

# Counting Namibia's living diamonds

TEXT, PHOTOS AND ILLUSTRATIONS BY ANTJE BURKE

*The northern portion of the Succulent Karoo – the prime hotspot of plant diversity in Southern Africa – extends into southern Namibia. Locked up in the enigmatic Sperrgebiet or Diamond Area 1, a remarkable diversity of living diamonds rivals the riches excavated by the diamond industry from ancient beaches beneath the sand and sea.*

Patches of yellow, pink and purple-flowered succulents, their leaves bursting with water, carpets of yellow and white daisies and slopes covered in delicate, violet-flowered herbs – all this set against a backdrop of dramatic mountain scenery and vast open plains as far as the eye can reach. We are in the Sperrgebiet after an extremely good rainy season, and my colleagues from Namibia's National Botanical Research Institute and myself have the daunting but exciting task of documenting this remarkable diversity.

"Have we packed enough plant presses, cardboard and newspapers to collect all these plants?" my colleague Coleen Mannheimer asks in despair when we meet at the appointed place to set off into the Sperrgebiet. Escorted by Chief Warden of the Sperrgebiet, Trygve Cooper, we enter from the north at Rotkop Gate, the main entrance on the private road that links Lüderitz with Oranjemund and is the primary traffic conduit through the area. We are joined by Fred and Sarah Gess, two dedicated and well-known insect specialists from South Africa. They are interested in a group of wasps that seem to be largely restricted to the Succulent Karoo, possibly linked to the evolution of the mesembs.

'Mesembs' are members of the family Mesembryanthemaceae or Aizoaceae, commonly known also as vygies or midday flowers. There is truth in their common name, because many start opening their flowers only when it warms up during the day. They are usually in full bloom in the afternoon, before the chill of the evening or damp fog makes them close their precious blooms. Midday was thus prime time for our insect specialists, who set out every day with sweeping and butterfly nets, cameras and collecting jars to document this understudied sector of biodiversity.

The mesembs are the most diverse and spectacular group of plants in the Sperrgebiet. Many are restricted

to this winter-rainfall area and found nowhere else on earth. "How will we ever be able to count them properly?" asks Sonja Loots, the Botanical Institute's Red Data expert, while we scamper across the plains trying to count one of the many species concerned. The fact that most of *Psammophora nissenii* is hidden underground to escape the onslaught of sandstorms and desiccating winds, does not make our task any easier. Having been sand-blasted, scorched by the sun and dried out by bergwinds ourselves on many occasions, we do have sympathy for this little plant, of which only the leaf tips stick out, and we marvel at its magnificent adaptation. When we are forced to kneel down to count properly, we discover that it has evolved yet another ingenious way to survive in the harsh desert environment. Its leaves are covered in sand. This may not sound unusual, since the ever-present winds blowing across these open plains always carry sand, depositing it whenever an obstacle comes in the way.

However, the sand sticks to the surface of the leaves, adhering to a sticky substance the plant has excreted. This is a unique adaptation, known only from a few plants that grow in sand- and wind-swept areas, such as the Sperrgebiet and Namaqualand. These psammophorous (sand-bearing) plants – note the genus name – are particularly plentiful in the Sperrgebiet. Considering the climatic conditions, this is no surprise. Four species of *Psammophora* occur here, two of which, *Psammophora nissenii* and *Psammophora modesta*, are endemic to the Sperrgebiet. Although the more common *Psammophora modesta* could well reach numbers of near ten thousand individual plants, one should never forget that this is the only place on earth where they occur. Apart from *Psammophora*, there are also several lilies and small shrubs that show this remarkable adaptation.

Hiding beneath the ground is an excellent adaptation for this environment, as is indicated by the variety of other mesembs that have evolved similar modifications. There is the famous window plant, *Fenestraria rhopalophylla*, represented here by two subspecies, one being endemic to the Sperrgebiet. There are the popular stone plants – *Lithops* species – which are not restricted only to the Sperrgebiet, but also occur in isolated populations along the coast extending into the central Namib. And there is *Titanopsis*, a small, strange mesemb which looks as if it has chicken-pox – no doubt another ingenious adaptation to reduce water loss, deflect abrasive sand grains or some other as yet unknown means to overcome environmental stresses imposed by the desert.

Studying mesembs is quite a challenge. There is no other group of plants in Southern Africa, if not in the world, that is in such a state of taxonomic confusion.



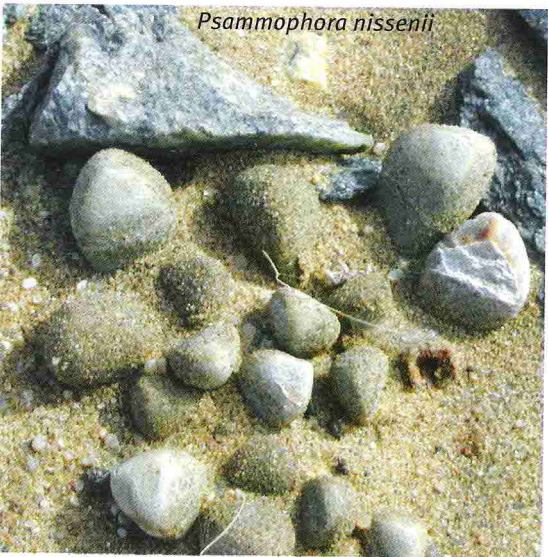
Identification is hence extremely difficult. Species in this family number about 5 000. This is more than the entire number in Namibian flora, which comprises well over one hundred families. It is no wonder that the handful of taxonomists trying to unravel this enormous puzzle are a long way from presenting us with a consistent and simple key to the names of all these different species. Moreover, many groups, and amongst these several from the largely inaccessible Sperrgebiet, have not been studied to any great extent.

Furthermore, conventional taxonomy tools are poorly suited to deal with succulents. Can you imagine trying to describe a species from a pressed herbarium specimen that in the veld has thick, juicy, perfectly cylindrical leaves, glistening cells and pretty, large straw-coloured flowers that turn to insignificant white when pressed between sheets of newspaper? The pressed specimens, even if prepared with the utmost care, usually bear little resemblance to the plants in

nature. There is only one way around this – studying the plants in their natural setting, which means a great deal of travelling, considerable expense and plenty of time, or alternatively, building up live collections.

Coleen Mannheimer must be admired for not being put off by this daunting challenge. She is currently sorting out one of Namibia's most important group of mesembs – a small group of tufted dwarf succulents with stunning flowers and a potential for cultivation in rock gardens. Almost the entire group is endemic to the Sperrgebiet, some species being restricted to a very small area. We look forward to her exciting revelations on the evolution of the intriguing *Dracophilus*, *Namibia* and *Juttadinteria*.

Despite the difficulties of working with succulents, the development of modern techniques such as DNA analysis has enabled mesemb-taxonomists to take great leaps forward. The discovery of the speed of evolution in the mesembs recently made headlines in



the scientific world. The tempo of development of new species is remarkably faster than for any other family of flowering plants and is believed to be – in evolutionary terms – a very recent phenomenon. How many of these newly evolved plants occur in the Sperrgebiet? Our current tally is 165 species, and there are probably more waiting to be discovered.

“Now, we definitely have to repack” says Coleen as we traverse a small dune field north of the Klinghardt Mountains on our way back. The roof rack on the Landcruiser has collapsed under the weight of the plant presses. But this unfortunate event was the result of an extremely successful collecting trip, and Coleen was right – we did run out of presses, newspaper and cardboard!

*Antje Burke is a plant ecologist who has been working in the Sperrgebiet for nearly a decade. Her field guide entitled Wild flowers of the southern Namib was published recently.*