Identifying potential vectors of Australian wildlife trypanosomes

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Trypanosomes are a group of flagellate protozoan parasites found worldwide, which are capable of causing disease in humans, domesticated animals and wildlife, and are most often transmitted by haematophagous (blood-feeding) invertebrates. In overseas countries, well known insect vectors of mammalian trypanosomes include triatomine bugs and tsetse flies however ticks, mites and leeches have also been implicated in vector studies.

In Australian wildlife, multiple trypanosome species have been found infecting individual animals, often with detrimental health effects [1, 2]. Moreover, several trypanosome species found in Australian wildlife appear to be closely related to the South American human pathogen *Trypanosoma cruzi* [3]. Surprisingly, despite their negative impact on vulnerable native wildlife and the biosecurity risk posed by the potential for establishment of exotic trypanosome species in Australian wildlife hosts [4], the vectors of Australian trypanosomes presently remain unknown.

Identifying insect vectors that are capable of potentially transmitting trypanosomes to Australia's wildlife, some of which are critically endangered, is an important first step in closing the current knowledge gap in regards to understanding the process by which Australian trypanosomes are transmitted by, and develop within, their insect vector. This information is essential for assessing any risks towards Australia's wildlife populations [4, 5]. Ticks, flies and leeches will be opportunistically collected from Australian mammals and/or their physical environment. The salivary glands, hindgut and haemolymph of dissected specimens will be subsequently examined for the presence of trypanosomes using optical, scanning-electron (SEM), transmission-electron (TEM) and X-ray (microCT) microscopy approaches.

Information gained from this preliminary research into potential vectors of Australian wildlife trypanosomes will be a crucial first step towards aiding future investigations concerned with assessing the transmission dynamics and life histories of Australia's trypanosomes. With the current lack of information available on the identity of potential vectors of Australian wildlife trypanosomes, the risk they pose to Australia's vulnerable wildlife is uncertain. Consequently, it is only through this preliminary investigation and later understanding of the life histories of Australia's trypanosomes that we may begin to develop more effective management plans for the control of trypanosome infections.

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