

7. Flies on pastured cattle

7.1 Microbial control of flies on pastured cattle

The project, initiated in 1997, was concluded in 2000. It included two parts: A field survey of the natural occurrence of entomopathogenic fungi in flies on pastured cattle, and a laboratory evaluation of the potential of different fungi for microbial control of these flies.

The survey showed that cattle flies are infected by a range of fungus species (Hyphomycetes and Entomophthorales). Isolates of Hyphomycetes were later used in the laboratory experiments. The prevalence of both groups of fungi was very low in both years, on all locations, and in all fly species. Thistles in the pastures acted as transmission site for *Entomophthora muscae s.l.*, and harboured numerous fungus-killed cadavers of non-pestiferous fly species. Different live cattle flies were observed on the thistles, but the fungal prevalence in cattle flies remained low.

Transmission experiments confirmed the high specificity of *E. muscae s.l.*, and emphasized that exploitation of the naturally occurring inoculum of *E. muscae s.l.* for fly control not is relevant. A number of hyphomyceteous fungi was shown to infect adult face flies (*Musca autumnalis*) and horn flies (*Haematobia irritans*) in the laboratory. An isolate of *Metarhizium anisopliae* was the most virulent against face flies when they were immersed in spore suspensions. The same isolates were tested against houseflies, and in comparison face flies are generally less susceptible to fungus infection. At 22 °C the mortality caused by the most virulent *M. anisopliae* 7 days after inoculation was only 10%, but this increased to over 90% after 14 days. The lethal time was reduced at 25°C, and 90% of the flies had died within 7 days at this temperature. Females of *M. autumnalis* are significantly more susceptible to fungus infection than males.

In conclusion, detailed information on the occurrence of entomopathogenic fungi in flies associated with pastured cattle was obtained in this project, and the infection experiments provided new information of importance for future exploitation of Hyphomycetes for microbial control of cattle flies.

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7.2 *Entomophthora muscae s.l.* in houseflies

Entomophthora muscae s. str. and *E. schizophorae* have been studied in relation to houseflies in Vibeke Kalsbeek's Ph.D. project (see DPIL Annual Reports 1996, 1997 and 1998). The work has been compiled into four manuscripts that have been accepted by or submitted to international journals. The Ph.D. thesis will be completed in 2001.

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