Lay summary, McCarren et al., JPollEcol 30(22)

DOI: 10.26786/1920-7603(2021)648

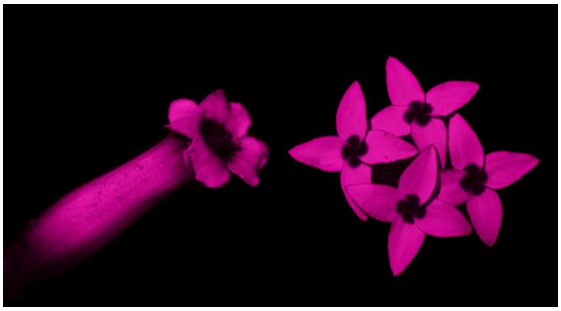
SENDING PRIVATE MESSAGES: FLORAL ULTRAVIOLET SIGNALS ARE ASSOCIATED WITH POLLINATION SYNDROMES IN *ERICA*

by Sam McCarren, Jeremy J Midgley, Anina Coetzee

Different pollinators vary in what they can see. Some of them can see light that is invisible to humans: Ultraviolet (UV). They also react to it in different ways, which could have caused the evolution of UV reflectance in some plant species. We chose the heaths (*Erica*) to study the role of UV for pollination because of their diversity in pollinators, which are insects, sunbirds, long-tongued flies, rodents, and the wind.

We collected flowers from 125 different *Erica* species representing all pollinator groups and measured their UV reflectance. As expected, the groups pollinated by insects, rodents or wind had little or no UV reflectance, but 17% of the sunbird-pollinated species and all of the long-tongued fly-pollinated species reflected UV.

To investigate this further, we tested if those two pollinators prefer UV-reflecting flowers. First, we offered sunbirds artificial flowers with UV and without UV. They visited both types of flowers equally, but when we only put sugar water in the flowers with UV, they learned to only visit those flowers. This means that sunbirds can see UV, but it is not very important for them.



Aristocrat heath (Erica aristata) and Four-sisters heath (Erica fastigiata coventryi) are pollinated by long-tongued flies. Their ultraviolet reflectance is shown in violet. Photos taken with a UV-camera.

We also did an experiment on the Aristocrat heath (*Erica aristata*), which reflects UV and is pollinated by long-tongued flies. We removed UV from some flowers by applying sunscreen and later found almost no seeds inside them because the flies did not visit them. At the same time, we found much more seeds in the flowers with UV. This means, that long-tongued flies strongly prefer flowers with UV. This preference might be the reason why UV evolved in so many long-tongued fly-pollinated *Erica* species.