

Epidemiological Features of Coronaviruses in Bats in Australia

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For my AB-CRC Vacation Scholarship, I was lucky enough to get involved in Craig Smith's PhD project "Investigations of SARS-like coronaviruses in bats" and accompany Craig and Carol de Jong into the field and into the laboratory over the six week period. At Booloumba Creek, just outside of Kenilworth, we set up camp and considering the weather forecast, made sure all of the tents were waterproof! In the morning we set out on a 3 km hike to an old gold mine and here Craig used a hand net to catch thirty eastern horseshoe bats (*Rhinolophus megaphyllus*). Blood, faecal and urine samples were taken from each bat and the amount of blood collected, excreta collected, fore-arm length, sex of the bat and approximate age of the bat were recorded. The bats were released soon after and the process repeated again the next day. We were hoping to collect some more bats of a different genus (*Miniopterus* spp.) from a second gold mine but most likely owing to the wet weather, there were few to be found. In search of some different bat genera, we went looking under several local bridges and came across a group of large-footed myotis (*Myotis macropus*) hanging out underneath. Not wanting to disturb this small colony, we thought of some ways we could collect some faecal samples. We put newspaper down underneath each roost and came back the next day to collect the samples. In addition, faecal samples from Gould's long eared bats (*Nyctophilus gouldi*) were collected from bats in a bat box.

Going out in the field was a very exciting experience. It was great to be able to go bushwalking everyday, handle the amazing little bats and see many other wildlife species such as frogs, monitors and birds. I learnt that you have to be resourceful when conducting research in the field and that even with simple methods; you can still conduct very good science.



Back at the lab, the faecal and urine samples were put through a process to extract any viral RNA present and after making up the appropriate reaction mix, each sample underwent a PCR. The DNA products of the PCR were then subject to gel electrophoresis and the results viewed with an

ultraviolet light and camera. Craig and Carol allowed me to take a part in each stage of the viral RNA extraction and PCR and I was even able to run my own reaction from start to finish.

At the end of my six weeks, I felt that I had learnt a lot about the complex nature of viruses (in particular SARS CoV) and how by constantly mutating they are able to survive in hosts other than the natural maintenance host. I felt I had also gained useful practical laboratory skills and an understanding of the intricacies of RNA extraction, PCR and DNA sequencing. It was great to be involved in a project with both biosecurity and public health aspects as after graduation I would like to be employed in a Government biosecurity, quarantine or research role. This experience cemented my desires to follow such a career path and provided me with skills and knowledge to hopefully make me an attractive candidate for such a role.