Summary

My research focuses on the ecology, behaviour and control of arthropod parasites and disease vectors of veterinary importance. I also have interests in pastureland ecology and the effects of insecticides on decomposition processes. A key feature of my approach has been the use of fundamental ecological and epidemiological principles to inform practical control applications. Further information about my research and research group.

Topics I am interested in:

- Essential oils for ectoparasite control
- Ticks and tick-borne disease
- Myiasis and mange
- Impacts of climate change on ectoparasites

Essential oils for ectoparasite control

The control of ectoparasites of veterinary importance using synthetic neurotoxic insecticides has been progressively undermined by the development of insecticide resistance. In addition, restrictions on the use of some insecticides because of their effects on human health and the environment have led to increased research into the development of alternative approaches to ectoparasite management. My research is investigating the use of botanical alternatives, particularly essential oils; we are currently testing and commercialising essential oil formulations for practical use by pet and livestock owners, particularly to help manage infestations of mites, lice and ticks. We are working closely with our commercial partner AgriEnt Limited (http://www.agrientlimited.com/).

Ticks and tick-borne disease

Apparent changes in tick distributions and the prevalence of tick-borne disease (TBD) within Europe have been reported over the last 10-20 years. Climate change may be responsible in part for this, but changes in habitat management, host movement patterns and changes in abundance, particularly deer, may be equally important. The recent removal of compulsory tick treatment for companion animals entering the UK from continental Europe is a further factor which has raised fears about the potential for the introduction of new tick species or new tick-borne pathogens. Given the complexity of the climate/vector/host/pathogen interactions, it is difficult to differentiate the impact of the various risk factors to allow confident predictions about future tick-borne disease epidemiology. In our ongoing studies we have examined the distribution and prevalence of ticks infesting domestic dogs in Great Britain; the results show that 50% of veterinary practices surveyed reported that at least 15% of dogs selected at random were carrying ticks and 15% of practices reported that more than 50% of dogs carried ticks. Borrelia was detected in 2% of ticks tested, Babesia spp. in 2% and Anaplasma in 2%. We are currently examining the potential for urban green spaces to act as epidemiological bottlenecks for TBD. Conservation strategies which encourage the greater integration of green-spaces into the urban and peri-urban environments and their management for wildlife and biodiversity, provide important recreational spaces but also facilitate an increase in abundance of hosts such
as small mammals and deer. This is likely to lead to an increase in the abundance and distribution of ticks and an increased exposure of people and companion animals to ticks in environments such as gardens and parks. Changes may also be associated indirectly with social and economic trends, often mediated by climate, which influence outdoor activity, exposure and the risk of being bitten.

Further information about my research and research group.

Memberships

Organisations

School of Biological Sciences

Other sites

• Infection-immunity

Research groups

• Plant and Agricultural Sciences
• Ecology and Environmental Change

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