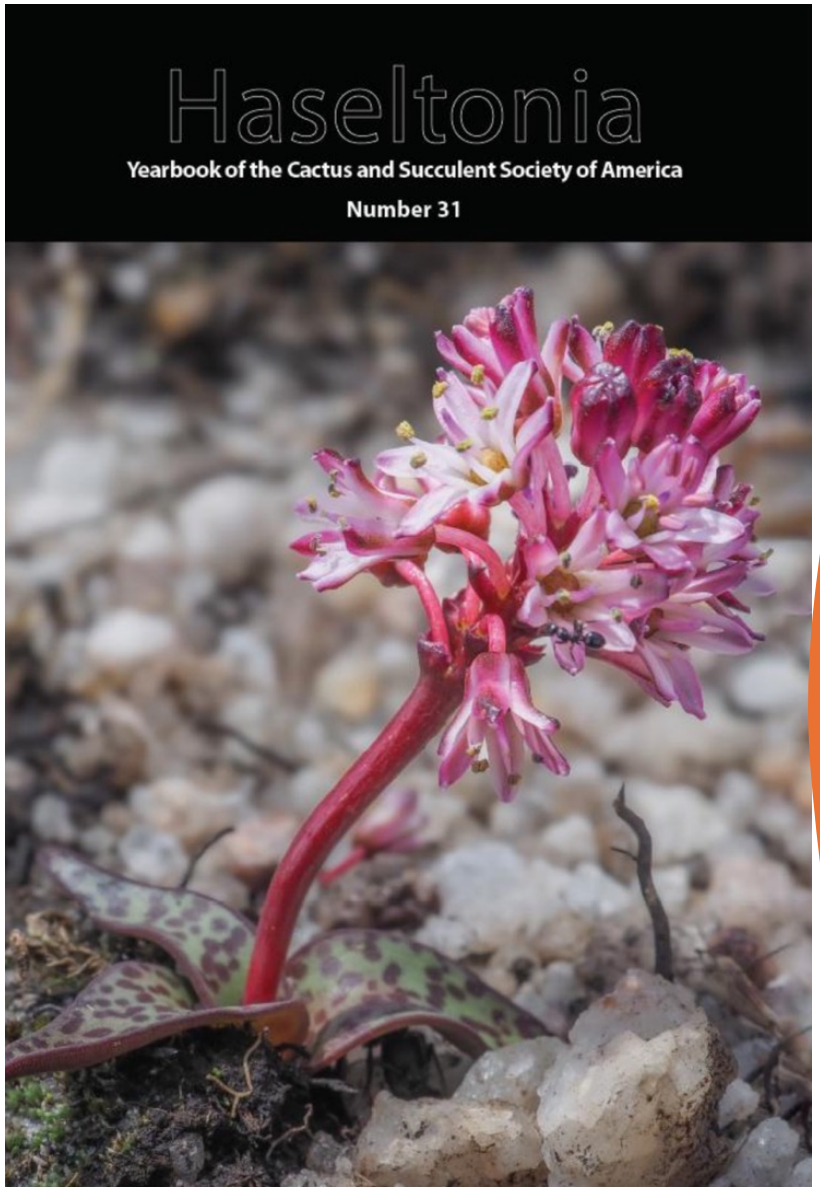
Four new species of *Ledebouria* from the high altitude grasslands of the Steenkampsberg, South Africa.

Andrew Hankey & Tony De Castro



This paper was published in Haseltonia 31 : 2024.

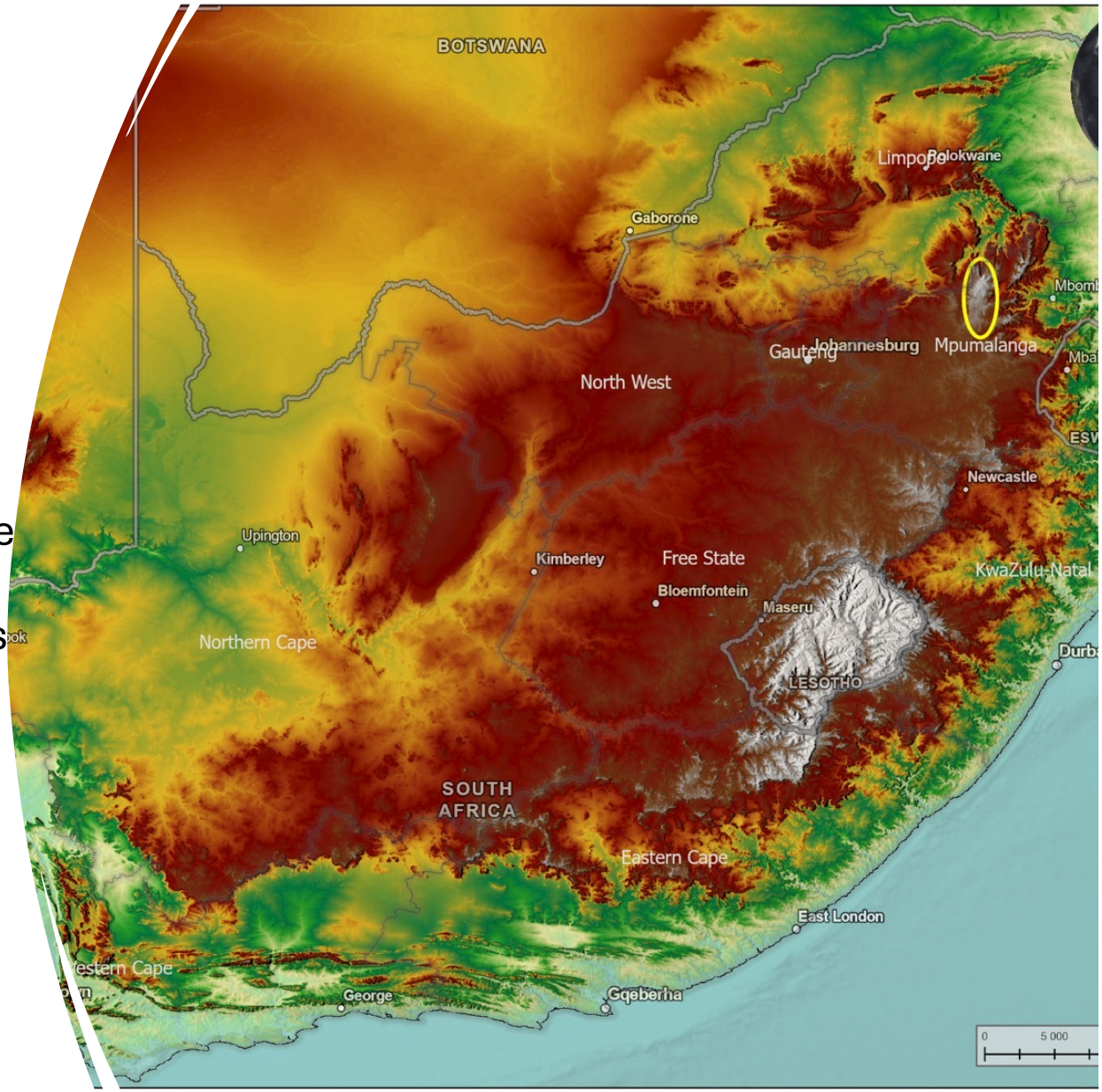
- Here we will present an overview of the paper as well as extracts from the De Hoop NR Botanical report

and

- We will also provide emphasis on the autecology of the four species, and the uniqueness of the location.

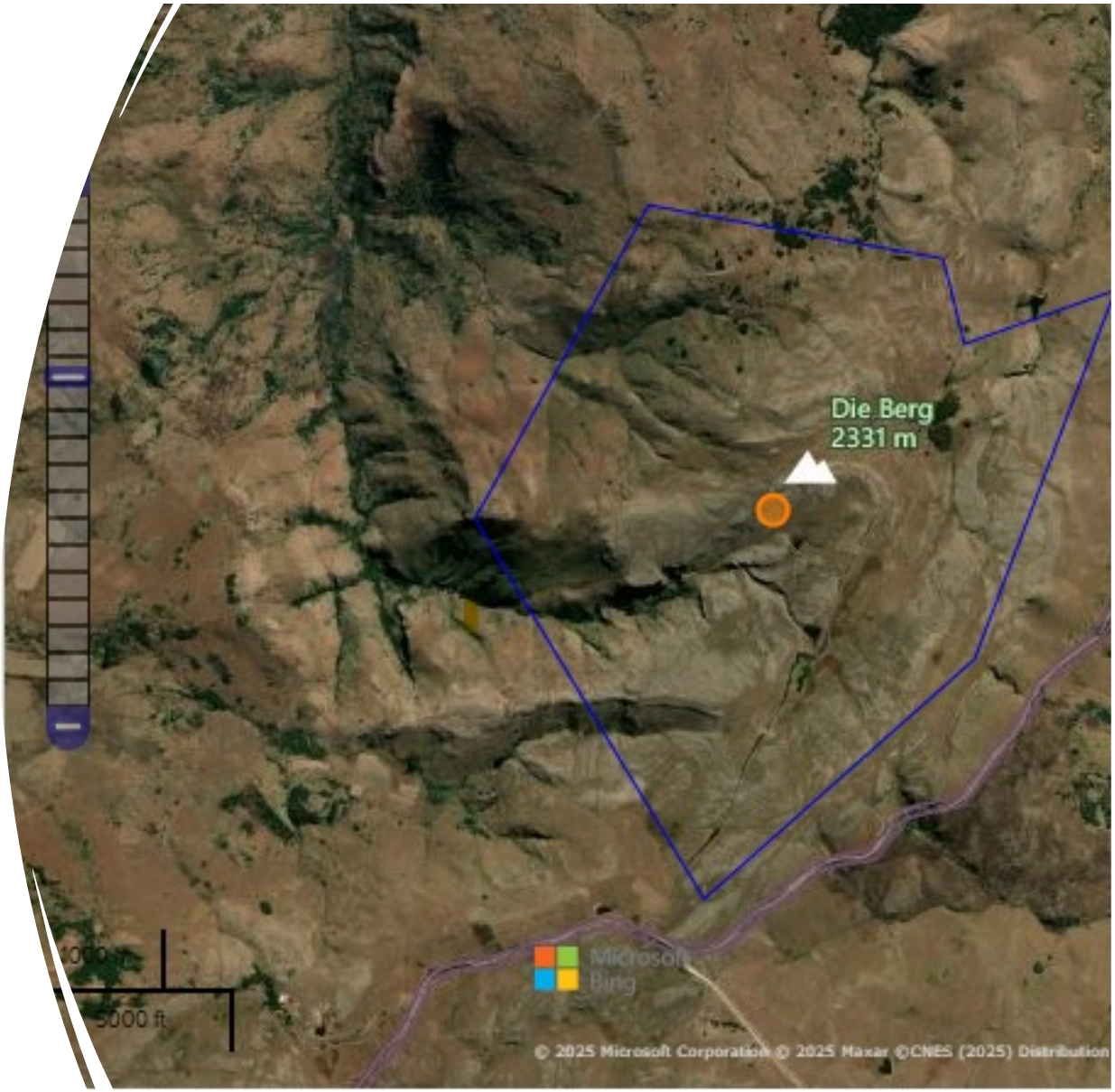
Steenkampsberg - Orientation & Geology

- The Steenkampsberg is an isolated mountain range located to the west of Lydenberg, in the Mpumalanga Province
- The highest peak on the mountain reached 2,331masl, which is the highest point in Mpumalanga.
- The geology on the high plateau is quartzite, giving rise to acidic nutrient poor sandy soils.
- Lower altitudes sees more ultramafic noritic type geology of the Sekhukhuniland group.



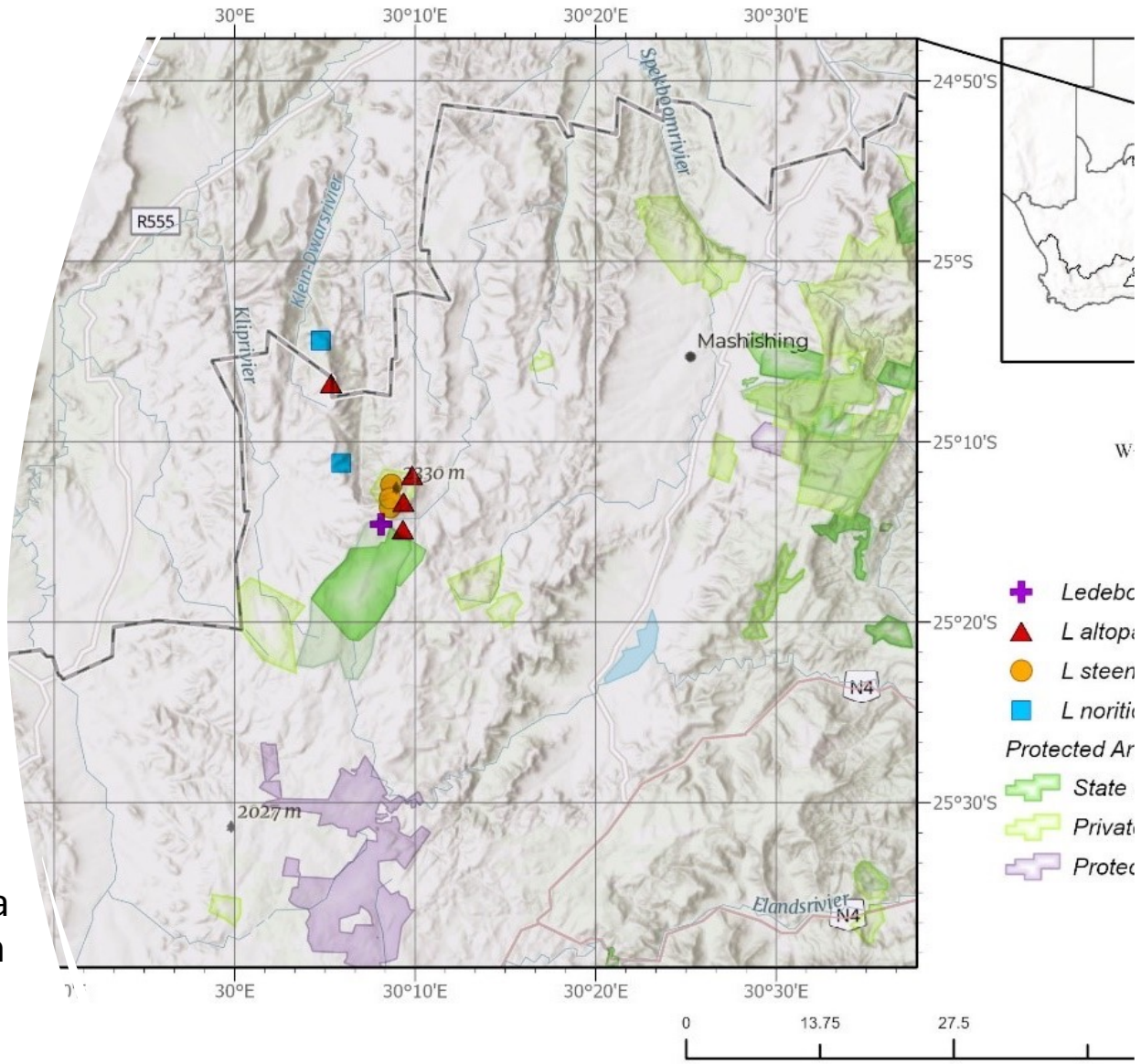
De Berg Nature Reserve (DBNR) Steenkampsberg

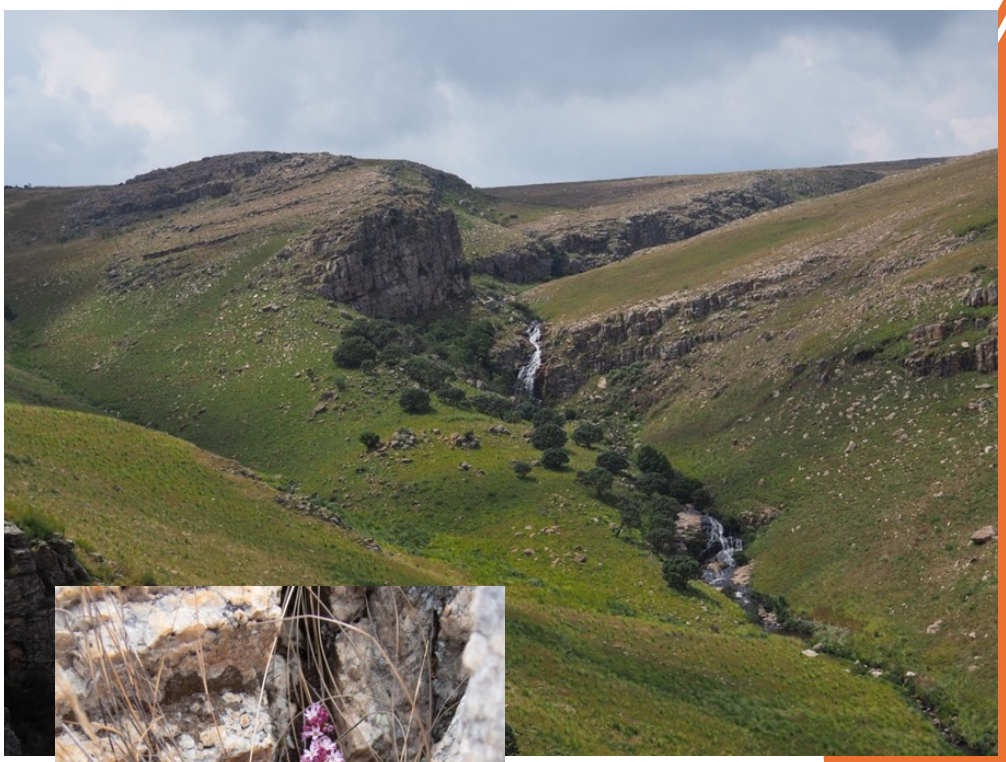
- The DBNR reserve is 2,127ha in size
- In 2024 the Reserve was registered as the 30th Ramsar Wetland of international importance.
- DBNR Includes over 70 wetlands that account for approximately 185 hectares (14.5%) of its surface area.
- DBNR has high plant diversity 930 plant species, which is an exceptional diversity for such a small reserve.



De Berg Nature Reserve (DBNR) Steenkampsberg

- DBNR is less than half the size of adjoining Verloren Valei NR, yet contains more than double the number of plant Species Conservation Concern (SCC).
- DBNR has 42 plant SCC; 19 threatened species (CR, EN or VU), 11 Near Threatened, 7 Rare and 5 Declining species.
- Of the 200 Threatened and Near Threatened plant species for Mpumalanga province, 15% occur in DBNR. In less than 0.03% of the province.





Endemism in DBNR

- 100 endemic and near-endemic taxa are known for the SCPE Siebert (1998), 15 of which occur in DBNR.
- 80 endemic and near endemics are known for the LCPE Lötter (2019) 17 of which occur in DBNR.
- 52 spp. sensu LMEE (Clark et al. 2022) endemics occur within the DBNR
- The DBNR is the single highest plant diversity “hot spot” in the Mpumalanga province

Ledebouria taxonomy

Due to broad species concepts adopted by previous scientists working in the genus (notably Jessop 1976), defining species boundaries have become problematic.

Three of the four species named in this paper, were previously known entities, but had never been formerly named, largely due to the broad concepts mentioned above.

The four species named are compared with their most closely related species groups viz. *L. sandersonii; L. cooperii* and *L. galpinii*.

For that reason, I will post pictures of those three species for the benefit of people in the audience who may not be familiar with those related taxa.

1. *Ledebouria purpurea*

- This species has been known since 1998 when it was collected by the first author.
- This species is most closely related to *L. sandersonii* based primarily on morphological characters.
- The species differs from its closest relative by the glossy cymbiform leaves, dark purple flowers combined with the unique morphology of the ovary.

L. purpurea

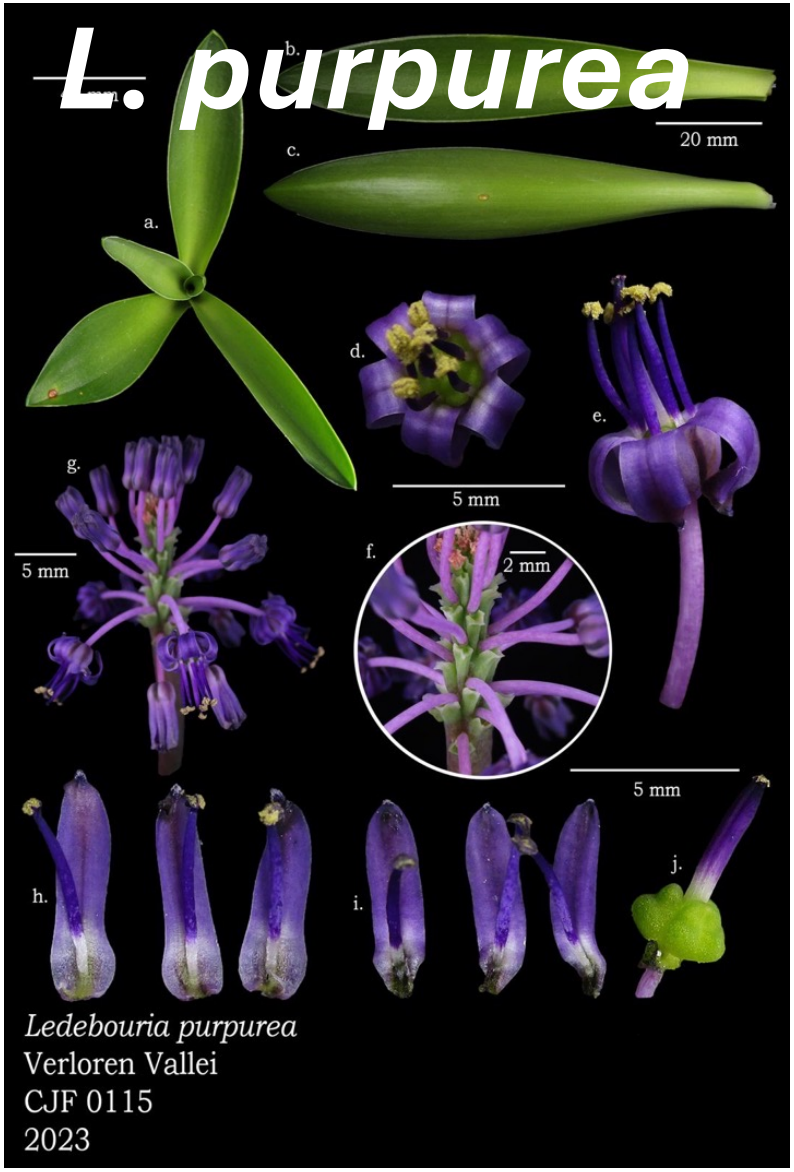
Autecology of L. purpurea

The species is recoded from 14 sites in the DBNR, possibly also in VVNR

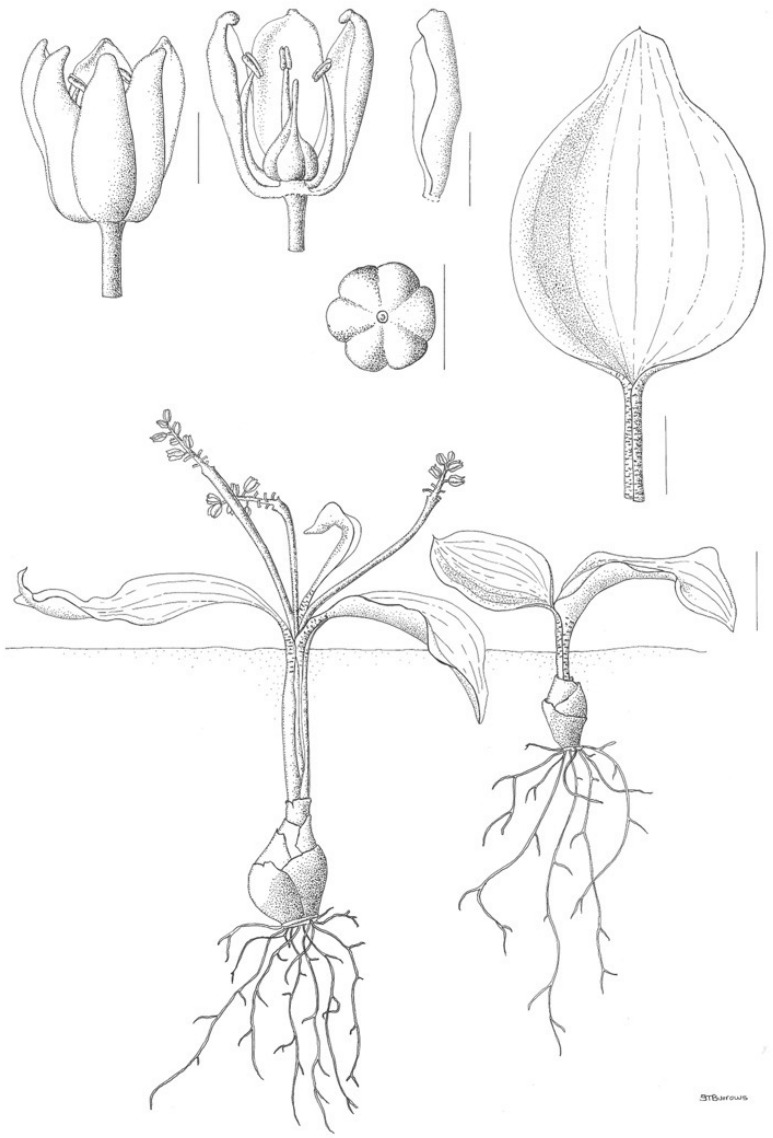
Narrow endemic to the Steenkampsberg subcentre of the Lydenberg Center of Plant Endemism (LCPE)(Lotter 2019).

Habitat specialist – grows in shallow skeletal soils overlying quartzitic bedrock on gradual mountain slopes and terraces in areas that experience periodic surface flow, the soils are seasonally to temporarily saturated.

Only found in the altitudinal band from 2151 – 2303 masl.

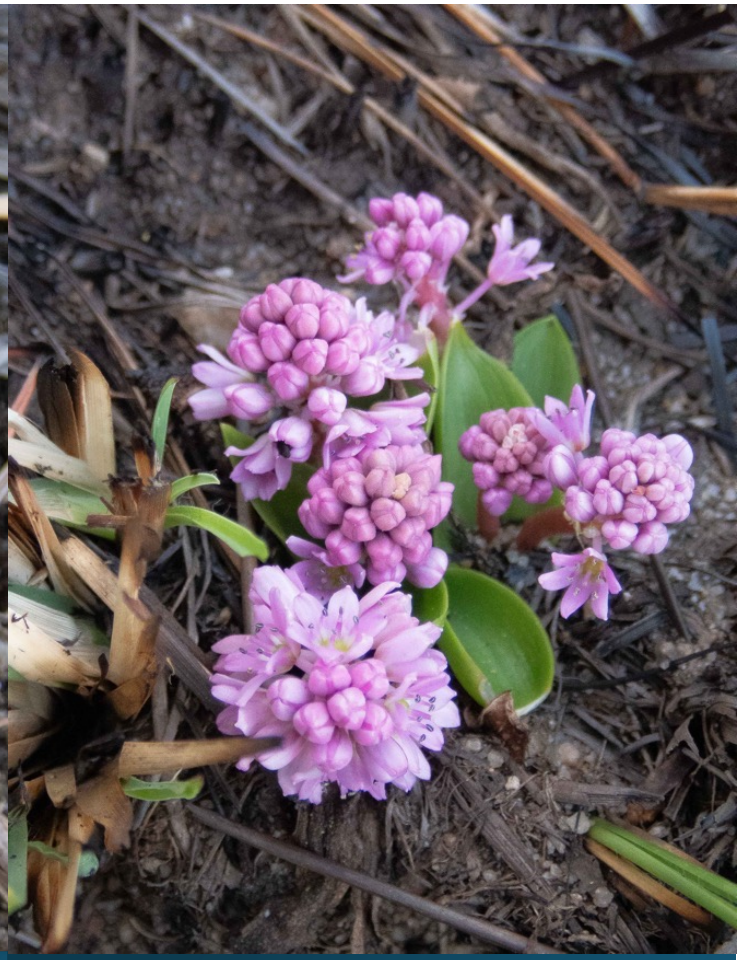


L. sandersonii for comparison



2. *Ledebouria altopaludosa*

- This species has also been known for many years, with Craib (2006) referring to it as *L.* species affinis *L. monophyla*.
- Venter (2008) commented on Craib (2006) saying that he regarded the it as an undescribed entity related to *L. monophyla*.
- When we studied this species it became clear that the ovary characters placed it closer to *L. cooperii* than to *L. monophyla* (or *L. sandersonii* which it superficially resembles).
- The ovary characters of this species are most similar to *L. cooperii* although they lack the characteristic basal lobes of that species.



L. altopaludosa

Autecology of *L. altopaludosa*

Recorded from 27 sites in the DBNR and VVNR

Narrow endemic, Mpumalanga occurring in the Steenkampsberg subcentre of the Lydenberg Center of Plant Endemism (LCPE)(Lotter 2019) and the Sekhukhuneland Center of Plant Endemism (Siebert 1998, Van Wyk & Smith 2001).

Restricted to high altitudes between 2, 020 – 2,258 masl

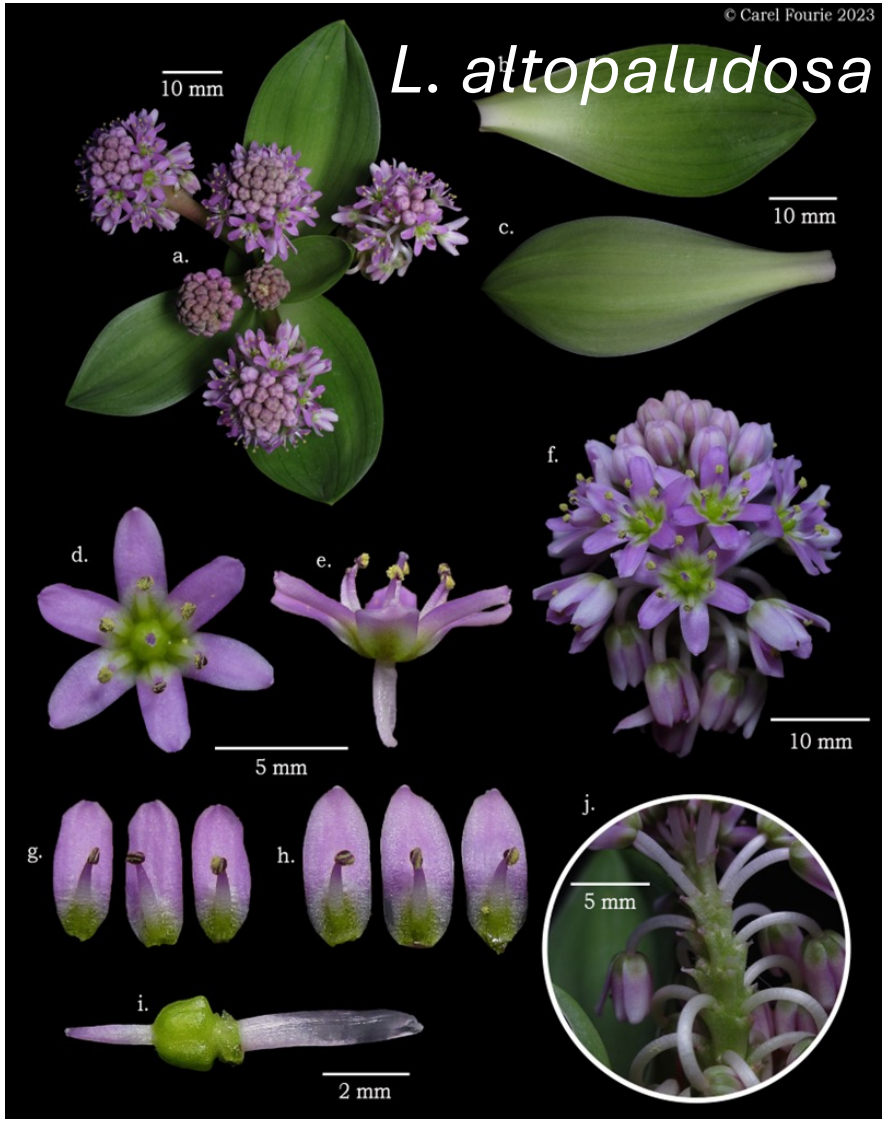
Habitat specialist occurs in valley bottom wetlands and seeps growing only in true peat substrates

Most abundant in the outer zones of actively forming peat mires within the DBNR and VVNR

Peat wetlands are rare at this altitude in the province

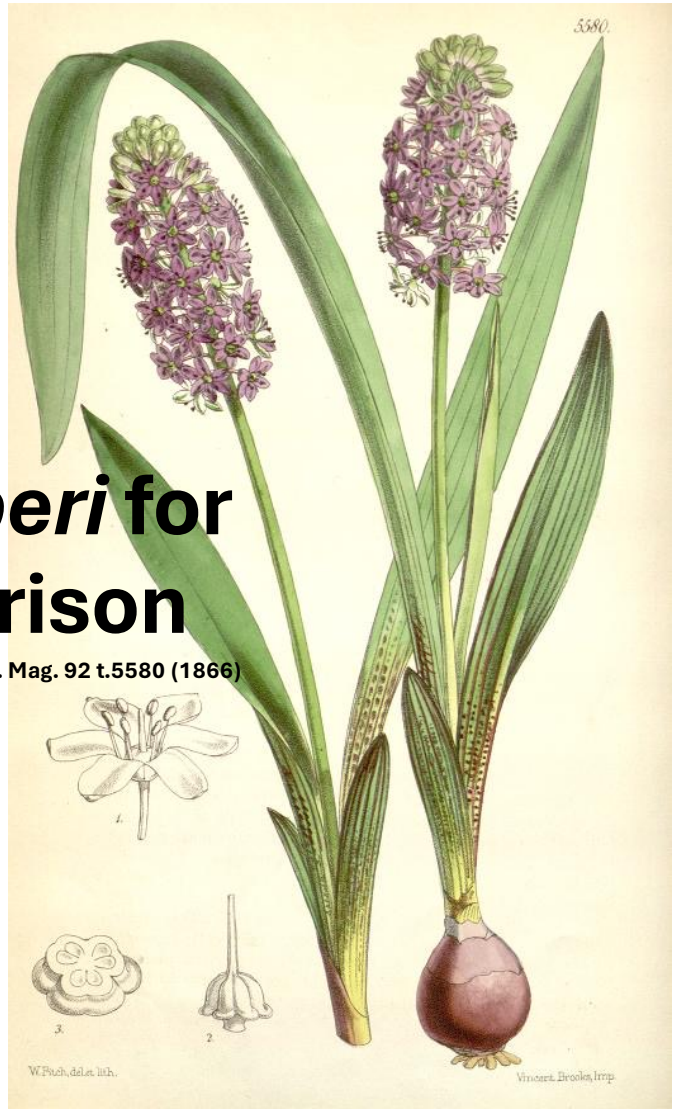
De Berg Nature Reserve

L. altopaludosa



L. cooperi for comparison

Scilla cooperi Hook.f. Bot. Mag. 92 t.5580 (1866)



3. *Ledebouria steenkampsbergensis*

- This species remained misidentified as *L. sandersonii* since the first record dated 1953 by L.E.W Codd in the national herbarium PRE.
- It was even illustrated and hand coloured, although it was never formerly named. Pencil annotation *“L. sandersonii”* by unknown author.
- The species is more closely related to *L. galpinii* based on ovary and leaf morphology.
- It shares the absence of basal lobes on the ovary plus the lacunate pitted maculations with *L. galpinii*

L. steenkampsbergensis

Autecology of *L. steenkampsbergensis*

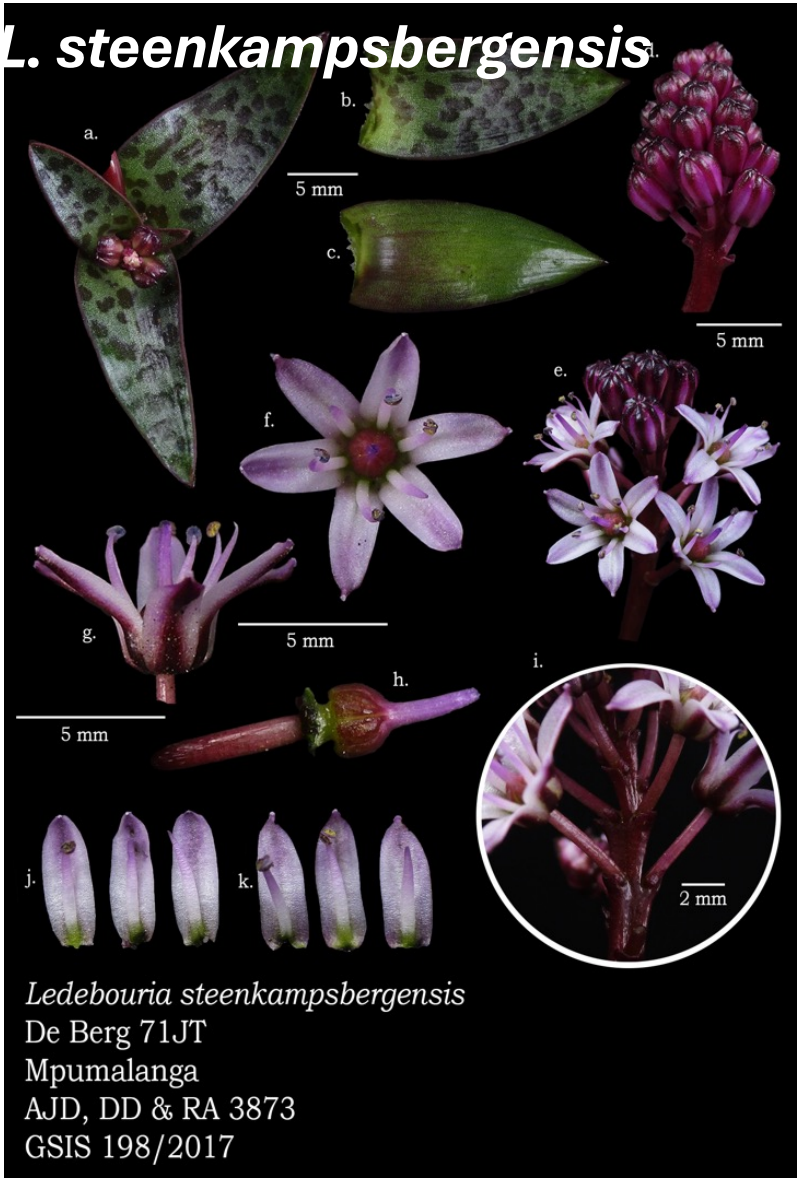
Recorded from 17 sites in the DBNR

Narrow endemic Steenklampsberg subcentre of the Lydenberg Center of Plant Endemism

Restricted to the high altitudes of between 2,202 – 2,330 masl. (highest in Mpumalanga)

Habitat specialist occurring in microhabitats comprised of sparsely vegetated shallow skeletal soils overlying quartzitic bedrock, and at the bases of and in crevices between rocks.

Often found growing amongst *Selaginella kraussiana* and *Bryum* spp. on rock sheets



L. galpinii for comparison

4. *Ledebouria noritica*

- This species was first discovered during the establishment of the DBNR during biodiversity studies being undertaken by the second author in 2020 in remote parts of the reserve.
- The species is superficially similar to *L. cooperii* (*L. saturata form*) from which it can easily be distinguished by several characters most notably the shape of the ovary.
- The ovary shape indicates that species is actually more closely related to *L. sandersonii* and not related to *L. cooperii* at all.

L. noritica

Autecology of *L. noritica*

This species has been recorded from only two sites

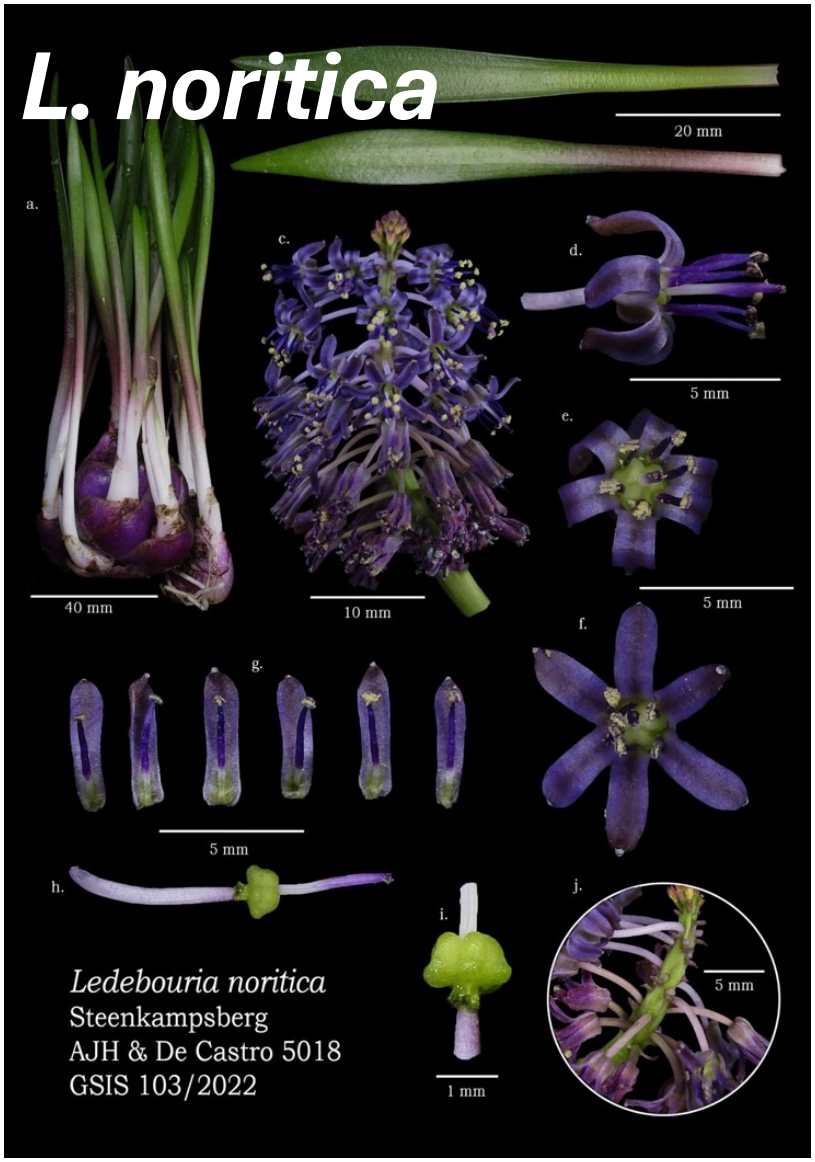
The species is restricted to norite lithology

Narrow endemic to the Sekhukhuniland Centre of Plant Endemism (Siebert 1998, van Wyk & Smith 2001). Mainly within Mpumalanga.

Restricted to sheetrock wetland in gravelley soils overlying norite lithology on west-facing slopes

Altitudes between 1,760 – 1,920masl.

Sekhukhune Montane Grassland vegetation type



L. sandersonii for comparison

References:

- Carel Fourie - is thanked for the colour plates
- Mervyn Lotter - is thanked for the maps
- Sandie Burrows - is thanked for the artwork

For full list of references see :

Hankey, A.J. & A. De Castro 2024. **Four new species of *Ledebouria* Roth. (Hyacinthaceae) from the high altitude grasslands of the Steenkampsberg, South Africa.** Haseltonia 31: 103 -126.

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