# Investigating fine-scale geographic variation in a newly described Australian funnel-web spider (*Atrax sutherlandi*)

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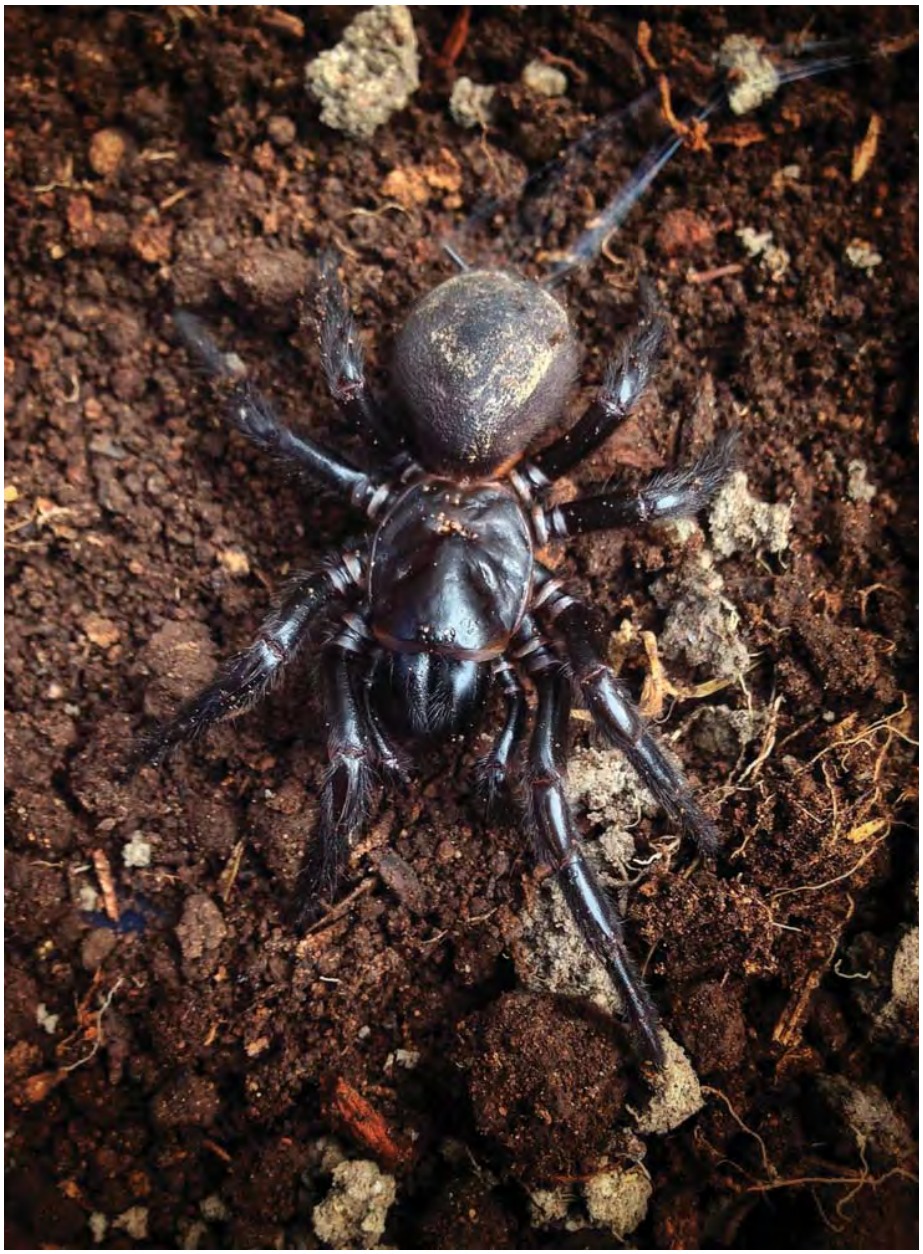
My research focuses on *Atrax sutherlandi*, a newly described species of funnel-web spider belonging to the same genus as the notorious Sydney funnel-web, and named after the late toxicologist Professor Struan Sutherland. *A. sutherlandi* is distributed across south-eastern Australia, including the Tallaganda forests of New South Wales. Previous work in this region has shown that throughout past Pleistocene glacial-interglacial cycling, native eucalpyt forests would repeatedly contract into isolated low-lying hydrological catchments otherwise known as 'refugia'. During such harsh climates, these isolated forest remnants preserved local habitats and enabled a variety of species to persist in an otherwise inhospitable region. While the forest is now continuous, many of Tallaganda's species still reflect this ancient isolation in their genetic makeup. That is, in many groups including water skinks, velvet worms, springtails and flatworms, several distinct genetic forms are presently recognisable across the forest.



*Atrax sutherlandi* female. Photo: M Wong 2014

Such genetic biodiversity associated with geographically distinct refugia regions is also well illustrated for the funnel-web spider *A. sutherlandi*, where differences between six refugia populations in Tallaganda are of a magnitude generally attributable to distinct species. Given that such unequivocal genetic differentiation and short-range endemism at Tallaganda was induced by historical climate change, it may be advantageous to investigate corresponding geographic variation in *A. sutherlandi* phenotype, since this could potentially aid in elucidating and demonstrating the effects of climate change on a species' physical characteristics. This would in turn be relevant to conservation planning and land management in the face of increasing climate change. Furthermore, as *A. sutherlandi* displays geographically-associated phylogenetic patterns similar to those of other terrestrial invertebrates in Tallaganda, such communities are likely to have shared analogous

**Above:** Mark Wong laying out a transect in Tallaganda forest. Photo: Thomas Wallenius

responses to previous climate change, and thus information from studying *A. sutherlandi* may be extrapolated to a variety of other important species. Exploring the phenotypic variation associated with ancient geographic refugia regions has therefore been the main focus of my research on these handsome but deadly spiders, and the phenotypic characters I am presently studying range from morphological characters such as body size and shape, to physiological characters which include metabolic rate, water loss rate and venom yield. A secondary aim of my research is to examine the extent to which such variation can also be explained by the contemporary environment.

At present, I am undertaking statistical analysis to interpret the phenotypic and environmental data that I have collected for various *A. sutherlandi* populations distributed across Tallaganda forest. While it is still too early to tell, the initial results do appear to hint at the presence of variation between the geographic regions in some phenotypic characters. My subsequent work will thus focus on scrutinizing and evaluating any apparent variation in an evolutionary and ecological context.

I would like to express my sincere appreciation to the Australian Wildlife Society for not only providing me with support for this research, but also many valuable insights into the conservation of Australia's native species.

Mark Wong in the field

Distinctive 'funnel-web' of *Atrax sutherlandi* on Tallaganda forest floor. Photo: M Wong 2014

*Atrax sutherlandi* male. Photo: Andras Keszei