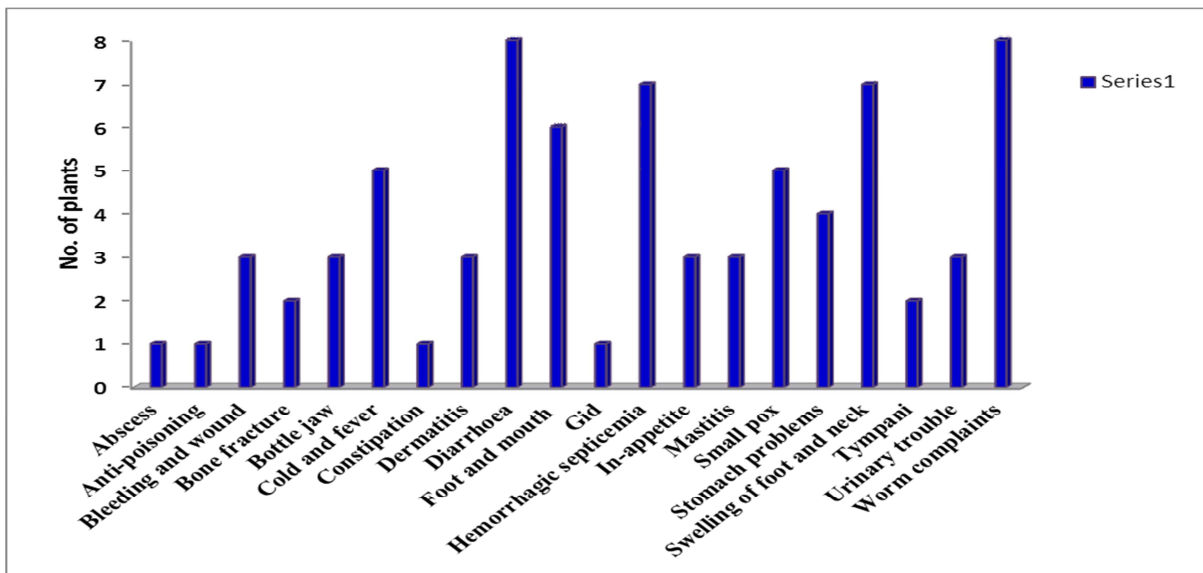


Fig. 3. Number of plants used for different diseases of domestic animals.

Only leaves of 11 species (21%), leaves with other parts of 17 species (34%), roots and underground parts of 10 species (20%), whole plants of 8 species (15%) and fruits and seeds of 5 species (10%) were being used for the treatment of livestock diseases in the study area (Figure 5). As per ranking of importance of plants to the local people, 10 plants were found most important to them (Figure 6).

Human being has been using plants as medicine to get cured from diseases of their livestock since long ago and is still rely on it when modern veterinary medicine advances a lot. During the study it was found that most of the reported plants were available

in the locality.

This information is also comparable with the result of other studies in Bangladesh (Harun-Ur- Rashid *et al.*, 2010; Rahmatullah *et al.*, 2010; Alam *et al.* 2013) and in West Bengal, India (Das and Tripathi, 2009; Rahman *et al.*, 2009).

Furthermore, the techniques of administration of the remedies were relatively simpler than the complex techniques involved in modern medicine. These indigenous animal healthcare techniques were widely practiced by the people in the area where communication problem was not so easy. No

published information exists on the diversity of plants of ethno-veterinary importance in Atrai region but this area is regarded as an important livestock producing area. However, recent development has focused on research on ethno-veterinary treatment of ruminants in other areas e.g. in India (Girach *et al.*,

1998; Harsha *et al.*, 2005; Reddy *et al.* 2006) in Pakistan (Dilshad *et al.*, 2008; Farooq *et al.*, 2008) in Nigeria (Nweude and Ibrahim, 1980; Arowolo and Awoyele, 1982; Daniel *et al.*, 1993; Okoli *et al.*, 2002; Kolawole *et al.*, 2007) in Sub-Saharan Africa (de Haan and Bekure, 1991).

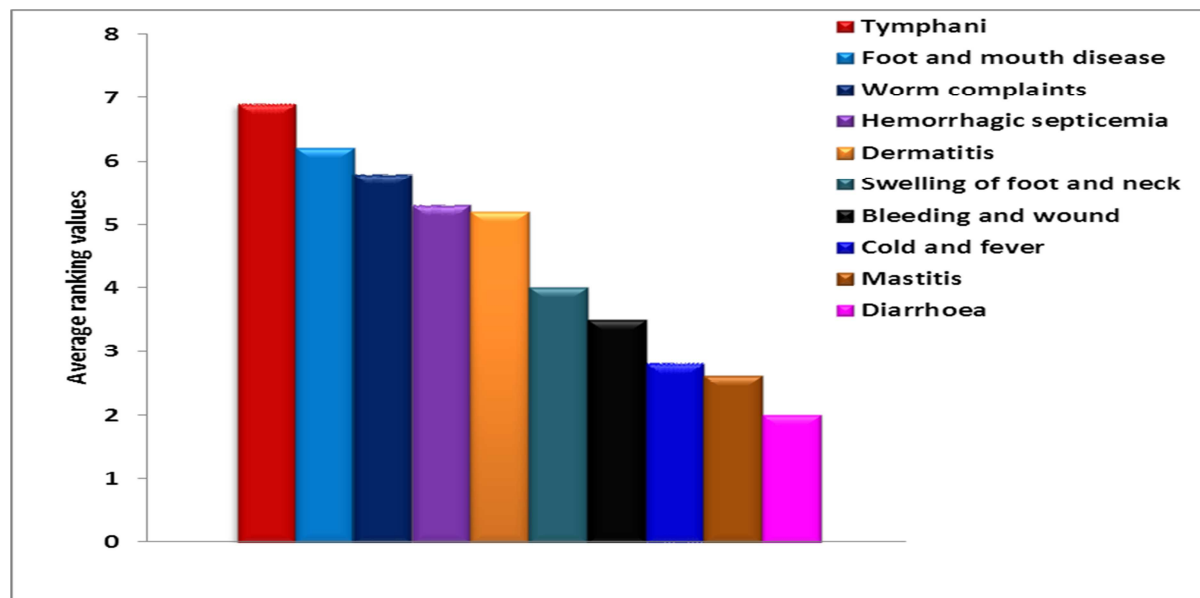


Fig. 4. Most commonly occurring diseases of domestic animals (scale 1 to 10).

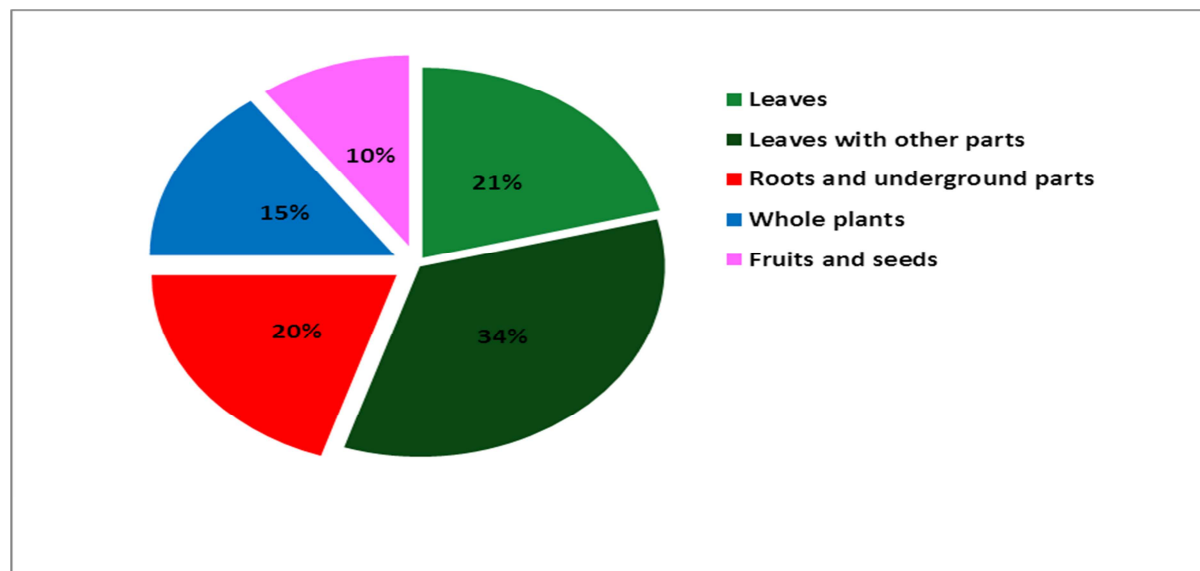


Fig. 5. Plants parts used for the treatment of animal diseases.

This research gathered information on ethno-veterinary practices of Atrai region, Bangladesh. This information on locally available plants with veterinary importance could help scientists to investigate into particular therapeutic actions for developing relevant drugs of the respective diseases. On the other hand,

due to the rapid socio-economic and cultural changes, the traditional knowledge about plant is declining.

Thus the documentation of this knowledge is valuable for further scientific consideration and wider uses in treating domestic animals.

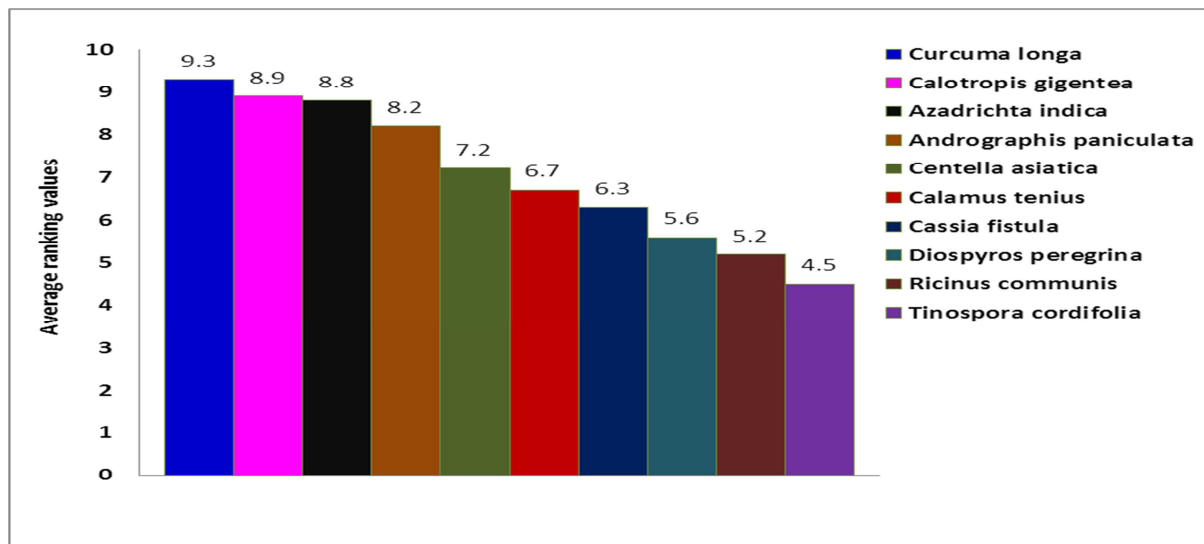


Fig. 6. Most important plants to the local people for the treatment of their domestic animals (scale 1 to 10).

Conclusion

The findings of the study predicted that most of the medicinal plants were used by the local people of the study area contain active chemical constituents in different organs of plants. This traditional knowledge about medicinal plants indicates to a great potential for research and discovery of new drugs to cure the diseases of animals. Therefore, there is a need to generate awareness among the people towards the sustainable utilization and conservation of those medicinal plants.

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