USE OF FRESH PARTS OF MEDICINAL PLANTS FOR HEALTH AND PRODUCTION IN LIVESTOCK – A NEW CONCEPT OF FARMING

Shibabrata Pattanayak¹, Debabrata Maity*², Sonia Mitra³, P.K. Debnath⁴, T.K. Mandal⁵ and S.K. Bandyopadhyay⁶

ABSTRACT: Farm animals are reared for production to meet up the demand for animal protein in human. Various modern medicines are extensively used for production as well as treatment and prevention of diseases of animals, which can ultimately reach us through food chain. Herbs are now considered as an important source of alternative medicines. The Ayurvedic medicines prepared by manufacturers contain processed plant parts and added with preservative and other chemicals in many cases. The present way of research on herbal medicine follows the path of identification of active principles from the extracts of preserved parts of medicinal plants after testing of their efficacy in laboratory. This concept of research have the limitation of loss of many aromatic and other phytochemicals present in the living plant, which may have very important role when used together. Animals maintained in modern farm may be given relief from modern medicines in minor and moderate ailments, cure of problems related with their production with the validated fresh plant medicine available from the plants cultivated adjacent to the farm area. Consulting the reports of ethno-botanical study, a preliminary list of medicinal plant is prepared which are having antipyretic, analgesic, wound healing, immunostimulant, hepato-protective, fertility enhancing, pregnancy assisting, lactation assisting, anthelmintic, astringent, expectorant, purgative and anti-flatulent, nutriceutical, antiseptic, anti-dermatitis, anti-dysenteric and anti-enteric, hematenic, stomachic, diuretic and kidney stone removing effects and insecticidal or insect repelling effects. This list may be enriched further and plants may be selected for a farm from these groups according to the agro-climatic condition of the area, disease prevalence, problems encountered during farming practice and other requirements of the farm. Validation of reported effects of the plants is to be performed in fresh condition, so that parts of the plants can be utilized by the trained personals of the farms.

Key Words: Fresh parts, medicinal plant, Health, Livestock, Farming.

¹Asst. Director, ARD (Microbiology), Institute of Animal Health & Veterinary Biologicals, Kolkata, West Bengal, India.
²&³Taxonomy and Biosystematics Laboratory, Department of Botany, University of Calcutta, 35 Ballygunge Circular Road, Kolkata – 700 019, West Bengal, India.
⁴Consultant, National Research Institute of Ayurveda for Drug Development, Salt Lake, Kolkata, West Bengal, India.
⁵Professor, Department of Pharmacology and Toxicology, West Bengal University of Animal & Fishery Sciences, Kolkata, West Bengal, India.
⁶Director, Medical Education & Research, Government of West Bengal, India.
*Corresponding author
INTRODUCTION

Present day farm animals are the successors of their free living ancestors. Domestication of animals was started thousands of years ago as documented in the signs of the ancient civilizations. As most of the modern farm animals are herbivorous, their body system is accustomed with utilization of nutrients available after digestion of plant materials. Concept of addition of animal protein, minerals, growth promoters, pre and probiotics etc. in the feeds of farm animals is need based with less expenditure through feeding, breeding and management. As a part of management, we developed health care systems of the farm animals with the tools available in our hand for our use. In many cases that was not properly effective due to the physiological / systemic differences among man and different species of animals, but we adhered with our concept. Sometimes we used the resources at libidum among farm animals. Apart from the issue of huge financial involvement, the dangers behind this concept are appearing in last few years. Mad cow disease, gathering of toxic chemicals in our body from animal, fish and bird products and expression of their effects through various diseases, increased incidence of several zoonotic diseases, development of resistance among micro-organisms against antibiotics, development of superbug etc. are examples.

CONTEMPORARY METHODS OF STUDY

Plants reported to have any medicinal effect are now identified by ethno-botanical study. After identification and characterization, the reported plant parts are collected and preserved. Then methanolic, ether, acetone or aqueous extract of the preserved plant part is stored. Then these are tested for their reported medicinal use in vitro or among in vivo animal models, either in this form or in semi-purified or purified form after extraction of active principles. The efficacy of the extracted part or the separated active principles cannot show the total effect of the plant part in question, as many of the principles become lost during the whole process.

PROPOSAL FOR FARMING WITH NEW CONCEPT

To overcome the problems of partial study of effectiveness and to utilize (and also to validate when needed) the medicinal effect of reported plants the animal farms, a new concept may be designed.

a) Every animal farm may be added with a small medicinal plant garden of selected plants for supply of fresh inputs.

b) These can be used for better production and prevention and treatment of minor and moderate ailments.

c) Trained personals may be used for mixing and palatable materials before marketing. In the way of collection, transportation, storage and processing of these plant parts, almost all the volatile and aromatic ingredients may be lost. Some of the temperature and humidity sensitive ingredients may also become ineffective due to these reasons.
of parts of plants and their use.

d) Study for proper validation of the medicinal effect of known, common use as well as non-familiar use of plants may be done.

e) Study on effectiveness and side effects of combined use of parts of plants may be done.

f) Parts of the plants grown at different agro-climatic condition may be mixed as a part of mixture, if required.

g) Standardization of dose schedule are also to be determined for that purpose.

h) Beside supplying parts for medicinal use, many of these plants may supply green fodder to the animal.

**PLANTS WHICH MAY BE USED IN ANIMAL HUSBANDRY**

According to available literature, several plants are reported to have medicinal properties on diseases of human and animals. Similar effects on same type of diseases/ailments of both human and animals are observed. These reports may be gathered to prepare a knowledge base for further study. Like modern medicines, research for validation of such claims may be started on animals. As herbivorous animals took herbs as their normal diet, they may be given such oral medicinal herbs after a trial on laboratory animals, particularly to know the possible toxic effects of the medicinal plants. Study of medicinal effects by local application of plant parts may be started on laboratory animals as well as on farm animals in a limited scale primarily. Wide spread use of effective plants may be started afterwards.

Plants having possible effects on prevention and cure of common health and production related problems are listed in twenty groups. This primary list contains the names of some representative plants available mainly in plains of our country which may be modified with gathering of more information.

**Plants with antipyretic effect:**


**Plants with Analgesic effect:**

Plants with wound healing effect:

Plants with immunostimulant effect:

Plants with Hepato-protective property:
Plants with effect on fertility and libido:
Withania somnifera (L.) Dunal (Jain 1995),
Tribulus terrestris L. (Jain 1995),
Aloe vera (L.) Burm.f.,
Saraca indica L. (Biswas et al. 2009),
Asparagus racemosus Willd.,
Bacopa monnieri (L.) Wettst.,
Sida cordifolia L. (Jain, 1995),
Mucuna pruriens (L.) DC. (Roychowdhury 2008),
Ipomoea mauritiana Jacq. (Roychowdhury 2008),
Cheilocostus speciosus (J.König) C.Specht (Roychowdhury, 2008),
Piper betle L. (Roychowdhury 2008),
Tinospora cordifolia (Willd.) Miers (Jain 1995),
Cinnamomum verum J.Presl,
Azadirachta indica A.Juss.,
Asparagus racemosus Willd.,
Tectona grandis L.f.
Woodfordia fruticosa (L.) Kurz
Mimosa pudica L.
Cucurbita pepo L. (Sunilchandra et al. 2008)
Rauwolfia serpentina Baill.,
Abrus precatorius L.,
Mesua ferrea L.,
Saraca asoca (Roxb.) Willd. (Jain 1995) etc.

Plants with effect on pregnancy and parturition:
Ficus religiosa L.,
Nelumbo nucifera Gaertn.,
Hibiscus rosa-sinensis L.,
Pergularia daemia (Forssk.) Chiov. (Jain 1995),
Asparagus racemosus Willd.,
Tectona grandis L.f.,
Woodfordia fruticosa (L.) Kurz,
Mimosa pudica L.,
Cucurbita pepo L. (Sunilchandra et al. 2008)
Rauwolfia serpentina Baill.,
Abrus precatorius L.,
Mesua ferrea L.,
Saraca asoca (Roxb.) Willd. (Jain 1995) etc.

Plants with effect on lactation:
Acacia nilotica (L.) Delile,
Ipomoea mauritiana Jacq.,
Ipomoea aquatica Forssk.,
Euphorbia hirta L. (Jain 1995),
Asparagus racemosus Willd.
Mimosa pudica L. (Sunilchandra et al. 2008),
Madhuca longifolia (J.König ex L.) J.F.Macbr. (Jain 1995),
Leptadenia reticulata (Retz.) Wight & Arn.,
Ambroma augusta (L.) L.f. (Roychowdhury 2008),
Cuminum cyminum L. (Roychowdhury 2008),
Nigella sativa L. (Roychowdhury 2008),
Ficus hispida L.f. (Sunilchandra et al. 2008)

Plants with Anthelmintic property:
Vernonia anthelmintica (L.) Willd.
Emblica ribes Burm.f.,
Mallotus philippensis (Lam.) Müll.Arg. (Jain 1995),
Butea monosperma (Lam.) Taub. (Jain 1995, Biswas et al. 2009)
Andrographis paniculata (Burm.f.) Nees (Jain 1995),
Holarrhena pubescens Wall.,
Punica granatum L.,
Acorus calamus L.,
Swertia chirata Buch.-Ham. ex Wall. (Jain 1995),
Artemisia nilagirica (C.B.Clarke) Pamp. (Jain 1995),
Adhatoda vasica Nees,
Azadirachta indica A.Juss.,
Curcuma longa L.,
Areca catechu L. (Jain 1995),
Ficus racemosa L.,
Nyctanthes arbor-tristis L.,
Euphorbia hirta L. (Jain 1995),
Peganum harmala L. (Jain 1995),
Cullen corylifolium (L.) Medik. (Jain 1995),
Cucurbita pepo L. (Sunilchandra et al. 2008),
Albizia lebbeck (L.) Benth. (Biswas et al. 2009) etc.

Plants with astringent property:
Andrographis paniculata (Burm.f.) Nees,
Azadirachta indica A.Juss.,
Aegle marmelos (L.) Corrêa (Jain 1995),
Cyperus rotundus L. (Roychowdhury 2008),
Terminalia chebula Retz. (Roychowdhury 2008),
Piper nigrum L. (Roychowdhury 2008),
Eclipta prostrata (L.) L. (Roychowdhury 2008),
Symlocos racemosa Roxb.(Jain 1995),
Saraca indica L.,
Terminalia arjuna (Roxb. ex DC.) Wight & Arn.,
Prunus serotina Ehrh.,
Acacia catechu (L.f.) Willd.,
Gardenia resinifera Roth (Sunilchandra et al. 2008),
Plectranthus amboinicus (Lour.) Spreng. (Biswas et al. 2009) etc.
Plants with expectorant and anti-bronchitis property:


Plants with nutriceutical Property:


Plants with antiseptic property:


Plants with purgative and anti-flatulent property:

Plants with anti-dermatitis and skin disease curing effect:


Plants with anti-dysentery and anti-enteritic property:

Hematenic and blood parameters influencing plant:
Hygrophila auriculata (Schumach.) Heine (Gomes et al. 2001), Salacia chinensis L. (Sikanwar and Patil 2012), Aristolochia indica L. (http://siddham.in/topic/blood purifier 2010), Triticum aestivum L., Spinacia oleracea L., Beta vulgaris L. (Bond 2011) etc.

Diuretic and Kidney stone removing plant:

Plants having insect repellent or insecticidal property:
Cymbopogon flexuosus (Nees ex Steud.) W.Watson, Ocimum tenuiflorum L., Pinus palustris Mill., Azadirachta indica A.Juss., Leucas aspera (Willd.) Link, Jatropha curcas L. (Sunilchandra et al. 2008) etc.

Plants with stomachic effect:

Selection of medicinal plant:
Plants may be selected for cultivation in a farm depending on following criteria:

i) Selection of plant species will be according to the agro-climatic condition of the area.

ii) It will be of minimum number.

iii) It is seen that some plants grow as weeds and some others as naturally growing plants of an area. Selection of such plants will be given preference over exotic plants.

iv) As different parts of a plant can be used for different purposes, singly or in combination with parts of other plants, availability of such member plants may be performed with planned plantation.

v) It will be according to the species of animal of the farm, their common ailments in that particular area and their requirements.

vi) In some cases, a few plant parts may have to be stored for other seasons than season of cultivation and in some cases some plant parts are to be purchased from outside due to requirement of completely separate agro-climatic condition for their cultivation.

vii) Requirement of cultivation of exotic plant may be unavoidable in some cases. Effort will be given in arrangement of natural cultivation environment for such plants.

viii) Use of inorganic fertilizer, chemical insecticide etc. may be avoided.
CONCLUSION

Modern allopathic medicines are extensively used in the animal farming which are becoming sources of many serious problems. The plant derived medicines marketed by different pharmaceuticals for this purpose are not always effective in animals, might be due to loss of many active principles during processing and storage. To overcome this, every animal farm may be added with a small medicinal plant garden of selected plants for supply of fresh inputs for better production and prevention and treatment of minor and moderate ailments. Trained personals may be used for mixing of parts of plants and their use. Study for proper validation of the medicinal effect of known, common use as well as non familiar use of plants along with standardization of dose schedule will be determined for that purpose.

ACKNOWLEDGEMENT

Authors are thankful to the Hon'ble Vice-Chancellor, The West Bengal University of Health Sciences, for providing necessary facilities for studies related with this article.

REFERENCES

Ambasta SP(ed.).(1986). The Useful Plants of India. NISCAIR. CSIR. New Delhi.


