

SANBI Team Member: tbc

University Supervisor(s): Şerban Procheş (UKZN, Westville), John Wilson (SANBI)

Location: KZN

Level of project: Masters or Doctoral

Working title: The invasions ecology of bromeliads—are epiphytic invasions a growing concern?

Background

Invasion science has made significant progress by exploring similarities and differences between invasions in different taxonomic and functional groups. There are a few broad generalisations that can be made around residence time, introduction effort, and climatic match; but specific insights useful for regulation and management are often case-specific, e.g., susceptibility to *Phytophthora* is a major factor limiting Proteaceae invasions. This has led to the development of the concept of invasion syndromes, the idea that groups of invasions can be jointly considered as they share similar features that mean they are amenable to similar types of regulation and management. Another increasing realisation is that often as much is learned from why some species do not invade (if given the chance) as from those that do invade.

This project aims to focus on a particular largely New World family—Bromeliaceae—many of which are epiphytes but others (including pineapples) are important terrestrial plants. Epiphytes (often sold as air plants) are becoming increasingly popular in horticulture. However, there are recent reports of invasions in forest ecosystems in South Africa. Are these of concern? To what extent does the use in the horticultural industry represent a threat? Is it possible to identify and distinguish taxa that have acceptably low risks of invasion? The project is likely to include the following aspects:

- A review of the movement of species in the group around the world, including synthesising the evidence for naturalisation, invasions, and impacts;
- Detailed studies of the invasion ecology of selected species in South Africa (at least one focussing on *Tillandsia* spp.);
- An evaluation of the status of the group in South Africa, compiling an inventory of taxa that are present in cultivation and outside, their uses, the risks they pose, how they are perceived, with the work culminating in a strategy for how benefits can be preserved while managing risks; and
- Development of a synthesis of epiphytic invasions exploring whether they represent an invasion syndrome.

This is a project suitable for students interested in using a variety of disciplinary tools and approaches to develop recommendations for regulation and management.

Key contacts

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Further Reading

Catford JA, Wilson JRU, Pyšek P, Hulme PE, Duncan RP (2022) Addressing context dependence in ecology.

Trends in Ecology & Evolution 37: 158-170. <https://doi.org/10.1016/j.tree.2021.09.007>

Kumschick S, Wilson JRU, Foxcroft LC (2020) A framework to support alien species regulation: the Risk Analysis for Alien Taxa (RAAT). Neobiota 62: 213–239. <https://doi.org/10.3897/neobiota.62.51031>

Mbobo T, Richardson DM, Lucas EJ, Wilson JRU (2022) Patterns of introduction, naturalisation, invasion, and impact differ between fleshy- and dry-fruited species of Myrtaceae. Perspectives in Plant Ecology, Evolution and Systematics 54: 125648. <https://doi.org/10.1016/j.ppees.2021.125648>

Moodley D, Geerts S, Richardson DM, Wilson JRU (2013) Different traits determine introduction, naturalization and invasion success in woody plants: Proteaceae as a test case. PLoS ONE 8: e75078, <https://doi.org/75010.71371/journal.pone.0075078>

Moodley D, Procheş Ş, Wilson JRU (2016) A global assessment of a large monocot family highlights the need for group-specific analyses of invasiveness. AoB Plants 8: plw009. <https://doi.org/10.1093/aobpla/plw009>

Nova A, Richardson DM, et al., Wilson JRU (2020) Invasion syndromes: a systematic approach for predicting biological invasions and facilitating effective management. Biological Invasions 22: 1801-1820. <https://doi.org/10.1007/s10530-020-02220-w>