The Journal of Phytopharmacology 2026; 15(3):168-173
Online at: www.phytopharmajournal.com

Review Article

ISSN 2320-480X
JPHYTO 2026; 15(3): 168-173
May- June
Received: 14-02-2026
Accepted: 08-06-2026
Published: 06-07-2026

doi: 10.31254/phyto.2026.15309

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Ethnoveterinary practices in poultry production: As an alternative to curb antimicrobial resistance

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ABSTRACT

The poultry industry has transitioned rapidly from a backyard hobby to a significant commercial agricultural sector, serving as a critical source of protein and minerals for the human diet. However, this intensification has led to a rise in infectious diseases, which not only reduce productivity but also pose public health risks through zoonotic transmission and the emergence of antimicrobial resistance (AMR). The widespread and sometimes careless use of conventional antibiotics has fueled a global AMR crisis, necessitating the search for safer, sustainable alternatives. This review explores the role of ethnoveterinary medicine (EVM)-incorporating local customs, traditional knowledge, and medicinal plants-as a viable strategy for poultry health management. Plant-derived feed additives, or phytobiotics, contain bioactive constituents like alkaloids, tannins, and flavonoids that provide antioxidant, anti-inflammatory, and immune-stimulatory benefits. Various plants such as *Aloe vera*, *Moringa oleifera*, and *Zingiber officinale* are highlighted for their effectiveness as growth promoters, improving feed conversion ratios and meat quality. Furthermore, the review details specific botanical interventions for major poultry ailments. For instance, Newcastle disease and Fowl pox are managed using extracts from *Allium sativum*, *Azadirachta indica*, and *Strychnos cocculoides*. The global challenge of coccidiosis is addressed through plants like *Carica papaya* and *Camellia sinensis*, which contain compounds capable of lysing oocysts and reducing intestinal lesions. The paper also examines plant-based solutions for anthelmintic, antifungal, and ectoparasite control, offering a comprehensive toolkit for organic disease management. Despite these advantages, the implementation of EVM faces limitations, including the seasonal availability of plants, lack of standardized dosages, and a need for further scientific validation of traditional practices. The review concludes that integrating validated ethnoveterinary practices into poultry production is essential for mitigating AMR, reducing chemical residues in food, and ensuring an economical, sustainable, and safe supply of poultry products. Future research must focus on the clinical interpretation and standardization of these traditional remedies to enhance global food security.

Keywords: Ethnoveterinary medicine (EVM), Poultry production, Antimicrobial resistance (AMR), Phytobiotics, Medicinal plants, Poultry diseases.

INTRODUCTION

The domestic birds like turkey, duck, goose and guinea fowl, which are kept in farms for the production of eggs and meat for human consumption, come under the category of poultry. Poultry is a good source of providing humans with eggs and meat, which contribute to the intake of proteins in the human diet. Poultry products are also a source of minerals [1]. With an annual growth rate of 8%, the poultry business has grown at one of the quickest rates in recent decades, transforming from a backyard hobby into a significant commercial agricultural sector [2]. Diseases in poultry lead to lower productivity, which reduces the supply of wholesome meat and eggs. Because some zoonotic diseases can spread from animals to people through contact or food, poultry diseases have wider implications for public health. Lastly, antibiotic resistance in nearby humans and animals is indirectly influenced by non-zoonotic poultry infections [3]. In India, for centuries, nearly 70% of the rural population has been utilising herbs as therapeutic agents to treat various ailments in livestock and poultry as they are natural, readily accessible, inexpensive and effective with minimal side effects, promising therapeutic efficacy, and a decrease in drug residues in animal products consumed by humans [4]. Recently, plant-derived feed additives have been widely studied as alternatives to antibiotics for animal health and production, due to their multiple biological functions and reduced resistance [5]. This review outlines some of the commonly available plants used as antimicrobial alternatives for treating poultry diseases in livestock production.

Ethnoveterinary Practices: A Key to Antimicrobial Resistance in Poultry

Antimicrobial resistance (AMR) is a worldwide health issue that kills millions of people annually. Antimicrobial usage in animals causes antimicrobial resistance (AMR), which subsequently spreads to people. AMR is becoming a bigger issue as the poultry industry becomes more intensified [3]. Drug residues from the careless use of antibiotics in animal products cause the emergence of hard-to-treat drug-resistant bacteria. Thus, the globe is searching for safer herbal alternatives to address the issue of drug resistance [6]. Phytobiotics are a group of plant-based products that are frequently used in animal feed to improve immunity, growth, gut integrity, antioxidant activity, and nutrient absorption. Alkaloids, tannins, terpenoids, saponins, and flavonoids are among its beneficial bioactive constituents. These have been regarded as an efficient substitute for feed antibiotics in order to lessen the residual effects on animal products like milk, meat, and eggs [7].

Ethnoveterinary medicine is a cost-effective healthcare solution for the treatment of diseases, particularly in areas where modern veterinary treatments are not affordable [8]. Despite the considerable advancement in the development of numerous new antibiotics over the past few decades, there has been a corresponding rise in bacterial resistance to these chemotherapeutic agents [9]. Furthermore, compromised immunity in host cells, along with the bacterial capacity to establish biofilm-associated drug resistance, has significantly increased the occurrence of life-threatening infections [10]. This circumstance has stimulated researchers to investigate novel alternative key molecules that can combat bacterial strains.

Common Diseases and Ailments in Poultry

As far as poultry is concerned, the major factors that lead to poultry losses, ranked in terms of significance, include diseases, predation, and the interplay between disease, parasitic attacks, and predation [11]. Disease results from the presence of different pathogenic organisms, which are contagious and transmissible either directly or indirectly. Pathogenic organisms causing various kinds of diseases may be classified into viruses, mycoplasmas, bacteria, fungi, protozoa, and parasites [12].

Among the different diseases that affect the health of poultry production, bacterial diseases represent one major aspect. It includes infectious coryza, salmonellosis, fowl cholera and collibacillosis. Major viral diseases include Newcastle disease, Marek's disease, fowl pox and avian encephalitis. Several fungal diseases and parasitic diseases, along with other common ailments such as respiratory infections, digestive disorders, wounds, etc., are also involved in financial decline in poultry. In contrast, the common diseases that affect poultry birds include collibacillosis, Newcastle disease, infectious bronchitis, coccidiosis, enteritis, infectious coryza, fowl pox, hydropericardium syndrome, salmonellosis, and aspergillosis [13]. It has been found through scientific research that the small-scale poultry farms are vulnerable to parasitic diseases, where the most common diseases found on these farms include coccidiosis, and then viral diseases [14]. The common signs observed during poultry bird diseases include depression, ruffled feathers, diarrhea (watery or bloody), breathing difficulty (respiratory rales), coughing, salivation, swollen head and eye regions, torticollis, and loss of egg productivity [15].

Ethnoveterinary Practices in Poultry Disease Management

The term "ethno-veterinary medicine" (EVM) describes the local approach to animal health management that incorporates the customs, knowledge, methods, and culture of a particular society [16,17]. By providing alternative approaches to veterinary care, EVM has contributed significantly to veterinary science [18]. Despite being widely used, the use of EVM in veterinary research has necessitated scientific validation to ensure its safety and effectiveness [16]. In order to improve growth and development and reduce bird mortality, herbal medicinal medications have been added to the drinking water of poultry, such as broilers, layers, local chickens, quails, ducks, and pet birds. The improved effectiveness of feed and chicken health is demonstrated by the use of a combination of medicinal herbs as a feed addition [7].

Flavonoids, phenols, tannins, terpenoids, alkaloids, and saponins are among the phytochemicals found in medicinal plants that have antioxidant, anti-inflammatory, anti-diabetic, anti-helminthic, cytotoxic, anticancer, antifungal, antiviral, and immune-stimulatory qualities. The growing incidence of antibiotic resistance is addressed by the use of medicinal herbs in animal feed. Additionally, this will assist food safety and poultry production [19]. Secondary metabolites from plants are responsible for their therapeutic effects, which vary depending on their concentration, combination, and use in animal feed [7]. This article highlights a number of ethnoveterinary techniques used in the management of poultry diseases.

Growth Promoter Plants

Growth promoters are substances that are added to animal feed as supplements or injections to improve the feed conversion ratio and growth in livestock and poultry. They increase the conversion rate of feed into muscle primarily by improving the distribution of fat and protein. Recently, with the ban on the use of antibiotics in broiler diets as growth promoters, there has been an increase in the inclusion of natural substances in broiler feeds [20]. There are different types of plant or herbal extracts that are frequently included in the diet of poultry in order to enhance their performance and health by improving body weight gain and feed efficiency [21].

Several plants are used as growth promoters like Aloe leaves (*Aloe vera*) which act as growth promoters and immunomodulators, Moringa leaves (*Moringa oleifera*) acting as a protein supplement and economically used in broiler production. Cinnamon bark (*Cinnamomum cassia*) is a potent growth promoter in broilers' diet. Pomegranate (*Punica granatum*) peel, Ginger rhizome (*Zingiber officinale*) improves the feed conversion ratio and meat quality, Rosemary leaves (*Rosmarinus officinalis*) have high antioxidant capacity [22]. *Ocimum basilicum* & *Ocimum sanctum* (basil) are used as growth promoters. Turmeric (*Curcuma longa*) rhizome enhances the feed utilization to promote growth. Onion bulb (*Allium cepa*) improves the role of microflora in digestion. It influences the growth performance of chicks and is hence used as a growth promoter. In poultry, *Allium sativum* (garlic) is used as a prebiotic to enhance growth [4].

Plants used to treat specific poultry diseases

In poultry, *Allium sativum* (garlic) is used as a disinfectant during Ranikhet disease outbreaks. *Curcuma longa* (turmeric) is effective in respiratory diseases, wing rot and fowl pox. *Azadirachta indica* (neem) and *Cuminum cyminum* (Cumin) are effective against Ranikhet disease and fowl pox [4]. *Strychnos cocculoides* unripe fruit is crushed, then the contents are mixed with water and given to birds in drinking water to cure Newcastle Disease and Fowl pox. *Senna singueana* is dissolved in the drinking water of birds to treat Newcastle Disease. Fresh leaves extract and sap of *Ximenia americana* are given to birds affected with fowl pox. The fruit of *Citrus limon* is also effective in fowl pox. The seeds of *Capsicum frutescens* are crushed and mixed with a sugar solution for the birds to drink to cure Newcastle Disease [23]. The rhizome of *Amorphophallus paeoniifolius* and the bark of *Bridelia scandens* are effective in Fowl Pox. The fruit of *Anacardium occidentale*, leaves of *Annona squamosa, Cannabis sativa, Coriandrum sativum* and seeds of *Brassica nigra* are beneficial in managing Ranikhet disease [6].

Plants with Anticoccidial Activity

Coccidiosis is among the deadliest disease conditions affecting the global poultry sector. Thus, coccidiosis prevention and control remain the highest priority for the poultry sector. Due to increased drug resistance and the presence of drug residues in the meat, eggs, and environment, there is an urgent need for herbal plants to manage coccidiosis. Various diseases can be cured using traditional alternative medicines, which are made from various plant, herb, or mineral components. Herbal mixture combinations have been incorporated into animal feed, producing satisfactory results in controlling coccidiosis on poultry farms [24].

Carica papaya leaves, often known as papaw leaves, have been shown to considerably reduce coccidial oocysts. *Eimeria tenella* infection symptoms have been demonstrated to decrease when whole or oil flaxseed is added to the beginning diets of day-old chicks. *Mesembryanthemum cordifolia* (rock rose/red aptenia), *Morinda citrifolia* (beach mulberry/cheese fruit), and *Malvaviscus arboreus* (turkscap) all have anti-coccidial properties. Several plants exhibit anti-coccidial properties, such as *Holorrhena antidysentrica* (kurchi), Allium spp., and Berberis spp [7]. Mixed infections with Eimeria spp. can be treated with a combination of *Quercus infectoria*, *Artemisia annua*, and *Allium sativum* [24]. *Camellia sinensis* (Green tea) extract prevents the sporulation of coccidial oocysts and deactivates the enzymes liable for coccidian sporulation due to the presence of polyphenolic compounds [25,22]. Saponins present in *Cyamopsis tetragonoloba* (guar bean) lyse coccidian oocysts, reducing the chances of coccidiosis in poultry [26]. Curcumin (diferuloylmethane) in *Curcuma longa* (turmeric) rhizome inhibits sporozoites of E. tenella and diminishes gut damage in poultry [22]. The fruits of *Phyllanthus emblica* (Amla) possess tannins, which render their application in the treatment of coccidiosis [27]. *Moringa oleifera* (drumstick tree) leaves contain flavanol, rutin and glycosides, which are administered in drinking water to poultry by crushing to reduce oocyst count and increase body weight [28,29]. *Olea europea* (olive tree) contains saponins and maslinic acid, the novel anticoccidial component in the fruit and leaves that lyse the oocysts [30] Gallic acid and ellagic acid found in *Quisqualis indica* (Rangoon creeper) lower oocyst count and bird mortality [31]. The flavonoid-echinolone and chloric acid found in *Echinacea purpurea* (cone flower) trigger the immune system's humoral response against coccidiosis [22].

By causing oxidative stress, berberine, an isoquinoline alkaloid found in the root and bark of Berberis lyceum (Barberry), suppresses the sporozoites of *E. tenella* in chickens [22,32]. Similarly, by downregulating oxidative stress, proanthocyanidin found in Vitis vinifera (grape seed) lessens coccidiosis [33]. Aloe vera fresh leaves ground and added to drinking water exhibited considerably fewer intestinal lesions [29,34]. *Pinus radiata* bark is effective in E. tenella, E. maxima, and E. acervuline infections [22]. *Catharanthus roseus* roots and *Senna singueana* are mixed in drinking water separately to treat coccidiosis [23].

Plants with anthelmintic activity

Endoparasites are major issues that enhance financial losses in large commercial systems or in household chicken farms in remote areas [35]. The promise of plant-based therapies to combat parasites is currently being recognised more and more. Numerous plants have been shown to possess anthelmintic qualities, which are important in treating parasite disorders by lowering stress and reducing oxidative stress, which improves nutrients, health, and productivity. Their use may limit drug resistance and drug residues in chicken meat, and they could serve as a replacement for synthetic medications that are sold commercially [7].

Herbal plants such as *Anacardium occidentale* (Cashew nut), *Allium sativa* (garlic), *Tribulus terrestris* (Gokhru), *Bassia latifolia* (Butter tree, Mahua), *Piper betle* (Betle Pepper), *Morinda citrifolia* (Indian Mulberry), *Cassia occidentalis* (Negro-coffee), and *Aloe secundiflora* (Aloe vera) have anthelmintic action against *Ascaridia galli in vitro* while *Psorelia corylifolia* (babchi), *Piper betle* (Betle Pepper), *Pilostigma thonningi* (monkey biscuit tree), *Caesalpinia crista* (Squirrel's Claws), *Ocimum gratissimum* (basil-clove), and *Anacardium occidentale* (Cashew nut) are effective *in vivo* [36]. The oil from leaves and flowers of *Chenopodium ambrosioides* is also used as an anthelmintic [37]. In poultry, *Andrographis paniculata* (green chiretta) is also an effective anthelmintic [4].

Phenolic acids that exist in *Brassica rapa* L and *Terminalia avicennioides* Guill and Perri have an impact on helminth's signal transduction and gene expression. The isoflavones present in *Acacia oxyphylla* lead to the helminth's flaccid paralysis and energy production inhibition, as well as its inability to utilize calcium. The flavonoids of *Chenopodium album* L and *Mangifera indica* L produce an effect based on phosphodiesterase and Ca^{2+}-ATPase action. Terpenoids of *Cucurbita moschata* L result in neurotransmission disorders leading to paralysis and the inability to hatch eggs. These plants could be used for their anthelmintic activity in poultry [38]. Papain – a protein hydrolyzing enzyme in the leaves of papaya can digest parasites [39, 40].

Plants used to eliminate ectoparasites

Birds may host several ectoparasites on their bodies, which include lice, fleas, mites, and ticks. These ectoparasites cause irritation and restlessness in birds, a darkened or soiled appearance of feathers, and can interfere with feed consumption, ultimately resulting in a decrease in productivity [41]. To eradicate ectoparasites, fermented water of *Allium cepa* (onion) bulb or *Allium sativum* (garlic) is sprinkled onto the birds. Grind the dried roots of Solanum indicum and suspend in drinking water for ectoparasite treatment [29]. *Allium sativum* bulbs are chopped or ground and mixed in 4 litres of water and used as a bird wash once daily until free of lice [42]. Fresh leaves of *Lippia javanica* are applied to the fowl run for ectoparasites [23]. For treating red bird mites, chopped dried stems of *Nicotiana rustica* (Wild tobacco) are used. Its seed pods and leaves are also used for external parasites in poultry [43].

Plants with Antibacterial Activity

In spite of the production of many new antibiotics during the last few decades, the frequency of resistance among bacteria towards these drugs has increased. In most cases, bacteria have innated resistance mechanisms towards antibacterials that are specifically produced for the cure of infections in humans and animals. Extracts from cumin seeds (*Cuminia cyminum*) can damage the cell walls of bacteria and detach their internal cellular structures. *Ginger rhizome* (Zingiber officinale) inhibits bacterial multiplication. Membrane permeability and oxidative stress in bacteria are enhanced by Clove flowers (*Syzygium aromaticum*). Pomegranate peel (*Punica granatum*) disrupts bacterial protein secretions. Thyme leaves (*Thymus vulgaris*) lead to lysis of bacterial cell walls [22].

By stimulating phagocytes, the tannins in Amla fruit powder have the capacity to eradicate microorganisms. Guava fruits contain compounds that stop strains of *Salmonella typhimurium* and *Escherichia coli* from growing. Tannins, terpenoids, alkaloids, and flavonoids found in *Syzygium cumini* plant sections, such as the stem, have an impact on the growth of *Bacillus amyloliquefaciens*, *S. aureus, E. coli*, and *Pseudomonas aeruginosa*. Pathogens like Salmonella, Klebsiella spp., Streptococcus spp., Proteus spp., and *S. aureus* are impacted by bioactive substances found in eucalyptus leaves, such as tannins, flavonoids, volatile oils, and terpenoids. Tamarind fruits include alkaloids, flavonoids, saponins, and tannins that inhibit the growth of *Salmonella paratyphi* A, *Klebsiella pneumoniae*, and *E. coli*. [44].

Plants with antifungal properties

Antifungal chemicals derived from plants can be a practical option for developing innovative and enhanced alternative formulations in the field of antifungal medicine. The most prevalent fungi-related ailments in birds of all species include Aspergillosis, Dactylariosis, Histoplasmosis, Candidiasis, Cryptococcosis, Rhodotorulosis, Torulopsis, Mucormycoses, and Cryptococcosis [45]. Aspergillosis is the most frequent respiratory disease in birds caused by Aspergillus fumigatus compared to other Aspergillus spp [46]. *Carum copticum* (ajwain) seeds and fruit extract are effective against Aspergillus spp. by inhibiting growth [47]. Clove essential oil (CEO) and Lemon leaf extract have antifungal properties against *Penicillium glabrum* fungi with CEO being more effective in inhibiting the development of fungus than lemon leaf extract [48]. Spinach leaves (Spinacia oleracea), *Mentha arvensis* (mint) leaves, *O. sanctum* leaves, *A. sativum* bulbs and *C. longa* rhizomes are also used as antifungals in poultry [44]. Additionally, the leaves of the *Satureja bachtiarica* species contain substances like thymol and γ-terpinene that inhibit the growth of *Candida albicans*, *Candida krusei*, and *Kennedia glabrata* [49]. *Prosopis spicigera, Zingiber officinale*, and *Trachyspermum ammi* are rich in alkaloids, amino acids, protein, sterols, and terpenes that prevent *Candida albicans*, *Candida krusei*, and *Candida tropicalis* from growing [50]. Essential oils of oregano, thyme, clove, cinnamon, and tea tree have demonstrated antifungal action against *Aspergillus fumigatus* and *Candida albicans in vitro* [51].

Plants used to treat Respiratory tract infections

To treat respiratory disorders, crushed bulbs of *Allium cepa* (onion) or *Allium sativum* (garlic) are placed in drinking water [29]. In chronic respiratory distress, *Piper nigrum* (Pepper) is effective. *Ocimum basilicum* & *Ocimum sanctum* (basil) are used for respiratory problems in poultry [4].

Plants with antipyretic activity

Capsicum annuum (Bell pepper) fruit powder and weaver ant (*Oecophylla maragdina*) is crushed and given to birds as feed for the antipyretic effect. Similarly, *Mimosa pudica* roots are crushed and prepared for feeding the birds [52]. *Coriandrum sativum* leaves are also used for fever in birds [6]. Curcumin, the main bioactive in turmeric [53]. is capable of damaging the bacterial membrane integrity to reduce fever [54].

Plants used to heal wounds

Datura stramonium leaves are crushed and their extract applied to wounds [23,29]. Similarly, *Bidens pilosa* leaf extract and *Ximenia caffra* leaf extract are separately used to heal wounds. *Solanum incanum* dried roots are ground and dissolved in drinking water for treating wounds [23].

Miscellaneous uses of herbal plants

Phyllanthus emblica (Amla) as an anti-stressor in poultry supplemented through feed in summer [4]. Aloe vera leaves have immunomodulatory action [22]. For curing eye problems (conjunctivitis), *Curcuma longa* (turmeric) rhizome powder and mustard oil are mixed and applied on the affected area of the eye [52].

Limitations of EVM

Despite several advantages of Ethnoveterinary medicine (EVM), there are limitations like seasonal availability of plants, some remedies are inconvenient to prepare or use or sometimes ineffective or harmful, traditional diagnoses may be inadequate, their dosages are uncertain and treatments are also not standard. Ethnomedicine is less suitable for treating epidemic & endemic infectious [52]. Interactions between natural products and drugs are not fully explored [55]. The scope of dissemination of some ethnoveterinary methods is limited as they are often very localised. Scientific validation of the effectiveness of cures is variable according to season and method of preparation. Moreover, EVM has little significance against the acute viral diseases of animals [56]. The lack of proper documentation of knowledge has been one of the major setbacks of ethno-veterinary medicine. In addition, modernisation has brought about changes in people's lifestyles which have influenced the use or total loss of EVM [57].

CONCLUSION

There are a number of medicinal plants that have been utilized as a means of controlling a range of poultry diseases. When added to the diet of birds, phytochemical components found in them make them good substitutes to antibiotics. To ensure sustainable poultry farming, enhance food security and mitigate any incidences of antibiotic resistance, it is imperative that the utilization of medicinal plants should be extensively researched. While information in traditional medicine is varied, there have not been many efforts made to interpret its uses in clinical practices. EVM will help mitigate the use of antimicrobial residues, reduce the dependency on antimicrobials and other chemical veterinary drugs in the management of veterinary health using poultry production that is both safe and economical.

Author Contributions

Swati Koli, Gayatri Dewangan, and Rajeev Ranjan were involved in concept, design and literature review. Ravindra S. Tayde, Gaya P. Jatav and Shweta Rajoriya conceptualised the manuscript. Statistical analysis and data acquisition not applicable. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

The data that support the findings of this study are available and will be made available upon request.

Use of AI in Drafting of Manuscript

The authors declare that they have not used any generative AI/AI-assisted technologies in the writing of this manuscript.

Conflict of interest

The authors declared no conflict of interest.

Financial Support

None declared.

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REFERENCES

1. Osuji MN. Assessment of factors affecting poultry (broiler) production in Imo State, Nigeria. Asian *J Agric Ext Econ Sociol*. 2019;3(2):1-6.

2. Chatterjee RN, Rajkumar U. An overview of poultry production in India. *Indian J Anim Health*. 2015;54(2):89-108.
3. Grace D, Knight-Jones TJD, Melaku A, Alders R, Jemberu WT. The public health importance and management of infectious poultry diseases in smallholder systems in Africa. *Foods*. 2024;13(3):411;1-19.
4. Divisha R, Soundararajan C, Arul Prakash M. Ethno-veterinary medicine in poultry health management. *Vet Sci Res*. 2018;3(4):000168.
5. Wang J, Deng L, Chen M, Che Y, Li L, Zhu L, *et al*. Phytogenic feed additives as natural antibiotic alternatives in animal health and production: a review of the literature of the last decade. *Anim Nutr*. 2024;17:244-64.
6. Nair MN, Punniamurthy N, Kumar SK. Ethno-veterinary practices for animal health management and the associated medicinal plants from 24 locations in 10 Indian states. *Curr Res Agric Vet Sci*. 2021;3:86-102.
7. Jamil M, Aleem MT, Shaukat A, Khan A, Mohsin M, Rehman TU, *et al.* Medicinal plants as an alternative to control poultry parasitic diseases. Life. 2022;12(3):449.
8. Oladeji JO, Ogunleye KY, Adejumo AA. Perception of ethno-veterinary medicine among poultry farmers in Oyo State. *Int J*. 2020;7(3):194-201.
9. Nascimento GGF, Locatelli J, Freitas PC, Silva GL. Antibacterial activity of plant extracts and phytochemicals on antibiotic-resistant bacteria. *Braz J Microbiol*. 2000;31:247-56.
10. Raut JS, Karuppayil SM. A status review on the medicinal properties of essential oils. *Ind Crops Prod*. 2014;62:250-64.
11. Moreki JC, Poroga B, Dikeme R, Seabo D. Ethnoveterinary medicine and health management in poultry in Southern and Western Districts, Botswana. *Livest Res Rural Dev*. 2010;22(6):107.
12. Mor-Mur M, Yuste J. Emerging bacterial pathogens in meat and poultry: an overview. *Food Bioprocess Technol*. 2010;3:24-35.
13. Bano S, Naeem K, Malik SA. Seroprevalence of avian influenza virus and its relationship with high mortality and dropped production. *Avian Pathol*. 2003;32:283-7.
14. Ahmed A, Mijinyawa MS, Adamu AY, Suleiman AO. Small holder poultry management practices and constraints among women poultry farmers in Kano, Nigeria. Niger Vet J. 2011;32(2);151-23.
15. Akidarju MS, Onyemaechi EG, Dauda MG. An assessment of some poultry management practices and disease recognition by poultry farmers in Maiduguri arid zone, Nigeria. *Worlds Poult Sci J*. 2010;66(2):285-96.
16. Wanzala W, Zessin KH, Kyule NM, Baumann MPO, Mathia E, Hassanali A. Ethnoveterinary medicine: a critical review of its evolution, perception, understanding and the way forward. 2005;17(11):1-40.
17. Lulekal E, Kelbessa E, Bekele T, Yineger H. An ethnobotanical study of medicinal plants in Mana Angetu District, southeastern Ethiopia. *J Ethnobiol Ethnomed*. 2008;4(1):1-10.
18. Majeed M, Bhatti KH, Amjad MS, Abbasi AM, Bussmann RW, Nawaz F, *et al*. Ethno-veterinary uses of Poaceae in Punjab, Pakistan. PLoS One. 2020;15(11):e0241705.
19. Olujimi AJ. Medicinal plants and their applications in poultry production: a review. *Int J Glob Sustain Res*. 2025;3(4):285-92.
20. Jouany JP, Morgavi DP. Use of natural products as alternatives to antibiotic feed additives in ruminant production. *Animal*. 2007;1:1443-66.
21. Niranjan D, Sridhar NB, Chandra US, Manjunatha SS, Borthakur A, Vinuta MH, *et al*. Recent perspectives of growth promoters in livestock: an overview. *J Livest Sci*. 2023;14:53-64.
22. Abo-EL-Sooud K. Ethnoveterinary perspectives and promising future. *Int J Vet Sci Med*. 2018;6(1):1-7.
23. Jambwa P, Katsande S, Matope G, McGaw LJ. Ethnoveterinary remedies used in avian complementary medicine in selected communal areas in Zimbabwe. *Planta Med*. 2022;88(3-4):313-23.
24. Li T, Fei C, Wang X, Wang C, Zhou W, Zhang R, *et al*. The effects of various herbal extract combinations on Eimeria tenella-infected broilers investigated in battery experiments. *J Appl Poult Res*. 2026;100682.
25. Molan AL, Faraj AM. Effect of selenium-rich green tea extract on the course of sporulation of Eimeria oocysts. *J Dent Med Sci*. 2015;14:68-74.
26. Hassan SM, El-Gayar AK, Cadwell DJ, Bailey CA, Cartwright AL. Guar meal ameliorates Eimeria tenella infection in broiler chicks. *Vet Parasitol*. 2008;157:133-8.
27. Kaleem QM, Akhtar M, Awais MM, Saleem M, Zafar M, Iqbal Z. Studies on Emblica officinalis-derived tannins for their immunostimulatory and protective activities against coccidiosis in industrial broiler chickens. *Sci World J*. 2014;2014:378473.
28. Ola-Fadunsin SD, Ademola IO. Direct effects of *Moringa oleifera Lam*. (Moringaceae) acetone leaf extract on broiler chickens naturally infected with Eimeria species. *Trop Anim Health Prod*. 2013;45:1423-8.
29. Gobvu V, Pote W, Poshiwa X, Benhura MA. A review of ethnoveterinary medicines used for poultry health management in Zimbabwe. *Worlds Poult Sci J*. 2023;79(4):851-65.
30. De Pablos LM, Dos Santos MFB, Montero E, Garcia-Granados A, Parra A, *et al*. Anticoccidial activity of maslinic acid against infection with Eimeria tenella in chickens. Parasitol Res. 2010;107:601-4.
31. Youn HJ, Noh JW. Screening of the anticoccidial effects of herb extracts against Eimeria tenella. *Vet Parasitol*. 2001;96:257-63.
32. Malik TA, Kamili AN, Chishti MZ, Tanveer S, Ahad S, Johri RK. *In vivo* anticoccidial activity of berberine [18,5,6-dihydro-9,10-dimethoxybenzo(g)-1,3-benzodioxolo(5,6-a)quinolizinium]—an isoquinoline alkaloid present in the root bark of Berberis lycium. Phytomedicine. 2014;21:663-9.
33. Wang ML, Suo X, Gu JH, Zhang WW, Fang Q, Wang X. Influence of grape seed proanthocyanidin extract in broiler chickens: effect on chicken coccidiosis and antioxidant status. *Poult Sci*. 2008;87:2273-80.
34. Yim D, Kang SS, Kim DW, Kim SH, Lillehoj HS, Min W. Protective effects of Aloe vera-based diets in Eimeria maxima-infected broiler chickens. *Exp Parasitol*. 2011;127:322-5.
35. Angel C, Akhter N, Arijo A, Qureshi TA, Gandahi JA, Qazi IH. Comparative efficacy of ivermectin and *Nigella sativa* against helminths in Aseel chickens (*Gallus gallus* domesticus). *J Helminthol*. 2019;93:533-8.
36. Raza A, Muhammad F, Bashir S, Aslam B, Anwar MI, Naseer MU. *In vitro* and *in vivo* anthelmintic potential of different medicinal plants against *Ascaridia galli* infection in poultry birds. Worlds Poult Sci J. 2015;72:115-24.
37. Guarrera PM. Traditional antihelmintic, antiparasitic and repellent uses of plants in Central Italy. *J Ethnopharmacol*. 1999;68(1-3):183-92.
38. Zirintunda G, Biryomumaisho S, Kasozi KI, Batiha GES, Kateregga J, Vudriko P, *et al*. Emerging anthelmintic resistance in poultry: can ethnopharmacological approaches offer a solution? *Front Pharmacol*. 2022;12:774896.
39. Nghonjuyi NW, Tiambo CK, Kimbi HK, Manka'a CN, Juliano RS, Lisita F. Efficacy of ethanolic extract of *Carica papaya* leaves as a substitute for sulphonamide for the control of coccidiosis in Kabir chickens in Cameroon. *J Anim Health Prod*. 2015;3(1):21-7.

40. Al-Fifi ZIA. Effect of leaf extracts of *Carica papaya*, Vernonia amygdalina and Azadirachta indica on coccidiosis in free-range chickens. *Asian J Anim Sci.* 2007;1(1):26-32.
41. Soulsby EJL. Helminths, arthropods and protozoa of domesticated animals. 7th ed. London: Baillière Tindall; 1982. p. 366-87.
42. Guèye EF. Ethnoveterinary medicine against poultry diseases in African villages. *Worlds Poult Sci J*. 1999;55(2):187-98.
43. Iqbal Z, Lateef M, Jabbar A, Ghayur MN, Gilani AH. *In vitro* and *in vivo* anthelmintic activity of *Nicotiana tabacum* L. leaves against gastrointestinal nematodes of sheep. *Phytother Res*. 2006;20:46-8.
44. Hartady T, Syamsunarno MRA, Priosoeryanto BP, Jasni S, Balia RL. Review of herbal medicine works in avian species. *Vet World*. 2021;14(11):2889-99.
45. Arne P, Risco-Castillo V, Jouvion G, Le Barzic C, Guillot J. Aspergillosis in wild birds. *J Fungi (Basel).* 2021;7(3):241.
46. Tell LA, Burco JD, Woods L, Clemons KV. Aspergillosis in birds and mammals: considerations for veterinary medicine. In: Recent developments in fungal diseases of laboratory animals. Cham: *Springer International Publishing*; 2019. p. 49-72.
47. Alizadeh A, Zamani E, Sharaifi R, Javan-Nikkhah M, Nazari S. Antifungal activity of some essential oils against toxigenic Aspergillus species. *Commun Agric Appl Biol Sci*. 2010;75(4):761-7.
48. Moustafa SMN, Elsayed TR, El-Dahshour MF, Gomah SA, Zhang L, Mustafa NS. *Biosci Res*. 2024;21(1):228-40.
49. Pirbalouti AG, Bahmani M, Avijgan M. Anti-Candida activity of some Iranian medicinal plants. *Electron J Biol*. 2009;5(4):85-8.
50. Khan R, Zakir M, Afaq SH, Latif A, Khan AU. Activity of solvent extracts of *Prosopis spicigera*, *Zingiber officinale* and *Trachyspermum ammi* against multidrug-resistant bacterial and fungal strains. *J Infect Dev Ctries*. 2010;4(5):292-300.
51. Akram D, Yaseen G, Razzaq MA, Ali M, Dar NW, Ilyas S, *et al*. Essential oils for poultry disease control: a natural antifungal strategy. *Res Med Sci Rev*. 2025;3(9):286-97.
52. Muwal H, Bhateshwar V. Ethno-veterinary medicine and health management in livestock and poultry. *Agri Mag*. 2022;1(2):58-61.
53. Teow SY, Liew K, Ali SA, Khoo ASB, Peh SC. Antibacterial action of curcumin against *Staphylococcus aureus*: a brief review. *J Trop Med*. 2016;2016:2853045.
54. Tyagi P, Singh M, Kumari H, Kumari A, Mukhopadhyay K. Bactericidal activity of curcumin I is associated with damaging of bacterial membrane. *PLoS One*. 2015;10(3):e0121313.
55. Shi S, Klotz U. Drug interactions with herbal medicines. *Clin Pharmacokinet*. 2012;51:77-104.
56. SriBalaji N, Chakravarthi VP. Ethnoveterinary practices in India: a review. *Vet World*. 2010;3(12):549-51.
57. Ayoola MO, Ogunlakin AD, Oguntunji AO. Status of ethno-veterinary medicine in the management of dairy animals in Nigeria. *J Anim Health Prod*. 2025;13(1):88-105.

HOW TO CITE THIS ARTICLE

Koli S, Dewangan G, Tayde RS, Jatav GP, Rajoriya S, Ranjan R. Ethnoveterinary practices in poultry production: As an alternative to curb antimicrobial resistance. J Phytopharmacol 2026; 15(3):168-173. doi: 10.31254/phyto.2026.15309