

## UV REFLECTANCE PATTERNS IN THE FLOWERS OF AUSTRALIAN NATIVE PLANTS

### FINAL REPORT OF A PROJECT FUNDED BY THE AUSTRALIAN FLORA FOUNDATION

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The project was carried out during the spring and summer of 1988, in the Mt Lofty Ranges near Adelaide. The first part of the project involved perfecting a technique to record the UV-reflectance patterns. This was done successfully, and the technique was described in a paper published in the Newsletter of the Australian Systematic Botany Society; viz: Randell B.R. and B.C. Rowland (1989), A method for recording UV-reflectance patterns in flowers. *Aust. Syst. Bot. Soc. Newsl.* 59: 2-4

Using this technique, some 50 species of native plants, belonging to 37 genera, were surveyed. Fourteen genera contained species which showed UV reflectance in their flowers, 23 did not (Table). One genus contained species with and without reflectance [*Cassia*], and one family showed genera with and without reflectance abilities [*Goodeniaceae*].

In the *Labiatae*, a unique pattern of reflectance was evident. Petals of *Prostanthera* and *Westringia* were non-reflective, but spots and hairs within the throats of the flowers were reflective, so the flowers had, in effect, a bright spot near the reproductive organs.

All seven of the surveyed genera of the *Papilionaceae* showed evidence of UV reflectance, usually by having highly-reflective petals, with a non-reflective dark spot on the standard petal, near the reproductive organs. This corresponded closely with the dark spot on the petals visible to the naked eye. One species, *Phyllota pleurandroides*, did not have this visible dark spot on the standard. Nevertheless, it had a standard petal that was highly UV-reflective with a non-reflective dark spot at the base.

In the *Goodeniaceae*, fresh flowers of several species of *Goodenia* had highly-reflective petals, with a dark spot near the reproductive organs, while *Dampiera rosmarinifolia* was not reflective. Two species of *Scaevola* did not have reflective petals, but *Scaevola crassifolia* had petals which were slightly reflective. I also determined that flowers of dried herbarium specimens of *Goodenia geniculata* and *Velleia paradoxa* had highly-reflective petals and a conspicuous dark spot.

Within the *Caesalpiniaceae*, *Senna charlesiana* had reflective petals and a conspicuous dark centre, as did the introduced *Cassia fistula*. However, the native *Cassia brewsteri* had non-reflective petals.

The study revealed that UV-reflectance patterns may be common in Australian wildflowers.

The funds provided by the Australian Flora Foundation were used to purchase two camera bodies, one macro lens [105mm], and a lens filter which blocks visible light but permits the passage of UV light. Other expenses were for travel [minor cost, as all photography was done within 50 km of Adelaide], and the purchase of films, and development and printing of the photographs.

Table. Names of species photographed, and whether or not their flowers show the presence of UV reflectance patterns.

Showing UV reflectance patterns	NOT showing UV reflectance patterns
<i>Daviesia ulicina</i> <i>Hardenbergia comptoniana</i> <i>Dillwinia hispida</i> <i>Pultenaea largiflorens</i> <i>Indigophers sp.</i> <i>Platylobium obtusangulum</i> <i>Goodenia ovata</i> <i>Goodenia blackiana</i> <i>Goodenia geniculata</i> <i>Vellaea paradoxa</i> <i>Phyllota pleurandroides</i> <i>Stylidium graminifolium</i> <i>Prostanthera behriana</i> <i>Westringia [cultivar]</i> <i>Senna charlesiana</i> <i>Cassia fistula</i>	<i>Hymenosporum flavum</i> <i>Billardiera cymosa</i> <i>Comesperma patens</i> <i>Grevillea lavandulacea</i> <i>Beckaea sp.</i> <i>Melaleuca sp.</i> <i>Callistemon sp.</i> <i>Calothamnus sp.</i> <i>Chamaeleucium sp.</i> <i>Leptospermum sp.</i> <i>Calythrix sp.</i> <i>Scaevola microcarpa</i> <i>Scaevola calendula</i> <i>Scaevola spinescens</i> <i>Dampiera rosmarinifolia [herbarium specimen]</i> <i>Ptilotus obovatus</i> <i>Brachyscome multifida</i> <i>Helichrysum cunifolium</i> <i>Helichrysum scorpoides</i> <i>Helichrysum baxteri</i> <i>Helipterum demissum</i> <i>Wahlenbergia stricta</i> <i>Cassia Brewsteri</i> <i>Stackhousia monogyna</i> <i>Astroloma conostephoides</i> <i>Boronia filifolia</i> <i>Zieria veronicea</i> <i>Pimelia glauca</i> <i>Pimelia ferruginea</i> <i>Pimelia octophylla</i>
Showing SLIGHT UV reflectance patterns	
<i>Adenanthos terminalis</i> <i>Scaevola crassifolia</i> <i>Thomasia petalocalyx</i> <i>Tetrateca pilosa</i>	