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Popular Article

The Progression of Myiasis and Management in The Free Ranging Cattle Of Tamil Nadu In India

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Abstract

Myiasis is a parasitic infection on cattle due to maggot of various parasitic fly's larvae and causes severe damage in the tissues of its affected area in animals particularly in the free-ranging cattle. This article provides information on prevalence, causes and consequences of myiasis in the indigenous Bargur cattle of Bargur Hills in the Anthiyur Taluk of Erode Tamil Nadu. The ectoparasites fly's species belongs to families namely Calliphoridae, Sarcophagidae, and Muscidae usually lay eggs on the skin surface of the cattle after hatching larvae feed on living tissues, causing irritation, pain, and tissue damage and serve as a portal of entry for secondary bacterial infections. The secondary bacterial infections lead to complications such as abscesses, cellulitis, fasciitis, sepsis, and toxemia. Effective animal husbandry management strategies such as prompt antimicrobial treatment, and integrated parasite management practices are crucial for mitigating the effect control measures for myiasis and improvement of animal husbandry practices such as proper nutrition, hydration, and shelter can also reduce the susceptibility of cattle to maggot infestation.

Keywords: Ectoparasites, Flies, Myiasis, Free-ranging cattle, Muscidae, Secondary infections.

Introduction

At least 739,500 species of arthropods, relatively few such as certain flies, ticks, mites etc, are the numerous medical and veterinary importance. This is not only because many serve as carrier or intermediate hosts of other deadly parasites. Parasitic throughout their lives where as fleas are parasitic only as adults, and certain flies and mites only as larvae and parasites infect man and his livestock and cause enormous damage. The free-ranging cattle of indigenous and hybrid cattle found in rural and semi-urban areas where they usually graze on natural pastures and crop residues. These cattle are often part of Indian traditional farming systems also contribute significantly support rural economy by providing milk, draught power, and manure. The Tamil Nadu state is known for its diverse cattle breeds including both indigenous and hybrid breeds one among the state in India. Among the indigenous cattle, the Bargur cattle (Semmaraimadu) and Bargur buffalo two breeds found in the Bargur hills in Tamil Nadu along with high milk-yielder like *Jersey* and *Holstein Friesian* breeds (Selvam et al., 2023). In



general, free-ranging cattle often susceptible to various physical illnesses because easily exposure to various environmental factors and pathogens. Few common struggles include diseases caused by various pathogens, parasitic infestations, including gastrointestinal worms, liver flukes, and ectoparasites flies (Radostits et al., 2007). Although foot rot infection that causes lameness and pain, typically associated with wet and muddy conditions (Greenough et al., 1997) and mastitis infection that leading to udder inflammation and reduced milk production due to bacterial infections due to poor hygiene (Seegers et al., 2003). In addition, few infections may cause by ectoparasites because of the poor animal husbandry practices (Radostits et al., 2007). Always free ranging cattle kept in the open enclosures are susceptible for various ectoparasites infestations in the Bargur hills of TamilNadu.

Seeds of Myasis

The flies are the dominant synanthropic, endophilic and invertible species in the environment comes under order Diptera (P. Nosal et al., 2019). Besides the taxonomic classification further these flies are classified based on their feeding habits which reflecting their diverse ecological roles as follows

| Fly | Feeding Habits | Ecological Role | Examples |
|--|--|--|---|
| Herbivorous flies | Feed on nectar and pollen | Crucial role in pollination | Flower flies, Hoverflies |
| Hematophagous flies | Feed on the blood of mammals, birds, reptiles, and amphibians | Vectors of diseases such as malaria, trypanosomiasis, and leishmaniasis | Mosquitoes (Culicidae), Tsetse flies (Glossinidae), Sandflies (Psychodidae) |
| Carnivorous and Parasitic flies | Prey on other insects or infest the tissues of mammals, including humans | Control of insect populations and potential medical relevance due to tissue infestation | Robber flies (Asilidae), Botflies (Oestridae) |
| Scavenger and Omnivorous flies | Feed on decaying organic matter, plant and animal secretions, and sometimes other insects | Vital role in decomposition and nutrient cycling | Houseflies (Muscidae), Blowflies (Calliphoridae) |
| Saprophagous flies | Feed on decaying plant material, fruits, and fungi | Contribute to the breakdown and recycling of organic matter | Fruit flies (Drosophilidae) |
| Necrophagous flies | Lay eggs on dead or decaying animal carcasses, with their larvae consuming the decomposing flesh | Crucial for forensic science in determining the time of death in criminal investigations | Blowflies (Calliphoridae), Flesh flies (Sarcophagidae) |
| Source: Dhamorikar, 2017 | | | |

Mostly host ectoparasites interactions are play an important role in pathogen spill over risk, influenced by ecological and biogeographic factors (Hamer et al., 2010) and further few parasites can cause direct and indirect effect on the host. The major parasitic fly species comes under the family Calliphoridae, Sarcophagidae, Muscidae, Fannidae, Syrphidae,



Drosophilidae, and Piophilidae parasites harms livestock by causing anxiety, stress, skin lesions, myiasis, blood loss, and immunosuppression as the direct effect (P.Nosal et al., 2019). Indirectly, the diversity and prevalence of ectoparasite communities directly impact the transmission dynamics of arthropod-borne pathogens, with higher diversity leading to increased disease spread (Parola and Raoult, 2001).

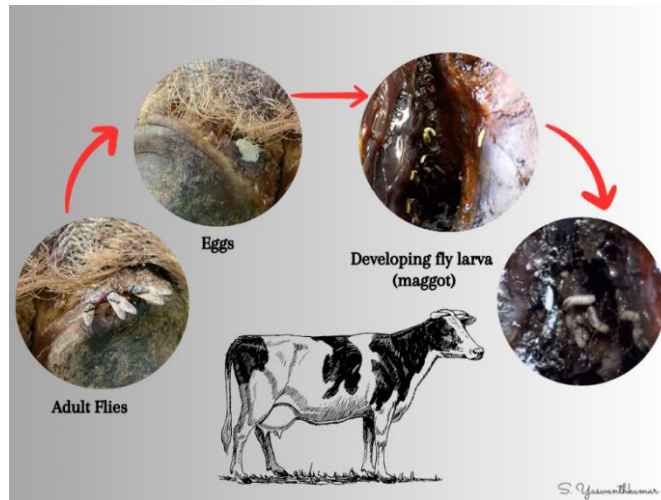


Figure 1. Mode of Myiasis Infection

Myiasis refers to parasitic infestation caused by the larvae of certain fly species that invade the living tissues of cattle and other vertebrates. Myiasis can be classified into three major types such as accidental, facultative, and obligatory. Accidental myiasis occurs when non-parasitic flies lay eggs on contaminated food or wounds. Facultative myiasis involves opportunistic larvae that can infest living tissue but can also develop in decaying matter. Obligatory myiasis is caused by species whose larvae must develop within a living host. Myiasis is a known cause of lower productivity in livestock due to pathological consequences and high management expenses. The condition commonly seen among domestic animals in the tropical areas and represents as global welfare issue, especially in livestock rich countries (Zumpt,1965).

Mode of Myiasis Infection

The female flies often laid eggs on the suitable surface areas like areas with wounds, sores, or moist environments of the cattle skin. The eggs hatches within an hour after laying the emerged larvae known as maggots immediately penetrate into the host skin and begin vigorously feeds on live tissue. The maggot infection causes significant irritation, pain, and tissue damage in the infected cattle. The larvae continue to grow and feed for several days before they leave the host to pupate in the soil (Sunny, 2018).

Parasite to Pathogen

The maggot's slowly deepens the wound day by day by feed on the cattle tissue damage is a portal entry for secondary microbial infectious diseases such as *E. coli*, *Staphylococcus aureus*, and *Streptococcus pyogenes* etc. These bacteria can be opportunistic pathogens, taking advantage of the compromised tissue and immune system of the cattle. The sequence of events from the entry to infection as follows,



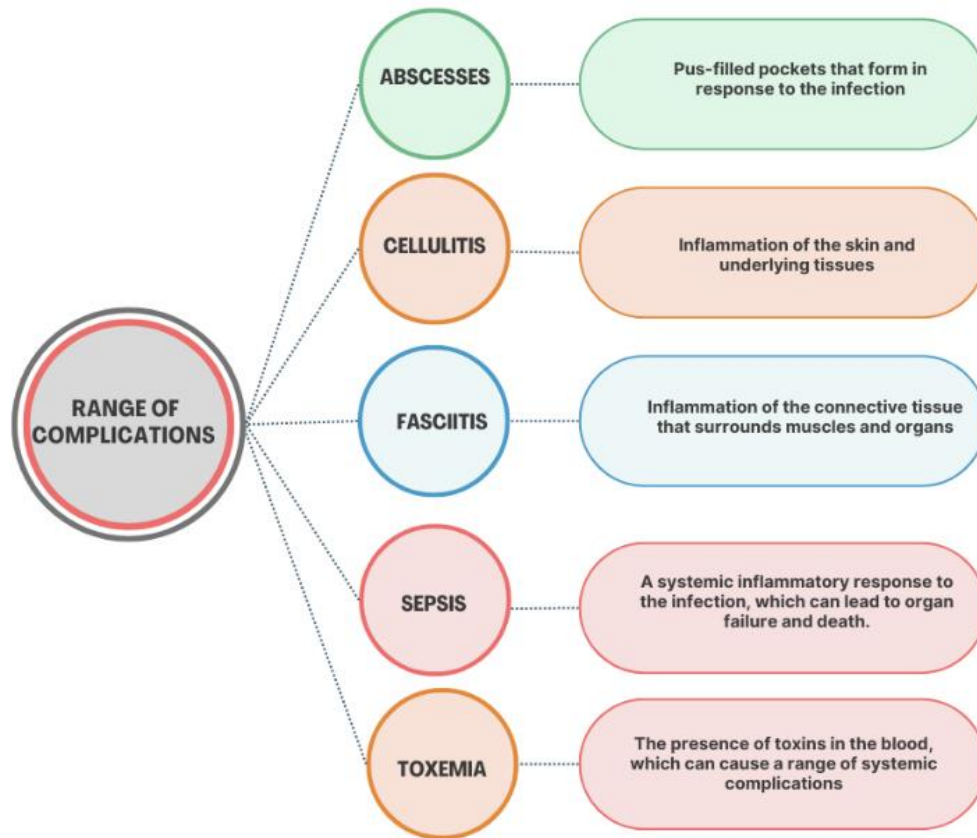


Figure 2. Range of complication of Myiasis

Maggot infestation (Larvae): The maggots feed on the cattle's tissue, causing damage and creating a wound.

1. Tissue damage and wound creation: The maggots' feeding activity creates a wound that can serve as a portal of entry for secondary pathogens.
2. Secondary bacterial infection (Pathogen): Bacteria enter the wound and cause an infection.
3. Infection leads to various complications (pathogen-induced disease): The infection can lead to a range of complications, including abscesses, cellulitis, fasciitis, sepsis, and toxemia.

Conclusion

The maggot infestation remains a significant animal welfare concern and economic burden for free-ranging cattle operations in the developing countries such like India particularly in Tamil Nadu. The occurrence of ectoparasites flies can lead to maggot formation, causing tissue damage, secondary bacterial infections, and reduced cattle productivity and milk yield. Effective management strategies, such as regular monitoring, prompt removal of maggots, antimicrobial treatment, and implementation of integrated pest management (IPM) practices,



are crucial to mitigation measure for maggot infestation. In addition, maintaining good animal husbandry practices, like proper nutrition, hydration, and shelter, can help reduce the susceptibility of cattle to maggot infestation. By prioritizing maggot control and prevention, cattle producers can promote animal welfare, reduce economic losses, and maintain a healthy and productive free-ranging cattle operation.

References

- Selvam R, Satheeshkumar P, Priyadharsini R and Richard Jagatheesan PN. (2023). Malaimadu - Hill cattle of Tamil Nadu: Habitat, characteristics and livestock keeper perceptions. *International Journal of Veterinary Sciences and Animal Husbandry*. 2. 15-17.
- Radostits, O. M., Gay, C. C., Hinchcliff, K. W., & Constable, P. D. (2007). *Veterinary Medicine: A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats*. Elsevier Health Sciences.
- Greenough, P. R., Weaver, A. D., & Weaver, L. D. (1997). *Lameness in Cattle*. W.B. Saunders Company.
- Seegers, H., Fourichon, C., & Beaudeau, F. (2003). "Production effects related to mastitis and mastitis economics in dairy cattle herds." *Veterinary Research*, 34(5), 475-491. <https://doi.org/10.1051/vetres:2003027>
- Nosal, Paweł & Kowal, Jerzy & Węglarz, Andrzej & Wyrobisz-Papiewska, Anna. (2019). The occurrence and diversity of flies (Diptera) related to ruminant farming in southern Poland. *Annals of Parasitology*. 65. 357-363. 10.17420/ap6504.221.
- Dhamorikar, A.H. (2017). Flies matter: a study of the diversity of Diptera families (Insecta: Diptera) of Mumbai Metropolitan Region, Maharashtra, India, and notes on their ecological roles. *Journal of Threatened Taxa* 9(11): 10865–10879; <http://doi.org/10.11609/jott.2742.9.11.10865-10879>
- Hamer, S. A., Tsao, J. I., Walker, E. D., Hickling, G. J. (2010). "Invasion of the lyme disease vector *Ixodes scapularis*: implications for *Borrelia burgdorferi* endemicity." *Ecohealth*, 7(1), 47-63.
- Parola, P., & Raoult, D. (2001). "Ticks and tickborne bacterial diseases in humans: an emerging infectious threat." *Clinical Infectious Diseases*, 32(6), 897-928.
- F. Zumpt, *Myiasis in Man and Animals in the old world*. (Butterworths, London, 1965)
- Sunny B, Sulthana L, James A, Sivakumar T. Maggot Infestation: Various Treatment Modalities. *J Am Coll Clin Wound Spec*. 2018 Mar 30;8(1-3):51-53. doi: 10.1016/j.jccw.2018.03.002
<https://wcv.m.usask.ca/learnaboutparasites/parasites/myiasis.php>

