

Ethno-veterinary practices used for animal health care management: A review

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Abstract

The Livestock sector in India offers a promising means to reduce poverty, and it employs around 8.80 per cent of the Indian population. Marginal, small and semi-medium farmers raise about 87.70 per cent of the livestock in the country. One of the key issues in the livestock industry is increasing farm animal productivity. Disease outbreaks such as Foot and Mouth Diseases, Black Quarter, and Influenza continue to wreak havoc on livestock health and output. Farmers find it difficult to treat their ailing livestock due to the high expense of conventional treatment, inadequate veterinary health facilities, and the remoteness of certain rural settlements. Ethno-veterinary practices are part and parcel among livestock owners in rural areas. Traditional healers have a wealth of knowledge regarding the transmission and spread of diseases. Although the change to modern livestock treatment procedures has reduced the usage of ethno-veterinary practises, they are still used as a first aid for the treatment of many animal ailments and diseases. The recognition of several effective ethno-veterinary medicinal products has sparked renewed interest in traditional practices. As a result, traditional medicine has become increasingly popular in recent years in practically every corner of the globe. This article discusses ethno-veterinary procedures employed by livestock keepers in various parts of the world, traditional methods of making herbal medication for animals, the benefits of ethno-veterinary practices, and risks to ethno-veterinary knowledge. Furthermore, the review will encourage the integration of ethno-veterinary medicine with current veterinary medications through laboratory experimentation and scientific logic, as well as additional ethno-veterinary research for livestock disease management.

Keywords: Disease, Ethno-veterinary practices, Livestock, Traditional medicine, Treatment

Highlights

- This review article will aid in understanding ethno-veterinary medicine, as well as the future direction.
- In order to provide animals with sustainable health care, research should concentrate on ethno-veterinary medicine and merge with standard veterinary techniques.
- A total 124 ethno medicines were documented for the treatment of various diseases of various animals.
- Medicinal plants are highly used in the ethno-veterinary practice as considerable livestock resources.

INTRODUCTION

Ethno-veterinary practices comprise the traditional management of veterinary diseases, their remedies, and the spiritual elements associated with the healing procedures practiced by a local community (Mathias, 2004). People's methods, knowledge, skills, practises, and beliefs concerning animal care are covered by ethno-veterinary practices (McCorkle, 1986). In contrast to the allopathic veterinary medicine that used to be taught in Veterinary schools, Colleges, Universities and any educational institution, "ethno-veterinary medicine" is the knowledge developed by rural livestock owners. Both are dynamic and in constant flux. Also, it is cost-effective (Warren, 1991). Farmers develop ethno-veterinary medicine in the field and barns rather than in scientific laboratories. Orally,

ethno-veterinary practices pass from one generation to the next generation. It is less methodical, less formalised, and is typically passed down orally rather than in writing. Because of the advantage of modern veterinary practices, ethno-veterinary medicine is at risk of extinction.

The interaction between men and animals is as old as human civilization, and they have had a symbiotic relationship from the dawn of time. The lives and livelihoods of rural people are reliant on livestock. People make money by selling their animals and products to others in need. Man is reliant on his livestock to meet his numerous needs, including food, milk, clothes, agriculture, fertilisers, labour, and money. Animal waste is a good source of manure for agricultural crops, and it also helps to improve soil

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fertility. In many societies of human, animal is an integral part of their life and as well as animals play a significant role and consider as equal to human. Humans cure many diseases and afflictions of animals with locally accessible herbs to keep them well. For centuries, people have used their own knowledge to treat various diseases in animals. Many communities in India, such as the Raika and Gujjar, used to travel from one location to another in search of pasture for their animals. Because they did not have access to a veterinarian throughout their migration, they treated their animals using their own knowledge (Meena *et al.*, 2021). These customs and knowledge were passed down orally from one generation to another generation of people. Ethno-veterinary medicine has a variety of patterns and types. It is based on the availability of local herbs and plants that are readily available in the area, are inexpensive to use, have minimal side effects, and are environmentally sustainable in comparison to modern medicine (Fasil, 2001). In general, people have established ethno-veterinary practices by trial and error (Asayegn and Abiy, 2009). The topic of ethno-veterinary research and development is gaining popularity. Ethno-veterinary practices have been used in India from ancient times. The Atharva Veda is recognised as a reservoir of traditional medicine, including prescriptions for animal treatment, in several ancient Indian scriptures. Other ancient texts include the Agni Purana, Devi Purana, Garuda Purana, Skand Purana, Matsya Purana, and Linga Purana, as well as Charaka Samhita, Susruta Samhita, and Shalihotra, which offer knowledge on the use of medicinal plants to treat animal ailments. Prince Nakul and Prince Sahadev were the veterinary doctors for horses and cows, respectively in the Mahabharata. Salihotra was known as the “Father of Veterinary Science” since he was the greatest and most recognised veterinary science teacher (Jadhav, 2009). As per WHO, among most people in developing countries, more than eighty per cent use traditional knowledge to treat animal and human diseases (Jabbar *et al.*, 2005), and about ninety per cent of livestock herders in Ethiopia rely on traditional medicine to treat various livestock diseases (Endashaw, 2007). The vast cultural diversity in countries like South Africa and also in many other developing nations around the world is represented in the use of plants as medicines, people of south African around sixty per cent believed and followed the traditional practices mostly by the contract traditional healers, usually in addition to orthodox medical treatments (Van Wyk *et al.*, 1997). Because of the present speedy changes in communities everywhere in the world, ethno-veterinary knowledge is on the verge of extinction (Sri Balaji and Chakraborty, 2010). Despite the

growing popularity of traditional ways for treating animal illness there is little or no documentation about ethno-veterinary practice and medical plant that are effective. The objective of this review article is to chronicle the many ethno-veterinary practices used around the world to cure animal diseases.

Preparatory methods of ethno-veterinary medicine

There are various methods to prepare ethno-veterinary medicine by using medicinal plant and their parts like leaves, woods, barks etc. (McCorkle and Mathias, 1992). Different types of methods for preparing the medicine are as follows.

Boiling: The roots and bark are often boiled, and a decoction (watery product) is obtained that is used externally or internally. Boil extract the active ingredients and materials from the plant, and a decoction is prepared from the solid part by passing through a sieve (Minan, 1996).

Soaking: The active components can be extracted from the roots or stems by soaking them in cold water. Soaking is especially crucial and difficult for hard, dry plant materials that must be steeped and kept inside the hot water for at least up to one hour. Soaking time can be measured by using various methods such temperature of the water (cold water takes longer) and plant part like roots. Before being utilised medicinally, a liquid is filtered through a sieve after soaking (McCorkle and Mathias, 1992).

Pounding: This involves crushing the plant part to harsh, intermediate or fine grain sizes. Conventional crushing precedes other methods, such as pickling, depending on the structure of the plant being prepared (McCorkle and Mathias, 1992).

Pelleting: “Rhombus” or “bolus” is a solid pill. It is made by thrashing fresh or dried plant material and adding honey, molasses or a binder together into granules, and rolling or shaping by hand to form an oval or round (Minan, 1996; Reddeff, 1970).

Paste formation: A paste is a moist, semi-solid preparation made by using various ingredients, such as grinding fresh and dried plant material with a little oil, water, molasses and honey (Dawit and Ahadu, 1993).

Juice preparation: Juice is prepared by pressing the parts of the plant or pounding plant material and passing it through a strainer or cloth to extract the juice (Dawit and Ahadu, 1993).

People with vast knowledge of ethno-veterinary practices have enlisted some of the practices (Table 1), which have been taken from the various research articles studied across the world.

Table 1. Ethno-veterinary practices used by livestock keeper in various parts of the world

Sl. No.	Plant species	Plant part used	Diseases/Condition	Reported area	References
1	<i>Solanum indicum</i>	Fruits	Eye problems	Zimbabwe	Marandure 2016
2	<i>Pauzzoziamixta</i>	Leaves	Bloat	Zimbabwe	
3	<i>Musa paradisiacal</i>	Roots	Worms	Zimbabwe	
4	<i>Amaranthus gneizaus,</i> <i>Musa paradisiacal</i>	Roots	Snake bite	Zimbabwe	
5	<i>Cassia tora</i>	Flower	Diarrhoea	Maharashtra (India)	Das <i>et al.</i> , 2004
6	<i>Colocynthis vulgaris</i>	Fruits	Wound healing	Kerla (India)	Das <i>et al.</i> , 2004
7	<i>E. undulata</i>	Leaves	Heart water	South Africa	Mthi <i>et al.</i> , 2020
8	Dietes iridaceae	Roots	Anaplasmosis	South Africa	
9	<i>S. henningsii</i>	Bark	Babesiosis	South Africa	
10	<i>Achillea millefolium</i>	Aerial part	Mastitis and Anthelmintic	Spain	Blanco <i>et al.</i> , 1999
11	<i>Amaranthus viridis</i>	Whole plants	Constipation	Pakistan	Shah <i>et al.</i> , 2012
12	<i>Atropa Belladonna</i>	Leaves	Mastitis		McCrorry, 2012
13	<i>Acacia leucophloea</i>	Stem	Dislocated bones	MP (India)	Sikarwar 1996
14	<i>Abutilon indicum</i>	Leaves	Diarrhoea, Arthritis	MP (India)	Shukla <i>et al.</i> , 2007; Tripathi and Singh, 2010
15	<i>Acalypha indica</i> L.	Leaves	Wound	Chhatisgarh (India)	Ekka and Amin, 2015
16	<i>Acanthospermum hispidum</i> DC.	Leaves	General Tonic	MP (India)	Satya and Solanki, 2009
17	<i>Aloe vera</i> L.	Leaves	Mastitis	MP (India)	Dwivedi <i>et al.</i> , 2009; Kade <i>et al.</i> , 2006
18	<i>Ziziphus nummularia</i>	Root	Yoke sore	MP (India)	Sikarwar, 1996
19	<i>Wrightia tinctoria</i>	Bark	Anti-inflammatory	MP (India)	Satya and Solanki, 2009
20	<i>Withania somnifera</i>	Root	Retained Placenta	UP(India)	Nigam and Sharma, 2010
21	<i>Tinospora cordifolia</i>	Stem and Leaves	Increase flow of milk	MP (India)	Patil and Deshmukh, 2015
22	<i>Syzygium cuminii</i>	Bark	Dysentery	Chhatisgarh and MP (India)	Ekka <i>et al.</i> , 2015; Kadel and Jain, 2006
23	<i>Solanum nigrum</i>	Leaves	Body swelling	MP (India)	Sikarwar, 1996
24	<i>Sida acuta</i>	Leaves	Wounds	MP (India)	Chouhan and Ray, 2014
25	<i>Senna auriculata</i>	Leaves	Pox	MP (India)	Sanghi and Bala, 2014
26	<i>Semecarpus anacardium</i>	Seeds and Fruits	Mouth Disease	MP (India)	Patil and Deshmukh, 2015
27	<i>Sapindus laurifolius</i>	Fruits	Snake bite	MP (India)	Satya and Solanki, 2009
28	<i>Azadirichta indica</i> and <i>Psidium guajava,</i> <i>Carica papaya</i>	Leaves, stem bark, root	Trypanosomiasis	Nigeria	Abu <i>et al.</i> , 2009
29	<i>Mangifera indica</i>	Bark, Root	Poor milk flow	Nigeria	
30	<i>Carica papaya</i>	Stem, Root	Helminthiasis	Nigeria	

Cont. Table 1.

Table 1., Cont. ...

Sl. No.	Plant species	Plant part used	Diseases/Condition	Reported area	References
31	<i>Parinari polyandra</i>	Leaves	Coccidiosis	Nigeria	
32	<i>Waltheria indica</i>	Leaves, Stem	Pneumonia	Nigeria	
33	<i>Albezia anthelmintica</i>	Root bark	Helminths	Ethiopia	Ermias <i>et al.</i> , 2001
34	<i>Azadirachta indica</i>	Roots	Endoparasite	Ethiopia	
35	<i>Cucuribita Pepo</i>	Seed	<i>Taenia saginata</i>	Ethiopia	Sori <i>et al.</i> , 2004
36	<i>Jasminum malabaricum</i> , <i>Leucas martinicensis</i> , <i>Nicatanate bacum</i>	Root	Endoparasite	Ethiopia	Fás <i>et al.</i> , 1999
37	<i>Albizia gummifera</i>	Leaf	Nematode	Ethiopia	Demelash <i>et al.</i> , 2001
38	<i>S. oxyacantha</i>	Leaf	Helminths	Ethiopia	Fás <i>et al.</i> , 1999
39	<i>Pouzolzia mixta</i> , <i>Hermaniaguer keana</i> , <i>Ozoroa paniculosa</i>	Root	Retained placenta	Botswana	Moreki <i>et al.</i> , 2012
40	<i>Spirostachys africanum</i>	Bark	Retained placenta	Botswana	
41	<i>Brachylaena discolor</i> DC.	Leaves	Anthelmintic for calves	Natal Press	Hutchings <i>et al.</i> , 1994
42	<i>Brachylaena elliptica</i> (Thunb.) DC. and <i>Brachylaenailici folia</i> (Lam.) Phill	Roots and Leaves	Diarrhoea in lambs	South Africa	Dold and Cocks, 2001
43	<i>Callilepis laureola</i> DC.	Roots	Used to kill maggots in cattle	Africa	Watt and Breyer-Brandwijk, 1962
44	<i>Schkuhria pinnata</i> (Lam.) Thell.	Aerial parts	Eye infections, Pneumonia, Diarrhoea, Heart water	Africa	Van der Merwe <i>et al.</i> , 2001
45	<i>Vernoniame spilifolia</i> Less.	Stems	Heart water	South Africa	Dold and Cocks, 2001
46	<i>Balanitesmau ghamii</i>	Leaves	Diarrhoea	Africa	
47	<i>Euphorbia cooperi</i> N.E.Br. ex A. Berger	Aerial parts	Black Quarter	Africa	
48	<i>Jatropha curcas</i> L.	Seeds	Constipation, Diarrhoea	Africa	Luseba and Van, 2006
49	<i>Senna italica</i> Mill	Bark, Roots	Diarrhoea and Gall sickness	Africa	
50	<i>Zanthoxylum davyi</i> (Verdoorn) Waterm	Root	Retained placenta	South Africa	Masika <i>et al.</i> , 2000
51	<i>Acacia nilotica</i> (L.) Delile	Leaves	Diarrhoea	Haryana (India)	
52	<i>Aegle marmelos</i> (L.) Correa	Fruit	Dysentery and Diarrhoea	Haryana (India)	Yadav <i>et al.</i> , 2014
53	<i>Albizia lebbeck</i> (L.) Benth	Leaves	Eye problem	Haryana (India)	
54	<i>Allium sativum</i> L.	Fruit	Cold and Fever	Haryana (India)	
55	<i>Argemone Mexicana</i> L.	Whole plant	Retained placenta	Haryana (India)	
56	<i>Asparagus recemosus</i> Willd.	Whole plant	Heat production	Haryana (India)	

Cont. Table 1.

Table 1., Cont. ...

Sl. No.	Plant species	Plant part used	Diseases/Condition	Reported area	References
57	<i>Azadirachta indica</i> A. Juss.	Leaves	Stomachache	Haryana (India)	
58	<i>Boerhaavia diffusa</i> L.	Whole plant	Retained placenta	Haryana (India)	
59	<i>Cicer arietinum</i> L.	Seed	Increase the milk quantity	Haryana (India)	
60	<i>Citrullus colocynthis</i> (L.) Schrad.	Fruit	Dysentery	Haryana (India)	
61	<i>Gossypium hirsutum</i> L.	Seed	Increase the milk quality	Haryana (India)	
62	<i>Helianthus annuus</i> L.	Seed	Smooth delivery	Haryana (India)	
63	<i>Vernonia cinerea</i> (L.) Less.	Seed	Increases in appetite	Haryana (India)	
64	<i>Withania somnifera</i> (L.) Dunal	Root	Cold and cough	Haryana (India)	
65	<i>Chlorophytum comosum</i> (Thunb.)	Bulb	Lactation	Uganda	
66	<i>Steganotaenia araliacea</i> Hochst.	Roots	East coast fever	Uganda	
66	<i>Balanites aegyptiaca</i> (L.)	Roots	Abdominal worms	Uganda	
67	<i>Ananas comosus</i> (L.) Merr	Fruits	East coast fever	Uganda	
68	<i>Euphorbia tirucalli</i> L. and <i>Synadenium grantii</i> Hook.	Aerial parts	East coast fever	Uganda	Tabuti <i>et al.</i> , 2003
69	<i>Azadirachta indica</i> A. Juss	Leaves	Skin disease (Itching)	Uganda	
70	<i>Sarcocephalus latifolius</i> (Smith), Bruce	Roots	Diarrhoea	Uganda	
71	<i>Vernonia amygdalina</i> Delile	Leaves	Cough	Uganda	
72	<i>Caesalpinioideae</i> , <i>Senna occidentalis</i> (L.) Link	Leaves	Diarrhoea	Uganda	
73	<i>Lantana camara</i> L.	Leaves	Measles	Uganda	
74	<i>Abelmoschous esculentus</i> L.	Root	Blocked urination	Odisha (India)	
75	<i>Acacia nilotica</i> L.	Spines	Colic pain	Odisha (India)	
76	<i>Acalypha indica</i> L.	Leaf	Scabies	Odisha (India)	
77	<i>Alangium salvifolium</i> (L.f)	Root	Snake bite	Odisha (India)	
78	<i>Andrographis paniculata</i> (Burm.f.)	Stem, Leaves	Fever, Foot and Mouth Disease	Odisha (India)	
79	<i>Atylosia scabaeoides</i> L.	Leaf	Diarrhoea	Odisha (India)	
80	<i>Azadirachta indica</i>	Leaf, Fruit	Constipation, Internal fever	Odisha (India)	Mallik <i>et al.</i> , 2012
81	<i>Bauhinia racemosa</i>	Leaf	Redness of eye	Odisha (India)	
82	<i>Bombax ceiba</i> L.	Stem bark	Dislocated bones	Odisha (India)	
83	<i>Brassica campestris</i> L. and <i>Brassica nigra</i> (L.)	Seeds	Cough and cold	Odisha (India)	
84	<i>Calotropis procera</i> (Ait).	Flowers	Cough and cold	Odisha (India)	
85	<i>Careya arborea</i>	Bark	Debility in cattle	Odisha (India)	

Cont. Table 1.

Table 1., Cont. ...

Sl. No.	Plant species	Plant part used	Diseases/Condition	Reported area	References
86	<i>Chloroxylon swietenia</i> DC.	Wood	To relieve neck pain	Odisha (India)	
87	<i>Ficus religiosa</i> L.	Stem bark	Constipation	Odisha (India)	
88	<i>Mitragyna parvifolia</i> (Roxb).	Bark	Filariasis	Odisha (India)	
89	<i>Musa paradisiaca</i> L.	Flower	Diarrhoea	Odisha (India)	
90	<i>Strychnos potatoru</i> L.	Seeds	Sexual stimulant	Odisha (India)	
91	<i>Terminallia chebula</i>	Fruit	Loss of appetite	Odisha (India)	
92	<i>Vigna radiate</i> (L)	Leaves	Wound	Odisha (India)	
93	<i>Psidium guajava</i> , <i>Anacardium occidentale</i>	Seeds and Leaves	Diarrhoea	Trinidad and Tobago	
94	<i>Aloe vera</i>	Leaves	Poultice and wound	Trinidad and Tobago	Lans and Brown, 1998
95	<i>Azadirachta indica</i> , <i>Petiveria alliacea</i> , <i>Ruellia tuberosa</i>	Leaves	Anthelmintic	Trinidad and Tobago	
96	<i>Laportea aestuans</i>	Leaves	Urinary problems	Trinidad and Tobago	
97	<i>Brassica napus</i> , <i>Nigella sativa</i>	Seeds	Bloat	Rajasthan (India)	Meena ^a <i>et al.</i> , 2020
98	<i>Cucumis sativus</i>	Fruits	Jaundice	Rajasthan (India)	Meena ^a <i>et al.</i> , 2020
99	<i>Butea monosperma</i>	Flower	Jaundice and wood	Rajasthan (India)	Meena ^a <i>et al.</i> , 2020
100	<i>Solanum melongena</i>	Fruits	Fever	Rajasthan (India)	Meena ^c <i>et al.</i> , 2020
101	<i>Artemesia vulgaris</i> L.	Leaves	Prophylactic	Arunachal Pradesh (India)	Bam <i>et al.</i> , 2015
102	<i>Ageratum conyzoides</i> L. and Eww Namya	Leaves	Stop bleeding from the site of leech	Arunachal Pradesh and Sikkim (India)	
103	<i>Thalictrum foliosum</i> DC., <i>Aralia species</i>	Roots	Fever	Arunachal Pradesh (India)	Maiti <i>et al.</i> , 2013
104	<i>Rubus idaeus</i> L.	Stem	Fever	Arunachal Pradesh (India)	
105	<i>Cissampelos pareira</i> L.	Root	Dog bite	West Bengal (India)	
106	<i>Abrus precatorious</i> L.	Seed	Diarrhoea	West Bengal (India)	
107	<i>Piper nigrum</i> L., <i>Trachyspermum ammi</i> (L.)	Fruit	Fever	West Bengal (India)	Mandal and Rahaman, 2016
108	<i>Achyranthes aspera</i> L.	Root	Hemorrhagic Septicaemia	West Bengal (India)	
109	<i>Annona squamosa</i> L.	Leaves	Ectoparasite	West Bengal (India)	

Cont. Table 1.

Table 1., Cont. ...

Sl. No.	Plant species	Plant part used	Diseases/Condition	Reported area	References
110	<i>Brassica campestris</i> L.	Seeds	Bloat	Pakistan	
111	<i>Trachyspermum ammi</i> L.	Seeds	Fever and cough	Pakistan	
112	<i>Vernonia anthelmintica</i> Willd.	Seeds	Mastitis	Pakistan	Deeba <i>et al.</i> , 2009
113	<i>Acacia arabica</i> (Lam.) Willd.	Bark	Foot-and-mouth diseases	Pakistan	
114	<i>Achillea millefolium</i> L.	Leaves	Ruminants Endoparasites	Kashmir (India)	Tariq and Tantry, 2012
115	<i>Urtica dioica</i> L.	Seeds	Ruminants Endoparasites	Nordic	Waller <i>et al.</i> , 2001
116	<i>Senna occidentalis</i>	Leaves	Anthrax	Ethiopia	Giday <i>et al.</i> , 2003
117	<i>Eucalyptus globulus</i>	Leaves	Brucellosis	India	Alizadeh <i>et al.</i> , 2018
118	<i>Cymbopogon nardus</i>	Leaves	Ectoparasite	Africa	Junquera, 2018
119	<i>Piper nigrum</i>	Leaves	Anthrax	India	Raveesha and Sudhama, 2015
120	<i>Carica papaya</i>	Fruit	Foot and Mouth Diseases	India	Raveesha and Sudhama, 2015
121	<i>Moringa oleifera</i> , <i>Capsicum annuum</i>	Leaves, Fruit	Infectious Coryza	Africa	Ogni <i>et al.</i> , 2016
122	<i>Datura stramonium</i>	Leaves	Rabies	Africa	Admasu and Mekonnen, 2014
123	<i>Lawsonia inermis</i>	Leaves	Itching	Rajasthan (India)	Meena ^b <i>et al.</i> , 2020
124	<i>Vitex negundo</i>	Roots	Trypanosomiasis	Rajasthan (India)	Meena ^b <i>et al.</i> , 2020

Conclusion

This review of ethno-veterinary practices concludes that herbal ethno-veterinary medicine can be used instead of modern medicine against the treatment of various livestock diseases across the world. Herbal medicine is sustainable, eco-friendly and affordable to livestock farmers. Methods of preparation and plants material vary from area to area. We observed that many plant materials have been used against similar diseases. Ethno-veterinary knowledge varies from region to region. Despite such a huge amount of knowledge among people, unfortunately, very limited research has been conducted to validate ethno-veterinary practices. We believe that this review will help to understand the various ethno-veterinary practices used by

livestock keepers and encourage the use of cost-effective strategies to address important livestock production issues.

Conflict of interest: The author(s) hereby declare that there is no conflict of interest in the concerned paper.

Author's contributions: DCM, AC: Constructing an idea; DCM, AC, PBN, AK: Collected various published papers related to ethno-veterinary practices for the animals; AC, PBN: Wrote introduction of the article; DCM, PBN, AK: Extract materials from the papers and arranged it into tabular form; AC, AK: Aiding logical conclusion.

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Received- 28.12.2022, Accepted- 17.11.2023, Published- 07.03.2024 (Online), 01.06.2024 (Print)

Section Editor: Dr. I. Samanta, Associate Editor