

The background image shows a desert landscape with light-colored, rocky soil. In the foreground, a cluster of Lithops (living stones) is visible. These plants have rounded, greyish-green bodies with dark, mottled patterns, making them blend in with the surrounding stones. A small green plant is also visible in the upper right, and a larger green leaf is in the bottom left corner.

Unlocking new horizons

The lasting jewels of the Sperrgebiet

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18 February 2022

Namibia's prime natural asset

Let me tell you why...

No BIG 5, but the most exquisite SMALL 5

...'small' only because they are subtle

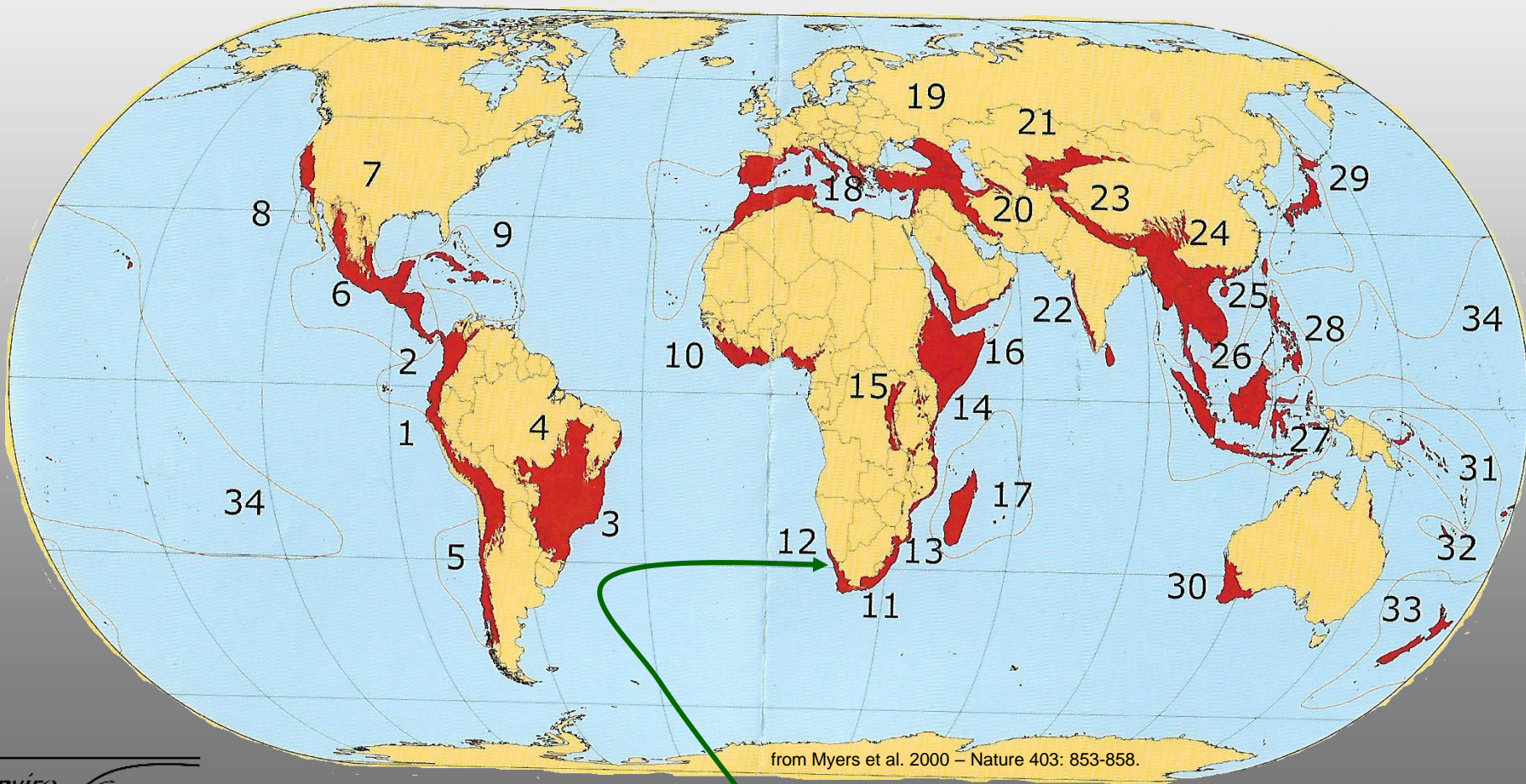
1. Almost all geological periods of Namibia represented
2. Impressive fossil record
3. All possible desert habitats
4. Highest plant diversity in Namibia
5. Highest level of plant endemism

... and never mind
the fascinating
cultural heritage



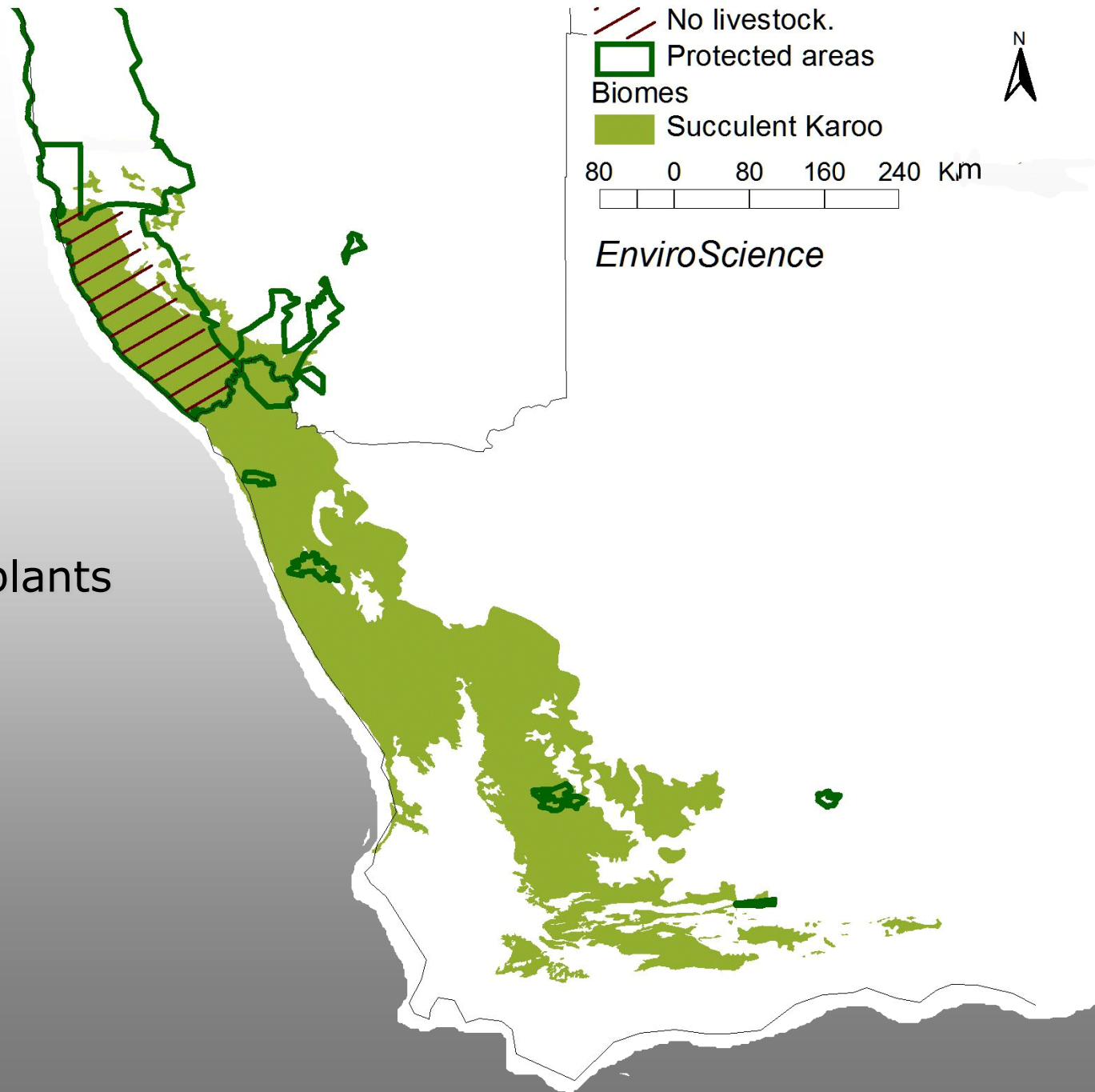
Global perspective

But before we go into more detail – let's take a step back and put this into context



Succulent Karoo Biome

❖ Succulents
= water-storing plants

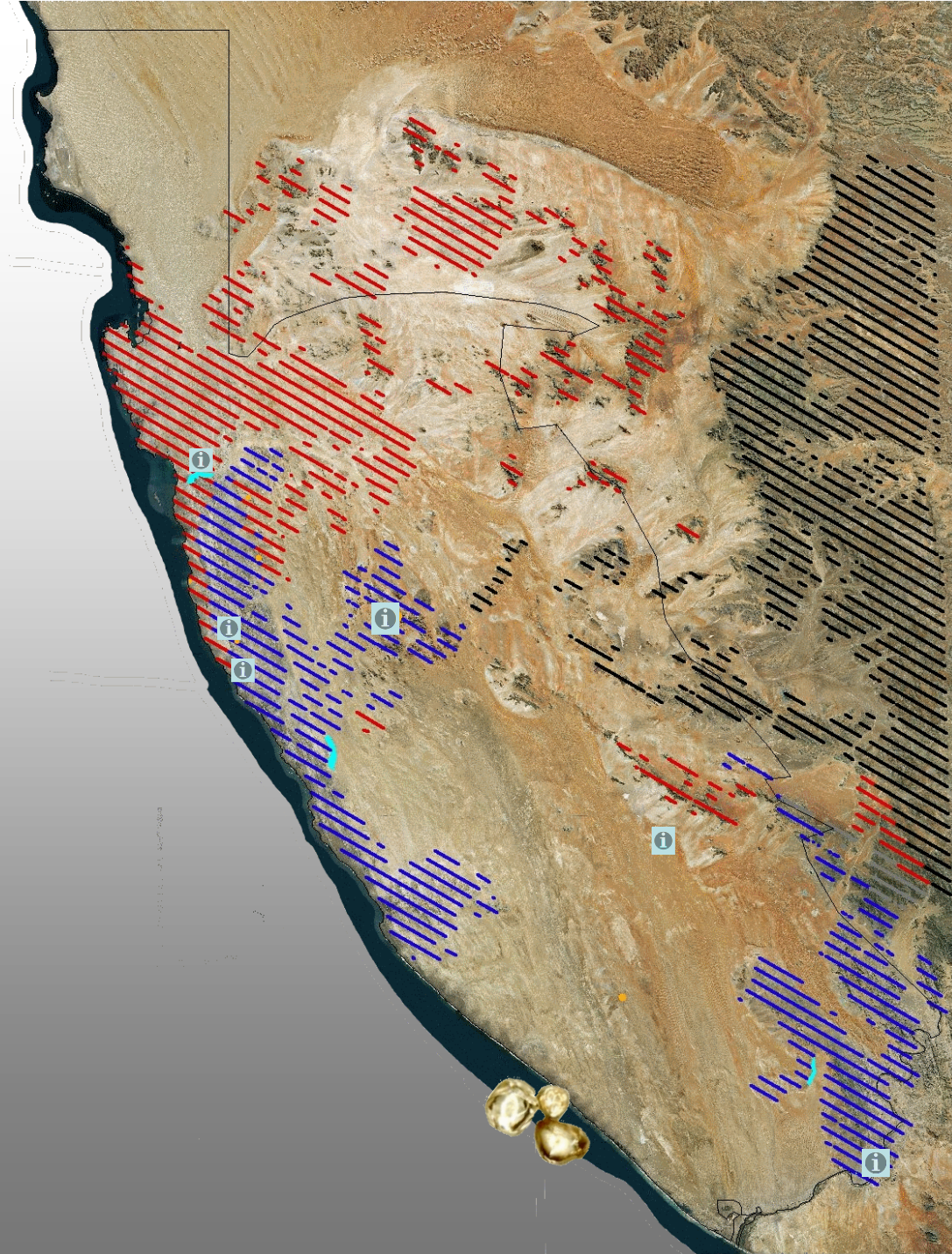


Where are we?



1. The foundation

...back to the 'SMALL' five





Miocene fauna (23 Ma)



Roter Kamm

Pliocene (3.7 Ma)



Earth



Klinghardt phonolites

Eocene (35 Ma)





Cretaceous (133Ma)



Granitberg



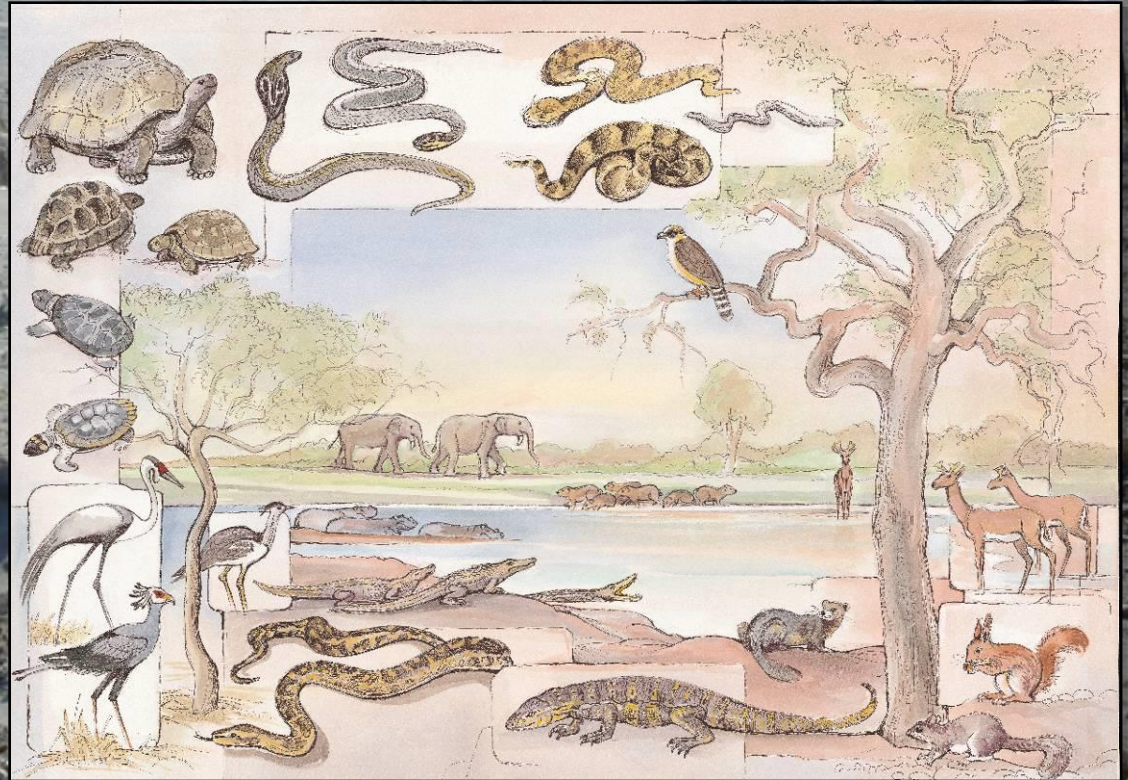
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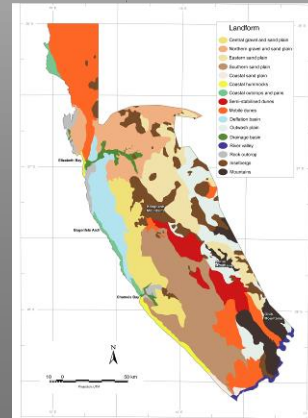
Gariep belt (900-500 Ma)

Arrisdrift fossil site

- ❖ Most important Cenozoic fossil site in Africa (17 ma)
- ❖ >10 000 fossils (mammals, reptiles, birds + fish)



2. Desert habitats







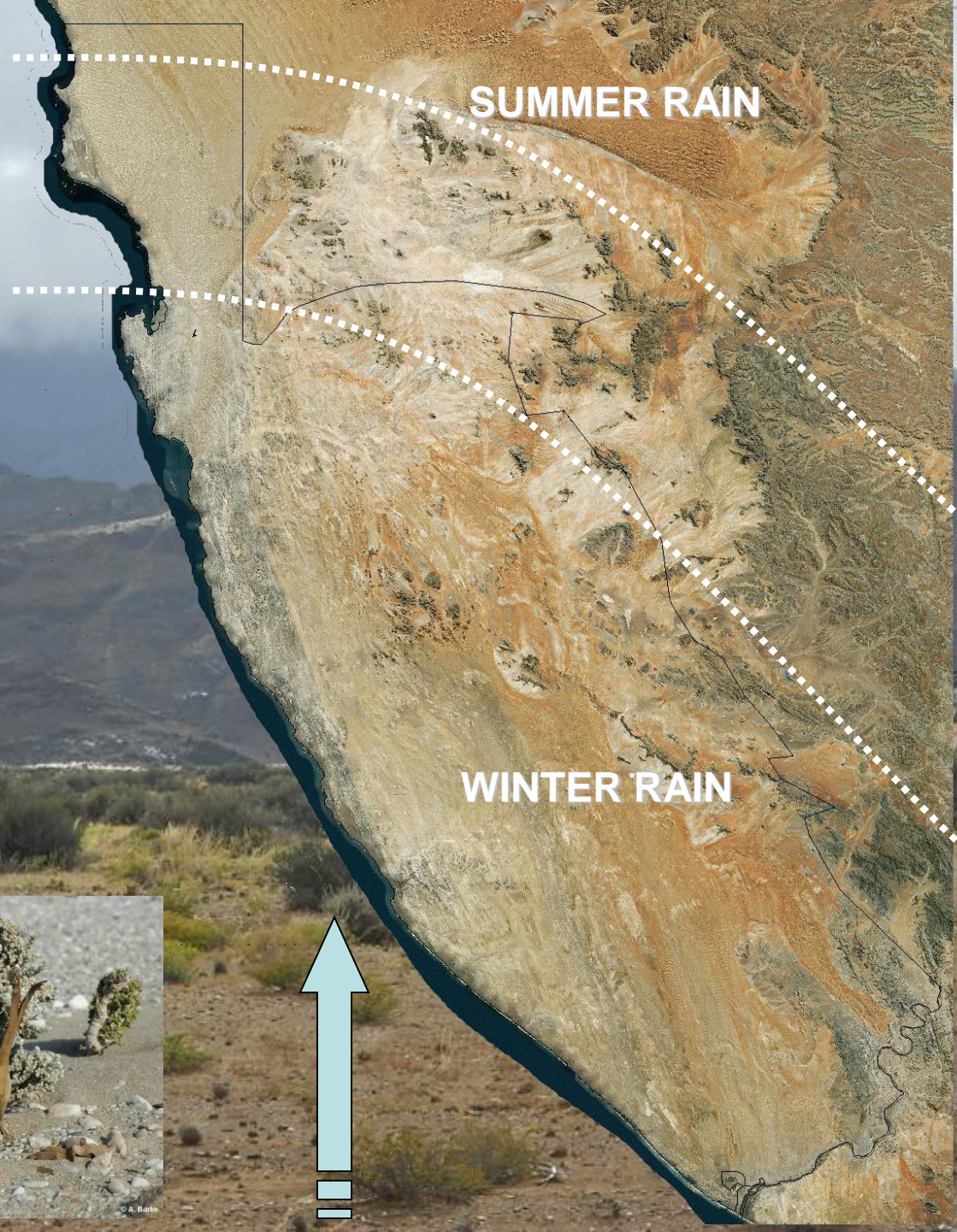






The environment

Succulent Karoo - Desert
Nama Karoo Biomes



4. and 5. Biodiversity

- ❖ Over 1000 plant species
- ❖ 31 park endemics, 11 extremely restricted
- ❖ Critical biodiversity areas

...based on highest plant diversity and endemism and special habitats







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Aurus saddle

- ❖ Nearly 200 plant species recorded
- ❖ 15 species of *Crassula*, 3 *Conocarpus* species and other collector's finds
- ❖ One plant endemic to the mountain
- ❖ At least 44 protected species
- ❖ Many unusual plants such as orchids, succulents, bulbs





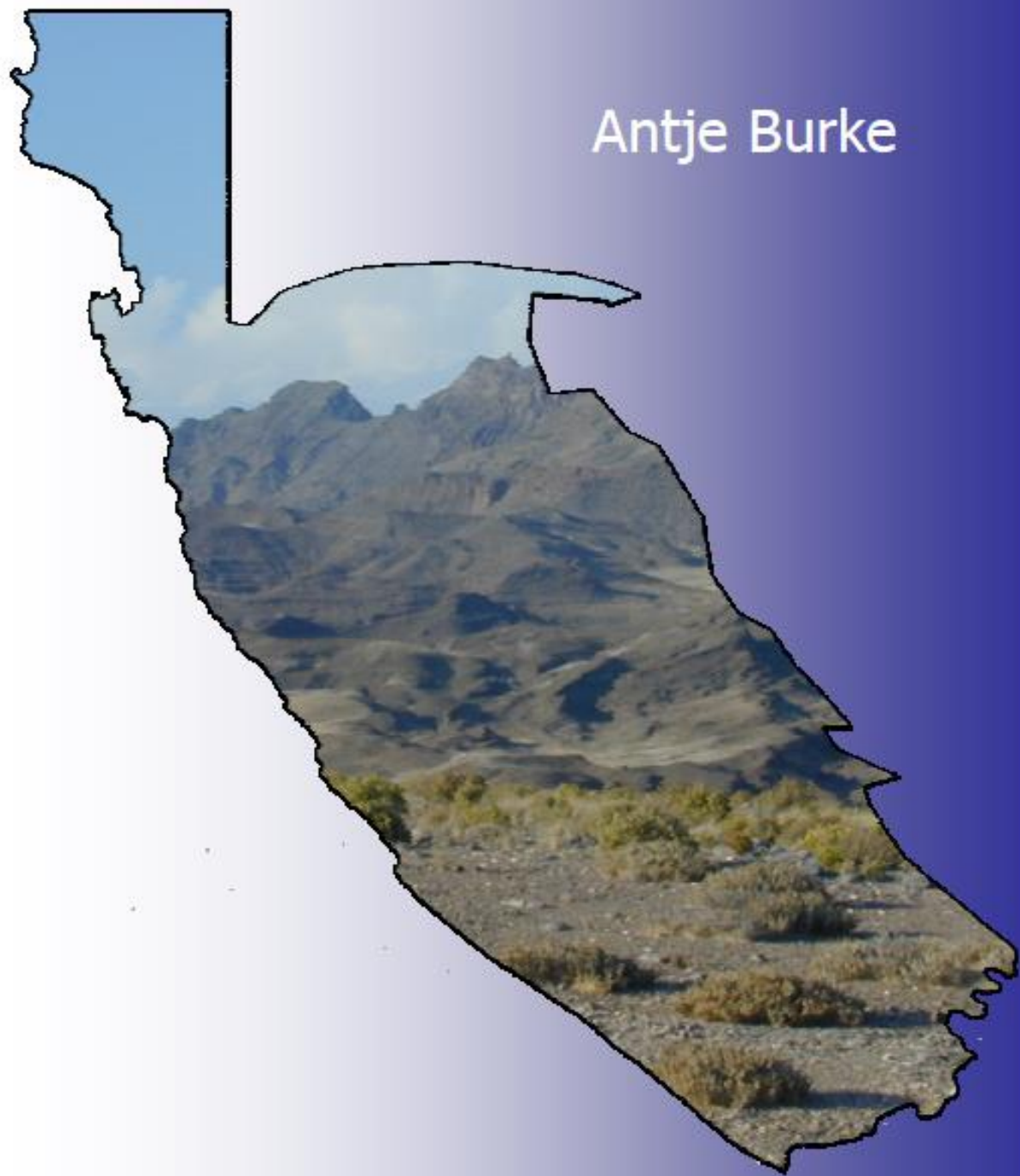
Endemic plants



...possibly mirrored in invertebrate endemism

Endemic plants of the Sperrgebiet

A photographic guide



Marlothiella gummifera

Sp

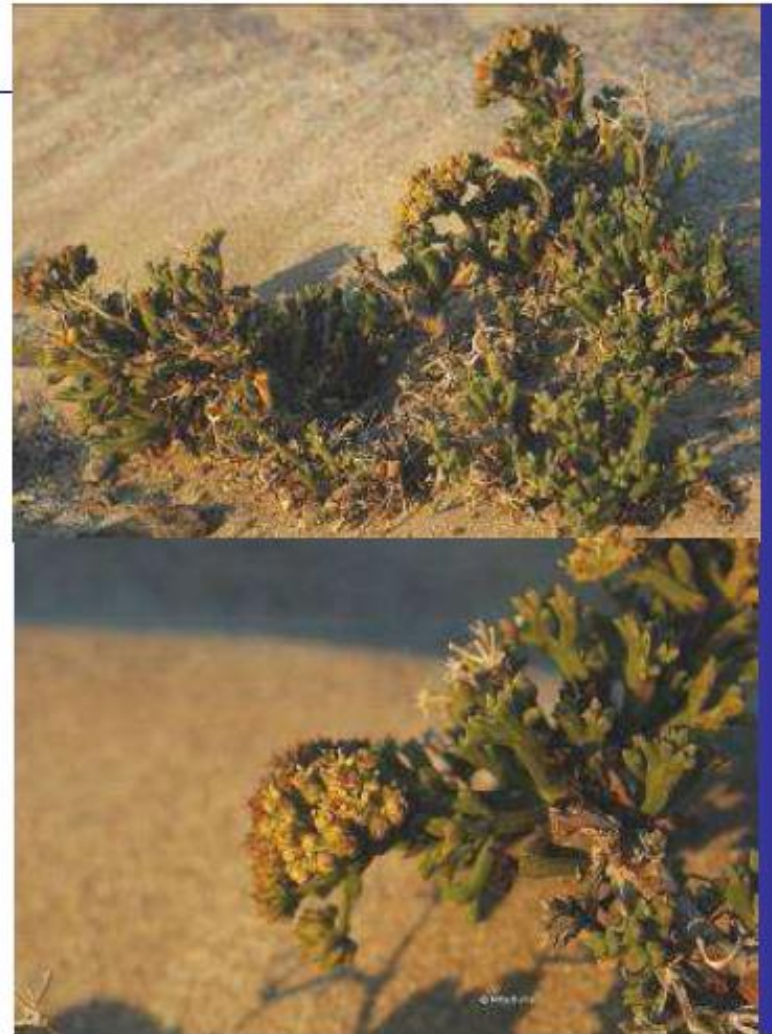
Named after the botanist Marloth and refers to its resin-bearing nature.

DESCRIPTION This densely branched, compact small shrub grows no more than 30 cm high. Its leaves are yellow-green, profusely divided, somewhat succulent, but nevertheless hard and aromatic. They are evergreen and clustered along the branches. The small, pale-green flowers are arranged in dense umbrella-like clusters. The plant exudes an aromatic resin.

DISTRIBUTION This dwarf shrub is restricted to the Sperrgebiet's coastal area and grows on rocky outcrops and gravel plains.



SIMILAR to, but only vaguely, the related *Polemanniopsis namibensis*. However, their distributions do not overlap, and *P. namibensis* leaves are three-divided, dull to dark green, non-succulent and only present in winter.



Apiaceae (carrot family)

Polemanniopsis namibensis

Sp

Named after the 19th century naturalist Polemann and refers to its occurrence in the Namib Desert.

DESCRIPTION This small shrub grows up to 0.5 m high and is rather inconspicuous most of the year because it bears leaves only in winter. The leaves are mostly three-divided, dull to dark green and resemble those of parsley. The small cream-coloured flowers appear in loose clusters in the summer, well before the leaves appear. The fruits have five wings.

DISTRIBUTION *Polemanniopsis namibensis* occurs in a few isolated populations in the north-central part of the Sperrgebiet, north and south of the Kaukausib valley.



SIMILAR to possibly its closest relative in the Sperrgebiet, *Marlothiella gummifera* (see previous page).

Although known for decades, this shrub has only recently been named, because flowers appear separate from the leaves and therefore not when expected.



Apiaceae (carrot family)

Eremothamnus marlothianus

Gar Named after the botanist Marloth.

DESCRIPTION This dwarf shrub, which grows no higher than 50 cm, can be recognised by its silver velvety leaves, which have sharp teeth on their margins, as do the large bracts (flower-bearing leaves) which hold the flowers. The striking, solitary, yellow flowers on the tips of branches are also characteristic.

DISTRIBUTION *Eremothamnus marlothianus* is restricted to rocky outcrops in the Sperrgebiet's coastal area from Spencer Bay to Chameis.



SIMILAR to *Didelta carnosa* ssp. *tomentosa* which can be clearly distinguished by its flower with massive spiky bracts and absence of spines on its leaves.



Frankenia pomonensis

Sp

Named after Professor Franke, a 17th century botanist from Uppsala, and because it occurs near Pomona.

DESCRIPTION This rather unremarkable, densely branched, heather-like erect shrub grows no more than 30 cm high and bears clusters of small, needle-like leaves. Leaves and stems are often covered in dense papillae. The small flowers are borne near the branch tips and can range in colour from white to dark pink.

DISTRIBUTION This shrub only occurs on the central coast in the Sperrgebiet in the area around Pomona and Bogenfels in rocky and sandy terrain.



SIMILAR to the only other species in this genus in Namibia, *F. pulverulenta*, which is an annual and grows prostrate on the ground.



Frankeniaceae (Frankenia family)

Hoodia officinalis ssp. *delatiana*

Sp

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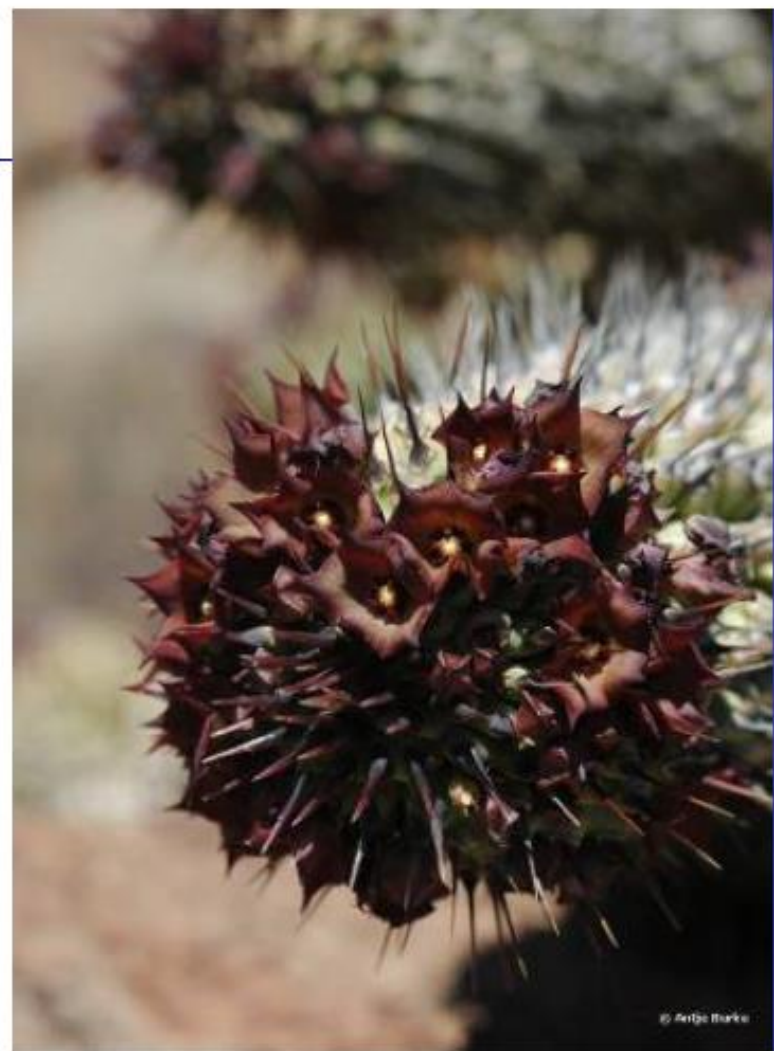
Named after the 19th century British succulent collector Hood, and Frans de Laet, a Belgian succulent expert.

DESCRIPTION This medium-sized stem succulent can grow over 50 cm tall, but is often found scrambling over rocks. It is recognised by its 19–23 rows of rather stout spines which can be up to 12 mm long. The 1–3 flowers are usually 14–20 mm in diameter and on short stalks (<2 mm). The red-brown flowers have few papillae. The horn-shaped capsule splits into two halves.

DISTRIBUTION The plant has so far only been found in the Klinghardt Mountains on quartz and quartzite outcrops and inselbergs.



SIMILAR to many other *Hoodia* species which are difficult to tell apart without flowers. Subspecies *delatiana* is distinguished from its closest relative, ssp. *officinalis*, by its flower without papillae; ssp. *officinalis* has a larger, densely papillose flower.



Apocynaceae (oleander family)

Conophytum klinghardtense ssp. *klinghardtense*

Sp

P

R

Named after the place where it occurs.

DESCRIPTION This mat-forming dwarf succulent is characterised by a relatively closed, yellow-green, squat body and distinctive red keels. It is usually distinctly spotted. The flowers initially open at night and are whitish-yellow to copper. The capsules have four to six chambers.

DISTRIBUTION This plant has so far only been found in the southern part of the Klinghardt Mountains and in the Heioab–Aurus mountain range. It can be found in sheltered crevices, mostly on the moisture-receiving south to west-facing slopes.



SIMILAR to ssp. *baradii* (see previous page).



Aizoaceae (mesembs)

Fenestraria rhopalophylla ssp. *rhopalophylla*

Sp P Named after the 'window' at the leaf tips.

DESCRIPTION This intriguing little mesemb has opted to bury most of its body in the sand. Usually only the tips of the leaves can be seen, showing a clear window, which gave the plant its common name, window plant. Spectacularly large, white flowers with a yellow centre emerge during the winter months. The capsules have 10–12 chambers and are produced on a long stalk.



DISTRIBUTION This succulent grows on sand and gravel plains, occasionally on the foothills of rocky outcrops; it is mainly restricted to the coastal area of the Sperrgebiet.

SIMILAR to ssp. *aurantiaca* which has a yellow flower.



Aizoaceae (mesembs)

Lithops optica

Gar

P

This species is named after its clearly visible 'open windows'.

DESCRIPTION These tiny succulents hide most of their bodies below the ground with only the top of the leaf pair visible. Strictly speaking, the underside of two leaves, appear above ground. The large, open window is characteristic. The flowers are white and the capsules five-chambered.

DISTRIBUTION This dwarf succulent occurs in the coastal strip of the Sperrgebiet, on rocky outcrops and gravel plains.

SIMILAR to *L. herrei* which has a yellow flower with a white centre.



Lithops optica is currently being combined with *L. herrei*, and will then no longer be endemic to the Sperrgebiet, but also occur in the northwestern Cape. Reddish plants, thought to be originating from a mutant, occur on the Lüderitz peninsula.



Aizoaceae (mesembs)

Namibia cinerea

Sp

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NT

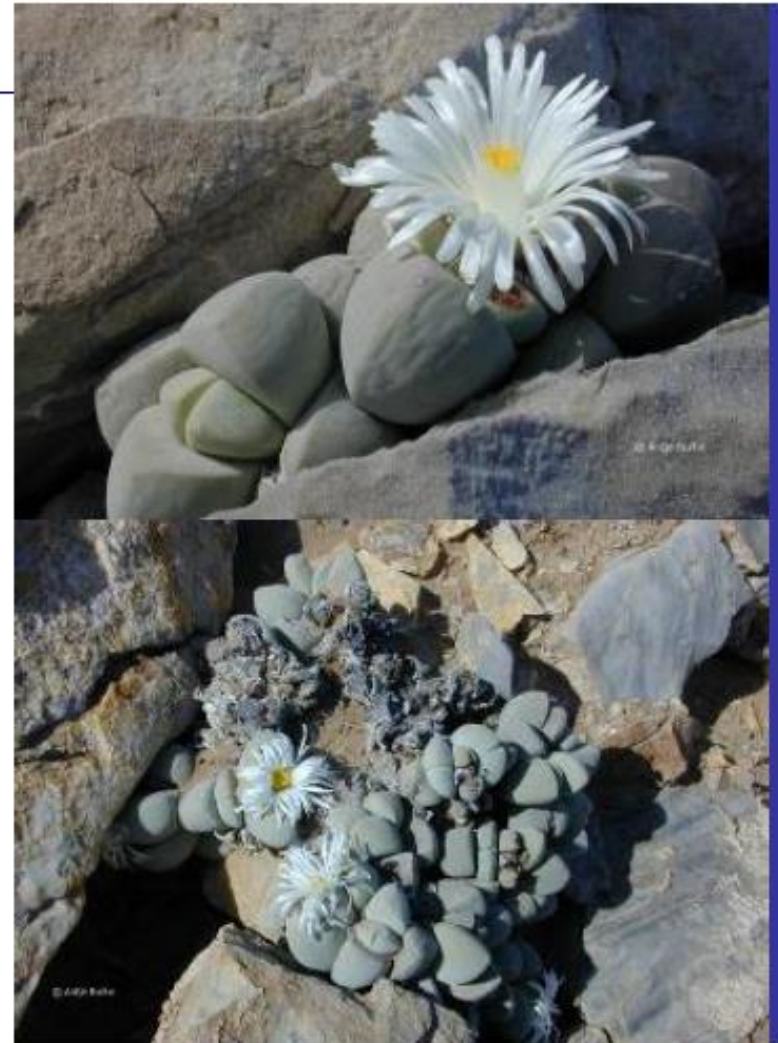
The plant is named 'cinerea' because of its ash-coloured appearance.

DESCRIPTION This dwarf succulent is characterised by a grey to brown-green, velvety appearance and compact, semi-globose growth; it hardly reaches 20 cm in height. The white flowers are large, up to 55 mm, and have a sometimes square appearance. The fruit capsules have 8–14 chambers.

DISTRIBUTION This plant grows in rock crevices, largely on dolomite outcrops in the coastal and near-coastal area.



SIMILAR to
N. ponderosa which has pink flowers.



Aizoaceae (mesembs)



Tylecodon aridimontanus

Sp

R

So named because it occurs on a desert mountain.

DESCRIPTION This tiny succulent grows no more than 5 cm high. A few tapered branches emerge from a broad base – often partially underground. The leaves are ovate to elliptical, dark green, covered in glandular hairs, have a distinctive fold and do not have a swollen leaf base. The inflorescences branch and the flowers are on stalks of about 1 cm in length. They are pink to lilac and hairy inside.

DISTRIBUTION This dwarf succulent is only known from the Klinghardt and Heioab mountains in the central Sperrgebiet.



SIMILAR to *T. bleckiae*, *T. aurusbergensis* (see next page) and *T. schaeferianus*, all of which are extremely difficult to distinguish when the plants are small and have not yet developed a distinct stem.



Tylecodon aurusbergensis

Sp

P

R

So named because it occurs in the Aurus Mountains.

DESCRIPTION This dwarf succulent grows up to 8 cm high. Its knobby, peeling stem is distinctive. The leaves are succulent, flattened, spade-like, dark green, densely hairy and leave a swollen base where they have fallen off. The 1–3 pink flowers grow on stalks which can be up to 2 cm long.

DISTRIBUTION *Tylecodon aurusbergensis* has only been found on west- to south-facing slopes of the Aurus Mountains.



SIMILAR to *T. bleckiae*, *T. aridimontanus* and *T. schaeferianus*. The proposed revision of the genus may throw some more light on these very similar-looking dwarf succulents.



Crassulaceae (stonecrops)

In conclusion...

- ❖ Aridity, special habitats and unique biodiversity make the area fragile.
- ❖ Most habitats and vegetation are not restorable.
- ❖ These would irretrievably lost, if disturbed.



Diamond mining

- ❖ Responsible for large tracks of undisturbed Succulent Karoo
- ❖ Most large-scale mining in (to some extent) restorable habitat – the coastal sand plains
- ❖ Different at inland sites (Orange River): intensive intervention takes place to restore mined habitats, but outcome uncertain



A word of caution...

There are land use conflicts between

- ❖ Conservation – tourism
- ❖ Conservation – mining
- ❖ Conservation – renewable energy/
green hydrogen

All developments (including tourism) have the potential to directly contribute or—in the extreme—result in the extinction of species.

Sacrificing irreplaceable biodiversity cannot

- be called 'green' development or
- marketed as 'ecotourism/sustainable' tourism.



Unlocking new horizons

Let's make sure the
jewels last!

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Thank you!