

Cryptic species in Helichrysum Group 4 due to polyploidy: taxonomic and ecological implications?

**Associate Prof G. Goodman-Cron, University of the Witwatersrand
IBSG13052718273**

Quantifying biodiversity is key to advancing conservation and bio-economic knowledge. Although South Africa harbours one of the world's greatest biodiversity hotspots, the number of undescribed plant species due to whole genome duplication (polyploidy) remains largely unknown. Polyploidy can produce new and often cryptic species. The plant genus *Helichrysum* L. is one of the most diverse genera in southern Africa (~500 species). South Africa alone harbours an estimated 250 species. Moreover, polyploid lineages are known to exist within some *Helichrysum* species. The remarkable species diversity coupled with the presence of polyploidy suggests that this group is ideal to identify and describe new polyploid species to improve biodiversity estimates. Here, we propose to investigate unrecognized polyploid species and variants of the taxonomic Group 4 in *Helichrysum*. This group comprises four species: *H. odoratissimum*, *H. griseolanatum*, *H. infaustum*, and *H. gymnocomum*¹. The highly variable nature of these species is consistent with the presence of new species likely due to genome duplication events. Using morphological, genetic and chemical data, we will reassess the number of species in Group 4, with a special focus on *H. odoratissimum* L., due to its bioeconomic importance. At least two high-impact outcomes are expected, specifically for bio-economy and highlighting potential losses due to global change. First, polyploidy can alter chemical compounds and quantities thereof. Thus, evaluations of changes in chemical profile and quantity will be beneficial for those interested in the medicinal properties of *H. odoratissimum*. Second, polyploids may be unusually affected by global change, and thus at higher risk of extinction relative to diploids. Identifying the number of new species generated via polyploidy will improve estimates of biodiversity loss.