

Identification of some ethnoveterinary practices for treatment of foot and Mouth disease in Polasara block, Ganjam district, Odisha, India

Authors:

Dibakar Mishra

Institution:

Department of Zoology
Polasara Science College,
Polasara Ganjam (Odisha)
India 761105.

Corresponding author:

Dibakar Mishra

Email:

drdkm@hotmail.com

Web Address:

[http://jresearchbiology.com/
Documents/RA0141.pdf](http://jresearchbiology.com/Documents/RA0141.pdf)

ABSTRACT:

The present study was made to collect data regarding this undiscovered field of herbal treatment in the study area. Different locations including the remote rural area were visited, people of different age groups including house-wives and veterinarians were contacted, and raw data was collected regarding different common cattle diseases and the practice of the local people to treat these diseases. Surprisingly it was found that the locally available herbal medicines (ethno-veterinary medicines) were much effective in comparison with their counterparts, the allopathic medicines. Local people prefer these time-tested herbal medicines to treat their ailing cattle. Foot and mouth disease has been a great concern for the local livestock owners as they completely depend upon their domestic animals for their economic needs. They are attached with the animals emotionally, culturally and religiously. Age old traditional herbal treatment learnt from their forefathers supported with traditional belief make them to treat with plants preparations to get rid of different ailments. Nothing has been done in this area till date. Scientific investigations and further research is necessary to identify the value of traditional herbal treatment and to establish its value. Such an attempt has been made to document this hidden treasure.

Keywords:

Ethno-veterinary treatment, Traditional Healers (THs), Allopathy, Aphthovirus, Polasara, Odisha.

List of Abbreviations used

°	:	degree
'	:	minute
"	:	second
°F	:	degree Fahrenheit
%	:	percent
ICAR	:	Indian Council for Agricultural Research
O=	:	Local name of the plant in Odia.

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Dibakar Mishra

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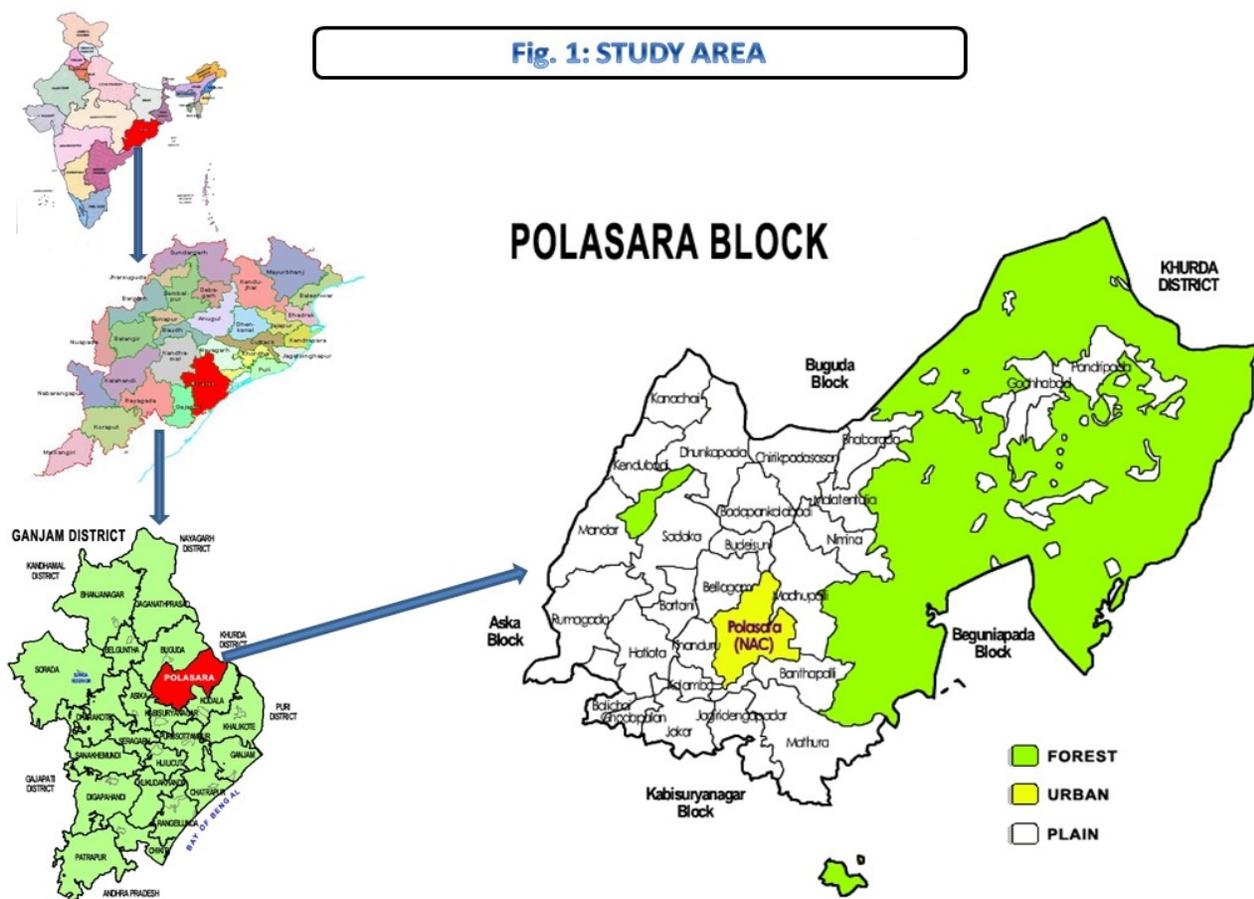
INTRODUCTION:

The people from the rural belt of Polasara block in the Ganjam district in the state of Orissa chiefly rely on the age old ethnoveterinary knowledge (EVK) to control common livestock health problems. The knowledge of herbal mode of treatment of their domestic animals has been passed on generation to generation. In spite of cattle's central role in their traditional culture and livelihoods, there has been no systematic recording of their ethnoveterinary plant-based cures to date.

Basing upon this, the present study was made to document the remedies used to treat foot and mouth disease in livestock, their preparation and administration. An attempt has been made to record the ethnoveterinary data available with the rural folk of Polasara block of Ganjam district as no such work was undertaken previously in this area. (Fig.1) Out of different common veterinary ailments occurring in this area foot and mouth disease (FMD) has been given much importance because it's after effects badly affect the cattle which alternatively affect the economic condition of the local people. In this study 15 most common but effective preparations are selected and observed in

the on-field experiments. Plants/parts used, their family, drug preparations, dose, duration, cost-effectiveness etc. are studied.

Foot and mouth disease (FMD) is a highly contagious viral infection of wild and domestic cloven-hoofed animals. Classified as a member of the *Aphthovirus* genus in the family *Picornaviridae*, FMD virus causes a transient yet drastic decrease in production due to the formation of painful blisters in epithelial sites, primarily mouth and feet. Because of its extremely contagious nature, FMD is exceedingly difficult to control (Jain & Saklani, 1992, Brown Corrie C. et al, 1992). This is a very common disease found in most parts of the district. The hybrid varieties of cattle are mostly affected. Locally this disease is called as *Fatua*. The disease spreads rapidly among the animals through breath, saliva, mucus, milk, or faeces. Most commonly it spreads through the movement of infected animals within the herd. It can also be spread by the wind or by mud or manure sticking to foot. As mentioned earlier FMD affects cloven-hoofed animals (those with divided hoofs), including cattle, buffalo, camels, sheep, goats, deer and pigs. Cattle are able to be infected by breathing in small quantities of the



virus. The virus can be excreted by animals for up to four days before clinical signs appear and some animals can continue excreting the virus for long periods (years) after apparent recovery. Incubation period varies from 2 to 14 days depending upon the dose of the virus and route of infection.

There are seven serotypes of the virus: A, O, C, SAT1, SAT2, SAT3 and Asia1 (DAFF Report, 2011). These are further subdivided into more than 60 strains (Longjam Neeta et al., 2011). Within 3-8 days of infection, the animal suffers from high fever (104-106°F). Then blister-like lesions on the tongue, nose and lips, in the mouth, on the teats and between the toes which then burst, leaving painful ulcers appear (**Fig.2**). Anorexia followed by frequent and profuse salivation occurs. The blisters cause a heavy flow of sticky, foamy saliva that hangs from the mouth. Infected animals sway from one foot to the other due to the tenderness of the feet. Foot lesions leave animals lame and unable to walk to feed or water. Tongue and mouth lesions are very painful and cause animals to drool and stop eating. Although older cattle usually do not die from the infection, they suffer a severe illness which leaves them in a weakened state. Adults usually begin eating again after a few days, but young animals may weaken and die, or be left with foot deformities or damage to the mammary glands. Due to high fever there are chances of abortion. Flies make the wounds more worse. The animal feels much pain in walking. Infection in the udder leads to infection into the mammary glands, thus opening the chance of occurrence of mastitis. Even in the pregnant cows this infection can terminate the pregnancy. This disease may be fatal to the young

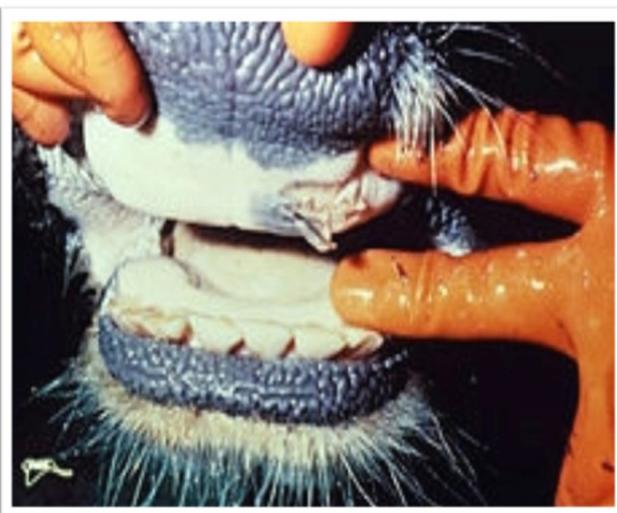


Fig.2: Ruptured nasal blister

calves. After few days of infection, bleeding from the infected parts occur. Heart beat of the animal increases along with the rate of respiration. As observed pulse rate 75 to 90 and rate of respiration was 26 to 32 per minute. Sometimes dysentery or blood-dysentery was also reported. The animals gradually became weak and could not even walk. The hooves elongate. If not properly handled, this may turn into an epidemic. According to a recent news, India loses INR180 billion annually due to foot and mouth disease (FMD) in cattle and livestock."According to the latest research conducted by ICAR on FMD in livestock, the country is losing directly Rs18,000 crore per annum". The losses are the result of reduced milk production due to FMD in animals and the meat of the infected animals is not good for consumption. (Cattle Site News,2011)

MATERIALS AND METHODS:

Out of 22 Blocks of Ganjam District Polasara Block is present in the North-east direction with co-ordinates 19°42'23"N & 84°49'10"E. Total area of the block is 280.07sq.km., which includes 26 Gram Panchayats, 139 revenue villages and one NAC. Population of the block is 119754 (as per 2001 census). Out of the total area 43.9% is covered by forest (Fig.1). The natives of the forest areas are mainly tribal belonging to Kond and Saura (Sabar) tribes.

The present study was made during 2004 – 2007 to collect data regarding this undiscovered field of herbal treatment. Basing on the method adopted by Jain and Saklani (1992), the study area was frequently visited for selection of the contact persons including the Traditional Healers (THs), local people having the knowledge of EVK and veterinarians, collection of information on occurrence of FMD, the causes, symptoms, herbal treatment methods, medicinal plants/parts used for preparation of the traditional medicines, methods of drug administration etc. Field interviews were conducted with local animal-keepers, traditional healers (THs) and farmers. Persons of different age groups ranging from 20 to 70 and both sexes were contacted for the collection of data. With a fixed interval the same persons were contacted for collection of concurrent data. Several meetings/group discussions were also made with the local livestock holders, their wives, traditional healers (THs) and local veterinarians to have a detailed knowledge about the system of traditional

treatment. The plant samples were collected for identification and confirmation in the Department of Botany, Berhampur University.

Data thus collected were compiled and screened for future reference. During the next year further visits were made to the areas and similar data on common cattle ailments and diseases were collected along with their methods of traditional herbal treatment. This was done to get concurrent data regarding traditional herbal treatment or more appropriately the ethno-veterinary treatment (EVT).

Out of this compiled data, common methods of EVT for FMD were sampled out. Also out of all such preparations for the disease, some which were frequently used by the local people and THs were selected for administration to the ailing cattle in the following on the field experiments. The results were recorded and accordingly a statistics was prepared regarding the gradation of cure with the traditional medicines like: fully cured, symptomatically cured, less effective and non-effective. Only preparations those produced results for fully cured and symptomatically cured were taken into account and documented according to their effectiveness. Plant specimens were collected, pressed, dried and identified with the Post Graduate Department of Botany, Berhampur University, Odisha. The indigenous knowledge about the use of medicinal plants were arranged in alphabetical order of botanical names followed by family, English name, vernacular name, part used, Pharmacognosical properties and number of times used in traditional herbal preparations are recorded in tabular form for future use.

RESULTS:

During research work, the indigenous knowledge of 20 plants belonging to 19 families related to ethnoveterinary uses to treat FMD was collected. Ethnoveterinary data of different plants/parts used by the local people in the study area with their method of preparation of the ethnoveterinary medicines (EVM) are described below.

1. The affected parts are thoroughly washed with pre-boiled warm water with *Azadirachta indica* A. Juss. (O=Neem, Meliaceae) leaves and soaked dry.
2. Alum and Cupper sulphate powder in the ratio 3:1 is regularly applied to the infected parts.
3. Alternatively cream prepared from neem (*A. indica* A. Juss.) or *Pongamia pinnata* (L) Pierre. (O=Karanja, Fabaceae) oil and with Naphthalene powder is applied over the

affected parts.

4. A mixture in water and Caustic Soda, Black Salt and *Swertia angustifolia* Buch. Ham. (O=Chireita, Gentianaceae) powder in equal proportions mixed with six times of molasses is administered orally for 6-10 days.
5. Extracts of Neem leaves, bark extract of *Shorea robusta* Gaertn. f. (O=Shal, Dipterocarpaceae), leaves of *Strychnos nux-vomica* L. (O=Kuchila, Strychnaceae), bark extracts of *Syzygium jambolanum* (Lam.) DC. (O=Jamun, Myrtaceae), dry powder of *Acacia catechu* Willd. (O=Khair, Mimosaceae) gum and alum are mixed in equal proportions to make a paste. This paste is applied to the affected parts regularly twice daily.
6. Bark of *Ficus religiosa* L. (O=Aswattha, Moraceae), *Allium sativum* L. (O=Rasun, Amaryllidaceae) and *A. catechu* Willd. are boiled or fried together. Fried materials are then pulverized and mixed with water. This preparation is used to wash oral cavity and hoof. These are applied twice or thrice a day. With this vesicular lesions are gradually healed.
7. Equal quantity of leaves of *Nicotiana tobaccum* L. (O=Dhuan Patra, Solanaceae), fruit of *Terminalia bellerica* Roxb. (O=Bahada, Combretaceae) and decoction of *P. pinnata* (L) Pierre. leaves mixed together with small quantity of alum. This mixture is applied on sores.
8. Bark of *F. religiosa* L. and fruits of *Nyctanthes arbor-tristis* L. (O=Ganga Siuli, Oleaceae) paste is applied over the infected parts. (Acharya E & Pokhrel B, 2006)
9. Bark of *A. catechu* Willd. boiled with water drenched once a day.
10. Tender leaves of *Mangifera indica* L. (O=Amba, Anacardiaceae) are fed to the ailing animal.
11. *Allium cepa* L. (Pyaj, Liliaceae) bulbs grind and mixed with black salt and warm water was drenched to the animal.
12. *Picrorhiza kurrooa* Royle ex Benth. (O=Katuki, Scrophulaceae) dried roots ground with sugar and water. The preparation is drenched to the ailing animal.
13. Buds of *Lyonia ovalifolia* (Anyar-Ericaceae) milled with bark of *Juglans regia* L. (O=Akhrot, Juglandaceae) are made to paste with mustard oil and is applied externally. (Phondani *et al.*, 2010; Sindhu ZUD *et al.*, 2010)

14. *Entada abyssinica* Steud. ex A.(O=Gilo, Leguminosae), *Vitex negundo* L. (O=Nirgundi, Verbenaceae) leaves are dried in shade and powdered. Mixed powder is applied topically over the infected hooves. (Alawa JP et al, 2002; Ibrahim MA et al, 1984)
15. Infected tongue was washed with soda ash and an ointment made of honey plus powdered *Eleusine coracana* (L.) Gaertn. (O=Mandia, Poaceae) was applied topically.

Animal owners take regular preventive measures like regular washing of cow-shed with caustic soda water. Stocked fodder of all kinds is burnt and infected animals are kept in isolation. They immediately start herbal treatment as mentioned above, or rush to the local TH. Only a few persons contact local veterinary authorities.

DISCUSSION:

During the course of this work it was also observed that, in most of the cases the animal keepers seldom visit the veterinarians for allopathic treatment or even for vaccination. In some cases, FMD affected animals were unable to stand erect. Anorexia, loss of appetite and reduction of milk yield in lactating animals were other observations. Foaming mouth, pus-filled foot and teats were other pre-treatment effects. (Fig. 3 & 4). Out of 47 adult animals recorded for observation 39 were fully cured after 10 days of herbal treatment and other eight took some more days as those animals developed pus in their hooves. This gives a promising result of 100% success in the old, traditional herbal treatment. Similarly out of seven calves, only one died while all others recovered and survived.

The only thing that is worth mentioning here is that, hygienic condition of the cow-shed has to be maintained properly and regular disinfection of the place is absolutely necessary.

Similarly, this traditional method of treatment requires a very less amount of money for the purchase of materials like alum, naphthalene etc. As cow is emotionally, culturally and religiously associated with these people they take care of them properly as if their family members, which is another advantage for fast recovery.

Information on 20 plant species and 6 non-plant materials are described in this paper. Plant species are distributed over 20 genera and 19 families. The most common plant part used was leaves (25%) followed by barks (20%). (Fig. 5) Nine remedies listed used a single plant, while others include multiple plants. The route of administration was primarily oral followed by topical applications. Almost all plants are collected from the wild; a few cultivated plants used had been planted for domestic use. The THs in the study site possess a wealth of EVK which they use to maintain animal health. Their rich knowledge and high diversity of plants were recorded here for the first time. *Acacia catechu* Willd. was used in three preparations, followed by *A. indica* and *F. religiosa* L. in two and other plants were used in only once for the preparations. Preparation number eight has been mentioned by Acharya and Pokhrel (2006), number 13 by Phondani *et al.* (2010) and Sindhu *et al.* (2010) while preparation number 14 was recommended by Ibrahim *et al.* (1984) and Alawa *et al.* (2002). Although the method of preparation, dose and mode of administration is different, yet this proves the efficacy of EVT which spreads over the political boundaries of country.

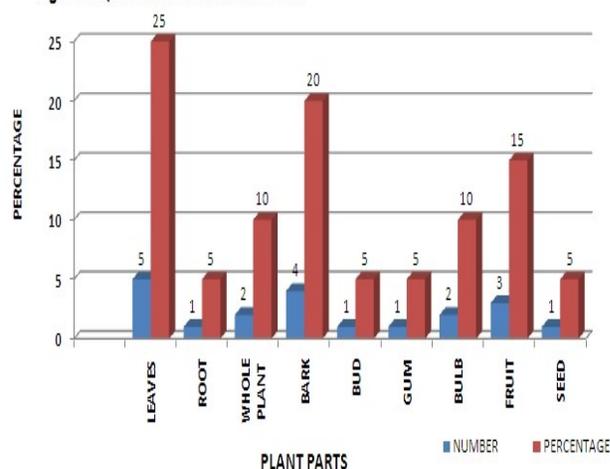


Fig.3: Foaming Mouth



Fig.4: Infected teat

Fig. 5:FREQUENCY OF PLANT PARTS USED



In the present work, information gathered from the local people was scrutinized minutely and critically and only the information asserted, averred, and advocated by the native veterinary practitioners of EVM that produced positive results is presented. Although the local healers, in clinical terms, have tested the medicinal value of these plant species for ages, yet their confidence regarding the medicinal value of these plant species was not sufficient to validate their claims. Documentation of the present EVM knowledge regarding traditional phytomedicinal preparations demands validation like modern biochemical and pharmacological assays.

It is further stressed that the true therapeutic potential of the EVM information described in the present work would only be realized and validated when experimental studies would be conducted in the laboratories and on field experiments in the study area keeping the climatic and geographic conditions in mind. This valuable medicinal wealth is now under great pressure of extinction due rapid urbanization, industrialization, and biodiversity degradation.

CONCLUSION:

Foot-and-mouth disease is an important veterinary problem which can cause widespread epidemics. It affects the economic stability of the live stock owners of the locality badly. Long term experience, traditional belief, economic value, and easy accessibility made EVT the first choice of the local people. With the critical need for improved diagnostic tests to detect viral infection, effort need to be concentrated on the development of simple, rapid, noninvasive tests that can be performed without expensive laboratory equipment.

Rural population has good knowledge about the use of many plants. They believe that all afflictions are caused by supernatural forces. Traditional healers use their eyes, ear, nose and hands to diagnose the diseases, this way of diagnosis is interesting because they live in interior areas and lack the use of modern scientific equipment for treatment, and they however treat diseases using medicinal plants (Santhya et al. 2006).

Scarcity of the medicinal plants due to natural and manmade reasons made it essential to focus on conservation of these plants. Herbal medicines prescribed by traditional healers are either preparation based on single plant part or a combination of several plant parts.(Mishra D, 2008) Determining the biological (activity) properties of plants used in traditional medicine shall be helpful to the rural communities and researchers for establishment of importance of EVT. Several authors have undertaken to isolate the active compounds by bioassay-guided fractionation from the species that showed high biological activity during screening. Therefore, these scientific investigations may be utilized to develop drugs for these diseases. Further research is absolutely necessary to isolate the compounds responsible for the observed biological activity.

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