

Myiasis In Livestock

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Abstract

Myiasis, derived from the Greek word "mya" meaning fly, was originally introduced to describe diseases in humans caused by dipterous larvae. It is now defined as the infestation of living vertebrates, including humans and animals, by these larvae. Flies that cause myiasis remain among the most destructive insects globally, leading to severe impacts on livestock, with economic consequences such as decreased milk production, weight loss, fertility problems, and lower hide quality. The dipterous larvae may feed on living or dead tissue, bodily fluids, or ingested food, leading to a variety of infestations depending on the location on the body and their interaction with the host. Myiasis can occur in various parts of the body, such as the eyes, intestines, mouth, nose, urogenital tract, and brain, where the larvae feed on dead or living tissues, ingested food, or body fluids. The calliphorid fly *Chrysomya bezziana* is the commonest etiologic agent, along with other blow flies. The treatment comprises mechanical removal of maggots, surgical debridement of the infested wound, intensive rinsing with antiseptic solutions, and dressing.

Introduction

Myiasis is defined as the infestation of live vertebrate animals and humans with dipterous larvae that, for at least part of their life cycle, feed on the host's dead or living tissue, bodily fluids, or ingested food. These larvae may be obligate or facultative parasites, with the former relying entirely on living vertebrate tissues for development and the latter only needing them for a short period. Species that cause obligatory myiasis require a living host for their growth, while facultative species lay eggs or larvae on living hosts only occasionally, typically developing in decaying matter. Common facultative myiasis-causing flies include *Musca domestica* (house flies); blowflies like *Calliphora*, *Lucilia*, and *Phormia* spp.; and *Sarcophaga* spp. (flesh flies). Among the types of myiasis, cutaneous myiasis, which affects the skin and underlying tissues, is particularly common and significant. For cutaneous myiasis, various terms describe the infested body regions, and it can be classified as specific, semi-specific, or accidental.

Classification

Myiasis can be classified entomologically (as obligate, facultative, or accidental/pseudomyiasis) or clinically (based on the affected part of the body).

Entomological classification of myiasis

Obligatory myiasis is caused by larva infesting living tissue, typically in wounds or body openings of warm-blooded animals, including humans, leading to severe tissue damage if not treated promptly. *Chrysomya bezziana* is a screwworm that is known for causing obligatory myiasis, similar to *Cochliomya hominivorax*.

Facultative myiasis can be further divided into primary, secondary, and tertiary forms, depending on whether the species initiates the infestation or follows an existing one. Primary flies, like *Lucilia cuprina*, initiate the infestation, while secondary flies, such as *Chrysomya bezziana*, lay eggs in wounds already created by primary larvae. Tertiary flies, like *Musca* species, arrive during the healing process. Accidental myiasis occurs with free-living larva not able to

complete its life cycle and causes pathological reaction when accidentally in contact with the host.

Clinical classification of myiasis

Myiasis can also be categorized by anatomical location, such as auricular (ear), cutaneous (skin), gastrointestinal, ophthalmic (eye), oral, and urogenital. In this context, myiasis involving the nervous system is classified as "neurological," while those affecting the respiratory system are termed "respiratory."

- Nasopharyngeal myiasis involves the nasal, sinus, or pharyngeal regions.
- Gastrointestinal target the digestive system like *Gasterophilus* flies
- Urogenital myiasis involves the urinary system (bladder, vaginal).
- Ocular myiasis affects the eyes and related tissues. *Oestrus ovis* is the main agent causing external ocular myiasis.
- Cutaneous myiasis typically develops in untreated wounds contaminated with excrement, urine, or dirt, which produce a putrid smell, creating an ideal environment for larvae. Most larvae are harmful to the host, causing extensive tissue damage, although some help clean necrotic tissue and promote healing. Severe tissue damage can lead to toxemia and fatal outcomes. Economically, cutaneous myiasis leads to decreased animal productivity, reduced meat and hide quality, and significant losses in wool production in sheep. In severe cases, extensive tissue damage, secondary infections, and toxemia can result in death. Subtypes of cutaneous myiasis include furuncular myiasis, where nodules form with larvae inside, and migratory myiasis, where larvae move under the skin, creating multiple lesions. *Cordylobia anthropophaga* (the 'tumbu fly') causes furuncular myiasis in humans and animals.
- Wound myiasis occurs when maggots infest open wounds, such as ulcers caused by neuropathy or vascular insufficiency, basal cell carcinoma, or psoriasis. Common culprits include flies from the Calliphoridae and Sarcophagidae families, such as the *Cochliomyia hominivorax*, *Chrysomya bezziana*, and blowflies like *Lucilia sericata* and *L. cuprina*. These flies have significant medical and veterinary importance due to their role in traumatic or wound myiasis.

Fly strike in sheep is primarily caused by species such as *Lucilia cuprina*, *L. sericata*, *Calliphora* sp and *Chrysomya rufifacies*. The larvae cause irritation, injury, and death to layers of skin, producing exudates. Breech strike, the most common type, typically occurs when urine or feces soil the area around the breech, often during diarrhoea. Body strike usually affects the shoulders or back, following conditions like fleece rot or dermatophilosis, and is more frequent during wet seasons or fly outbreaks. Pizzle or belly strike mainly affects wethers and rams when urine dampens the belly wool. Poll or head strike is common in horned rams.

Pathogenesis

Pathogenesis occurs when a wound on a vertebrate host emits a foul odour, attracting gravid female flies to lay eggs at the wound's edge. The larvae hatch and burrow into necrotic or living tissues. These flies target open wounds or natural body openings such as the eyes, ears, nose, vagina, or anus, encouraged by the foul-smelling discharge from diseased tissue. Once the larvae hatch, they invade broken skin or pre-existing wounds, enlarging the wound. This infestation can cause blood loss, debilitation, and, if vital organs like the brain or lungs are affected, death. The maggots irritate the host, causing restlessness and poor feeding, leading to deteriorated health. Maggots can tunnel through the skin into deeper tissues, creating cavities several centimeters in diameter. Without treatment, the infestation can spread rapidly, attracting more flies and worsening the condition. Untreated infestations can lead to death from shock, intoxication, tissue destruction, or septicemia. A distinctive pungent odour often accompanies the infested tissue.

Key Preventive and Treatment Measures:

- Treatment involves removing all visible larvae and performing debridement if necrotic tissue is still present. Irrigation can be especially helpful for lesions with holes or cavities. A solution of camphor in olive oil, or turpentine oil or ether, may assist in immobilizing the larvae and easing their removal.
- For treatment, clipping the hair around lesions to assess the damage and remove larvae is crucial. Removing maggots from deep tissues may require sedation or anesthesia.
- If secondary bacterial or fungal infections are present, broad-spectrum antimicrobials should be administered.



- Shearing: Wool is cut close to the skin to remove maggots, leaving a clean wool barrier around the affected area.
- Dressing: Apply treatment to the shorn area to prevent further strikes.
- Culling: Remove affected sheep from breeding programs.
- Crutching: Remove wool from around the tail and rear legs to prevent feces from attracting flies. Crutching or tagging can control blowfly infestation for 6–8 weeks.
- Mulesing: This surgical procedure removes skin around the rump, preventing urine staining in ewes and reducing the risk of breech strike.
- Fly Control: Preventing fly infestations by removing dead animals, afterbirth, and waste is a strong preventative measure. Fly traps can also reduce fly-strike significantly.
- Tail Docking: Docking tails at the third joint reduces faecal contamination, lowering the incidence of fly-strike.
- Scouring Control: Prevent or treat diarrhoea to avoid soiling and attracting blowflies.
- Chemoprophylaxis involves using insecticides and larvicides like dicyclanil, cyromazine, ivermectin, and spinosad on susceptible areas.
- Disposing of carcasses by burning or burying may help with hygiene, though it has limited impact on primary strikes.
- Genetic manipulation involves controlling blowfly populations by breeding partially sterile males that pass a gene causing blindness in female offspring.
- Animals with wounds should be kept in fly-free areas, with their hair coat clean from urine or feces, as matted, contaminated coats attract adult myiasis-producing flies.
- Controlling adult flies and eliminating breeding sites are effective preventive strategies.

- Kouam, M. K., Meutchieye, F., Miegoue, E., Nguafack, T. T., Tchoumboue, J., & Tegua, A. (2017). Prevalence and husbandry-related risk factors of myiasis in domestic cavies in the western highlands of Cameroon. *Epidemiology and infection*, 145(2), 339–346.
- Patton, W. S. (1921) Notes on the myiasis-producing Diptera of man and animals. *Bull Entomol Res.*, 12,239–61.
- Scholl, P.J., Catts, E.P., Mullen, G. R. (2009). Myiasis (Muscoidea, Oestroidea). In: Mullen G, Durden L, editors. *Medical and Veterinary Entomology*. San Diego: Elsevier, 309–38.
- Sinha S. K. (2012). Myiasis in domestic animals: new records of calyptrate Diptera. *Journal of Parasitic Diseases*, 36(2), 277–279.
- Zumpt F (1965). *Myiasis in man and animals in the Old World*. London: Butterworths

References

- Francesconi, F., & Lupi, O. (2012). Myiasis. *Clinical microbiology reviews*, 25(1), 79–105.
- Kotze, A. C., & James, P. J. (2022). Control of sheep flystrike: what's been tried in the past and where to from here. *Australian veterinary journal*, 100(1-2), 1–19.