POSTDOCTORAL FELLOWSHIP 2020 (R250 000)

TITLE: Quantum dots and Pollen wars

DESCRIPTION: Much of the extraordinary variety in floral form is thought to have arisen through sexual selection, with a multitude of strategies to move male gametes as efficiently as possible from one flower to another flower on a different plant. Flowers are often likened to billboards, colourful signs that attract visitors and maximize pollen export as well as receipt. But it is clear that efficient pollen movement is influenced by more than just the ability to attract pollinators. Flowers also interact mechanically with pollinators, the adaptive fit between plant and pollinator morphology sometimes being likened to a lock and key which enhances pollen transfer. But imagine if the available space for pollen transfer onto a pollinator's body is limited by how much pollen is already on the pollinator. Or if rival pollen, already on a pollinator reduces the probability of success by new pollen being placed on the pollinator. This may lead to pollen wars, where each visit by a pollinator represents a chance for a flower to smother or displace the pollen from rival males and so alter the three-dimensional structure of how pollen from different flowers is laid down on pollinators (pollen landscapes). By attaching different coloured quantum dots (fluorescent nano particles) to the pollen grains of different flowers, I would like a postdoctoral fellow to document the structure of pollen landscapes and whether variation in floral morphology affects that structure. Finally, I would like the postdoc to investigate the reproductive consequences of having structured pollen landscapes on pollinators and whether flowers are able to alter those landscapes to their advantage.

REQUIREMENTS & VALUE: The postdoc fellow will be based at Stellenbosch University, South Africa where he/she will use several of the local study systems to address the above aims. The ability to use quantum dots to study the fates of pollen grains is fairly novel and each species that we have worked on has its own idiosyncratic difficulties to overcome. Application of quantum dots can be fiddly work and requires fine motor skills, a good deal of patience, attention to detail, and the ability to troubleshoot and improvise. I am looking for a postdoc with an interest in pollinators or floral evolution, who enjoys working outdoors and is statistically strong. The initial postdoc is for one year (starting August 2020) with the possibility of a second year if good headway is made. The fellow will be paid a total of R250 000 p.a. which can be used for living expenses (this should allow for a reasonably comfortable standard of living). I will cover all of the project running costs. Please note that postdoctoral fellows are not appointed as employees and are therefore not eligible for employee benefits. Postdoctoral fellowships are also awarded tax free. Candidates are required to have graduated within the last 5 years.

HOW TO APPLY: Please send your applications to me, Bruce Anderson (banderso.bruce@gmail.com). The application should include a brief cover letter of why you would like to work on this project and why you think you would be a good candidate for the position. In addition, please send an up to date CV and two reference letters. Applications need to reach me by **1 May 2020**.

I would recommend reading the following three references which outline some of the methods (Minnaar and Anderson 2019, Methods in Ecology & Evolution), ideas (Minnaar et al 2019, Annals of Botany) and an application of the two (Minnaar et al., New Phytologist).

Minnaar C and Anderson B 2019. Using quantum dots as pollen labels to track the fates of individual pollen grains. Methods in Ecology and Evolution. 10: 604-614

Minnaar C, Karron J, de Jager M and Anderson B 2019. Plant-pollinator interactions along the pathway to paternity. Annals of Botany. 123, 225-245