Dr Gavin Gouws, a Senior Scientist at NRF-SAIAB, undertook a research visit to Australia in early February 2019. The primary purpose was to visit the Western Australian Museum (WAM) to examine a south-western Australian genus of freshwater isopods from the family Phreatoicidea. The visit was to conclude the taxonomic description of a new species identified in a genetic study published by SAIAB in 2013.

The ancient supercontinent known as ‘Gondwana’ broke up about 180 million years ago. The Phreatoicidea is a mysterious and ancient group of isopods that were distributed across the subcontinent and which now occur in South Africa, Australia, New Zealand and India, with fossils known from Antarctica (Fig. C).

To be able to describe this species, Dr Gouws needed to examine material which was collected in the early 1900s by Professor Nicholls and which is housed at the WAM. When he did this, he encountered specimens that Nicholls had collected from an island off the Kimberleys (northwestern Australia) which had later been identified as *Amphisopus* (Figs. B & D). However, this is outside of what scientists now consider to be the natural range of this genus.

On further examination, these specimens were identified as a new species of *Eremisopus*. Only one species of this genus was previously known, and only from one locality in the “far north”. In collaboration with the WAM curator, Andrew Hosie, Dr Gouws will describe this new species using state of the art computerised tomography (better known as CT) scan.

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**Figure A:** Some specimens of phreatoicidean freshwater isopods (genus *Amphisopus*) examined at the Western Australian Museum.

**Figure B:** Prof. Nicholls’s original slide mounts of isopod mouthparts, used in the original descriptions of *Amphisopus* species in the 1940s.

**Figure C:** Schematic map of Gondwana showing the taxonomic and geographic relationships among various families of the phreatoicidean freshwater isopods. Image taken from: Wilson, G.D.F. & Edgecombe, G. D. 2003. The Triassic isopod Protamphisopus wianamattensis (Chilton) and comparison with extant taxa. Journal of Paleontology 77: 454-470.
On the second leg of his visit, Dr Gouws engaged leading evolutionary biologists at the University of Western Australia (UWA) with the view to expanding research begun by NRF-SAIAB PhD candidate Martinus Scheepers during his MSc, on the patterns of mating, paternity and sexual selection in intertidal marine fishes (see sidebar on right).

Dr Gouws gave seminars at a number of institutes, including the Indian Ocean Marine Research Centre at UWA, the Centre of Sustainable Aquatic Ecosystems at Murdoch University (Perth), and the Centre for Marine Studies, School of Biological Sciences, University of Queensland, in order to show-case and internationalize NRF-SAIAB and its research, and to develop links and partnerships.

**Bringing Godwana back together across the Indian Ocean**

The description of new isopod species is of importance for various reasons. It increases the known diversity of the Phreatoicidea in Australia, where Western Australia, in particular, is understudied. Most Phreatoicidea are represented by single species and are known from only one or a few localities; often these are in areas of importance to development or mining. The collaboration around these descriptions is equally significant, as the retirement of George (“Buz”) Wilson from the Australian Museum has left Australia without a specialist phreatoicidean taxonomist.

A common thread that emerged from the seminars was that there is a lack of collaboration among marine researchers working in the western and eastern Indian Ocean regions and there is a great need for cross-basin collaboration thus metaphorically bringing Gondwana back together across the Indian Ocean.

Dr Gouws’s presentation at the Murdoch University, in particular, gave rise to discussion around more formal collaboration between SAIAB and the Centre, given the wide overlap in interests and activities. The presentations also sparked interest among students, who are investigating options for continuing aspects of their research in partnership with SAIAB.

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**Figure D:** Prof. Nicholls’s handwritten labels from the 1930s from a jar of *Amphisopus* specimens.

**FAMILY CLINIDAE (Clinids aka Klipfish)**

Clinids are small to medium sized, diversely patterned fish found in tide pools and rocky areas to depths of 10m. They are well camouflaged and blend into their surroundings. The species shown here is the Highfin clinid, *Clinus superciliousus*. The Clinidae are found in pockets along the temperate south coasts of both South Africa and Australia, but how the different species reproduce differ among these regions and Martinus Scheepers is interested to find out to what extent patterns of mate choice, mating and sexual selection differ.

**Research team**

Dr Gavin Gouws (Senior Scientist), with Andrew Hosie (Western Australian Museum), Prof. Lynnath Beckley (Centre for Sustainable Aquatic Ecosystems, Murdoch University), Dr Oliver Berry (CSIRO, Indian Ocean Marine Research Centre) and Prof. Cynthia Riginos (School of Biological Sciences, University of Queensland).

A number of current PhD students, associated with Cynthia Riginos’s group, showed an interest in extending their research to South African systems or pursuing post-doctoral research in South Africa and at SAIAB. Some students have already opened discussions with SAIAB researchers.

4 **Additional Information**

A longstanding challenge, contributing to the taxonomic impediment (See [Featured Research November 2018](link)), is the fact that many experienced taxonomists are exiting the science system. This is either through retirement, funding constraints and/or institutional re-alignments. This often results from a shift in priorities from fundamental to applied research. This loss of taxonomic expertise is leaving us without the capacity to accurately document our biodiversity and natural resources and, in the face of unprecedented threats and impacts, without the fundamental knowledge that lies at the base of applied research.

To a certain extent, taxonomists themselves have contributed to this vacuum, by neglecting the development of future taxonomists. The field also struggles to draw prospective students, who fear the limited job prospects, and the staid nature and traditional approaches of the fundamental sciences. As such, those students that show a passion and aptitude for taxonomy need to be supported.

South Africa is, however, in a unique position, where dedicated funding is available to provide this information and to develop capacity through the National Science Collections Platform, where SAIAB is a central unit, and the NRF-DST-SANBI Foundational Biodiversity Information Programme.
SAIAB has prioritised the development of taxonomic capacity. A promising young taxonomist, Yonela Sithole, has been identified and enrolled for a PhD under SAIAB supervision. SAIAB supported her attendance at the Indo-Pacific Fish Conference in Tahiti in 2017, and Yonela is presently on a three-month training internship in taxonomy and data-basing at the Royal Museum of Africa in Tervuren, Belgium.

Report written by: Dr Gavin Gouws
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Useful links:

Centre for Sustainable Aquatic Ecosystems, Murdoch University:

School of Biological Sciences, University of Queensland: https://biological-sciences.uq.edu.au/

Centre for Evolutionary Biology, University of Western Australia: https://www.ceb.uwa.edu.au/


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1 Report compiled and edited by Penny Haworth, Manager: Communications & Governance