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Ethno-Veterinary Approaches to Mastitis Treatment in Cattle: A Sustainable and Cost-Effective Alternative

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Abstract

Mastitis, a prevalent and costly disease in dairy cattle, significantly reduces milk yield and quality while imposing high veterinary expenses. Conventional treatments largely depend on antibiotics, but concerns over antimicrobial resistance (AMR), drug residues, and economic burden necessitate alternative approaches. Ethnoveterinary medicine (EVM), based on traditional plant-derived remedies, offers an effective, affordable, and residue-free option for mastitis management. Various ethnomedicinal formulations—such as Aloe vera–turmeric–lime–lemon pastes, Withania somnifera root preparations, Calotropis poultices, essential oil-based ointments, and herbal oral therapies—have demonstrated clinical cure rates comparable to antibiotics, with added advantages of cost-effectiveness, safety, and sustainability. Beyond treatment, EVM supports udder health through its antimicrobial, anti-inflammatory, and immunomodulatory properties, while aligning with organic and eco-friendly farming practices. The integration of EVM into dairy management could mitigate AMR risks, reduce treatment costs, and enhance animal welfare. Further research, validation, and standardization will strengthen its role as a sustainable complement to modern veterinary medicine.

Key Words: Cattle, Mastitis, Ethno medicine, Treatment

1. Introduction

Mastitis, an inflammation of the udder tissue predominantly caused by bacterial infection, remains a significant health issue in dairy cattle worldwide. This condition not only reduces milk yield and quality but also incurs high veterinary costs, posing challenges to dairy farmers, especially smallholders. Conventional allopathic treatments primarily rely on antibiotics, which bring concerns such as the emergence of antimicrobial resistance (AMR), drug residues in milk, extended withdrawal periods, and considerable expense. Against this backdrop, ethnoveterinary medicine (EVM) — traditional knowledge-based, plant-derived remedies — offers a promising, affordable, and safer alternative for managing mastitis.

2. Understanding Ethno veterinary Medicine in Mastitis

Ethno veterinary medicine (EVM) encompasses indigenous animal healthcare practices using locally sourced plants and natural materials. These treatments are embedded in cultural traditions and adapted to local resources, often minimizing dependency on external

pharmaceutical inputs. In mastitis management, EVM focuses on harnessing the therapeutic properties of herbs and mineral supplements administered topically or orally.

3. Efficacy of Ethno veterinary Treatments

Multiple studies and field applications have demonstrated that ethnoveterinary treatments can yield clinical improvement rates between 83% and 96%, closely paralleling or sometimes exceeding the effectiveness of conventional antibiotics. For instance, a trial involving an Aloe vera-turmeric-lime-lemon paste reported an 89% recovery rate within 4–5 days of treatment. Such results underscore EVM's potential not only to cure but also to prevent the recurrence of mastitis.

4. Advantages over Allopathic Treatments

a) No Antibiotic Residues: Milk from cows treated with EVM remains free from potentially harmful antibiotic residues, eliminating withdrawal periods and ensuring safer dairy products.
b) AMR Mitigation: Plant-based formulations reduce the likelihood of developing drug-resistant bacterial strains, a growing global health concern linked to antibiotic overuse.
c) Cost-Effectiveness: Ethnoveterinary remedies typically cost between Rs. 100–500 per mastitis case, significantly less than the Rs. 500–4,000 range for standard antibiotic therapies, making treatment accessible to economically marginalized farmers.
d) Broader Health Benefits: Many herbal components exhibit anti-inflammatory, immunomodulatory, and antimicrobial effects that support overall udder health and animal well-being.

5. Key Ethno veterinary Remedies for Mastitis

a) External Applications

I. Aloe Vera and Turmeric Paste: Combining approximately 200–250g of Aloe vera pulp with 50g turmeric powder, 5–15g calcium hydroxide (lime), and juice of 1–2 lemons forms a potent topical paste. Regular application (3–5 times daily) on affected udders promotes healing and reduces inflammation.
II. Withania somnifera (Ashwagandha) Root Paste: Applied topically over several days, it supports recovery in chronic or recurrent cases.
III. Calotropis procera Poultices: Used for pain relief and reducing swelling, applied cautiously on the inflamed area.
IV. Essential Oil-Based Ointments (Eg: Phyto-Bomat): These blends of medicinal plant oils applied topically have demonstrated clinical cure rates comparable to antibiotics without residue issues.

b) Oral Treatments

i. Herbal Leaf and Fruit Mixes: Feeding cattle with combinations such as curry leaves, moringa leaves, jaggery, and lemon or tamarind extract boosts systemic recovery through immunomodulation.
ii. "Three Kings" Mixture: An oral paste made from betel leaves, black pepper, salt, and jaggery has traditional prominence in improving udder health.
iii. Lemon Feeding: Orally administering fresh lemon pieces or juice thrice daily aids in healing due to its natural antimicrobial properties.

c) Hygiene and Preventive Measures

Topical soaps and ointments incorporating plants like Tridax procumbens, Mentha spicata, and Aloe vera are widely used to maintain udder hygiene and prevent infection onset.

6. Scientific and Practical Insights

Research into these herbal remedies reveals that the phytochemicals within—such as curcumin in turmeric, aloin in Aloe vera, and various essential oils—possess potent antimicrobial, anti-inflammatory, and antioxidant properties. This multifaceted mode of action aids in controlling infection, reducing inflammation, and accelerating tissue repair.

From a practical standpoint, ethnoveterinary practices are sustainable and environmentally friendly, relying on easily accessible materials. They align well with organic farming principles and reduce dependence on synthetic drugs. However, preparation and consistent application require farmer knowledge and effort, which can be supported through extension services and development of ready-to-use herbal products.

7. Conclusion

Ethnoveterinary medicine presents a scientifically supported, economically viable, and ecologically sound approach to manage mastitis in dairy cattle. By combining traditional wisdom with modern validation, EVM offers effective treatment outcomes comparable to antibiotics while mitigating risks related to drug residues and antimicrobial resistance. Its affordability and accessibility empower smallholder farmers to improve animal health sustainably. Further research, standardization, and awareness programs could enhance acceptance and integration of EVM into mainstream veterinary practice, promoting healthier dairy industries worldwide.

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