Molecular identification of a mygalomorph spider (*Idiosoma* sp.) from near Arrowsmith, Western Australia

Report to *Bamford Consulting Ecologists*

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Summary

Bamford Consulting Ecologists requested the identification and sequencing of a mitochondrial COI sequence from one specimen of *Idiosoma* from near Arrowsmith. The main objective of the WA Museum's Molecular Systematics Unit (MSU) was to use COI barcoding to determine the taxonomic identity of the specimen.

DNA was extracted and a DNA barcoding sequence (COI) was amplified by PCR in the MSU and sequenced at the Australian Genomic Research Facility (AGRF) Perth node, using *Idiosoma*-specific primers (Rix et al. 2017). The DNA sequence was BLASTED against publicly accessible sequences in GenBank and with data sets derived from current research projects in collaboration with the WA Museum. The top 10 blast hits were gathered, duplicates removed, and analysed with a Maximum Likelihood phylogenetic analysis using a GTR+G model of evolution and 100 bootstraps (RAxML). Distances were calculated via tree-based estimates of identical bases in Geneious Prime 2020 2.5. A summary of specimen identification is in Table 1.
Table 1.

Table 1. Summary of queried sequences generated by the WA Museum.

ORDER	GENUS	SPECIES	# OF SPECIMENS	# OF SEQUENCES
Mygalomorphae	*Idiosoma*	*kwongan*	1	1

Results

A COI DNA barcode was amplified and successfully sequenced from the specimen. The COI sequence was compared to existing data held by the WA Museum and its collaborators, and the publicly accessible GenBank database. A summary of the comparison is provided in Table 2. The resulting Maximum Likelihood tree is provided in Appendix 2 for visualisation of genetic relationships. The new DNA sequence has a GenBank accession number available in Appendix 1, as well as with raw data in Appendix 3.

Rix et al (2018) report *Idiosoma kwongan* (formerly known by WAM identification code 'MYG472') as a poorly known species with an apparently restricted distribution in the southern Geraldton Sandplains bioregion of south-western Western Australia, from Eneabba south to Green Head and the Lesueur National Park (Fig. 374). It is closely related to the three other 'sigillate complex' species in the northern *clypeatum*-clade: *I. arenaceum*, *I. clypeatum,* and *I. kopejtkaorum*. It is considered data deficient for conservation purposes.

This specimen (star) extends the known range by 22 km to the northeast.

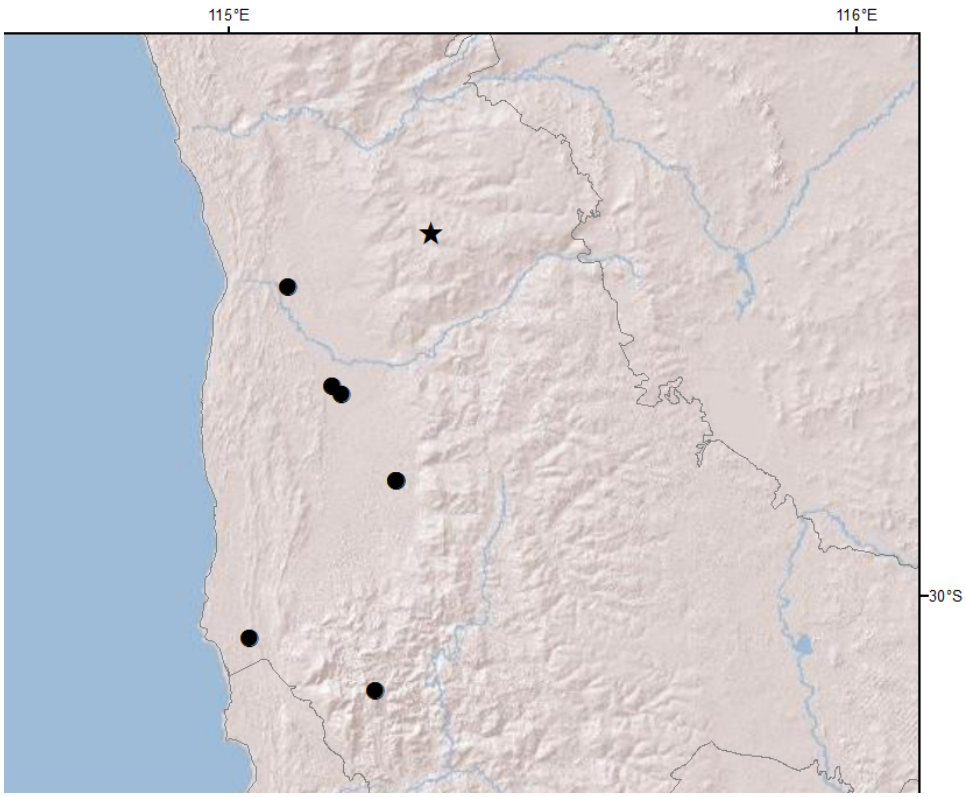


Table 2. Summary of results.

REGNO	SPECIES	SUMMARY OF RESULTS
WAMT155165	*Idiosoma kwongan*	The target specimen was 5.48% divergent from its nearest relative in the tree (WAMT144660- *I. kwongan*).

Conclusions

The main objective was to compare the successful COI sequence from the queried specimen to DNA barcoding sequences held with WAM and collaborators, and those publicly accessible in GenBank. The successfully sequenced specimen represents *Idiosoma kwongan*.

References

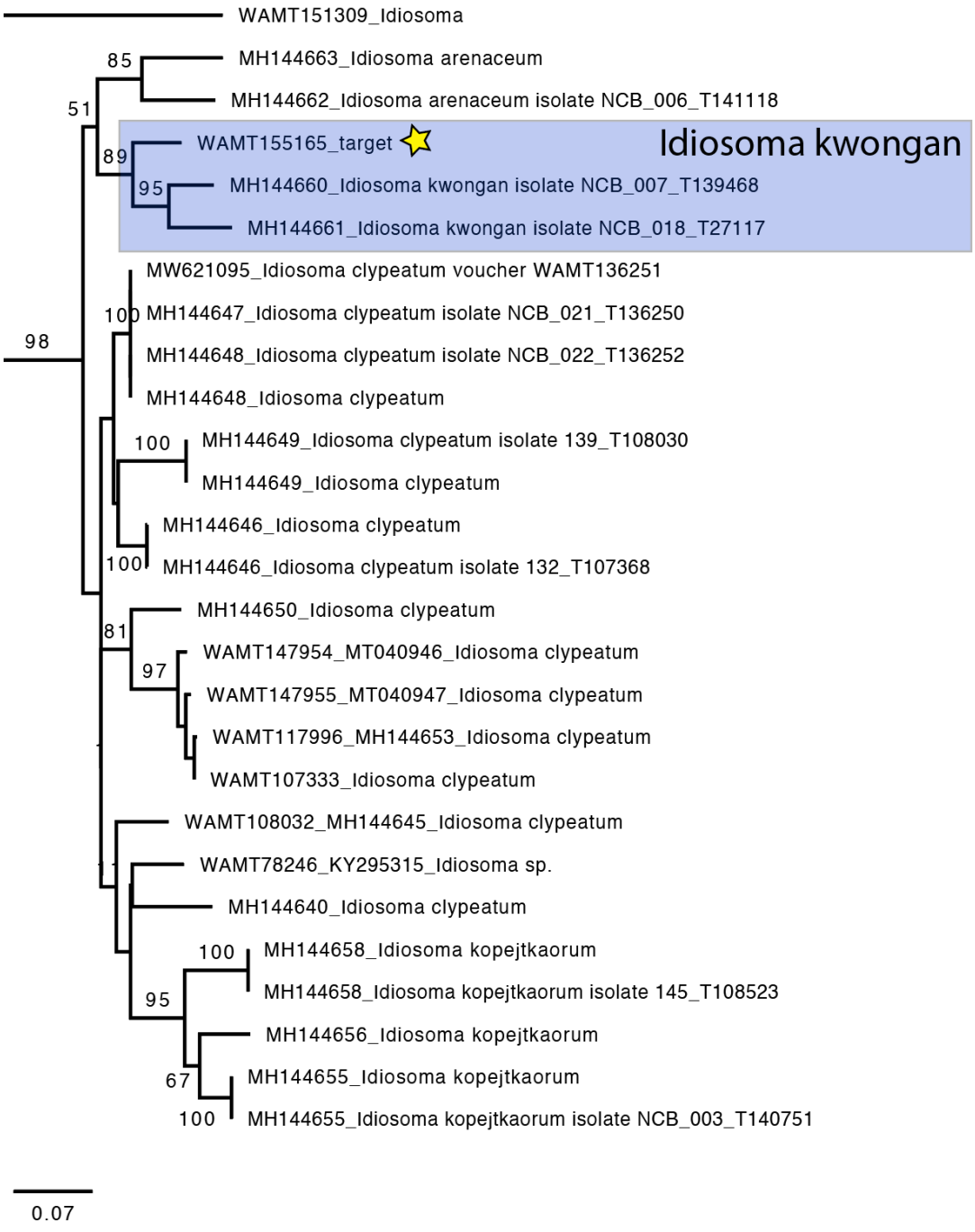
Rix, M. G., Cooper, S. J., Meusemann, K., Klopfstein, S., Harrison, S. E., Harvey, M. S., & Austin, A. D. (2017). Post-Eocene climate change across continental Australia and the diversification of Australasian spiny trapdoor spiders (Idiopidae: Arbanitinae). *Molecular Phylogenetics and Evolution*, *109*, 302-320.

Rix, M. G., Huey, J. A., Cooper, S. J., Austin, A. D., & Harvey, M. S. (2018). Conservation systematics of the shield-backed trapdoor spiders of the nigrum-group (Mygalomorphae, Idiopidae, *Idiosoma*): integrative taxonomy reveals a diverse and threatened fauna from south-western Australia. *ZooKeys*, (756), 1.

Appendix 1. Specimen data for all specimens.

REGNO	FIELD NO	GenBank NO	FAMILY	GENUS	SPECIES	SITE	LATITUDE	LONGITUDE
WAMT155165	MYG070-B8	ON159387	Idiopidae	*Idiosoma*	*kwongan*	ca. 28.5 km NE. of Arrowsmith	29°25`23"S	115°19`26"E

Appendix 2. Excerpt from Maximum Likelihood tree of *Idiosoma* COI, to be used *ONLY* for visualisation of genetic relationships. Bootstrap values less than 50 have been removed.



Appendix 3. COI DNA sequence data generated in this report

>WAMT155165 = ON159387

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TGATTTTTTTTATAGTGATGCCTATTATAATTGGAGGGTTTGGAAATTGGTTGGTCCCCTTGATGTTAGGAGC
ACCTGATATAGCGTTTCCTCGTATGAACAATTTGAGATTTTGGTTGTTGCCTTCTTCTTTGTTTTTTTTGATG
GTTTCTTCTTTGGTAGGGGTAGGCGTTGGTGCTGGATGAACTATTTATCCTCCTTTATCTTCTGGTGTTGGAC
ATAGAGGGGGAGGTATAGATTTTGTTATTTTCTCTTTGCATTTGGCTGGAGCTTCTTCTATCATAGGTGCTAT
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TCTGTAATGGTTACTGCGGTTTTATTGTTGTTGTCGCTTCCTGTTTTAGCTGGAGCTATTACTATGCTTTTGA
CTGACCGTAATTTTAATACTTCTTTTTTTGATCCTGCTGGTGGTGGAGATCCAGTTTTGTTTCAGCATTTGTT
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