

Renosterveld Riches – Snippets of the Lowlands Flora

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Densely green in winter with yellow splashes and scattered specks of greyish colour – brown and bare in summer, with only the grey remaining: These are the Cape Lowlands at a glance. Comprising two large regions, the Swartland on the West Coast and the Overberg Ruëns on the South Coast, they stretch out to the north and east of Cape Town, wedged in between the coast and the inland Fold Mountains. The Lowlands of today are most famous for their vast wheatfields thriving on the fertile clay soils and for their agricultural produce – wine, grains, fruit and oil. Not so much for their original inhabitants – whether plant or animal. Yet, the greyish remnants of natural vegetation (coastal renosterveld and sand-plain fynbos) still support a rich array of plant species. Many of these are endemic to the area and are of conservation concern due to large-scale habitat transformation. The geophytes are particularly well represented – Iridaceae being the largest family in the Swartland endemic flora – and they contribute some of the most interesting and beautiful plants to the frequently rather unexciting-looking renosterveld fragments. Most of the irids, including such genera as *Moraea*, *Ixia*, *Babiana* and *Geissorhiza*, flower over a relatively short time in spring and are thus easily overlooked in their natural environment. Similarly, the Amaryllidaceae tend to bloom for a limited period – but mostly in the autumn months.

Extensive field surveys, conducted over the past two years as part of the Cape Lowlands Project, have added greatly to the existing knowledge of the flora in the Overberg and Swartland regions. A good understanding of these areas - flora, fauna, general landscape and landowner willingness to conserve (see pp x-y, this issue) - is critical to the success of the Lowlands Project which is investigating conservation options for the remaining coastal renosterveld areas.

Observed from afar, renosterveld is not always the most ‘charismatic’ of natural habitats, and most of the fascinating interactions are often not immediately apparent. But closer examination is always rewarding, and is highly recommended. Amateur botanists can make enormous contributions, such as in the study of pollinators that may visit some of the rare species sheltering amongst the scratchy renosterbos, and they will soon appreciate the hidden stories in these often all too tiny islands in a sea of sterile wheat and vineyards. Below we highlight a few of the interesting stories and interactions that have caught our eye during the various forays into renosterveld patches throughout the field season:

During Lowlands Project fieldwork a total of eight as yet undescribed species were found in the Overberg – among them four brand-new discoveries that had never been collected before. One of these is a ‘buchu,’ belonging to the genus *Agathosma* in the citrus family, Rutaceae. It also has the very characteristic oil glands on its leaves, which, when crushed, release potent scent. For this reason, some species of *Agathosma*, such as *A. betulina* and *A. crenulata*, are commercially harvested for the lucrative essential oils that can be extracted. The new *Agathosma*, found only on a ridge of quartzose schist near Dassiesfontein west of Caledon, is classified as Endangered due to its very limited range.

It is surprising that, even though the Swartland renosterveld is well known compared with the Overberg flora, new species are still turning up from time to time. *Babiana* sp. nov. ‘bicolor’ (uintjie) is one example. This attractive, late-flowering species is now known to occur only on clay soils, in the area between the Piketberg and Groot Winterhoek Mountains, and is highly threatened over the majority of its intensively cultivated range.

Brunsvigia elandsmontana (Amaryllidaceae) represents another relatively recent addition to the list of Swartland endemics. First discovered in 1994 and described as a new species by Dee Snijman of the National Botanical Institute, it has so far only been collected from a single location on Elandsberg Private Nature Reserve, at the foothills of the Elandskloof Mountains. Like most amaryllids, this species produces flowers (brilliantly pink) in autumn before the leaves have appeared. In late autumn/early winter, once the inflorescence has dried out, it breaks off and tumbles across the ground, thereby scattering the seeds. This can lead to strange distribution patterns among the new generation of plants – for example when inflorescences are caught against a fence!

The striking *Moraea neopavonia* (Iridaceae) – now thought to be con-specific with *M. tulbaghensis* - is one of the ‘peacock’ moraeas (flappies). This group of seven highly threatened species includes two other Swartland species - *M. villosa* and *M. gigandra*. The common name is derived from their characteristic coloration, with prominent iridescent spots marking the centre of the flower. This feature is found in a wide range of species from completely different families and often hints at pollination by monkey beetles (Hopliini, Scarabidae). Indeed, research on three of the peacock moraeas has shown that monkey beetles are the primary, if not exclusive, pollinators. The beetles are attracted by strong visual cues, such as the brightly coloured petals, and they use the flowers as mating sites and also feed on pollen and nectar. In the case of *M. gigandra*, however, it is likely that horseflies are the most important pollinators, yet this is based on informal observations only. The black or blue peacock spots closely seem to resemble the beetle or fly pollinators themselves, and some authors have suggested that they play a role in sexual mimicry.

Many Swartland species of *Ixia*, a large genus in the Iridaceae, have similar dark central markings – one example being *Ixia maculata*. Monkey beetles are often seen on these species, and they may thus be employing the same strategy of sexual reproduction.

The unusual and quite rare orchid *Pterygodium inversum* turned up unexpectedly in a burnt patch of renosterveld in the Botriver Valley in September this year. A curious feature gives this orchid its specific name: the flowers undergo a 360° rotation as they mature, starting at the base and proceeding upwards towards the tip of the raceme. The reason for this behaviour is still unknown. *P. inversum* is also one of the tallest in its genus and is known to occur between Piketberg and Kleinmond. Although we found a large population of about 60 plants, the species usually grows at very low densities - a challenge for successful sexual reproduction. Like most other pterygodiums (moederkappies) the flowers of this species produce oil, serving as the sole reward for its pollinator – in this case *Rediviva peringueyi*. This oil-collecting bee has specialised front-legs with long hairs to which the oil clings very easily. The insects seem to use the oil for protecting their nests from the wet and to feed their young. Orchids that provide oil for their pollinators are almost exclusive to southern Africa, with only a limited number also found in South- and Central America.

An intriguing ‘pollination guild’, involving five species in the genera *Babiana* and *Geissorhiza*, is conspicuous in spring amongst the abundance of Darling wildflowers. The floral mimicry in *Babiana rubrocyanea* (rooiblou-bobbejaantjie), *Geissorhiza radians*, *G. eurystigma*, *G. matthewsii* (wine cups), and some forms of *G. monanthos* - all dwarf bulbs with dark-blue petals and a reddish centre - can be so deceptive that it may also fool the human eye at first. Convergent evolution of the floral form is usually aimed at attracting a common pollinator that responds strongly to a specific visual stimulus. It is still uncertain what the pollinator of this suite of species is - perhaps little tabanid flies (horsefly family), or even monkey beetles?

A major challenge that species relying on the same pollinator face, is to ensure that their pollen does not land up on another species’ flower. Solutions to this problem include the separation of flowering times and spatial separation (species may grow apart). Another way is for species to deposit pollen on different parts of the pollinator’s body, for example thorax versus head. This may be how the *Babiana-Geissorhiza* complex ensures efficient pollination as the flowering periods are largely overlapping. The species also co-occur in the loamy granite-derived sands that characterise large parts of the Darling area. Their habitat preferences are subtle, mainly appearing to be associated with differences in soil moisture.

Ruschia geminiflora (Mesembryanthemaceae) belongs to a complex consisting of at least four very poorly known species, the others being *R. rigidicaule*, *R. diversifolia*, and *R. serrulata* (the latter known only from the first ever collection). These are probably all endemic to the Swartland and there appear to be consistent morphological differences between them. All of the species are threatened and some even Endangered, as they are restricted to lowland clays and loams and have lost well over 70% of their original range. Work is urgently needed on the taxonomy of this complex, but it seems to be a typical example of speciation in the Lowlands, that may be associated with small differences in soil structure and geology. The diversity within this group has not been adequately recognised, which has significant implications for biodiversity conservation, since it is difficult to make plans to conserve what we don’t know about.

Diplosoma retroversum - the eendvoetvygie from Eendeskuil - is a small mesemb that grows exclusively on quartz pebbles overlying clay in the Eendeskuil area, near Piketberg. The only related species is found much further north in similar habitat in the Knersvlakte close to Vanrhynsdorp. Interestingly, the Swartland species

occurs in association with *Sarcocornia xerophila*, a shrubby species previously only known from the same habitat on the Knersvlakte, perhaps indicating an ancient link between these areas which are now separated by relatively wet Mountain Fynbos of the Citrusdal area.

Further reading -

Snijman, D.A. and Linder Smith C. 2001. *Brunsvigia elandsmontana*. Flowering Plants of Africa 57.

Steiner, K.E. 1998. Beetle pollination of peacock moraeas (Iridaceae) in South Africa. Plant Systematics and Evolution 209: 47-65.

Linder, HP and Kurzweil, H. 1999. Orchids of Southern Africa. A.A. Balkema, Rotterdam.