The Koala, an Iconic Animal under Threat

When one thinks of the iconic animals of Australia, it is no surprise that the koala (*Phascolarctos cinereus*) is among the most prominent. This marsupial is famous for many reasons, including the slow-moving and sleepy behavior associated with its low-nutrition diet, clip-on souvenirs, and it is quite possibly the only animal with a seemingly anatomically correct teddy bear. The koala is a must see for tourists, many of whom may also be regaled by locals’ humorous warnings of the dangers of attack by “drop-bears” while in the Australian bush (woodlands and forests).

Such status and popularity of an animal inherently draws attention from the community, with threats to the survival of koala carrying significant national profile. Three excellent articles in the present edition of *Journal of Wildlife Diseases* highlight the plight of koalas and threats posed by infectious diseases. Infections with *Chlamydia pecorum*, and possibly (indirectly) with koala retrovirus (KoRV), impact koala survival and reproductive capacity, particularly when combined with other key threats, including habitat fragmentation, feral dogs, and motor vehicle collisions. As illustrated by the studies in this issue, the impacts of diseases on this animal are complex and challenging to manage. More broadly, the multi-institutional and multidisciplinary approaches to the care of koalas are among the most prominent examples of Conservation Medicine and One Health initiatives in Australia.

Speight et al. (p. 301) report on *C. pecorum* infection in South Australian koalas. This study builds on a body of literature of infection from eastern Australia where ocular and urogenital tract chlamydiosis are common. They show that *C. pecorum* infection is common (nearly 90%), but overt disease is less common (21% of positive detections), with lesions mostly microscopic (47% of detections). Thus, inapparent and subclinical disease are common in the South Australian region, which differs markedly from eastern Australian populations where overt chlamydiosis is widespread. The complimentary study by Legione et al. (p. 426) targeted evidence of *C. pecorum* infection on French Island, in Western Port, southeast of Melbourne, Victoria. Koalas in this southern Australian population were established by translocation around 1898 just prior to a rapid decline in Victorian populations, and have long been considered a chlamydia-free refuge; that is, until the study by Legione et al. Two of 142 (1.4%) individuals examined were infected with *C. pecorum*. Potentially, this may indicate a recent disease introduction event, as no *C. pecorum* was identified during surveys in 2010. Important to local epidemiology, Legione et al. document high ompA gene sequence similarity of the infected koalas to that of livestock species which are farmed on the island. This study contributes to a small, but growing body of evidence that a portion of (possibly even all) *C. pecorum* infections of koalas may have livestock origin. Further evidence is needed to confirm or refute this hypothesis, but if livestock are the source of *C. pecorum* spillover to koala there may be a number of important in situ conservation outcomes to be considered (e.g., isolating some populations from contact with agricultural animals).

Finally, Waugh et al. (p. 422) studied antibodies to KoRV in koala from Queensland, New South Wales, and South Australia. This retrovirus has become widespread in koalas; it is endogenous in Queensland and undergoing endogenization in southern Australian states. While knowledge of disease impacts of KoRV strains is minimal, linkages with neoplasia and chlamydial disease have been reported. The study by Waugh et al., while opportunistic and preliminary, provides important evidence that an anti-KoRV recombinant protein-based vaccine was safe to administer and has potential to induce immune control of infection in koala. Such tools may become increasingly relevant if further