GOVERNMENT OF WESTERN AUSTRALIA
Department of **Biodiversity, Conservation and Attractions**
Biodiversity and **Conservation Science**

Report on genetic identification of Fur Seal tissue sample T16093 (T00216).

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The sample from a fur seal carcass was collected from Frankland and received from Kelly Waples October 2023.

DNA was extracted from the tissue sample using a TNES extraction method. The Displacement D-Loop mitochondrial primers L15925 Forward/H16499 Reverse were used to PCR non-coding mitochondrial D-Loop DNA using a Shaw hot start PCR program. PCR products were sequenced using the same Forward and Reverse primers at the Western Australian State Agricultural Biotechnology Centre (SABC) Murdoch University and sequence data for each region was aligned and edited using the Geneious Sequence Alignment Editor.

The sequenced region produced a contiguous alignment sequence read of 453bp. This sequence region was queried using the blastn suite (megablast) for highly similar sequences (https://blast.ncbi.nlm.nih.gov/Blast.cgi).

Of the top 100 sequences producing significant alignments, the first 94 with the greatest present identity were accessions of *Arctocephalus forsteri* (common names include the Australasian fur seal, South Australian fur seal, New Zealand fur seal, Antipodean fur seal, or long-nosed fur seal, Fig 1).

select all 100 sequences selected GenBank Graphics Distance tree of results MSA Viewer

Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
Arctocephalus forsteri isolate NZFS4 mitochondrion,...	Arctoce...	804	804	100%	0.0	98.68%	16577	KT693336.1
Arctocephalus forsteri voucher OZD Afo98B01 D-loo...	Arctoce...	784	784	97%	0.0	98.64%	546	KU510668.1
Arctocephalus forsteri voucher OZD Afo98B05 D-loo...	Arctoce...	776	776	97%	0.0	98.42%	545	KU510670.1
Arctocephalus forsteri voucher OZD OM7 D-loop, pa...	Arctoce...	773	773	97%	0.0	98.41%	543	KU510715.1
Arctocephalus forsteri voucher OZD Afo91T44 D-loo...	Arctoce...	771	771	97%	0.0	98.19%	545	KU510638.1
Arctocephalus forsteri isolate NZFS1 mitochondrion,...	Arctoce...	785	785	100%	0.0	98.01%	16575	KT693333.1
Arctocephalus forsteri voucher OZD HBM8 D-loop,...	Arctoce...	765	765	97%	0.0	97.96%	545	KU510686.1
Arctocephalus forsteri isolate NZFS2 mitochondrion,...	Arctoce...	780	780	100%	0.0	97.79%	16568	KT693334.1
Arctocephalus forsteri voucher OZD Afo92BK6 D-lo...	Arctoce...	761	761	97%	0.0	97.74%	546	KU510647.1
Arctocephalus forsteri isolate NZFS8 mitochondrion,...	Arctoce...	776	776	100%	0.0	97.57%	16570	KT693340.1
Arctocephalus forsteri isolate NZFS7 mitochondrion,...	Arctoce...	776	776	100%	0.0	97.57%	16570	KT693339.1
Arctocephalus forsteri isolate NZFS6 mitochondrion,...	Arctoce...	776	776	100%	0.0	97.57%	16571	KT693338.1
Arctocephalus forsteri voucher OZD Afo91K26 D-loo...	Arctoce...	756	756	97%	0.0	97.52%	546	KU510625.1
Arctocephalus forsteri voucher OZD Afo91T38 D-loo...	Arctoce...	756	756	97%	0.0	97.51%	546	KU510632.1
Arctocephalus forsteri voucher OZD Afo91T43 D-loo...	Arctoce...	754	754	97%	0.0	97.51%	544	KU510637.1
Arctocephalus forsteri isolate NZFS28 mitochondrio...	Arctoce...	769	769	100%	0.0	97.35%	16568	KT693360.1
Arctocephalus forsteri isolate NZFS5 mitochondrion,...	Arctoce...	769	769	100%	0.0	97.35%	16571	KT693337.1
Arctocephalus forsteri voucher OZD Afo91K29 D-loo...	Arctoce...	750	750	97%	0.0	97.29%	547	KU510628.1
Arctocephalus forsteri voucher OZD Afo91T40 D-loo...	Arctoce...	749	749	97%	0.0	97.29%	545	KU510634.1
Arctocephalus forsteri voucher OZD OPtF3 D-loop,...	Arctoce...	719	719	93%	0.0	97.18%	530	KU510716.1
Arctocephalus forsteri isolate NZFS13 mitochondrio...	Arctoce...	767	767	100%	0.0	97.14%	16572	KT693345.1
Arctocephalus forsteri isolate NZFS12 mitochondrio...	Arctoce...	765	765	100%	0.0	97.14%	16571	KT693344.1
Arctocephalus forsteri isolate NZFS10 mitochondrio...	Arctoce...	765	765	100%	0.0	97.14%	16571	KT693342.1
Arctocephalus forsteri isolate NZFS9 mitochondrion,...	Arctoce...	765	765	100%	0.0	97.14%	16571	KT693341.1
Arctocephalus forsteri voucher OZD Afo91T41 D-loo...	Arctoce...	747	747	97%	0.0	97.07%	548	KU510635.1
Arctocephalus forsteri voucher OZD VBF6 D-loop, p...	Arctoce...	745	745	97%	0.0	97.07%	547	KU510718.1
Arctocephalus forsteri voucher OZD HBF6 D-loop, p...	Arctoce...	745	745	97%	0.0	97.07%	547	KU510684.1

Figure 1. Sequences producing significant alignments for tissue sample T16093.

Overall, the queried sequence was significantly aligned to 150 accessions of *the Otariidae* (fur seals and sea lions, Fig 2.) with 143 of these being to *A. forsteri*.

Reports | Lineage | Organism | Taxonomy

100 sequences selected

Organism	Blast Name	Score	Number of Hits	Description
Otariidae	carnivores		153	
. Arctocephalus	carnivores		150	
. . Arctocephalus forsteri	carnivores	804	143	Arctocephalus forsteri hits
. . Arctocephalus australis	carnivores	676	2	Arctocephalus australis hits
. . Arctocephalus gazella	carnivores	630	1	Arctocephalus gazella hits
. . Arctocephalus townsendi	carnivores	582	2	Arctocephalus townsendi hits
. . Arctocephalus pusillus	carnivores	558	2	Arctocephalus pusillus hits
. Phocarctos hookeri	carnivores	614	3	Phocarctos hookeri hits

Figure 2. Number of significant alignments (Hits) for tissue sample T16093.

Results were also visualised as a Fast Minimum Evolution distance tree (Fig. 3).

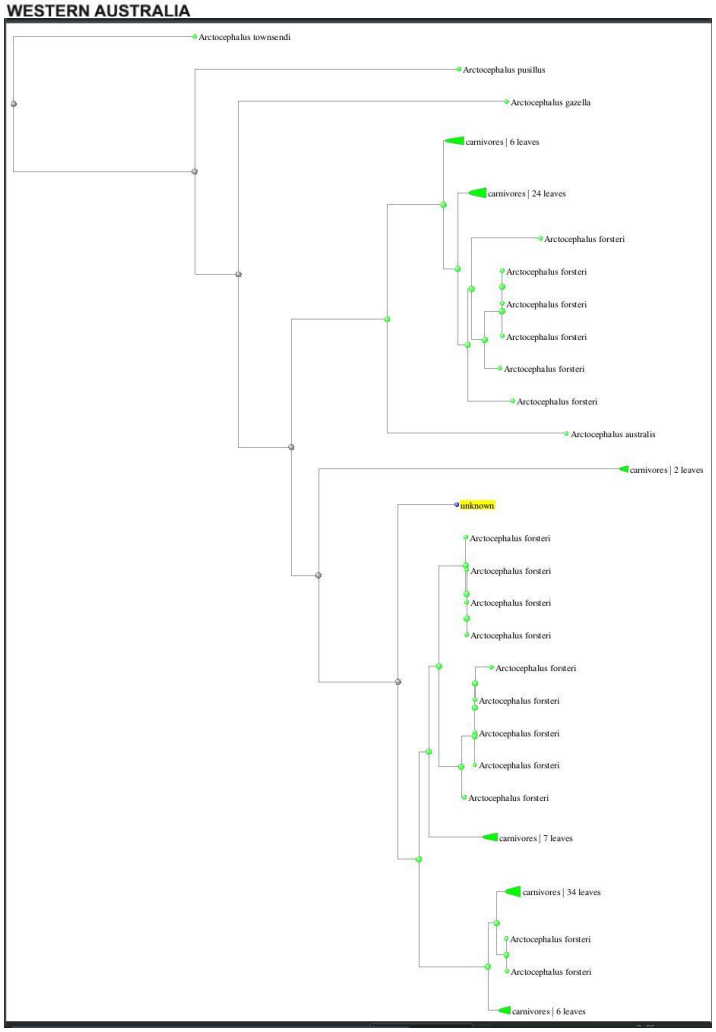

Figure 3. Yellow includes the queried (sample) region. Green are GenBank sequence accessions.

Conclusion

T16093 has the greatest sequence alignment with and is identified as a long-nosed fur seal *A. forsteri*.