

NITheCS COLLOQUIUM:

From Satellites to Molecules – Discovery & Explanation of the Slowest German Wasp Invasion in the World

Dr Ruan Veldtman (Stellenbosch University and SANBI)

Monday, 12 February 2024 | 16h00 – 17h00 SAST

Venue: Neelsie Cinema, Stellenbosch University and online

ABSTRACT

Insects have become globally important invaders with increasing rates of species introductions and resulting impacts. Social wasps in particular can easily reach non-native ranges as stowaways, invasions even starting with a single mated queen. Here I share on the journey of scientific discovery that I and colleagues have had from 2012 to current starting with the meeting of Dr Derek Daly. He also coined the term 'Stellenbosch method' that refers to the process of sequentially collaborating with scientists from different disciplines, to better explain the patterns we see and arising questions and hypotheses. I present some findings on the invasion history, genetic makeup and climatic tolerance of *Vespula germanica* in South Africa, the country with the slowest recorded invasion history of this species. We hypothesise that the original invasion in Cape Town South Africa was comprised of a founding genetic pool with poor tolerance to the average climatic conditions followed by a more recent arrival of better suited genetics. Invasion history, anecdotal records, and spatial distribution of remotely sensed environmental conditions related to moisture and heat, all explain this peculiar invasion and a retrospective analysis of the rate of invasion. We find that a rare haplotype occurs at sites with lower average maximum temperatures than a more frequent haplotype. Also, the common 'hot' haplotype continues the invasion through an unknown mechanism of relatively short human-mediated jump dispersal. This work simultaneously highlights the importance of haplotype, climatic suitability and spatial distribution of habitat and how it constrains the invasion of a social insect. I hope you can attend this talk to learn more about a fascinating insect invasion and see the importance of scientific cooperation to understand and manage this consequence of global change.

BIOGRAPHY

Dr Ruan Veldtman is active in the field of applied biodiversity research specialising in ecological entomology with a PhD from the University of Pretoria. He joined the South African National Biodiversity Institute (SANBI) in November of 2006 and is a research associate at the department of Conservation Ecology and Entomology, Faculty of AgriSciences, Stellenbosch University. His research interests include wild silk moth ecology, plant–insect interactions, weed biological control, pollination ecosystem services and invasive social wasp distribution and management. In 2016 he participated in the Intergovernmental Panel for Biodiversity and Ecosystem Services' Rapid Assessment Report on Pollinators, Pollination and Food Production as a lead author in chapter 4, 'Economic valuation of pollinator gains and losses'. He is an avid supporter of interdisciplinary exchanges around entomology such as geographical spatial analysis, genetics, agricultural economics and mathematical modelling.



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