



Introduction to the Special Issue on 'Emerging Zoonoses and Wildlife'



Wildlife, people and their domestic animals, and the environment are intricately linked through their various roles in maintenance and transmission of infectious diseases (Thompson and Polley, 2014). Wildlife have for a long time, and perhaps disproportionately, been 'blamed' for the emergence of zoonotic diseases in people (Blancou et al. 2005). Increasingly, the medical, veterinary medical and wildlife scientist communities are recognizing that this directionality of transmission is not so unidirectional, nor so simple. Anthropogenic landscape perturbation and climate change are massively altering species distributions and ecological relationships among people, animals and environments (Thompson, 2013). Concurrently, globalization is moving organisms around the earth, intentionally and unintentionally, at a rate unequalled by any other time in history. Wildlife health, human health, and our animal production systems are all vulnerable to these changes.

With heightened awareness of the importance of parasites as evolutionary drivers and determinants of population health the field of wildlife parasitology has grown from one of classical parasitology, taxonomy, and case studies to a much more complex discipline. Increased wildlife disease surveillance and sophisticated disease ecology modelling, complemented by the widespread application of molecular tools, have led to deeper insights into the parasitological interactions among people and wildlife. Findings indicate much greater parasite diversity than previously thought, and support that wildlife may not always be the source of zoonoses, rather they often can be the unwitting recipients of interspecies parasite transmission, spill-back (Lloyd-Smith et al. 2009) or reverse zoonotic (zooanthroponotic) transmission. New information on zoonoses and wildlife is thus growing all the time and was the driver behind this Special Issue *Emerging Zoonoses and Wildlife*.

The six invited reviews that make up this Special Issue cover the points emphasised above and focus on a variety of emerging issues involving wildlife and the major groups of eukaryotic parasites.

Insights gained through advances in molecular techniques with respect to inter-species parasite transmission, parasites biodiversity, and human vulnerability are illustrated through work on parasitic protozoa, cestodes, intermediate hosts, and human immune responses. Focusing on parasitic protozoa, Lucy Robertson and colleagues ask the question – 'Are molecular tools clarifying or confusing our understanding of the public health threat from enteric protozoa of wildlife?' Peter Deplazes and colleagues then demonstrate the value of molecular tools in diagnosing unusual infections with wildlife-transmitted metacestode

infections of *Taenia* and *Versteria* in immunosuppressed people and other primates.

Renewed interest in fish-borne cestodes is due partly to the increased popularity of eating raw fish but also because of the wealth of new information provided from the application of molecular tools. Tomáš Scholz and colleagues look at recent progress and future challenges in research on diphyllbothriid parasites of wildlife and humans, focusing on diversity, distribution and phylogenetic relationships.

In their review on *Anisakis* nematodes in fish and shellfish Andreas Lopata and colleagues provide an update on current knowledge on *Anisakis* as a food-borne parasite of a diversity of fish and crustacean hosts. They focus on emerging public health issues associated with exposure to allergens from invertebrate proteins.

Landscape disturbance and climatic changes are implicated in changing ecological interactions and increased zoonotic parasite transmission across a number of systems. The encroachment of urban areas into wild environments is a recurring theme. Domenico Otranto and Peter Deplazes examine the current status of zoonotic nematodes of wild carnivores and how human activities and politics influence their ecology and epidemiology, as well as impacting upon the conservation of wild carnivores.

The transmission of vector-borne pathogens and wildlife zoonotic disease emergence are driven to a large extent by changes in climate and land use. Usin selected examples of zoonotic vector-borne pathogens, Annapaola Rizzoli and colleagues examine these anthropogenic factors in their review 'Parasites and wildlife in a changing world: the vector-host-pathogen interaction as a learning case'.

References

- Blancou, J., Chomel, B.B., Belotto, A., Meslin, F.X., 2005. Emerging or re-emerging bacterial zoonoses: factors of emergence, surveillance and control. *Vet. Res.* 36, 507–522.
- Lloyd-Smith, J.O., George, D., Pepin, K.M., Pitzer, V.E., Pulliam, J.R.C., Dobson, A.P., Hudson, P.J., Grenfell, B.T., 2009. Epidemic dynamics at the human-animal interface. *Science* 326, 1362–1367.
- Thompson, R.C.A., 2013. Parasite zoonoses and wildlife: one health, spillover and human activity. *Int. J. Parasitol.* 43, 1079–1088.
- Thompson, R.C.A., Polley, L., 2014. Parasitology and One Health. *Int. J. Parasitol. Parasites Wildl.* 3, A1–A2.

Andrew Thompson, Susan Kutz

<https://doi.org/10.1016/j.ijppaw.2019.07.002>