Title: Species differentiation in the annual *Dimorphotheca pluvialis-sinuata* complex using next-generation RAD-seq (SNP) data.

Description: The winter-rainfall Namaqualand region harbours great diversity of annual daisy species. *Dimorphotheca pluvialis* (reenblommetjie) and and *D. sinuata* (Namaqualand daisy) are sister species with partially overlapping geographic ranges but unclear taxonomic boundaries. The (putatively) two species have traditionally been separated based on flower colour, but there are also two distinct habitats, and two different types of ray cypsela morphology. The flower-colour differences do not align with the other differences, and this, coupled with the frequent observation of dramatic variation in flower colour across different parts of Namaqualand within other daisy species, leads to the hypothesis that flower colour is misleading as a taxonomic character. Confusion about the taxonomic identity of these two species has implications for novel crop development of a wild South African plant, since the unusual industrial oil dimorphecolic acid is found only in the seeds of *Dimorphotheca*. This oil has great potential in industrial applications, and extensive crop-development studies have already been undertaken in the Netherlands. However, the live material for these trials was all sourced from European botanic gardens, where the geographic origin is unknown, and where only a very small portion of the natural variation is represented. Crop improvement will be facilitated by access to the full range of natural variation from all populations, and requires an updated, clarified taxonomy of the species complex. This project aims to investigate morphological variation and the taxonomy of the species complex and will involve the analysis of morphological characters and genomic molecular markers (SNP markers generated via RAD-seq). For analysis of genomic data, the incumbent will require undergraduate training in systematics and evolutionary biology, proficiency in basic statistics and familiarity with the R environment. The ability to conduct fieldwork independently, and a valid driver's licence (due to supervisors and facilities being in different institutions), are advantageous.

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Level: Honours